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Environmental Impact Assessment of drilling waste

Javad Tabatabaei

Department of Geology, Meymeh branch, Islamic azad university, Meymeh, Iran

Oil and gas development and its effects on nature, environmental guards were forced to make strong laws to protect and support of environment in the national and international level. In drilling industry that is one of the major industries of the upstream oil and gas, prevention and control of drilling fluids and cuttings obtained is important. During drilling operation, from exploration to production, various wastes produced, that each of them in the way are threatened for human, flora and fauna. This wastes can be divided to a variety of produced water, drilling wastes and related wastes. Typically, produced water to be included about 98% of total wastes flow. While drilling fluids and cuttings make up 2% of its remaining. In this paper, the toxicity of these wastes and their effects on man, plants and ecosystems is studied.

If a substance is highly toxic, only low concentrations of it can be fatal, and therefore lethal concentration values (LC50) and lethal doses (LD50), will be low. All drilling mud have undesirable components that potentially can have a marked effect on the environment. Drilling mud toxicity is significantly depends on its composition.

Environmental impacts of drilling wastes includes: hydrocarbons, salts, and heavy metals, that affects on marine organisms, ecosystems, human health, and growth of plants.

The results of tests measuring the toxicity shows, the oil-based fluids have different biological degradation rates and degradation rate have inversely proportional to the concentration of oil-based drilling fluid in the sediment (cuttings). The aerobic degradation occurs much faster than anaerobic, and the type of deposits (cuttings) are effective on destruction rate.

The main impact is on the sea floor organisms in limit of 500 m and especially in the place of cutting sedimentation in sea floor. Hydrocarbons in oil-based fluids to a distance of 4,000 meters in the direction of sea currents have been observed. Using environmentally friendly fluids that are generally silicate-based fluids, can decreased environmental effects of fluids and drill cuttings

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