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"T-R Cycle Characterization and Imaging: Advanced Diagnostic Methodology for Petroleum Reservoir and Trap Detection and Delineation"

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Abstract

The principal research effort for Year 3 of the project is to classify the known petroleum reservoirs in the Mississippi Interior Salt Basin by using a sequence stratigraphic framework based on T-R sequence terminology, to formulate exploration strategies for identifying specific facies with reservoir potential and for identifying possible stratigraphic traps using a sequence stratigraphic model in combination with the discovered reservoir classification, and to use these exploration strategies to assess the potential for underdeveloped and undiscovered petroleum resources in the Mississippi Interior Salt Basin.

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"T-R Cycle Characterization and Imaging: Advanced Diagnostic Methodology for Petroleum Reservoir and Trap Detection and Delineation"

Second Quarter Report for Year 3
December 1, 2005 – February 28, 2006

Introduction

The University of Alabama, Wichita State University and McGill University have undertaken a cooperative 3-year research project involving the characterization and modeling of transgressive-regressive (T-R) cycles to facilitate exploration for underdeveloped and undiscovered petroleum resources associated with stratigraphic traps and with specific facies in continental and coastal geologic systems that have reservoir potential.

Executive Summary

The principal research effort for Year 3 of the project is to classify the known petroleum reservoirs in the Mississippi Interior Salt Basin by using a sequence stratigraphic framework based on T-R sequence terminology, to formulate exploration strategies for identifying specific facies with reservoir potential and for identifying possible stratigraphic traps using a sequence stratigraphic model in combination with the discovered reservoir classification, and to use these exploration strategies to assess the potential for underdeveloped and undiscovered petroleum resources in the Mississippi Interior Salt Basin.

Project Objectives

The objectives of the project are to develop through T-R cycle characterization and modeling a sequence stratigraphic predictive model that can be used for improved petroleum trap and reservoir imaging, detection and delineation by using the characteristics and geometries of T-R cycle units and their associated bounding surfaces to provide a reliable and advanced approach for targeting stratigraphic traps and specific reservoir facies associated with continental and coastal plain geologic systems and to demonstrate the importance of using the concept of T-R cycles in the formulation of advanced exploration strategies in the search for underdeveloped and undiscovered petroleum resources associated with subtle stratigraphic traps and with specific continental and coastal plain reservoir facies.

Experimental

Work Accomplished

Exploration Strategy Development—The formulation of exploration strategies for identifying specific facies with reservoir potential and for identifying possible stratigraphic traps using a sequence stratigraphic model in combination with the discovered reservoir classification has been initiated. The interpreted stratigraphic trap at Little Cedar Creek Field, southwest Alabama, is being studied using the established sequence stratigraphic model.

<u>Work Planned</u>

Exploration Strategy Development—The formulation of exploration strategies for identifying specific facies with reservoir potential and for identifying possible stratigraphic traps using a sequence stratigraphic model in combination with the discovered reservoir classification will continue.

Identification of Underdeveloped & Undiscovered Resources—The exploration strategies formulated for identifying and defining specific facies that have reservoir potential and for detecting and delineating stratigraphic traps will be used to assess the potential for underdeveloped and undiscovered petroleum resources associated with potential stratigraphic traps and associated reservoir facies.

Results and Discussion

Brian Panetta and Kaiyu Liu have left the University to work for oil companies. Jamal Obid continues to work on the project.

Conclusions

The project work is on schedule.

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Table 1

Milestone Chart—Year 3

	S	O	N	D	J	F	M	A	M	J	J	A

Discovered Reservoir Classification   ▨▨▨▨▨▨▨▨▨▨▨▨▨▨
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Exploration Strategy   ▨▨▨▨▨▨▨▨▨▨▨▨▨▨
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Underdeveloped and Undiscovered Reservoirs   ▨▨▨▨▨▨▨▨▨▨▨▨▨

Technology Workshops   ▨▨

Work Planned   ▨▨
Work Completed   xxxx

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