

## Assessment of Water Quality and Bottom Sediment in the Coastal Area in State of Kuwait – A Case Study

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### ABSTRACT

The three refineries (Mina Abdullah, Mina Al-Ahmadi, and Mina Shuaiba) plays a major role for the oil industries in Kuwait as one of the greatest central locations along the coast of Kuwait for its transportation of oil and its products composition. The three refineries decompose oil into many product such as Naphtha, Kerosene, High Speed Diesel (HSD), European Gas Oil (EGO), Marine Diesel Oil (MDO) and High Sulfur Fuel Oil (HSFO). These products can cause high pollution if they are in contact with water or sediments and may cause a large environmental impact. This study will focus on analyzing the geochemistry of the water quality and sediments. Five water and five sediment samples were collected from a line of 1000 m length along the sea with a distance between each sample 200 m away. Physio-chemical parameters (Temperature, Salinity, Conductivity, pH, Dissolved Oxygen), Inorganic nutrients (N-NH<sub>3</sub>, N-NO<sub>2</sub>, N-NO<sub>3</sub>, P-PO<sub>4</sub>, Si-SiO<sub>3</sub>), Total Suspended Solids, Total Petroleum Hydrocarbons and Trace Metals (Pb, V, Cu, Fe, Ni) were measured in water samples. The Sediments were analyzed determine TOC, TPH and trace metals contents. Several sources of pollutants were found alongside the three refineries. These sources were mostly from the refineries sites, ports, storm outlet, oil pipeline transportation, and commercial ships entering toward some refineries. The most stations of pollution were discovered in Mina Abdullah refinery. It is recommended to make regular surveillance and monitoring for water quality and sediments, specific inspection of waste disposal on board ship while waiting to enter the port, the time permitted for vessels should not exceed three days of standby mode, the Ministry of Public Works should meet the terms with KEPA regulation for controlling discharge of untreated sewage into the sea, any illegal discharge of industrial waste into the emergency storm drain outlet should be punished by law and inspire marine researches on water quality hydrodynamics, bottom sediments and fisheries.