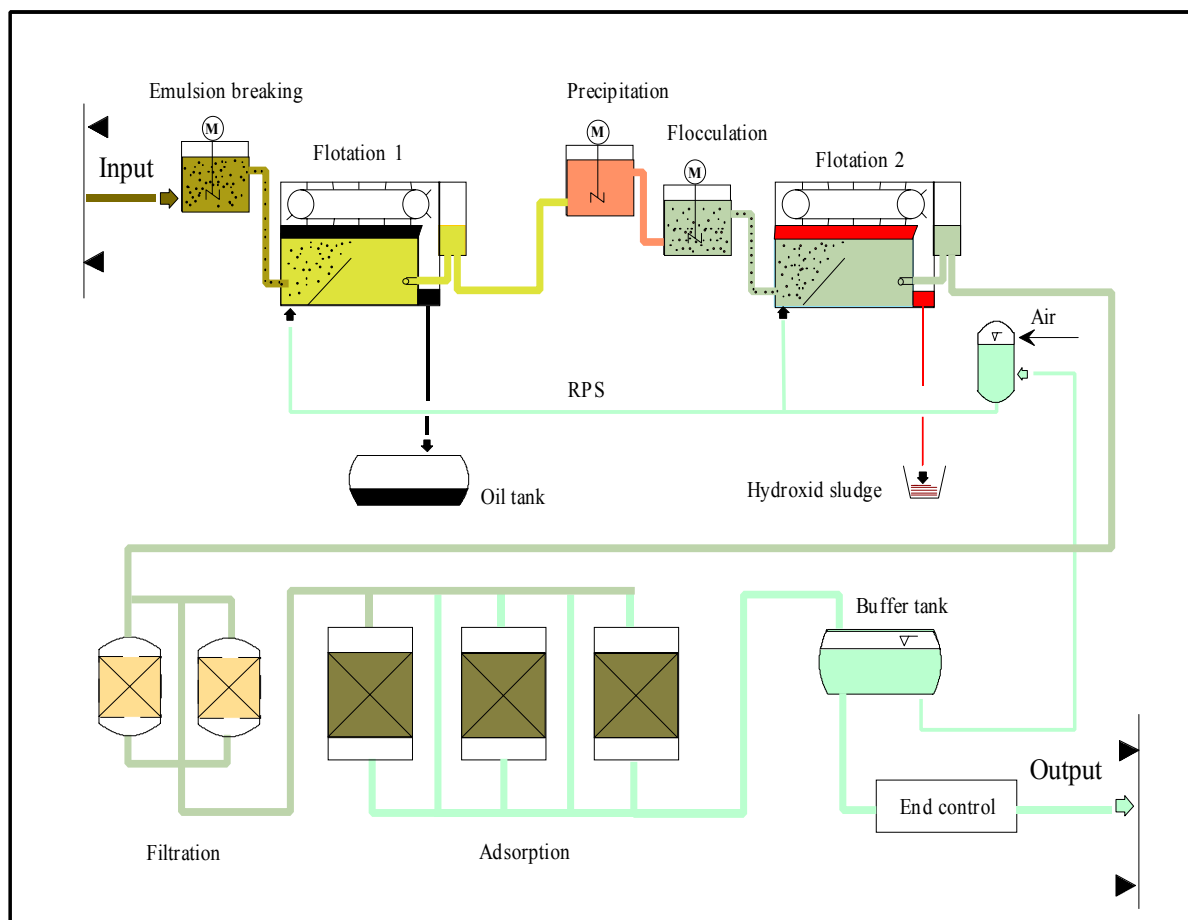


Economical Treatment of Hazardous Wastewater

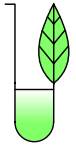
Hazardous Wastewater such as oil-water emulsions resulting and oil-water mixtures resulting from cleaning of oil tanks is a special waste. This kind of waste is contaminated not only with hydrocarbons but also with heavy metals and probably also with halogenated hydrocarbons. Disposal companies and companies, who have to treat this kind of waste are obligated to comply with the local regulations for indirect discharge.

The treatment costs depend very much on the disposal costs of the remains, which would occur as a result of the treatment. Therefore an economical and successful treatment should consider the use a combination of several treatment stages for separation the waste mixture in recyclable groups. This brochure describes a hazardous liquid waste treatment plant with a capacity of 7 m³/h. The significance of combined technologies would be recognised as a requirement for an economical and a successful treatment.

Apart of a mechanical treatment stage that separates solids and free oil from the emulsion phase, there are additional four chemical physical treatment stages. They are schematically shown in the following figure.



Chemical Physical Treatment (CPT) of liquid special waste.



In the first treatment stage the emulsion is broken chemically after adding an organic demulgator. The resulting oil sludge is separated within the first dissolved air flotation unit. This treatment stage removes ca. 98 % of contaminants in form of oil. The removed of this high amount of oil will relieve the next treatment stage dramatically and allow the recycling of removed oil.

In the second treatment stage all heavy metals will be removed via simultaneous precipitation and flocculation. The resulting sludge will be skimmed off in the second flotation unit. This treatment unit removes ca. 99% of the remaining contaminants.

The third treatment stage is a sand filtration. View particles that are not completely separated in the second flotation unit will be removed. This is important to have a particle free water to be treated within the adsorption unit (activated carbons). The last treatment stage is adsorption using activated carbons. It is an optional treatment to remove dissolved contaminants such as halogenated hydrocarbons.

The costs of this treatment process are minimised, because the remaining emulsified oil is a volatile product and the remaining heavy metal sludge is minimised after separation of hydrocarbons. The activated carbon stage would be used just for removal of halogenated hydrocarbons therefore is the consumption very low.

The purified water can be safely discharged into the sewer or used for several cleaning purposes due to its high quality.

Advantages of the process

- Separation of contaminants for recycling
- High purification performance
- Low operation costs
- Flexibility due to modular construction
- Affordable investment costs



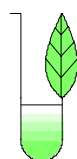
View of both flotation stages in the 1. floor



View of the filtration and adsorption treatment stages in the ground floor.

Furthermore We Provide Consulting, Engineering & Construction for:

- Pollution prevention
- Wastewater treatment
- Spent gas purification
- Remediation of contaminated soil
- Recovery of recyclables



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