

HISTORY OF WELL

Federal BE-1 was spudded at noon September 13, 1962 with Rotary Tools. 20" casing was set at 912' w/1500 sx. An attempt was made to drill with gas, but an inadequate portable gas sweetening system forced conversion to water at 1035'. Drilled 17 1/2" hole to 5344'. Ran logs. Cemented 13 3/8" casing at 5352' w/3450 sx. Gas drilling was tried again, but it was not possible to dry the hole and oil-emulsion mud was used as a drilling fluid to drill to 12,006'. Ran Gamma-Ray/Neutron, Dual Induction-Laterolog, and Microlog-Proximity logs. Cemented 9 5/8" casing at 12,005' w/2250 sx. Gas was successfully used as a drilling fluid immediately below the 9 5/8" casing. While drilling in Pennsylvanian from 12,240' to 12,250', a gas flow was encountered at 6:00 PM, November 24, 1962. The estimated flow rate through 1 1/4" and two 2" lines (2" lines had 3/4" and 1/2" chokes) was 23 MMCF/D w/200 psi flowing pressure. A multipoint test was taken which indicated an open flow potential of 15.5 MMCF/D. The 14-hour shut-in pressure was 4200 psi. As the pipe had become stuck, it was necessary to load the hole w/mud in order to kill the well. The drill pipe was backed off at 12,140'. The fish was washed over and recovered. Drilling proceeded to 12,307'. DST #1: 12,005' - 12,307' (302' Atoka). At maximum flow rate during 4 point test flowed 11,542 MCF/D thru 27/64" choke. CAOF 17.75 MMCF/D. Deliverability at 1000 psi 15,58 MMCF/D. Average GIR during 9 hour test 45,750. 2-hour ISIBHP 5780 psi. FBHP 4070 - 5580 psi. 11 hours 20 minutes FSIBHP 5780 psi (built up in 1 hour 30 minutes). HMP 8850 - 8785 psi. Recovered 346' (3.5 bbls.) condensate + 25' (0.1 bbl.) mud. Recovered mud titrated 1000 ppm Cl⁻. Pit mud titrated 1000 ppm Cl⁻. Conclusive Test. (HOWCO) Drilling continued, with moderate gas cutting using 12.5# per gallon mud and a rotating drilling head. On December 28 while spotting 14# per gallon mud on bottom prior to trip at 12,986' (to test blow out preventers), the well kicked and blew the pump relief valve. All operations were suspended until daylight, at which time the well was brought under control. The drill pipe was stuck and circulation was obtained with considerable difficulty. An extensive fishing job followed, but all the fish was recovered and drilling resumed February 2, 1963. Drilling continued uneventfully to the Mississippian Limestone at 14,176'. DST # 2: 14,115' - 14,190' (9' Mississippian Limestone). (Hookwall packer set in bottom liner at 14,115'). Tool open 2 hours thru 7/8" BC, 3/8" TC, 3 1/2" & 4 1/2" DP. Opened w/fair blow, constant. When seating packer, opened by-pass tool and lost 40 BM in DP. Recovered 4000' (57 bbls.) heavily gas and mud cut water blanket + 1680' (16.7 bbls.) heavily gas cut mud + 2975' (17.6 bbls.) heavily gas and slightly oil cut mud. FBHP 3625 - 3660 psi. 60 minutes FSIBHP 7555 psi. HMP in and out 9465 psi. No ISIBHP. Recovered mud titrated 4400 ppm Cl⁻. Pit mud titrated 2500 ppm Cl⁻. Conclusive Test. (HOWCO) DST # 3: 14,185 1/2' - 14,190' (4 1/2' Mississippian Limestone). Tool open 1 hour. No gas or fluid to surface w/6 bottles (no blow) and died. Recovered 3627' (28.2 bbls.) water blanket + 650' (4.5 bbls.) slightly gas and mud cut water blanket + 90' (0.5 bbl.) heavily mud and slightly gas cut water blanket. 128 minutes ISIBHP 3600 psi. FBHP 2245 - 2245 psi. 120 minutes FSIBHP 2315 psi. HMP 9715 psi - 9715 psi. Recovered mud cut water blanket titrated 750 ppm Cl⁻. Water blanket titrated 250 ppm Cl⁻. Pit mud titrated 2500 ppm Cl⁻. Conclusive Test. (HOWCO) DST # 4: 14,340' - 14,190' (2850') liner test. Tool open 1 hour, opened w/good blow dying in 12 minutes. Recovered 7000' water blanket + 700' mud cut water and mud. No ISIBHP. FBHP 3375 psi. 60 minutes FSIBHP 3475 psi. HMP 7475 - 7475 psi. No titrations. Conclusive Test. (HOWCO) At 14,176' ran radioactivity and electric logs. Cemented 7 5/8" liner at 14,181' w/1325 sx. which required a casing shoe squeeze to shut off communication with the Pennsylvanian gas. Drilled 6 5/8" hole into the Silurian, which was encountered at 14,648'. DST # 5: 14,660' - 14,900' (240' Devonian). Tool open 4 hours 20 minutes thru 5/8" BC, 3/8" & 3/4" TC, 4 1/2" & 3 1/2" DP. GTS 3 minutes. Flowed at maximum rate of 11 MMCF/D thru 36/64" choke. FSP 1439 psi. Recovered 29 bbls. condensate in 4 hours 10 minutes. Average GIR 46,448. 21.5 bbls. condensate/MMCF. Condensate gravity 57.5 deg. API. 30 minutes shut in surface pressure 4455 psi. Recovered 90' gas, oil and water cut mud + 320' slightly mud cut water in drill pipe. Recovered water titrated 1800 ppm Cl⁻. Pit mud titrated 400 ppm Cl⁻. 70 minutes ISIBHP 6415 psi. FBHP 2745 - 5465 psi. 127 minutes FSIBHP 6415 psi. HMP 7065 psi; BHT 212 deg. Conclusive Test. (HOWCO) The two following DST's lower in the Silurian indicated only tight or limited reservoir conditions. DST # 6: 14,900' - 14,970' (70' Devonian). Tool open 50 minutes thru 5/8" BC, 1" TC, 3 1/2" & 4 1/2" DP. Opened w/no blow. Packer failed after tool had been opened total 45 minutes. Recovered 4870' drilling mud. 60 minutes ISIBHP 100 psi. FBHP 70 - 130 psi. HMP 7300 psi. Recovered mud and pit mud titrated 400 ppm Cl⁻. Conclusive Test. (HOWCO) DST # 7: 14,970' - 15,048' (78' Silurian). Tool open 125 minutes thru 5/8" BC, 3/8" & 3/4" TC, 3 1/2" & 4 1/2" DP. Opened w/fair blow, increased to strong. GTS 10 minutes. Flowed sweet gas at stabilized rate 295 MCF/D. FSP 50 psi. Recovered 615' heavy mud and gas cut black sulfur water. 65