Shinnery Unit
T9&10S R34E Lea Co., New Mexico
Description and Geologic Justification

Yates Petroleum Corporation is requesting the formation of the Shinnery Unit to support the drilling of a 12,500' exploratory well to be located in the NW/4 of Section 9 Township 10 South Range 34 East, in Lea County, New Mexico. The unit will include the following lands as shown on figure 1: section 32 T9S R34E, and the sw/4 section 4, all of sections 5 and 8, and the w/2 section 9 T10S R34E. The primary objective of the proposed well will be the Atoka-Morrow sandstones at depths between 11,300 feet and 12,300 feet measured depth. Evidence from seismic and subsurface mapping studies in the area indicates that the Morrow deposition was influenced by paleotopographic features that resulted from a period of faulting and erosion in late Mississippian and early Pennsylvanian time. The Morrow Formation was deposited on an unconformity surface, which included incised valleys and fault bounded topographic highs. Seismic and subsurface evidence indicates that a thicker Morrow section, consisting of incised valley fill deposits, is present in the topographic lows that existed on this unconformity surface. These incised valleys are thought to have been the focus of deposition for coarse grained sandstone sediments which have been preserved and provide reservoirs for natural gas accumulations in the Atoka-Morrow formation.

Figure 2 is seismic line 3100 is an east-west line across the northern portion of T10S R34E and indicates the presence of a fault bounded topographic low at the top of the Mississippian (base of the Morrow), in the area of section 5. Figure 3 is a structure map on the top of the Mississippian, which incorporates information from the seismic line 3100 and four deep wells offsetting the proposed Shinnery Unit. The structure map indicates the presence of a fault bounded trough or graben which is believed to have been a topographic low at the time of Morrow deposition. Figure 4 is an isopach map of the Morrow Formation showing a thicker Morrow section in the area of the topographic trough shown in figure 2. Cross section A-A' (figure 5) is a stratigraphic cross section hung on the Atoka which illustrates the Atoka and Morrow Formations seen in the four deep wells offsetting the proposed unit and the interpreted North trending trough between the wells in sections 1 and 33. Gas bearing sandstones in the Atoka and Morrow Formations are the primary target in the proposed Shinnery Unit. The proposed unit is bounded on the east and west sides by the interpreted margins of the Morrow depositional trough.

BEFORE THE OIL CONSERVATION DIVISION
Santa Fe, New Mexico
Case No. 12336 Exhibit No. 10
Submitted by:
Yates Petroleum Corporation
Hearing Date: February 3, 2000