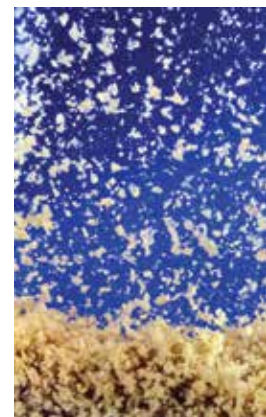# CLEANING UP THE EGG WASHING PROCESS

When a major Egg Washing facility was faced with the problem of biological oxygen demand in their effluent being discharged to sewer, the contacted CETCO engineers for a solution. CETCO's RM-10® clay-based flocculants were recommended and put in place to remedy the problem.

PROJECT DETAILS

Egg Washing Facility

LOCATION

Canada

PRODUCTS USED

RM-10® Flocculants

CHALLENGE:

A client in the egg washing industry, with facilities in central Canada, had a problem that's typical in the food industry. Their large flow of wastewater being discharged to sewer was substantially out of compliance in biological oxygen demand, or BOD. Local and state regulations require companies to maintain their BOD concentration below established levels. Anything above those levels results in a surcharge being applied, relative to the amount of water that the company consumes and consequently discharges.

There are two types of BOD: soluble and insoluble. Insoluble BOD is easier to remove than soluble BOD if you are able to precipitate them out of solution. Soluble BOD is more difficult to treat; it must be oxidized or provided with an active site or area where it can be adsorbed.

This particular facility's wastewater contained large amounts of both types of BOD and was subsequently incurring significant monthly surcharges.With with BOD levels in the range of 3,000 ppm to well over 4,000 ppmand local regulations limiting BOD concentrations in its water to 300 ppm, this company incurred a substantial penalties of around $86,000 per quarter. Aggravating the situation, their typical daily processes were using significant volumes of water — roughly 300 cubic meters per day, With plans for expansion.

CLEANING UP THE EGG WASHING PROCESS

Calculating water costs for our client follows a straightforward formula. With client facing BOD concentrations of 3,000 ppm and the city limit set at 300 ppm, the cost is the difference in concentrations, multiplied by the volume of water discharged, multiplied by the surcharge ($/kg):

Cost =
- Concentration of BOD above the city limit regulation   x
- Volume of water generated   x
- $/kg (set by the city)

For our client, the city cost per kilogram was $1.17 and the allowable BOD limit was set at 300 ppm. Consuming 19 cubic meters of water per hour generated:

19 cubic meters/hour	x 24 hours/day	=	456 cubic meters/day
456 cubic meters/day	x 5 business days/week	=	2,280 cubic meters/week
2,280 cubic meters/week	x 12 weeks/quarter	=	**27,360 cubic meters/quarter**

1 cubic meter = 1000 L ; 27,360 cubic meters = 27,360 KL

Furthermore, client's BOD levels average 3,000 ppm, the city limit is 300 ppm and the cost per Kilogram is $1.17:

3000ppm	–	300 ppm	=	2,700 ppm
2,700	x	(27,360KL/1,000)	=	73,872 over limit
73,872	x	$1.17	=	**$86,430/quarter**

The client approached us in an effort to reduce its overall costs, which were directly impacted by BOD levels and water consumption.

CETCO SOLUTION:
After assessing the client's needs, our engineers recommended CETCO RM-10®, which effectively reduces BOD levels in wastewater.

RM-10 is a single step treatment process composed of a non-hazardous blend of naturally occurring bentonite, pH adjusting agents, polymers and other proprietary components, and offers superior adsorption capabilities of contaminants, including BOD.

CETCO's line of RM-10 clay-based flocculants are available in granular, semi-granular, powdered and liquid varieties, and are especially suited to treat an array of industrial and municipal wastewater.

CLEANING UP THE EGG WASHING PROCESS

Application is generally straightforward: the product delivers a one-step removal of emulsified oil, heavy metals and suspended solids from wastewater streams by the following:

- Chemical components adjust the pH of the water to enhance the precipitation of metals and break oil emulsions
- Bentonite clay particles attract and encapsulate precipitated metallic ions
- The polymeric portion of the formulation attracts remaining oils and suspended solids and then forms a floc, which settles to the bottom of the treatment vessel
- The bentonite clay and polymer work together to create a strong filterable floc, which encapsulates and contains heavy metals through a pozzolanic reaction while at the same time allowing the floc to readily release water, resulting in a drier sludge cake

The entire process is completed in just a few minutes, resulting in clear water that can be discharged directly to a POTW. The sludge and its encapsulated contaminants are highly resistant to leaching and can be generally disposed of as a non-hazardous waste.

Effective and Efficient:
Confirmed by third-party testing, RM-10 can reduce BOD levels by as much as 84%.

At our client's facility, RM-10 treatment reduced BOD levels by 84% on average, resulting in a net BOD average 480 ppm. The resulting cost savings are considerable. The client ended up paying $5,762 per quarter rather than $86,430, **a net savings 93.3%**.

Sustained Savings:
After more than six months and minimal process adjustments, the client continues to save more than 90% in water costs per quarter, the result of its application of RM-10 to its wastewater.

MINERALS TECHNOLOGIES

CETCO®