

## Water treatment - Aerated lagoon

*Case study: Plant oil factory*

Water is necessary for the fabrication of many products of everyday life such as sugar, oil, paper... However, to use water contributes to its pollution; it is why remediation treatments must be done to limit the impact of polluted waters on the natural environment.

With the fluid discharge standards, industries must find economic solutions to recycle their polluted waters to avoid juridical penalties.

For over 60 years, FAIVRE Group gives advice to industrial companies to help them resolving issues related to the environment.

A plant oil factory located in Africa called FAIVRE to find solution to treat their effluents.

### Context

Palm oil is the main source of vegetable fat. The plant oil mill realizes every step which changes a palm in fruits, fibers, juices, oil, sludge, almonds...

A succession of different steps is made according to the following steps, in order to transform the palm:

- The stalk is collected after being scraped and represents 20 to 25% of the total bunch weight coming into the plant oil factory. Those stalks contain 60 to 70% of water and must be evacuated continuously.
- The effluents are made of condensates, sludge clarification and diverse types of washing and purging steps...
- The risks of pollution are very high into a plant oil mill so it is indispensable to treat the liquid discharges full of organic loads.

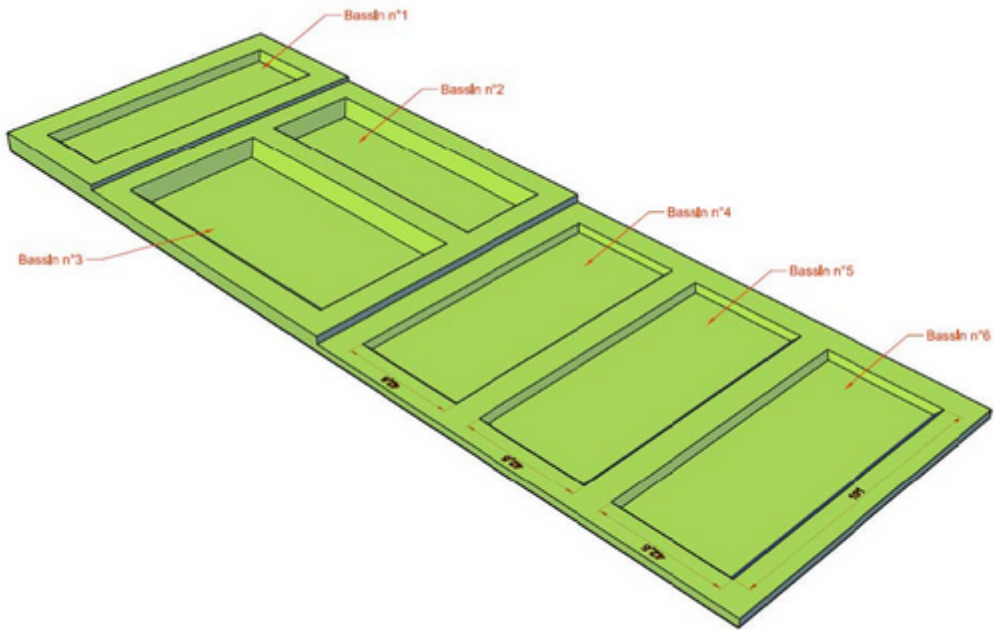
### Study of the issue

The unity of the palm oil production is submitted to the following fluid discharge standards:

Parameters	Values of the rejects (mg/L)
Oil and fat	10
BOD (Biologic Oxygen Demand)	100
COD (Chemical Oxygen Demand)	300
Suspended matters	50

The treatment system is divided in 6 ponds:

- The 1st pond is a cooling pond
- The 2nd and 3rd ponds are anaerobic treatment ponds
- The 4th - 5th - 6th ponds are natural lagoons



The yield of the initial installation gives the following results:

Parameters	Values of the rejects (mg/L)
Oil and fat	158
BOD (Biologic Oxygen Demand)	672
COD (Chemical Oxygen Demand)	2400
Suspended matters	150

We obviously see that the plant oil mill is off-standards and the factory must find an adapted solution to treat its waste water.

### Measures and advice

This study was about the dimension of the aeration area via some surface aerators on the 4th and 5th ponds while the 6th pond has a decanting role.

The important organic load level coming in the 4th pond has been fixed with the installation of 3 FLOPULSEs. The 5th pond (which receives the benefit of purification from the 4th pond) needed the installation of 2 FLOPULSEs.

The whole material was settled and exploited during a year.

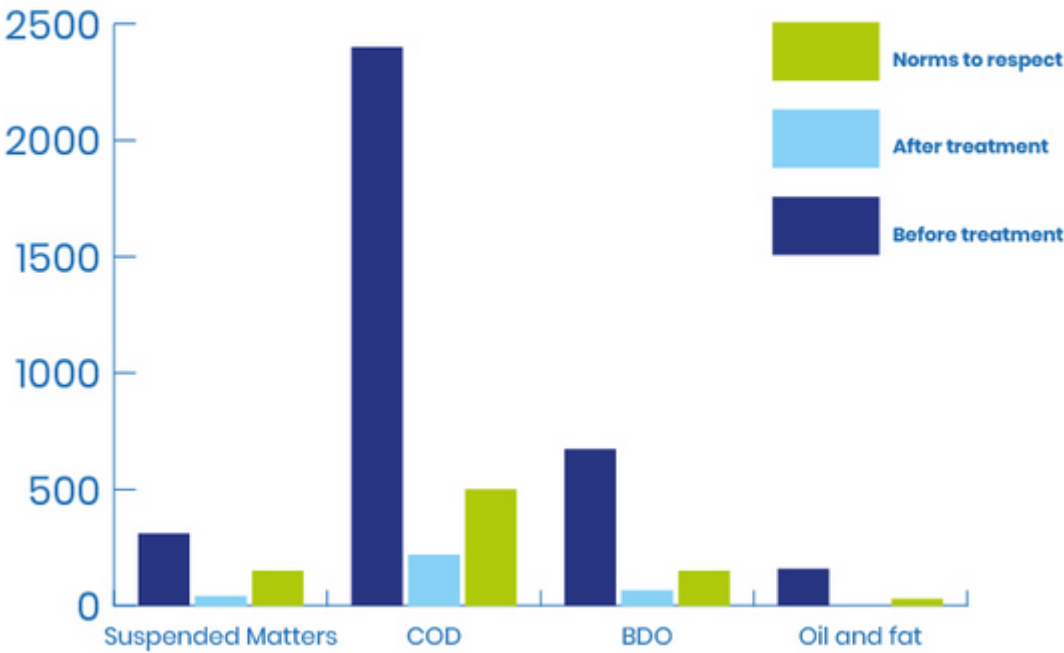


### Results after a year of exploitation

The solution settled by FAIVRE Group has permitted to the plant oil factory to become on-standards with the following results:

	Before treatment	After treatment	Standards to respect	Purifying standards
<b>Suspended Matters</b>	310	41	150	86,8 %
<b>COD</b>	2400	219	500	90,9 %
<b>BOD</b>	672	66	150	90,2 %
<b>Oil and fat</b>	158	0,5	30	99,7 %

**Performance of the lagoon after installation of the Faivre treatment**



**Conclusion**

With a purifying yield between 87 and 99%, the solutions brought by FAIVRE have permitted to the plant oil factory to become on-standards. With an optimized study, only 5 FLOPULSES 44kW have been necessary to obtain those results.