TECHNOLOGY OVERVIEW
Historically, most San Juan Basin production has been from naturally fractured, low permeability, Cretaceous sandstones such as the Dakota, Mesaverde and the Pictured Cliffs, or from the Fruitland Coal. In the past, Lewis was completed only in the few wells where large Lewis flow rates were encountered while air drilling for deeper targets. Prior to 1990, the Lewis was not a completion target. However, the Lewis is accessible between the Mesaverde and the Pictured Cliffs formations in thousands of existing wells across the San Juan Basin. A Burlington Resources study has shown that the Lewis has commercial gas potential throughout much of the San Juan Basin and could be completed in many new and existing wells. The New Mexico Oil Conservation Division has included the Lewis Shale within the Mesaverde pool definitions, which should simplify the regulatory issues when completing Lewis wells.

Lewis Characterization. The Lewis Shale is a 1,000 to 1,500 ft thick, layered reservoir composed of shale, siltstone, and minor sandstone that should be considered for completion and production purposes as a sandy siltstone rather than true shale. It was deposited during the final transgressive-regressive cycle of the Cretaceous Interior Sea. The Lewis is composed of four members that include, from top to bottom, the

BOTTOM LINE
As production from conventional reservoirs in the continental U.S. is decreasing, gas from the Lewis and similar unconventional reservoirs will become increasingly important for future gas supply. Significant Lewis Shale gas reserves may be commercially accessible in old and new wells within the San Juan Basin. Key features for successful development and exploitation include lithofacies (coarser-grained, quartz-rich intervals are best), presence of natural macro- and micro-fractures, number of treatments, type of stimulation, and optimal completion techniques.

PROBLEM ADDRESSED
The Lewis Shale can be successfully completed in a large number of old wells in the San Juan Basin where significant tight gas reserves remain. Completions in the Navajo City and First and Second Otero intervals of the Lewis Shale have a good track record in this basin. Characterization of reservoir properties can be integrated with reservoir simulation and hydraulic fracture models to high grade the Lewis, both regionally and within the nearly 1,500 ft thick vertical column. Although an optimal completion technique is still being developed for the Lewis, more than one stage of frac treatment is currently cost prohibitive and may be ineffective. Water-based stimulation fluids and frac fluid retention within the formation reduces relative permeability to gas and should be minimized. A type-curve model provides a practical and simple method to evaluate Lewis Shale reserves.

TECHNOLOGY OVERVIEW
Historically, most San Juan Basin production has been from naturally fractured, low permeability, Cretaceous sandstones such as the Dakota, Mesaverde and the Pictured Cliffs, or from the Fruitland Coal. In the past, the Lewis was completed only in the few wells where

Based on a workshop sponsored by PTTC's Southwest Region on February 21, 2001 in Albuquerque, New Mexico

SPEAKERS:
Geological & Production Features of Lewis Shale
S.R. Bereskin, Tesseract Corporation

Reservoir Characteristics of Lewis Shale
H. Dube, Burlington Resources

Reservoir Characterization and Log Model Development
G. Christiansen, Burlington Resources

Evaluating Fractured Gas Shale
J. Frantz, Schlumberger Holditch-Reservoir Technologies

KEY WORDS:
Lewis Shale
San Juan Basin
Natural Fractures
Frac Treatment
Completion Technique