



The hydrocarbons, usually methane, locked in solid forms within the Gas Hydrates present in the Eastern Mediterranean sea floor: characteristics, formation and impacts

C. Perissoratis (1), V. Lykousis (2), Chr. Ioakim (1)

(1) Institute of Geology and Mineral Exploration, Athens 11527, Greece, prs@igme.gr,

(2) Hellenic Centre of Marine Research, Mavro Lithari, Anavyssos, Greece

The “ANAXIMANDER” project (2003-2005) funded by EU surveyed the N.E. Mediterranean, where gas hydrates (GH) and deep biocommunities are present. For this purpose conventional and autoclave (were earlier reported ‘pristine’) cores were collected, sub-sampled and studied, in order to describe this extreme environment found in the Mediterranean Sea , one of the most vulnerable ocean basins in Europe and world wide. The study lead to the identification of many GH bearing Mud Volcanoes (MV), three already known from earlier researches and two discovered during this project. The periodicity of eruption in at least one MV was estimated at 10,000 yr BP. GH were sampled from seafloor sediments at water depths from 2250m to 1260m. Those occurring at shallower seawater depth are placed in the uppermost boundary of the GH stability curve. The methane concentrations were found to be between 2 and 4 mmol/kg wet sediment, classified as a mixture of biogenic and thermogenic gas. The Anaerobic Oxidation of Methane (AOM) occurs in the upper few cm of the sea floor sediment. The methane is further consumed by aerobic methane oxidation. The probability that a geological hazard (Great slides, MV eruptions, tsunamis) could take place is rather low, due mainly to the great sea depth the GH occurs. Also the quantity of methane and the GH density suggest that this GH field does not have at presence economically sound prospects as an energy source These new results provide the necessary information for the role of GH as a potential threat for vulnerable areas such as the Eastern Mediterranean and the technological and experimental approach used can be applied effectively to other areas in Europe where GH have being identified ,a

subject of the on going EU funded “HERMES” project . In realizing these new targets ,further extensive palaeoenvironmental investigations (including micropalaeontological and sedimentological evaluation) will be conducted at certain cores now present or collected in the future of the “HERMES “project from the Anaximander and other European seas.