

# REMEDICATION OF INDUSTRIAL HAZARDOUS WASTEWATER ©



## The Problem

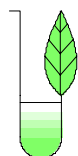
Oil/water emulsions that result from the use of cooling lubricants as well as from the cleaning of oiled surfaces belong in the category of hazardous waste. These wastewaters are contaminated not only with hydrocarbons, but also often with heavy metals and halogenated hydrocarbons as well. Companies who accrue such wastes are faced with the difficult problem of economically treating these wastewaters to meet water regulations for release into sewers.

## The Solution

Stage by stage, the various hazardous pollutants is extracted during the real time treatment process. Over the last eleven years, our proven track record documents that this innovative process is not only extremely economical but also efficient and reliable. Last, but not least, the low operating costs make this an ideal solution for wastewater disposal companies and industries that have large amounts of wastewater needing to be disposed of.

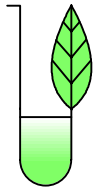
## The Process

The hazardous wastewater treatment plant pictured above was built for a disposal company for the treatment of used emulsions such as cooling and synthetic lubricants. The plant purifies the water in three stages. It has a treatment throughput capacity of 10 m<sup>3</sup>/h and is equipped with a programmable logic controller (PLC) for fully automated operation. Its modular construction makes it flexible to suit each customer's individual requirements.



**Malhis Engineering**

Environmental and Chemical Technologies



## Stage I

### Emulsion Breaking

In the first stage the emulsion is chemically broken after adding an organic demulgator. The resulting oil sludge is then brought to the surface through our advanced dissolved air flotation (ADAF) and skimmed off in the first flotation tank. In this treatment stage 99% of the hydrocarbons are thus removed. The oil sludge can then be recycled.

## Stage II

### Precipitation / Flocculation

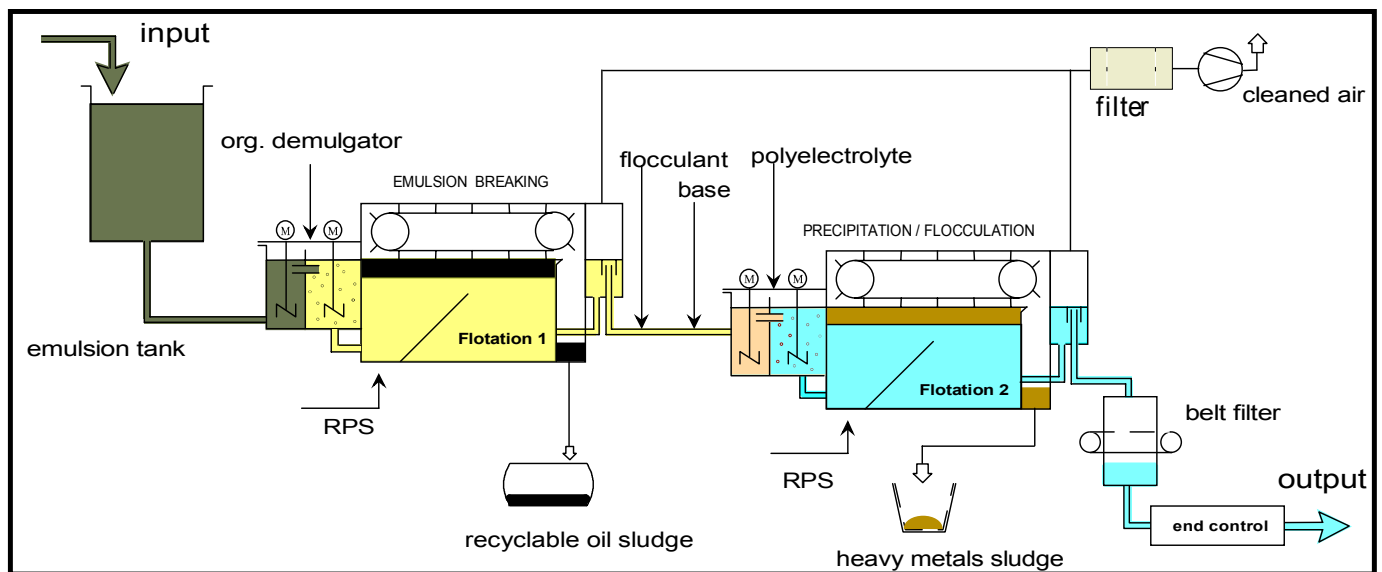
This treatment stage removes dissolved heavy metals by precipitation / flocculation. The process is carried out by adding a suitable flocculants, base and polyelectrolyte. The resulting heavy metal sludge is then separated in the second ADAF tank. This stage removes 99% of the remaining pollutants (heavy metals, suspended solids and partially dissolved organic compounds).

## Stage III

### Filtration

Particles that are not removed in the second flotation tank are separated with a band filter. The water then passes the end control where the parameters pH, temperature, electrical conductivity and integral flow are measured and documented by a multi channel printer.

The water quality now surpasses sewer discharge regulations.

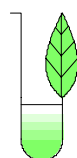


### Advantages of this Process:

- Real time treatment
- Very economical and cost effective
- High purification performance
- Flexibility due to modular construction

### Furthermore we provide Consulting, Engineering & Construction for:

- Waste remediation
- Wastewater remediation
- Recycling of wastewater
- Purification of spent air/gas and odor control



**Malhis Engineering**

Environmental and Chemical Technologies

Feldstrasse 38, 24105 Kiel, Germany. Phone +49- (0)431- 2 59 69 46. Fax +49- (0)431- 2 59 69 47

Email: [info@malhis-engineering.com](mailto:info@malhis-engineering.com), [www.malhis-engineering.com](http://www.malhis-engineering.com)