

**"ENVIRONMENTAL AND ECONOMIC ASSESSMENT OF  
DISCHARGES FROM GULF OF MEXICO REGION  
OIL AND GAS OPERATIONS"**

Contract Number: DE-AC22-92MT92001

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## **EXECUTIVE SUMMARY**

Task 2 (Preparation of the Sampling and Analysis Plan) activities involved revisions and additions to the Sampling and Analysis Plan. Task 3 (Environmental Field Sampling and Analysis of NORM, Heavy Metals, and Organics) work included analyses of water, sediment, and tissue samples as well as data management. Task 4 (Monitoring of the Recovery of Impacted Wetland and Open Bay Produced Water Discharge Sites in Coastal Louisiana and Texas) activities involved the continued analyses of samples and conducting field sampling at Bay de Chene. Task 5 (Assessment of Economic Impacts of Offshore and Coastal Discharge Requirements on Present and Future Operations in the Gulf of Mexico Region) activities included preparing a draft final report and review by the Scientific Review Committee (SRC). Task 6 (Synthesis of Gulf of Mexico Seafood Consumption and Use Patterns) work involved the preparation of the draft final report and review by the SRC. Task 7 (Technology Transfer Plan) activities involved the presentation of four papers. Task 8 (Project Management and Deliverables) activities involved the submission of the necessary reports and routine management.

## **INTRODUCTION**

This report represents the twelfth quarterly technical summary, the third Yearly Technical Progress Report, and the third Summary Report for the study "Environmental and Economic Assessment of Discharges from Gulf of Mexico Region Oil and Gas Operations." Activities associated with Tasks 2 through 8 are discussed in this report.

## PROJECT DESCRIPTION

Continental Shelf Associates, Inc. (CSA) was contracted to conduct a three-year study of the environmental and health related impacts of produced water and sand discharges from oil and gas operations. Data on naturally occurring radioactive materials (NORM), heavy metals, and hydrocarbons in water, sediment, and biota will be collected and evaluated. Health related impacts will be studied through field collections and analyses of commercially- and recreationally-important fish and shellfish tissues. Additionally, information on seafood catch, consumption, and use patterns for the Gulf of Mexico will be gathered and analyzed. The facilities to be studied will include both offshore and coastal facilities in the Gulf of Mexico. Coastal sites will be additionally studied to determine ecological recovery of impacted wetland and open bay areas. The economic impact of existing and proposed effluent federal and state regulations will also be evaluated.

The primary objectives of the project are to increase the base of scientific knowledge concerning (1) the fate and environmental effects of organics, trace metals, and NORM in water, sediment, and biota near several offshore oil and gas facilities; (2) the characteristics of produced water and produced sand discharges as they pertain to organics, trace metals, and NORM variably found in association with the discharges; (3) the recovery of four terminated produced water discharge sites located in wetland and high-energy open bay sites of coastal Louisiana and Texas; (4) the economic and energy supply impacts of existing and anticipated federal and state offshore and coastal discharge regulations; and (5) the catch, consumption and human use patterns of seafood species collected from coastal and offshore waters. The products of the effort will be a series of technical reports detailing the study procedures, results, and conclusions which contribute to the transfer of technology to the scientific community, petroleum industry, and state and federal agencies.

## PROJECT STATUS

Task 2 activities involved revisions and additions to the Sampling and Analysis Plan.

Task 3 activities included the completion of the laboratory analyses of the samples and data management.

Task 4 activities involved the completion of the second post-termination sampling of the Bay de Chene discharge site. Due to continued delays in the termination schedule of the Four Isle Dome site and the requirement to complete this program by June 1996, no post-termination sampling will be conducted at the Four Isle Dome site. Laboratory analyses of the Delacroix Island second post-termination samples were completed. Laboratory analysis of the second post-termination samples of the Bay de Chene discharge site are in progress. Ninety-three additional benthic infauna replicates are being analyzed from the Bay de Chene and Delacroix Island sites. Tissue samples were analyzed for radium concentrations from the Bay de Chene site.

Task 5 activities involved the completion of the draft report and review by the Scientific Review Committee (SRC).

Task 6 activities involved the completion of the draft report and review by the Scientific Review Committee (SRC).

Task 7 activities included a presentation by Dr. David Gettleson at the Minerals Management Service 14th Annual Information Transfer Meeting for the Gulf of Mexico OCS Region. Activities also involved a presentation by Dr. John Trefry et al. of a paper in Istanbul, Turkey entitled "Distribution and Bioaccumulation of Heavy Metals from Produced Water Discharges in the Gulf of Mexico." Two papers were also presented at the Society of Petroleum Engineers meeting in Houston, Texas. Dr. Al Hart et al. presented a paper entitled "Naturally Occurring Radioactive Materials Associated with Produced Water Discharges from Production Platforms in the Northwestern Gulf of Mexico," and Dr. Maureen Mulino et al. presented a paper entitled "Delineation of Biological Impact and Recovery of Selected Produced Water Discharges in Inshore Louisiana." Additional activities included the development of several abstracts for submittal to an upcoming conference entitled International Seminar on Produced Waters.

Task 8 activities involved the submission of the required reports, project management and cost plans, and routine management. A letter was also provided to Ms. Patricia Godley (DOE Assistant Secretary, Office of Fossil Energy) regarding the importance of this project to private industry.

## PLANNED ACTIVITIES

Task 3 activities will include data analysis and initiation of report writing.

Task 4 activities will include the continued taxonomic analysis of the benthic infauna samples. It is currently being determined whether there was sufficient tissue collected for analysis of radium concentrations from the Bay de Chene site during the second post-termination sampling.

Task 5 activities will involve reviewing and responding as appropriate to the SRC comments.

Task 6 activities will involve reviewing and responding as appropriate to the SRC comments.

Task 7 activities will include preparing manuscripts for the proceedings publication and making the following presentations at the 1995 International Seminar on Produced Water:

- US DOE Study - Environmental and economic assessment of discharges from Gulf of Mexico region oil and gas operations: An introduction.
- Naturally occurring radioactive material associated with offshore produced water discharges in the Gulf of Mexico.
- Bioaccumulation of heavy metals from produced water discharges to the Gulf of Mexico
- An ecological risk assessment for polycyclic aromatic hydrocarbons in produced water discharges to the western Gulf of Mexico, USA.
- Delineation of benthic impact and recovery at two produced water discharge sites in inshore Louisiana.
- Distribution of finfish caught near oilfield structures along coastal Louisiana and Texas.

Task 8 activities will include the submission of all required reports.

## **SUMMARY**

Task 2 activities involved revisions and additions to the Sampling and Analysis Plan. Task 3 work included analyses of water, sediment, and tissue samples as well as data management. Task 4 activities involved the continued analyses of samples and conducting field sampling at Bay de Chene. Task 5 activities included preparing a draft final report and review by the Scientific Review Committee (SRC). Task 6 work involved the preparation of the draft final report and review by the SRC. Task 7 activities involved the presentation of four papers. Task 8 activities involved the submission of the necessary reports and routine management.

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