ROCKWELL SPRINGS
(Oil)
T. 41 S., R. 25 E., SLPM
San Juan County, Utah

GEOLOGY

Regional Setting: Southwestern shelf, Paradox Basin
Surface Formations: Jurassic, Morrison Formation
Exploration Method Leading to Discovery: Subsurface geology and seismic
Type of Trap: Structural-stratigraphic algal mound
Producing Formation: Pennsylvanian, Paradox Formation; Desert Creek and lower Ismay zones
Gross Thickness and Lithology of Reservoir Rocks: Lower Ismay; average 40 feet gross pay thickness; limestone, leached algal blade porosity with excellent intercrystalline and vugular porosity. Desert Creek; average 85 feet gross pay thickness; dolomite, intercrystalline and pinpoint vugular porosity
Geometry of Reservoir Rocks: Lensoid
Other Significant Shows: None
Oldest Stratigraphic Horizon Penetrated: Pennsylvanian, Paradox Formation salt

DISCOVERY WELL

Name: Superior No. 34-42 Navajo Tribal
Location: SE NE sec. 34, T. 41 S., R. 25 E.
Elevation (KB): 4,542 feet
Date of Completion: August 19, 1978
Total Depth: 5,448 feet
Production Casing: 5 1/2" at 5,448 feet with 250 sacks of cement
Perforations: 5,317 to 5,341 feet, 5,351 to 5,386 feet with one jet shot per foot
Stimulation: 4,024 gallons of acid
Initial Potential: (flowing) 1,298 BOD, Desert Creek
Bottom Hole Pressure: Unknown

DRILLING AND COMPLETION PRACTICES

Wells in the Rockwell Springs field are drilled with gelled mud. After 13 3/4" conductor pipe is set at 100 feet, 1,100 to 1,200 feet of 8 5/8" surface casing is set and cemented with 600 to 800 sacks of cement. 5 1/2" production casing is run to total depth and prospective zones are perforated with one or two shots per foot. Acid stimulation is required to establish production, with the normal procedure being 3,000 to 4,000 gallons of 28 percent HCl. The wells will then flow approximately one year before being put on pump. Logging practices include sonic, neutron-density, and dual laterolog or dual induction laterolog. Geophysical velocity surveys have also been run on several of the field wells. Mudloggers were not used on earlier wells in the field; however, they have been used recently from a depth of 4,000 feet to total depth. The Rockwell Springs area is also archaeologically sensitive; planned well locations are often moved because of Indian artifacts found in the vicinity.

RESERVOIR DATA

Productive Area:
Proved (as determined geologically): 200 acres
Unproved: 0
Approved Spacing: None
No. of Producing Wells: 3
No. of Abandoned Wells: 1
No. of Dry Holes: 1
Average Net Pay: Lower Ismay, 20 feet; Desert Creek, 40 feet
Porosity: Lower Ismay, 9 percent; Desert Creek, 14 percent
Permeability: Lower Ismay, 140 millidarcies; Desert Creek, 30 millidarcies
Water Saturation: 25 percent
Initial Field Pressure: 2,000 psig (estimate)
Type of Drive: Solution gas
Gas Characteristics and Analysis: Specific gravity 0.970; Btu 1,636; (in molecular percent) CO2 0.32, H2S nil, N2 1.08, methane 53.75, ethane 22.52, propane 12.77, iso-butane 1.58, normal butane 4.10, iso-pentane 0.93, normal pentane 1.13, hexane and higher 1.82; liquids 12.886 gallons per MCFG
Oil Characteristics and Analysis: Dark green, 41.3° API gravity
Associated Water Characteristics and Analysis: CI 169,000 ppm, Ca 18,000 ppm, Mg 3,961 ppm, HCO3, 73 ppm, Fe 17 ppm, SO4, 9 ppm; water resistivity (Rw) 0.030 ohm-meter at 130°F
Original Gas, Oil and Water Contact Datums: Oil-water contact at minus 844 feet subsea (Desert Creek)
Estimated Primary Recovery: 850,000 BO
Type of Secondary Recovery: None planned
Estimated Ultimate Recovery: Same as primary
Present Daily Average Production: 113 BOD, 237 MCFGD, 17 BWD
Market Outlets: Oil to Four Corners Pipeline; Gas to El Paso Natural Gas Co.

FIELD COMMENTARY

Rockwell Springs field is located on the Navajo Indian reservation, four miles southeast of Aneth field. The discovery well, the Superior No. 34-42 Navajo Tribal, SE NE sec. 34, T. 41 S., R. 25 E., was drilled on a Walter Duncan Oil Properties lease, to evaluate a seismic anomaly. Oil pay was encountered in both the lower Ismay and Desert Creek zones; the latter being completed for 1,298 BOD in 1978. The Desert Creek reservoir is a porous, dolomitized, bioclastic build-up with approximately 80 feet of structural closure. The lower Ismay reservoir is limestone, with poorer porosity than the Desert Creek, but with excellent permeability. A north offset, the No. 34-31 Navajo Tribal was subsequently drilled and completed in the lower Ismay; however, it only produced 122 barrels of oil before being abandoned. A south offset, the No. 34-43 Navajo Tribal was drilled and completed as the second Desert Creek producer in June 1979 (see type log). The No. 34-43 was recompleted in the lower Ismay in October 1982

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