SUBSURFACE GAS-SHALE SAMPLES OF THE
UPPER CRETACEOUS EAGLE FORD SHALE, SAN MARCOS ARCH,
CENTRAL TEXAS: CORE SAMPLING FOR
MEASURED VITRINITE-REFLECTANCE (R_o) DETERMINATION

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Introduction

This report summarizes activities carried out by the Bureau of Economic Geology (BEG) during Fiscal Year (FY) 2009 for the National Coal Resources Data System State Cooperative Program (NCRDS project). In a continuation of the sampling strategy for measured vitrinite-reflectance (R_o) determination initiated last fiscal year (Hentz and others, 2009), this report provides a collection of oil- and gas-shale samples from the oil- and gas-productive Upper Cretaceous (Cenomanian–Turonian) Eagle Ford Shale in Texas. Whereas in FY2008 we provided Eagle Ford samples from the Rio Grande Embayment and associated Maverick Basin of the south part of the Eagle Ford play area, this year we have provided Eagle Ford samples primarily from the San Marcos Arch to the north in south-central Texas (Fig. 1). In the past year or so, gas-shale industry explorationists and producers have extended their activities beyond the primary Maverick Basin producing area. The San Marcos Arch is currently an area of increasing interest and expanding exploration.

We provide gas-shale samples from whole cores of the Eagle Ford Shale of seven wells in Frio, DeWitt, Gonzales, Guadalupe, Caldwell, and Brazos Counties (Fig. 1). These samples have been delivered to Dr. James Hower of the University of Kentucky

for measured vitrinite-reflectance (R_o). Each sampled shale's precise geographic location is identified using GIS applications.
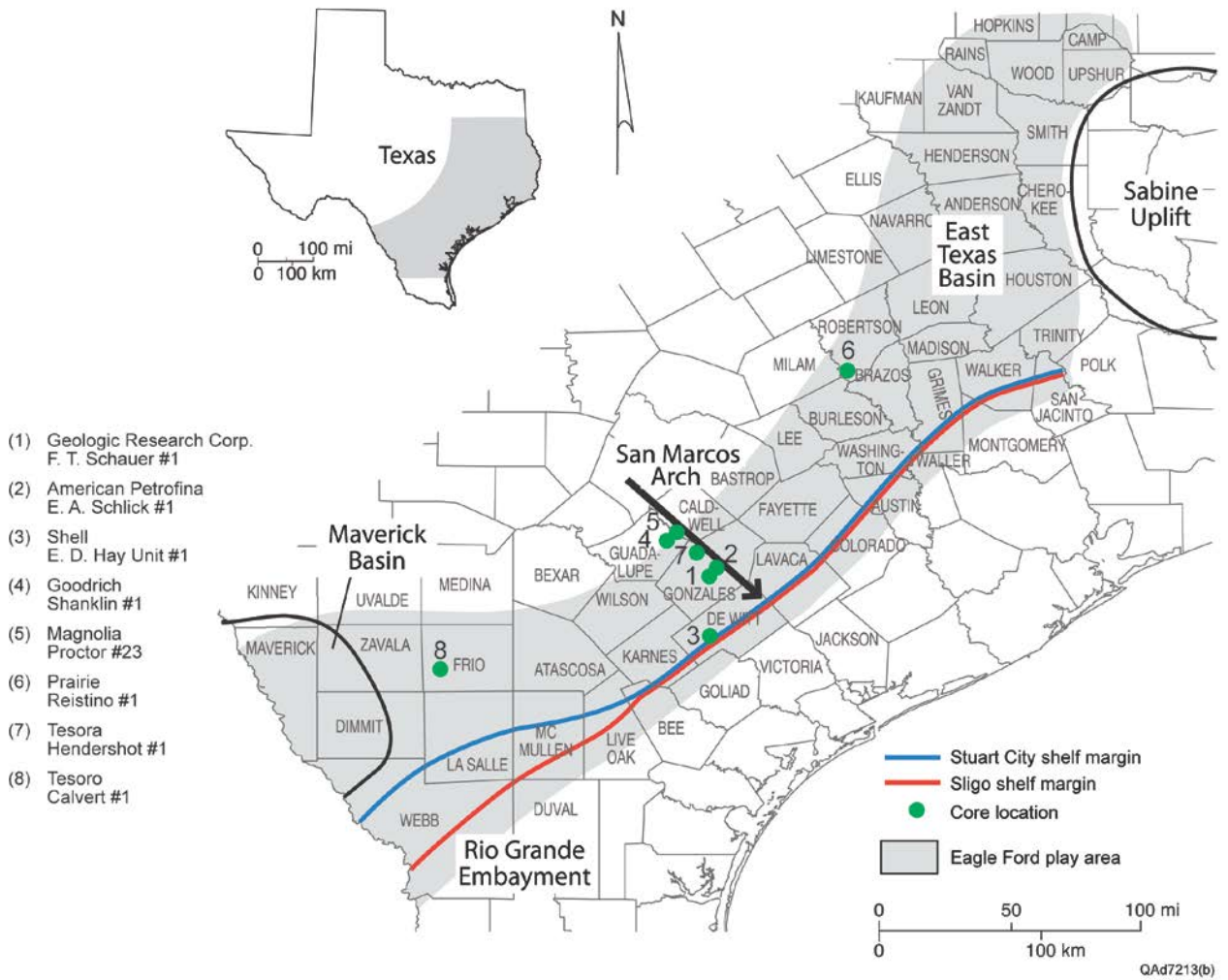

Figure 1. Sample locations and structural domains within the Eagle Ford Shale play area.

Objectives

We have two primary objectives related to analysis of this sample set: (1) compare R_o data between the Maverick Basin/Rio Grande Embayment and San Marcos Arch, two distinct structural provinces of the greater Eagle Ford play area, and (2) compare R_o data from samples strategically collected from cores taken along the southeast-plunging axis of the San Marcos Arch. In the context of the second objective, a few key issues arise. How do R_o results vary from the shallowest Eagle Ford samples (<2,000 ft) to the deepest samples (>13,700 ft) along the structure? Is the regional variance systematic or not? At what depth does transition from the oil and gas windows occur? Answers to these questions would help operators more effectively target potential oil- and gas-producing locations in this emerging field area of the play.

Samples

Twenty-nine Eagle Ford Shale samples were taken from whole cores of eight wells in south and central Texas: Geologic Research Corp. F. T. Schauer #1 in central Gonzales County, American Petrofina E. A. Schlick #1 in central Gonzales County, Shell E. D. Hay Unit #1 in southwest DeWitt County, Goodrich Shanklin #1 in northeast Guadalupe County, Magnolia Proctor #23 in southwest Caldwell County, Prairie Reistino #1 in south Robertson County, Tesoro Hendershot #1 in north Gonzales County, and Tesoro Calvert #1 in southwest Frio County (Fig. 1, Table 1).

Table 1. Distribution of gas-shale samples from cores of the Eagle Ford Shale in central
Texas.

Geologic Research Corp. F. T. Schauer #1 (Gonzales County, TX)

Sample depth (ft)

8,095
8,109.5
8,130
8,142
8,154

American Petrofina E. A. Schlick #1 (Gonzales County, TX)

Sample depth (ft)

7,187
7,202

Shell E. D. Hay Unit #1 (DeWitt County, TX)

Sample depth (ft)

13,701
13,824.5

Goodrich Shanklin #1 (Guadalupe County, TX)

Sample depth (ft)

2,139
2,141

Magnolia Proctor #23 (Caldwell County, TX)

Sample depth (ft)

1,955.5
1,957
1,960
1,964
1,965

1,967

Prairie Reistino #1 (Robertson County, TX)

6,428.5
6,433.5
6,435

Tesoro Hendershot #1 (Gonzales County, TX)

Sample depth (ft)

4,748
4,757.5
4,762.5
4,771
4,773.5

Tesoro Calvert #1 (Frio County, TX)

Sample depth (ft)

6,117.5
6,129
6,146
6,159

Analysis

Dr. James Hower at the Center for Applied Energy Research, University of Kentucky, is currently conducting measured vitrinite-reflectance analysis on the samples and will convey his findings to us and the USGS within a short period after receipt of this report.

Reference

Hentz, T. F., Breton, Caroline, and Ruppel, S. C., 2009, Subsurface Jurassic and Cretaceous gas-shale samples, Haynesville and Bossier Formations (Sabine Uplift), and Eagleford Group (Rio Grande Embayment): core sampling for measured vitrinite-reflectance (R_o) determination: The University of Texas at Austin, Bureau of Economic Geology, annual technical report prepared for NCRDS State Cooperative Program, under award no. 02ERAG0006, 6 p.