

COMPARISON OF WATER QUALITY STATUS AROUND THE EXPLORATORY DRILLING LOCATIONS IN GULF OF MANNAR: BEFORE AND AFTER DRILLING

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The study intended to carry out environmental monitoring for the exploratory petroleum drilling operations proposed in the Gulf of Mannar during pre and post drilling operations. Objective of this study was to carry out baseline studies during pre and post drilling phases to determine the impact of the marine environment.

The study was carried out from January to December 2013 including pre and post drilling operations in Gulf of Mannar. Water sampling was conducted at different depths at five locations in the open sea including the drilling locations. In-situ analysis were carried out for the determination of pH, which was measured using a pH meter, conductivity, total dissolved solids (TDS) and salinity were measured using a portable multi range conductivity meter, and turbidity was measured using portable meter. In addition, Biological Oxygen Demand (BOD) was measured using BOD sensors.

Furthermore, the collected samples were analyzed in accordance with the Standard Methods for Examination of Water and Waste Water (APHA 21st edition) for nutrients and significant trace elements namely Cadmium (Cd) Copper (Cu) Manganese (Mn), Zinc (Zn), Lead (Pb), Nickel (Ni), Barium (Ba), Chromium (Cr) and Mercury (Hg) were also measured.

Overall water quality of the pre drilling and post drilling locations respectively are as follows; Dissolved Oxygen (7.26 ± 0.7 mg/l) (5.95 ± 0.45 mg/l), BOD (24.73 ± 2.55 mg/l) (26.85 ± 3.11 mg/l), EC (53.49 ± 0.24 mS/cm) (52.44 ± 0.18 mS/cm), pH (8.9 ± 0.10) (8.26 ± 0.04), Turbidity (1.37 ± 0.68 NTU) (1.51 ± 1.00 NTU), Phosphate (0.54 ± 0.18 mg/l) (2.36 ± 1.87 mg/l) Nitrate -N (0.73 ± 0.19 mg/l) (0.03 ± 0.03 mg/l) and Salinity (35.40 ± 0.17 ppt) (34.57 ± 0.08 ppt) .

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Results revealed that recorded average turbidity values, BOD and Phosphate concentrations in after drilling operations were slightly higher than before drilling operations. However, there were no distinct changes detected for targeted trace elements at all selected locations before and after drilling operations.

Key words: *Water quality, Trace elements, Gulf of Mannar, Petroleum drilling*