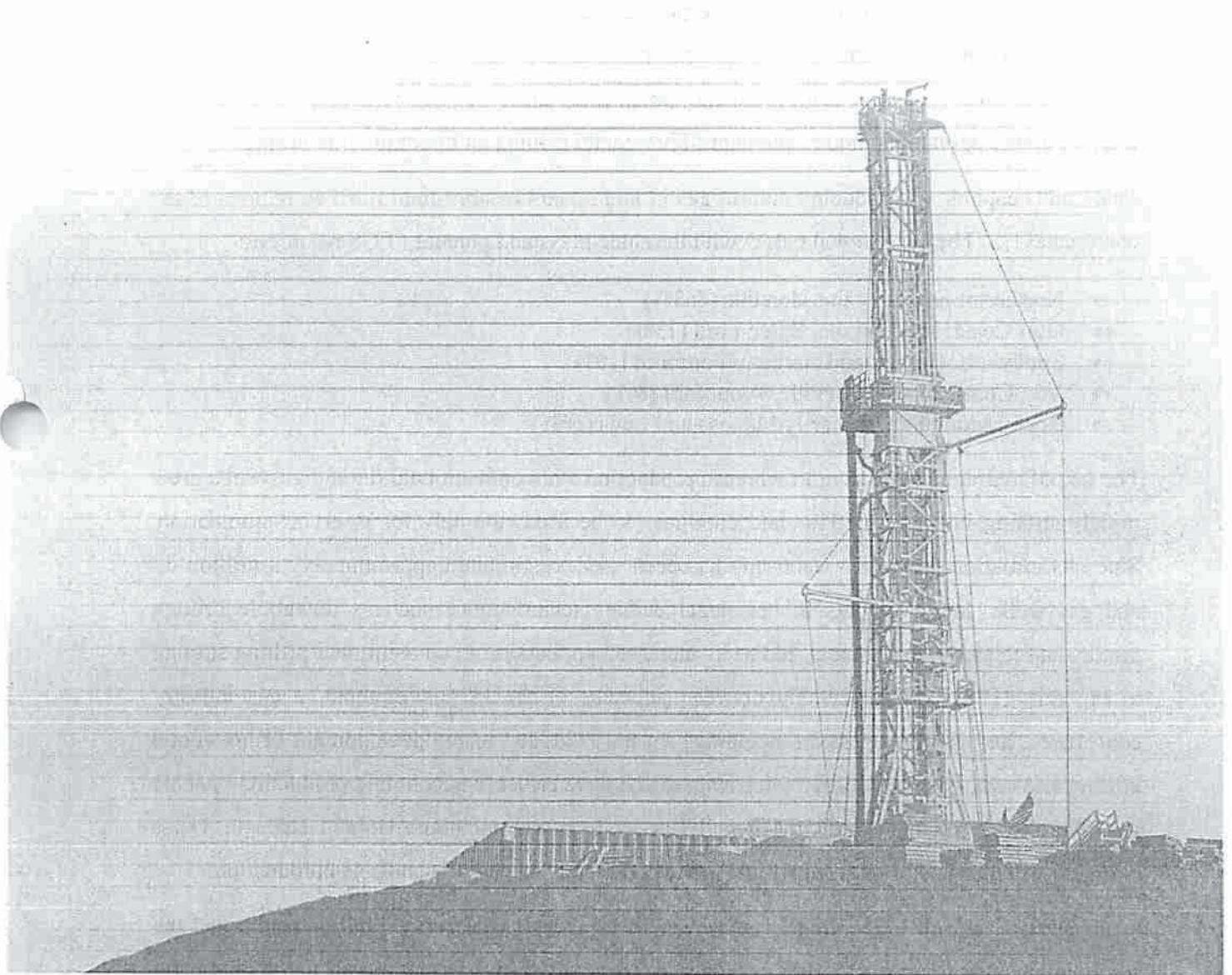


Fact-Based Regulation for Environmental Protection in Shale Gas Development



A REPORT BY



energy institute
THE UNIVERSITY OF TEXAS AT AUSTIN



2 Overview of Shale Gas – and Its Controversies

Shale gas is considered an unconventional gas resource because in conventional exploration and development it is understood that natural gas originates in shale as a "source rock" but that it must migrate into porous and permeable formations (termed "reservoirs"), such as sandstones, in order to be produced economically. Shale gas production involves going directly to the source rock to access the resource. Such production from shale units was not considered economically feasible before application and refinement of horizontal drilling and hydraulic fracturing.

Shale units capable of producing natural gas in large quantities are found in five regions of the continental US. They are shown below with the shale plays and percent of US resources:

- Northeast: primarily the Marcellus (63%)
- Gulf Coast: Haynesville, Eagle Ford (13%)
- Southwest: Barnett and Barnett-Woodford (10%)
- Mid-Continent: Fayetteville, Woodford (8%)
- Rocky Mountain: primarily Mancos and Lewis (6%)

The use of hydraulic fracturing to increase production from conventional oil and gas wells grew rapidly starting in the late 1940s and continues to be used routinely for reservoir stimulation. Since its initiation, hydraulic fracturing has been used to stimulate approximately a million oil and gas wells. Improvements in horizontal drilling technologies, such as downhole drilling motors and telemetry equipment, led to its increased application in conventional drilling starting in the early 1980s. A partnership between agencies of the US government, a gas industry consortium, and private operators beginning in the 1970s led to the development of horizontal drilling and multi-stage hydraulic fracturing, which were critical to economic production of shale gas. The development efforts of Mitchell Energy Corporation in the Barnett shale in Texas during the 1980s and 1990s were critical in the commercial success of shale gas production.

Shale gas has become embroiled in controversy over alleged impacts on public health and the environment. Some segments of the public have become deeply suspicious of the veracity and motives of gas companies. These suspicions were intensified by the natural gas producers and
