

Technical Announcement

MMS

U. S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Region

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Study of Barite Solubility and the Release of Trace Components to the Marine Environment

OCS Study MMS 2007-061

The Minerals Management Service (MMS), Gulf of Mexico OCS Region, announces the availability of a new study report, *Study of Barite Solubility and the Release of Trace Components to the Marine Environment*.

Barite (BaSO_4) is used extensively as a component of drilling fluids. A variety of trace metals may be present as impurities in the barite. When drilling fluids are discharged to offshore waters, the concentrations of these trace metals may become elevated above natural background levels in the sediments adjacent to the drilling sites. The trace impurities copper (Cu), lead (Pb), and zinc (Zn) are common. Mercury (Hg) and cadmium (Cd) concentrations are limited to 1 part per million (ppm) Hg and 3 ppm Cd in barite that may be discharged. Mercury is of special concern because, under certain environmental conditions in the Gulf of Mexico region, mercury may accumulate in fish.

This four-part study was designed to gather data to describe trace metals concentrations in barite and the environmental conditions that would cause their release from the barite to the environment. The study used barites that meet and exceed the current permissible trace metals concentrations. Mineralogic analysis was performed to determine which minerals within the barite contained the trace metals. The solubility of barite and its trace metals in seawater under static and flow-through conditions was examined. Experiments were conducted to determine the change in concentration of barium and other trace metals in pore water from oxic and anoxic sediment amended with barite. Lastly, experiments to simulate dissolution of barite and trace metals in acidic solutions of the digestive tract were performed.

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 2007-061. 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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