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***Effects of Oil and Gas Exploration and Development
at Selected Continental Slope Sites in the Gulf of Mexico
Volume I: Executive Summary, Volume II: Technical Report,
and Volume III: Appendices***

OCS Study MMS 2006-044, 2006-045, and 2006-046

The Minerals Management Service (MMS), Gulf of Mexico OCS Region, announces the availability of a new study report, *Effects of Oil and Gas Exploration and Development at Selected Continental Slope Sites in the Gulf of Mexico*, [Volume I: Executive Summary](#), [Volume II: Technical Report](#), and [Volume III: Appendices](#).

This report presents results of a large multidisciplinary study conducted between November 2000 and August 2002 to assess benthic impacts of drilling at four sites on the Gulf of Mexico continental slope. Water depths ranged from 1,033 to 1,125 m. Objectives and results include the documentation of drilling mud and cuttings accumulations, physical modification/disturbance of the seabed caused by anchors and their mooring systems, debris accumulations, physical/chemical modifications of sediments, and effects on benthic organisms. One exploration site was sampled before and after drilling, one site was sampled after both exploration and development drilling, and two sites were sampled after several exploration and development wells were drilled. Results include geophysical mapping of sites using data obtained from an autonomous underwater vehicle (AUV) and extensive chemical/biological sampling, including sediment profile imaging, invertebrate tissue analysis from baited traps, and spatial variations of macrofauna and meiofauna and microbial densities.

Specific conclusions from the results are wide ranging and cannot be detailed in this announcement. In general, most impacts were directly related to the dispersal of well cuttings and any associated drilling muds. The accumulation of muds and cuttings on the seabed could be detected through geophysical and chemical measurements that indicated deposition primarily within a 500-m near-field sampling zone with the greatest distance of approximately 1,000 m. Areas with cuttings and associated synthetic drilling muds were associated with higher total organic carbon and patchy anoxic condition of the sediment. The organic enrichment resulting from associated synthetic drilling muds resulted in patchy zones of disturbed benthic communities. Some benthic animal groups had reduced densities and diversity within the near-field discharge areas but others were represented by much higher densities including fishes,

polychaete worms, gastropod molluscs, and meiofauna. Sediment metals were slightly elevated in some near-field samples compared with far-field control sites but were within the expected range of background concentrations of uncontaminated marine sediments. Mercury concentrations in the barite associated with discharged drilling fluids were calculated to be within the U.S. EPA regulations of 1 part per million. Two trapped animal species, a large isopod and the red crab, did not show any differences in polycyclic aromatic hydrocarbon concentrations when compared between near- and far-field sites. Metals in these animals were also measured and the only consistent finding was elevated barium in near-field samples from two sites. This was concluded to likely be due to particles of sediment in the gut with consistent research demonstrating very low bioavailability. Mercury in the two animals was low but showed the only significant elevated values farther from drilling than near-field in all cases.

This report is available only in compact disc format from the Minerals Management Service, Gulf of Mexico OCS Region, at a charge of \$15.00, by referencing OCS Study MMS 2006-044, 2006-045, and 2006-046. The report may be downloaded from the MMS website through the [Environmental Studies Program Information System \(ESPIS\)](#). You will be able to obtain this report also from the National Technical Information Service in the near future. Here are the addresses. You may also inspect copies at selected Federal Depository Libraries.

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