

Tuesday, February 19, 2019

Southwestern Energy Conference Center, 10000 Energy Drive, Spring, TX 77389
Social 11:15 a.m., Luncheon 11:30 a.m.

Cost: \$35 Preregistered members; \$40 non-members/walk-ups

To guarantee a seat, pre-register on the HGS website & pre-pay by credit card.

Pre-registration without payment will not be accepted.

Walk-ups may pay at the door if extra seats are available.

If you are an Active or Associate Member who is unemployed and would like to attend this meeting, please call the HGS office for a discounted registration cost. We are also seeking members to volunteer at the registration desk for this and other events.

HGS Northsiders Luncheon Meeting

Michelle Thompson, Jenn Pickering

*Shell International Exploration & Production
Company*

Patricio Desjardins, Brian Driskill

Shell Exploration & Production Company

An Integrated View of the Petrology, Sedimentology, and Sequence Stratigraphy of the Wolfcamp Formation, Delaware Basin, Texas

Facies are stacked in predictive, repetitive packages that are linked to their position within a sequence stratigraphic framework. Four distinct cycles were identified: debrite, calciturbidite, fine-grained turbidite, and distal turbidite. The debrites and calciturbidites represent episodic events during low stands in sea-level where carbonate sediments from the platform are deposited in the basin. Fine-grained turbidites are thinly bedded and often interbedded with replacive microcrystalline dolomite are also deposited during low stands. Distal turbidites represent the most distal, muddy tails of turbidites where silty mudstones fine-upward into organic-rich, siliceous mudstones. Distal turbidites have the best reservoir quality and are thickest and more abundant during maximum flooding.

The sequence stratigraphic approach improves the lateral and vertical predictability of sweet spots and the zones/areas to stay away from, which ultimately drives appraisal and development decisions. Integrating our understanding of the cyclic nature of the Wolfcamp with the calibrated e-facies derived from logs in a stratigraphic framework allows for quick high-grading of acreage away from current control points support of development planning and new acreage evaluations.

The Wolfcamp A and B have been examined in detail in two proprietary cores from the central part of the Delaware Basin. Detailed sedimentological and petrographic techniques were employed to document the different facies types and bed boundaries, their characteristics, and associated rock properties to characterize the vertical changes in facies and reservoir properties. The robustness of the sequence stratigraphic framework was enhanced with seismic, biostratigraphic, geochemical, and

sedimentological data from additional available cores from Reeves, Loving, and Ward Counties in Texas.

This study was conducted in 2016-2017 to advance the understanding of how small-scale elements, such as texture, composition, pore-types, and diagenesis affect the rock properties of the Wolfcamp Formation. The objectives of this study were to define key rock types from thin section (petrofacies) and core (lithofacies) to describe predictable, cyclic packages in a sequence stratigraphic framework to better understand what is controlling reservoir quality and its distribution in the Wolfcamp. ■

Urtec publication, reference URTeC: 2901513

Biographical Sketch

MICHELLE THOMPSON is a Sedimentary Petrologist with Shell International Exploration and Production, Inc., based in Houston, Texas. Michelle has nearly 15 years of industry experience in sedimentary petrology of mudstones, carbonates, and siliclastics between Core Laboratories and Shell. Michelle's efforts within Shell has been focused on a variety of projects in the Permian (Texas), Mexico, U.S. Gulf of Mexico, Argentina, and the Rockies. She holds a BSc. in geology from the University of Wisconsin-Oshkosh, MSc in geology from the University of Wisconsin-Milwaukee, and a PhD in geology from the University of Alaska-Fairbanks. Her MSc and PhD were both focused on the sedimentology and petrology of carbonates.

