



Study of risks associated with the migration of toxic pollutants in groundwater in the humid tropical zone: The case of Abidjan District (Côte d'Ivoire)

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Groundwater is the main source of drinking water for people in Abidjan District. This District is located on the coastal sedimentary basin of Côte d'Ivoire. Groundwater extracted from drillings and wells in geological formations consisting mainly of quaternary sand and silt, sandy clay with few levels of mottled clays. The region's climate is humid equatorial with up to 2,000 mm an annual rainfall and an average relative humidity between 80 and 90%.

In the night of August 19, 2006, Abidjan District was victim of the spill of about 400,000 liters of toxic waste from the "Probo Koala" ship at various points. Analyses made by the Ivorian Anti-Pollution Centre have revealed that these wastes were composed of a very high content of hydrogen sulfide, organochlorines, sulfur, mercaptan sulfur, and hydrocarbons such as olefins and paraffins. According to the Ministry of Public Health, the dumping of waste caused a large number of poisoning (30,000 people) with more than ten fatalities, several cases of miscarriage, deformities and damages on the ecosystems.

The appreciation of the cleanup initiated by the Government of Côte d'Ivoire may be insufficient in terms of environmental protection. The fraction of the liquid waste that leaked into the soil with water infiltration could reach groundwater. Few studies were carried out to evaluate the human health consequences and the environmental impact of the discharge of these wastes. It is therefore important to conduct thorough investigations to assess the risk posed by these pollutants to the Abidjan population and especially to the groundwater.

This study involves data collecting from Ivorian authorities, data processing, physico-chemical analysis of soil and groundwater; moreover geological and hydrogeological models will be proposed. Results of this research will show the pollutants which still persist in the soil, the risk areas for public health, drillings that may be contaminated by these pollutants in the medium and long term, the deterioration of the physicochemical quality of groundwater, and the transfer time of pollutants.