

SPECIAL DRILLING EQUIPMENT

TO BE IN OPERATION BEFORE DRILLING WOLFCAMP (5520')

Totco Drilling Recorder (or equivalent)

Record depth and drilling rate, weight (hook load), rotary RPM, rotary torque, (or AMPS) stand pipe pressure, and pump SPM. Unit installed at driller's position.

Flow Sensor and Pump Stroke Counter

Dial indicator and control unit at driller's position. High and low alarms for percent flow installed in dog house.

Pit Volume Totalizer

Dial indicator at driller's position. Recorder with alarms for volume increase or decrease installed in dog house.

Mud Gas Separator

Installed in mud return line.

Swaco (Cameron) Adjustable Choke

Manifold along with a manually adjustable choke so that each choke can be isolated from flow stream. Turns in choke line to be kept to a minimum. Lines to be tied down to prevent excessive movement under flow conditions. Control console to be in view of driller.

Double Deck Shaker

Installed for use from 1200' to 9702' to help reduce solids in the mud.

Drilling Head

To allow for drilling ahead while encountering a pressure kick.