



Case Study: Chiquita



Project ID:

Company:	Chiquita
Location:	Panama
Year:	2003
Description:	Supply clean water for a Banana Packing plant
Goal:	Ferric, Manganese and Latex Removal from delaxing pools
Capacity:	40 m ³ /hr
Water Source:	A private deep well

The Problems:

- The plant's well water contained Ferric and Manganese.
- The incoming bananas oozed Latex from the cut.
- The combination of the above turned the water color to purple and stained the bananas.
- Water turbidity was above the maximum allowable level.
- Water polluted with germs and fecal coliforms.
- Wastewater were not recycled and created ecological problems downstream.

Parameter	Existing Values	Required Value
Turbidity (NTU)	150	< 10
Coliform Forming Units (CFU/100 ml)	1,500	< 10
Color (CU)	500	< 30
Ferric (mg/l)	1.5	< 1
Manganese (mg/l)	0.4	< 0.2
Latex		Minimize
Water & Energy Cost		Minimize

Technical Solution:

The following processes were carried out:

- Side-stream circulation: Screen Filtration with automatic back wash.
- Oxidation of Ferric, Manganese and Latex into a lamella reactor: Implementing Hydrogen Peroxide with redox control.
- Coagulant dosing in order to agglomerate the oxidized fine particles into bigger flocs.
- Media Filtration: Catalytic Media Filters – implementing AFM[®].

Dryden Aqua's Deliverables:



AFM[®]



ZPM



Air Diffusers



Chemical Dozing



Oxygen Probes



Dryden's Know-how

Delaxing Pools



Lamela-Oxidation-Reactor (L.O.R.)



Lamela-Oxidation-Reactor (L.O.R.) Process



Exterior view of the Catalytic Media Filters



Results:

Parameter	Required Value	Before Treatment	After Treatment	
Iron (mg/l)	< 1	1.5	0.3	✓
Manganese (mg/l)	< 0.2	0.4	0	✓
Color (color units)	< 10	500	10	✓
COD (mg/l)		120	25	✓
Turbidity (NTU)	< 10	150	2	✓
Colony forming units CFU/100 ml	1,500	1,500	10	✓
Appearance of delaxing pools		Purple-black	Clear	✓
Water saving (%)		0	84 %	✓
Electricity saving (%)		0	40 %	✓