WEST ST. MARY FIELD - COTTON VALLEY AND SMACKOVER
T19S-R25W
LAFAYETTE COUNTY, ARKANSAS

GREGORY J. HALVATZIS FIRST ENERGY CORPORATION AUGUST, 1986

DISCOVERY DATA

EXPLORATION METHOD: Subsurface and seismic
WELL: First Energy #1 Barker 5-10
LOCATION: 2340' FEL and 2160' FSL, Section 5-T19S-R25W
TOTAL DEPTH: 11206' API#: 03-073-11023
PERFORATIONS (Cotton Valley): 8626'-8632' COMPLETION DATE: April 3, 1984
INITIAL POTENTIAL (Cotton Valley): Pumped at a rate of 186 BOPD, GR. 40.6° API
PERFORATIONS (Smackover): 10,717'-10,721' COMPLETION DATE: March 5, 1984
10,738'-10,742'
INITIAL POTENTIAL (Smackover): flowed 1209 MCFGPD and 31 BCPD; 16/64" choke;
FTP 965 psi; GR. 60.5° API

NATURE OF TRAP (COTTON VALLEY)

The Cotton Valley "Barker sand" reservoir is a stratigraphic trap composed of a sandstone body
three-quarters of a mile wide extending approximately one and three-quarter miles in a north-south
direction across a gentle structural nose.

STRUCTURE (COTTON VALLEY)

The structure, as mapped on top of the productive "Barker sand", is a southwesterly trending structural
nose.

RESERVOIR PROPERTIES (COTTON VALLEY)

Thin section, scanning electron photomicrographic, and x-ray diffraction analyses done on conventional
core samples indicate the Cotton Valley "Barker sand" to be a quartzose sandstone reservoir. The rocks
consist largely of monocrystalline quartz (64-73%). Feldspars occur in only small quantities (0-19%).
Rock fragments form 11 to 17 percent of the bulk volume of the sands. Chert is the most common rock
fragment (6-13%). The chert has a tripolitic or microporous texture resulting from partial dissolution of
the chert grains. Metamorphic rock fragments (0-2%), clay balls (0-1%), shale fragments (trace), and
polycrystalline quartz (2-5%) are minor rock fragment varieties.

The rocks are cemented primarily by silica overgrowths (14-19%). Dolomite, feldspar overgrowths, and
pyrite are minor cements occurring in trace quantities. Authigenic clay cement occurs in quantities of a
trace to 2 percent. While the rocks lack laminar clay (detrital shale), both clay fragments (structural
clay) and dispersed clay (authigenic pore filling cement) are observed in the rocks. X-ray analyses
indicate the clay in the "Barker sand" consists largely of kaolinite. Illite-smectite (10%) expandable
layers occur in somewhat smaller quantities. Chlorite (iron rich) is detected in very small quantities.