



AMOCO EXPLORATION COMPANY
NO.1-14 AVALANCHE
SE NW SEC.14-T15S-R43W
CHEYENNE COUNTY COLORADO

WELLSITE GEOLOGY
BY
RSAY ENTERPRISES
RANDY SAY - GEOLOGIST
ARVADA, COLORADO

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| ENCLOSURE IN BACK COVER - GEOLOGICAL STRIP LOG | |

WELL DATA

Page 1

OPERATOR: AMOCO Production Company, Denver, CO.

WELL NAME: No.1-14 Avalanche.

FIELD NAME / PROSPECT: Wildcat.

LOCATION: 2040'fnl 2040'fwl SE NW SEC.14-T15S-R43W, Cheyenne Co., CO.

ELEVATION: 4112'- Ground; 4124'-KB.

SPUD DATE: 4/24/96.

COMPLETION DATE: 5/9/96.

STATUS: Plugged and abandoned 5/9/96.

HOLE SIZE: 12.250"-620'-Surface; 7.825"-TD[5710'].

CASING: 8.625"-608'-Surface casing; No production casing run.

DRILL COLLARS / PIPE: 6.25" / 4.50".

TOTAL DEPTH: 5710'(-1586') - Driller; 5710'(-1586') Electric Log.

CONTRACTOR: KUDU Drilling Co., Inc., RIG NO.1 Wichita, KS.

GEOLOGIST: Randy Say- RSay Enterprises.

ENGINEER: Ron Pulliam - AMOCO.

MUD COMPANY: Service Mud Company, Denver, CO.

MUD TYPE: NATIVE (SURFACE-3800'); DRISPAC-CHEM (3800' - TD [5710']).

MUDLOGGING: Gas detection [HOTWIRE AND CHROMATOGRAPH] monitored by wellsite geologist.

DRILL STEM TEST: DST NO.1 5200'-5340'(140') - Morrow Straddle Test.

CORES: Core No.1 5274' - 5316' (42) (Recovered 42');
Core No.2 5316' - 5274.8' (58.8') (Recovered 58.8').

ELECTRIC LOGS: Halliburton Energy Services, Woodward, OK.
Engineer: John Dixon.

| LOGS RUN | INTERVAL |
|------------|-------------|
| HRI-GR-SP | 12'-5699' |
| SDL-DSN | 2790'-5706' |
| BCS | 12'-5668' |
| MICROLOG | 2790'-5706' |
| QUICK LOOK | 12'-5706' |

SUMMARY

The AMOCO Production Company, No.1-14 Avalanche [SE NW SEC.14-T15S-R423, Cheyenne Co., CO] was drilled as a wildcat well in the Las Animas Arch, Colorado. The primary objective was the Pennsylvanian Morrow Upper and Middle Sands, with a potential Morrow Lower Sand. The No.1-14 Avalanche developed a 6 foot thick Upper Sand [5288'-5294'] and an 8 foot thick Middle Sand [5308'-5316']. The Morrow Lower Sand did not develop. The No.1-14 Avalanche Morrow Shale was cored from just above the Upper Sand to below the Lower Morrow Lime [CORE NO.1 5274'-5316' and CORE NO.2 5316'-5374.8'], See pages 12-15]. After electric logs were run, a drill stem test was run [DST No.1, 5200'-5340', See Pages 9-11], and recovered 1820 feet of drilling mud and water with no hydrocarbons. No shows of oil were found in the core or cutting samples, and no cut or fluorescence in any Morrow Sand cuttings. Electric logs showed the Upper Sand and Middle Sands to have thin stringers of good porosity [up to 20%], and decreasing to 10% in the tighter sand.

After electric logs, sample cuttings, core, and drill stem test data through the Upper and Middle Sand intervals were evaluated, the AMOCO No.1-14 Avalanche Morrow Sands were interpreted to be nonproductive.

The secondary objectives in the Pennsylvanian Shawnee/Topeka, Lansing Kansas City, Marmaton, and the Mississippian Spergen, developed eight shows. None of the shows warranted drill stem testing after electric logs and sample cuttings were evaluated.

On May 9, 1996, the AMOCO No.1-14 Avalanche was plugged and abandoned.

BIT RECORD, DEVIATION SURVEYS, AND ELECTRIC LOG FORMATION TOPS

| NO. | MAKE | TYPE | SIZE | DEPTH OUT | FOOTAGE | HOURS | FT/HR | DEV/DEPTH |
|-----|----------|-------|--------|-----------|---------|--------|--------|----------------|
| 1 | STC | FDS | 12.250 | 620 | 620 | 4.50 | 137.78 | 0.25° - 620' |
| 2 | REED | HP11 | 7.875" | 2178 | 1558 | 14.00 | 111.30 | 2.00° - 2178' |
| 3 | NEW TECH | NT15X | " | 5032 | 2854 | 121.00 | 23.59 | 0.875° - 5032' |
| 4 | NEW TECH | NT2 | " | 5274 | 242 | 20.75 | 11.66 | 0.75° - 5274' |
| 5 | STC | M71C | 7.844 | 5375 | 101 | 30.25 | 3.34 | |
| 6 | HTC | ATJ22 | 7.875 | 5443 | 68 | 9.50 | 7.16 | 0.75° - 5443' |
| 7 | HTC | ATJ22 | " | 5576 | 133 | 15.00 | 8.87 | |
| 8 | HTC | ATJ22 | " | 5710 | 134 | 14.25 | 9.40 | 1.25° - 5710' |

| DEVIATION SURVEYS | | | | | |
|-------------------|-------|-----------|-------|-----------|-------|
| DEVIATION | DEPTH | DEVIATION | DEPTH | DEVIATION | DEPTH |
| 0.25° | 620' | 0.75° | 5443' | | |
| 2.00° | 2178' | 1.50° | 5576' | | |
| 0.875° | 5032' | 1.25° | 5710' | | |
| 0.75° | 5274' | | | | |

| FORMATION /ZONE | DEPTH (FEET) | DATUM(KB-4124') |
|---------------------------|--------------|-----------------|
| Dakota | 1614 | 2510 |
| Cheyenne Sand | 1928 | 2196 |
| Morrison | 2012 | 2112 |
| PERMIAN | 2098 | 2026 |
| Day Creek | 2234 | 1890 |
| Blaine | 2466 | 1658 |
| Cedar Hills | 2812 | 1312 |
| Stone Corral | 2976 | 1148 |
| Stone Corral-BASE | 3008 | 1116 |
| Neva | 3566 | 558 |
| Foraker | 3736 | 388 |
| Shawnee/Topeka | 4054 | 70 |
| Topeka "C" | 4234 | -110 |
| Lansing Kansas City | 4314 | -190 |
| Marmaton | 4776 | -652 |
| Pawnee Member | 4800 | -676 |
| Fort Scott Member | 4846 | -722 |
| Cherokee | 4916 | -792 |
| Atoka | 5068 | -944 |
| Morrow Shale(SONIC) | 5214 | -1090 |
| Morrow Shale(STRAT) | 5230 | -1106 |
| 202 | 5270 | -1146 |
| SS | 5288 | -1164 |
| SS-BASE | 5294 | -1170 |
| 302U | | |
| SS-Middle-Zone | 5308 | -1184 |
| SS-Middle-Base-Zone | 5316 | -1192 |
| Lower Morrow Lime) | 5336 | -1212 |
| MISSISSIPPIAN | 5394 | -1270 |
| Spergen | 5582 | -1458 |
| TOTAL DEPTH(DRILLER) | 5710 | -1586 |
| TOTAL DEPTH(ELECTRIC LOG) | 5710 | -1586 |

DAILY DRILLING CHRONOLOGY

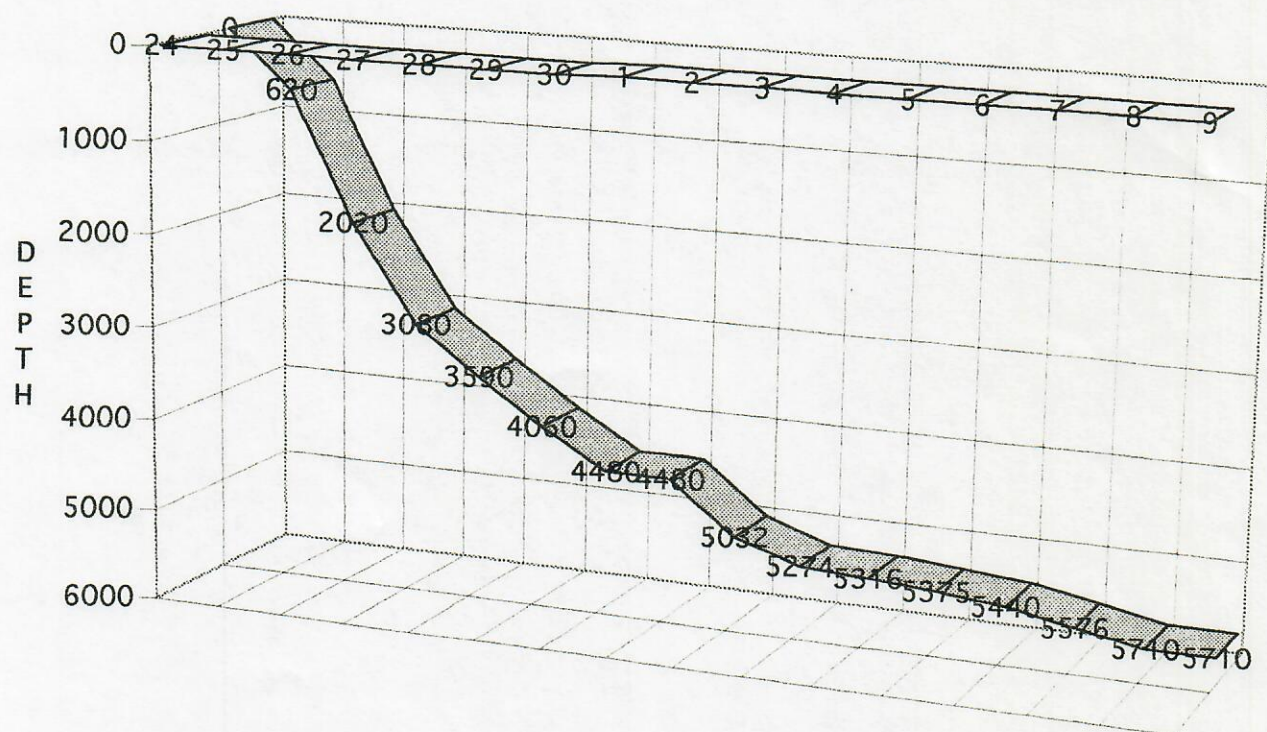
| DATE | DEPTH | 24HR FOOTAGE | DRILLING ACTIVITIES |
|------|-------|--------------|--|
| 4/24 | 0000 | 0000 | RIG UP, SPUD WELL W/NB1 [12.250"], DRLG, SURF HOLE TO 620', CIRC & COND HOLE, RUN SURF CSG [8.625"] TO 608' CMT SURF CSG, W.O.C. |
| 25 | 620 | 620 | Drlg, CMT W/NB2 [7.825"], Drlg. |
| 26 | 2020 | 1400 | Drlg. |
| 27 | 3080 | 1060 | Drlg, TOO H for NB3 at 2178', DS, TIH, w/NB3. |
| 28 | 3590 | 510 | Drlg. |
| 29 | 4060 | 470 | Drlg. |
| 30 | 4480 | 420 | Drlg, Lost 80 BBLs at 4071', Drlg. |
| 5-1 | 4800 | 320 | Drlg. |
| 2 | 5032 | 232 | Drlg, TOO H for NB 4, at 5032', DS, TIH W/NB4. |
| 3 | 5274 | 242 | Drlg, Reach Corepoint [5274'] at 5AM, CIRC and COND Hole, TOO H for CORE NO.1. |
| 4 | 5316 | 42 | Pickup Core Barrel, TIH W/NB5, Coring to 5316', TOO H W/Core No.1 [5274'-5316']. |
| 5 | 5375 | 59 | Lay Down Core No.1, TIH W/NB5, Coring Core No.2. |
| 6 | 5440 | 65 | TOOH W/CORE No.2 [5316'-5375'], Lay Down Core No.2, TIH, W/NB6, Drlg. |
| 7 | 5576 | 136 | Drlg, TOO H for NB7 at 5443', DS, TIH W/NB7, Drlg, TOO H for NB8 at 5576'. |
| 8 | 5710 | 134 | DRLG, REACH TD [5710] @ 12:30 A.M. CIRC & COND, TOO H FOR ELOGS, RUN ELOGS, W.O.O. |
| 9 | 5710 | 0000 | TIH W/DST No.1 [5200'-5340'] - Straddle Test, run DST No.1 TOO H and Lay Down Tools, W.O.O., Plug and abandoned. |

SUMMARY OF POROUS ZONES

SHOW ALL IMPORTANT ZONES OF POROSITY AND CONTENTS THEREOF: CORED INTERVALS AND ALL DRILL-STEM TESTS, INCLUDING DEPTH INTERVAL TESTED, CUSHION USED, TIME TOOL OPEN, FLOWING AND SHUT-IN PRESSURES AND RECOVERIES.

| FORMATION | TOP | BOTTOM | DESCRIPTION, CONTENTS, ETC. |
|------------------|-------|--------|---|
| Dakota | 1614' | 1790' | Water Sand |
| Cheyenne Sand | 1928' | 2012' | Water Sand |
| Cedar Hills | 2812' | 2894' | Water Sands |
| Morrow | 5214' | 5336' | See attached geologic report for CORE No.2 and 2. |
| Morrow | 5199' | 5340 | See attached geological report for DST No.1 analysis. |
| Spergen Dolomite | 5582' | 5710' | |

DAILY DRILLING CHRONOLOGY



APRIL 24 THRU MAY 9, 1996

| | | | | | | | | | | | | | |
|---------------|----------------------------|--------------------------|------|----------|------|----------|-------|------------------------|-------|-------|----------|-------|--|
| 966AMOCO | | AMOCO Production Company | | | | | | Mull Drilling Company | | | | | |
| 966RSWSG | | No.1-14 Avalanche | | | | | | No.1 Rooney | | | | | |
| | | 2040'fml 2040'fwi | | | | | | 1750'fsl 1900'fwi | | | | | |
| | | SE NW SEC.14-T15S-R43W | | | | | | NE SW SEC.14-T15S-R43W | | | | | |
| | | Cheyenne Co., CO | | | | | | Cheyenne Co., CO | | | | | |
| | | Wildcat 5-8-96 | | | | | | Wildcat 9/12/92 P&A | | | | | |
| | | AFE NO. | | | | | | AFE NO. | | | | | |
| | | API NO.05-017-070757000 | | | | | | API NO.05-017-07329 | | | | | |
| TIME STRAT | ROCK STRATIGRAPHIC | PROG | SMPL | DATUM-KB | ELOG | DATUM-KB | THICK | ELEV | DIFF. | E-LOG | DATUM-KB | THICK | |
| | | | | 4124 | | 4124 | | NO.1 | NO.2 | | | | |
| | QUATERNARY EOLIAN SAND | | | | SURF | --- | | | | SURF | --- | | |
| CRETACEOUS | NIORARA | | | | | | | | | | | | |
| | FORT HAYS | 1139 | | | 1146 | 2978 | | | | 1136 | 2994 | | |
| | CARLILE | | | | 1246 | 2878 | | | | 1244 | 2886 | | |
| | CODELL | | | | 1246 | 2878 | | | | 1244 | 2886 | | |
| | DAKOTA | 1617 | | | 1614 | 2510 | | | | 1614 | 2516 | | |
| | KIOWA | | | | 1790 | 2334 | | | | 1792 | 2338 | | |
| | CHEYENNE SAND | 1932 | | | 1928 | 2196 | | | | 1928 | 2202 | | |
| JURRASIC | MORRISON | | | | 2012 | 2112 | | | | 2014 | 2116 | | |
| | MORRISON-LOWER | | | | 2098 | 2026 | | | | 2096 | 2034 | | |
| PERMIAN | PERMIAN | | | | 2098 | 2026 | | | | 2096 | 2034 | | |
| | DAY CREEK | | | | 2234 | 1890 | | | | 2228 | 1902 | | |
| | WHITEHORSE | | | | 2252 | 1872 | | | | 2244 | 1886 | | |
| | BLAINE SALT | 2471 | | | 2466 | 1658 | | | | 2474 | 1656 | | |
| | CEDAR HILLS | 2817 | | | 2812 | 1312 | | | | 2808 | 1322 | | |
| | HARPER PLAIN | | | | 2894 | 1230 | | | | 2890 | 1240 | | |
| | STONE CORRAL | 2965 | | | 2976 | 1148 | 32 | | | 2974 | 1156 | 32 | |
| | STONE CORRAL (BASE) | | | | 3008 | 1116 | | | | 3004 | 1126 | | |
| | WELLINGTON | | | | 3008 | 1116 | | | | 3004 | 1126 | | |
| | CHASE | 3155 | | | 3154 | 970 | | | | 3152 | 978 | | |
| | NEVA | | | | 3566 | 558 | | | | 3560 | 570 | | |
| | RED EAGLE | | | | 3662 | 462 | | | | 3658 | 472 | | |
| | JOHNSON | | | | 3680 | 444 | | | | 3684 | 446 | | |
| | FORAKER | | | | 3736 | 388 | | | | 3730 | 400 | | |
| | ROOT | | | | 3890 | 234 | | | | 3886 | 244 | | |
| PENNSYLVANIAN | WAUBUNSEE/VIRGIL | 3928 | | | 3950 | 174 | | | | 3946 | 184 | | |
| | SHAWNEE/TOPEKA | 4078 | | | 4054 | 70 | | | | 4052 | 78 | | |
| | TOPEKA "C" | | | | 4234 | -110 | | | | 4228 | -98 | | |
| | HEEBNER SHALE | | | | 4286 | -162 | | | | 4276 | -146 | | |
| | TORONTO LIMESTONE | | | | 4298 | -174 | | | | 4288 | -158 | | |
| | LANSING KANSAS CITY | 4334 | | | 4314 | -190 | | | | 4304 | -174 | | |
| | MARMATON | 4757 | | | 4776 | -652 | | | | 4760 | -630 | | |
| | -PAWNEE MEMBER-2NDARY | | | | 4800 | -676 | | | | 4788 | -658 | | |
| | -FORT SCOTT MEMBER-2NDARY | | | | 4846 | -722 | | | | 4826 | -696 | | |
| | CHEROKEE | 4898 | | | 4916 | -792 | | | | 4882 | -752 | | |
| | ATOKA | 5065 | | | 5068 | -944 | | | | 5048 | -918 | | |
| | MORROW SHALE (SONIC) | | | | 5214 | -1090 | 122 | -26 | | 5194 | -1064 | 140 | |
| | MORROW SHALE (STRAT) | 5221 | | | 5230 | -1106 | 106 | -22 | | 5214 | -1084 | 120 | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | 202 | | | | 5270 | -1146 | | -38 | | 5238 | -1108 | | |
| | SS | | | | 5288 | -1164 | 6 | -31 | | 5263 | -1133 | 33 | |
| | SS-BASE | | | | 5294 | -1170 | | -5 | | 5295 | -1165 | | |
| | 302U | | | | | | | | | 5300 | -1170 | | |
| | MIDDLE SS | | | | 5308 | -1184 | 8 | -4 | | 5310 | -1180 | 14 | |
| | MIDDLE SS-BASE | | | | 5316 | -1192 | | 2 | | 5324 | -1194 | | |
| | LOWER SS | | | | | | | | | | | | |
| | LOWER SS-BASE | | | | | | | | | | | | |
| | LOWER MORROW LIME | 5331 | | | 5336 | -1212 | | -8 | | 5334 | -1204 | | |
| MISSISSIPPIAN | MISS | 5415 | | | 5394 | -1270 | | -20 | | 5380 | -1250 | | |
| | | | | | | | | | | | | | |
| | SPERGEN | 5555 | | | 5582 | -1458 | | | | 5592 | -1462 | | |
| | TOTAL DEPTH (DRILLER) | 5705 | | | 5710 | -1586 | | | | 5640 | -1510 | | |
| | TOTAL DEPTH (STRAP) | | | | | | | | | | | | |
| | TOTAL DEPTH (ELECTRIC LOG) | | | | 5710 | -1586 | | | | 5638 | -1508 | | |

TRILOBITE TESTING L.L.C.

OPERATOR : AMOCO PRODUCTION COMPANY
 WELL NAME: AVALANCHE #1-14
 LOCATION : 14-15S-43W CHEYENNE CO.
 INTERVAL : 5199.00 To 5340.00 ft

DATE 5-09-96
 KB 4124.00 ft TICKET NO: 9170 DST #1
 GR 4112.00 ft FORMATION: MORROW
 TD 5710.00 ft TEST TYPE: CONVEN. STRADDLE

RECORDER DATA

| Mins | Field | 1 | 2 | 3 | 4 | TIME DATA----- |
|-------------------|--------|-----|--------|-----|--------|------------------------|
| PF 15 Rec. | 13276 | | 2341 | | 13339 | PF Fr. 0106 to 0121 hr |
| SI 30 Range(Psi) | 4000.0 | 0.0 | 4995.0 | 0.0 | 4025.0 | IS Fr. 0121 to 0151 hr |
| SF 60 Clock(hrs) | 25814 | | ALP | | 23832 | SF Fr. 0151 to 0251 hr |
| FS 120 Depth(ft) | 5201.0 | 0.0 | 5333.0 | 0.0 | 5705.0 | FS Fr. 0251 to 0451 hr |

| | Field | 1 | 2 | 3 | 4 | |
|----------------|--------|-----|--------|-----|-----|-------------------|
| A. Init Hydro | 2618.0 | 0.0 | 2557.0 | 0.0 | 0.0 | T STARTED 2300 hr |
| B. First Flow | 298.0 | 0.0 | 370.0 | 0.0 | 0.0 | T ON BOTM 0103 hr |
| Bl. Final Flow | 622.0 | 0.0 | 634.0 | 0.0 | 0.0 | T OPEN 0106 hr |
| C. In Shut-in | 990.0 | 0.0 | 950.0 | 0.0 | 0.0 | T PULLED 0451 hr |
| D. Init Flow | 711.0 | 0.0 | 646.0 | 0.0 | 0.0 | T OUT 0830 hr |
| E. Final Flow | 970.0 | 0.0 | 937.0 | 0.0 | 0.0 | |
| F. Fl Shut-in | 990.0 | 0.0 | 955.0 | 0.0 | 0.0 | |
| G. Final Hydro | 2530.0 | 0.0 | 2523.0 | 0.0 | 0.0 | |
| Inside/Outside | 0 | | I | | S | |

RECOVERY

Tot Fluid 1820.00 ft of 560.00 ft in DC and 1260.00 ft in DP
 920.00 ft of DRLG. MUD
 900.00 ft of WATER
 0.00 ft of
 0.00 ft of
 0.00 ft of
 0.00 ft of
 0.00 ft of
 0.00 ft of RW .26 @ 60 DEG = 30000 PPM
 SALINITY 30000.00 P.P.M. A.P.I. Gravity 0.00

TOOL DATA-----
 Tool Wt. 2000.00 lbs
 Wt Set On Packer 35000.00 lbs
 Wt Pulled Loose 140000.00 lbs
 Initial Str Wt 110000.00 lbs
 Unseated Str Wt 120000.00 lbs
 Bot Choke 0.75 in
 Hole Size 8.88 in
 D Col. ID 2.25 in
 D. Pipe ID 3.80 in
 D.C. Length 560.00 ft
 D.P. Length 4625.00 ft

BLOW DESCRIPTION

IF; FAIR TO STRONG BLOW OFF BTM IN
 2 MINS.

ISI; BLED OFF BLOW - NO RETURN

FF; FAIR TO STRONG BLOW OFF BTM IN
 3 MINS.

FSI; BLED OFF BLOW - NO RETURN

SAMPLES:
 SENT TO:

MUD DATA-----
 Mud Type CHEMICAL
 Weight 9.10 lb/cf
 Vis. 60.00 S/L
 W.L. 5.60 in3
 F.C. 0.00 in
 Mud Drop N
 Amt. of fill 0.00 ft
 Btm. H. Temp. 147.00 F
 Hole Condition GOOD
 % Porosity 0.00
 Packer Size 6.75 in
 No. of Packers 4
 Cushion Amt. 0.00
 Cushion Type
 Reversed Out N
 Tool Chased N
 Tester ROD STEINBRINK
 Co. Rep. RON PULLIAM
 Contr. KUDU
 Rig # 1
 Unit #
 Pump T.

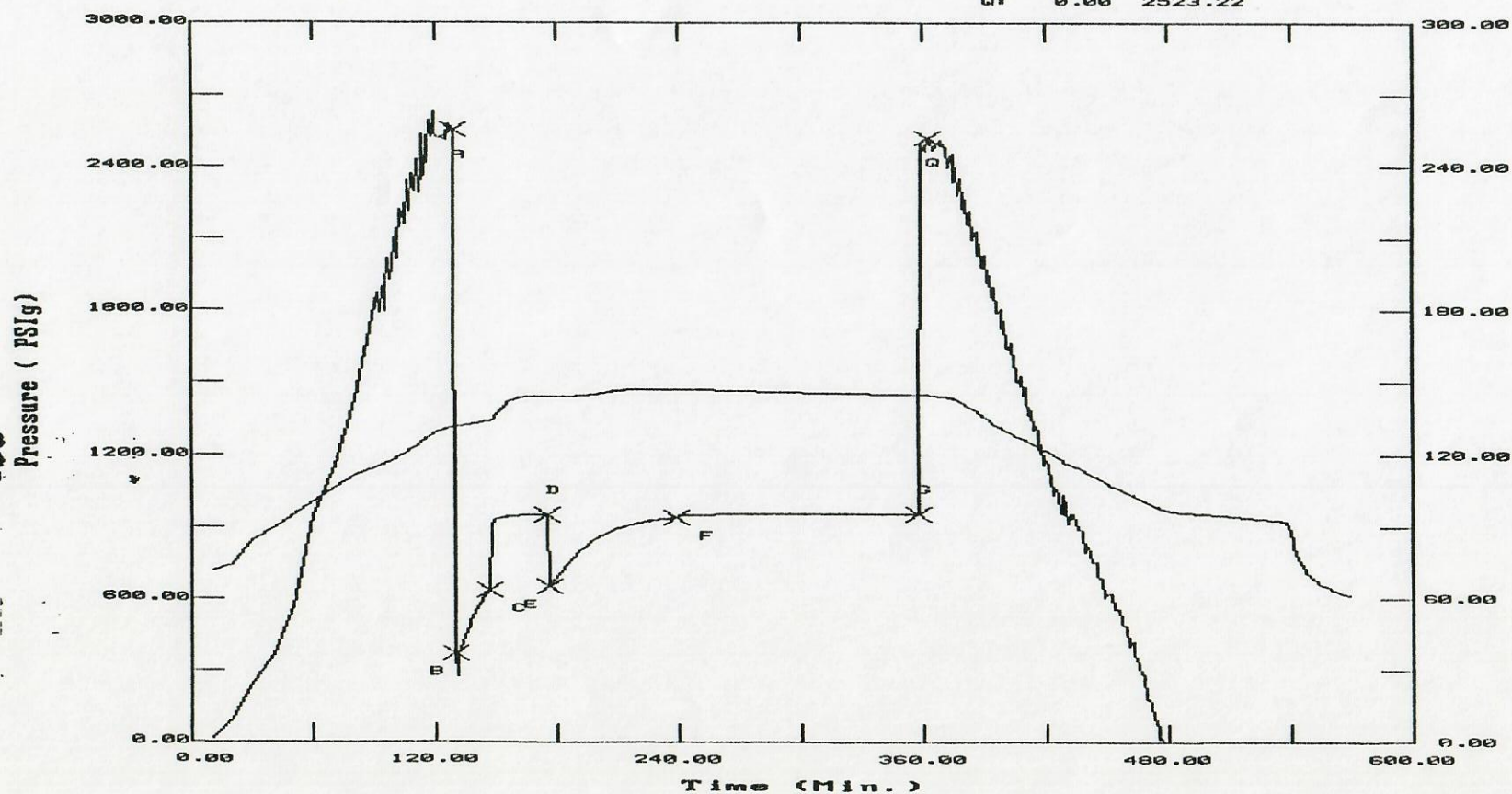
Test Successful: Y

TEST HISTORY

9170 DST #1 AVALANCHE #1-14 AMOCO PROD

Flag Points
t (Min.) P (PSIg)

| | | |
|----|--------|---------|
| A: | 0.00 | 2557.45 |
| B: | 0.00 | 370.44 |
| C: | 17.00 | 634.50 |
| D: | 29.00 | 950.47 |
| E: | 0.00 | 646.81 |
| F: | 63.00 | 937.78 |
| G: | 119.00 | 955.13 |
| H: | 0.00 | 2523.22 |



TRILOBITE TESTING L.L.C.

P.O. Box 362 - Hays, Kansas 67601

FLUID SAMPLER DATA

Ticket No. 7170 Date 5-7-96
Company Name Amoco Prod. Co. Cont. Kudu #1
Lease Avalanche #1-14 Test No. #1 Morrow
County Cheyenne Co. Sec. 14 Twp. 15^S Rng. 42^W

SAMPLER RECOVERY

Gas — ML
Oil — ML
Mud — ML
Water 4,000 ML
Other — ML
Pressure 300[#] PSI
Total 4,000 ML

PIT MUD ANALYSIS

Chlorides 3,600 ppm.
Resistivity — ohms @ — F
Viscosity 60
Mud Weight 9.1
Filtrate 5.6
Other L.C.M. 6[#] / Lbl.

SAMPLER ANALYSIS

Resistivity .26 ohms @ 60° F
Chlorides 30,000 ppm.
Gravity — corrected @ 60 F

PIPE RECOVERY

TOP
Resistivity .26 ohms @ 60° F
Chlorides 30,000 ppm.

MIDDLE
Resistivity — ohms @ — F
Chlorides — ppm.

BOTTOM
Resistivity .26 ohms @ 60° F
Chlorides 30,000 ppm.

CORE DESCRIPTION

CORE NO.1 5274'-5316' (42') Recovered 42'

| DEPTH | CORE DESCRIPTION |
|--------------------|---|
| 5274-5288.5 | SH dkgy-bk plty carb marine. |
| 5288.5' (-1164.5') | Top of Morrow Upper Sand. |
| 5288.5-5291 | SS m-cg very dirty matrix. |
| 5291-5292.5 | SS cg with SH plugs. |
| 5292.5-5294 | SS cg-vcg very dirty w/SH lams. |
| 5294'(-1170') | Base of Morrow Upper Sand. |
| 5294-5295.5 | SH gn-gy sft w/occ gn clay. |
| 5295.5-5298 | SH gn-ltgy laminated w/hd gy SLTST. |
| 5298-5301 | INTBD SH/SLTST ltgy-brign mica. |
| 5301-5304 | SH/SLTST aa wxy SH w/occ cly plugs. |
| 5304-5307 | SH/SLTST intbd ltgy-gn laminated. |
| 5307-5310 | SH ltgy-gn w/incr amount of SLTST. |
| 5308'(-1184') | Top of Morrow Middle sand. |
| 5310-5313 | SS vcg-cg massive bedded-rubble zone with abundant pyritic coal. |
| 5313-5316 | SS vcg ltgy-wh-ltgn glau clay filled with intbd coal and carb SH. |
| 5316'(-1192') | Base of Morrow Middle Sand. |
| 5316'(-1192') | Base Core No.1 |

Core and Drill Bit Record



Weatherford

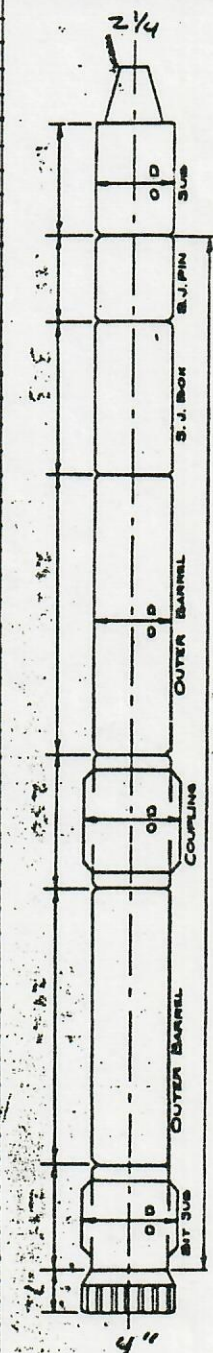
CUSTOMER

Weatherford Coring Services
P.O. Box 899
Pebble, Texas 77588-0899
(713) 485-3264

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Company AMOCO Engineer Ronnie Williams Date 5-3-96
Well AVALANCHE 1-14 Field WILDCAT No. 1 Pump Make EMSCO D375 Size 6x14
County Cheyenne State Colo. No. 2 Pump Make _____ Size _____
Company Core No. 1 Homco Core No. _____ Drill Pipe 4 1/2 1660 XH
Bit No. J99066 Type M71C Size 7 1/2 x 4 1/2 Collars OD 6 1/4 ID 2 1/4
Barrel No. 668GL Size 6 1/4 x 4 Cut 41' Recovered 41' Mud Weight 9.1 PV 14 Type Cham-Disp
Contractor KUBU Rig No. 2 Hole Size 7 7/8 CSu 85/10 B08
Inclination Sec. 14-15 43W Other Tools TERS X0 ID _____

| Start | Depth | Time | Min. Per Foot | FORMATION | Wt. On Bit | Rotary RPM | SPM | GPM | SURFACE PRESS | BIT PRESS DROP | TORQUE | |
|-------|-------------|-------------|---------------|--------------------------|--------------|------------|-----------|------------|---------------|----------------|--------|--------------|
| | <u>5294</u> | <u>4:22</u> | <u>23</u> | | <u>10-12</u> | <u>78</u> | <u>48</u> | <u>276</u> | <u>625</u> | <u>50</u> | | <u>05003</u> |
| 1 | 75 | :45 | 23 | <u>marrow</u> | | | | | | | | |
| 2 | 76 | :59 | 24 | | | | | | | | | |
| 3 | 77 | :31 | 22 | | | | | | | | | |
| 4 | 78 | :52 | 21 | | | | | | | | | |
| 5 | 79 | :08 | 16 | | | | | | | | | |
| 6 | <u>5280</u> | <u>28</u> | <u>20</u> | | <u>14-16</u> | <u>80</u> | <u>48</u> | <u>276</u> | <u>625</u> | <u>50</u> | | |
| 7 | 81 | :58 | 20 | | | | | | | | | |
| 8 | 82 | :04 | 26 | | | | | | | | | |
| 9 | 83 | :25 | 21 | | | | | | | | | |
| 10 | 84 | :49 | 24 | | | | | | | | | |
| 11 | 85 | :09 | 20 | | <u>16</u> | <u>80</u> | <u>48</u> | <u>276</u> | <u>625</u> | <u>50</u> | | |
| 12 | 86 | :29 | 20 | | | | | | | | | |
| 13 | 87 | :52 | 23 | | | | | | | | | |
| 14 | 88 | :09 | 17 | | | | | | | | | |
| 15 | 89 | :15 | 16 | | | | | | | | | |
| 16 | 90 | :17 | 2 | | | | | | | | | |
| 17 | 91 | :20 | 3 | | | | | | | | | |
| 18 | 92 | :22 | 2 | | | | | | | | | |
| 19 | 93 | :25 | 3 | | | | | | | | | |
| 20 | 94 | :28 | 3 | | | | | | | | | |
| 21 | 95 | :49 | 21 | | | | | | | | | |
| 22 | 96 | :59 | 10 | | | | | | | | | |
| 23 | 97 | :05 | 6 | | | | | | | | | |
| 24 | 98 | :12 | 7 | | | | | | | | | |
| 25 | 99 | :21 | 9 | | | | | | | | | |
| 26 | <u>5300</u> | <u>24</u> | <u>8</u> | | | | | | | | | |
| 27 | 01 | :47 | 18 | | | | | | | | | |
| 28 | 02 | :58 | 111 | | | | | | | | | |
| 29 | 03 | :12 | 14 | | | | | | | | | |
| 30 | <u>04</u> | <u>:22</u> | <u>10</u> | <u>CONN Lost 13 MINS</u> | | | | | | | | |
| 31 | 05 | :39 | 4 | | | | | | | | | |
| 32 | 06 | :42 | 3 | | | | | | | | | |
| 33 | 07 | :02 | 20 | | | | | | | | | |
| 34 | 08 | :11 | 9 | | | | | | | | | |
| 35 | 09 | :18 | 7 | | | | | | | | | |
| 36 | 10 | :23 | 5 | | | | | | | | | |
| 37 | 11 | :46 | 23 | | | | | | | | | |
| 38 | 12 | :48 | 62 | | | | | | | | | |
| 39 | 13 | :51 | 3 | | | | | | | | | |
| 40 | 14 | :52 | 1 | | | | | | | | | |
| 41 | 15 | :00 | 8 | | | | | | | | | |
| 42 | 16 | :30 | 90 | | | | | | | | | |
| 43 | 17 | | | | | | | | | | | |
| 44 | 18 | | | <u>Barrel Jammed</u> | | | | | | | | |
| 45 | 19 | | | | | | | | | | | |
| 46 | 20 | | | | | | | | | | | |
| 47 | 21 | | | | | | | | | | | |
| 48 | 22 | | | | | | | | | | | |
| 49 | 23 | | | | | | | | | | | |
| 50 | 24 | | | | | | | | | | | |
| 51 | 25 | | | | | | | | | | | |
| 52 | 26 | | | | | | | | | | | |
| 53 | 27 | | | | | | | | | | | |
| 54 | 28 | | | | | | | | | | | |
| 55 | 29 | | | | | | | | | | | |
| 56 | 30 | | | | | | | | | | | |
| 57 | 31 | | | | | | | | | | | |
| 58 | 32 | | | | | | | | | | | |
| 59 | 33 | | | | | | | | | | | |
| 60 | 34 | | | | | | | | | | | |
| 61 | | | | | | | | | | | | |
| 62 | | | | | | | | | | | | |
| 63 | | | | | | | | | | | | |
| 64 | | | | | | | | | | | | |
| 65 | | | | | | | | | | | | |



CORE DESCRIPTION

CORE NO.2 5316'-5374.8'(58.8'); RECOVERED 58.8'

| DEPTH | CORE DESCRIPTION |
|-------------------|---|
| 5316'(-1194') | Base of Morrow Middle Sand. |
| 5316-5319 | SS/SLTST xbedded lams of SH. |
| 5319-5322 | SS vg-fg w/intbd SLTST. |
| 5322-5325 | SS vfg w/intbd ltgy-gn SH and SLTST. |
| 5325-5327.5 | SH/SLTST grading into LS tan xfxl. |
| 5327.5 | SH/LS transition. |
| 5327.5-5331 | SH bk fis. |
| 5331-5336 | SH bk fis brittle. |
| 5336'(-1212') | Lower Morrow Lime. |
| 5336-5341 | LS gy w/Trace SS vfg slty. |
| 5341-5343 | LS gy hd dns w/Thin SH strgs. |
| 5343-5346 | LS gy-tan w/Thin SH strgs. |
| 5346-5347 | SH gn-gy sft. |
| 5347-5349 | SH gn wxy. |
| 5349-5351.5 | SH mgy-gn w/gn cly plugs. |
| 5351.5-5352 | LS tan hd dns xline. |
| 5352-5353 | LS tan-gy hd xfxl. |
| 5353-5354 | SH bk plty marine. |
| 5354-5357 | LS tan-gy hd w/SH strgs intbd. |
| 5357-5357.5 | SFT Clay plug gy-gn. |
| 5357.5-5360 | LS mot tan-crm. |
| 5360-5360.5 | SH sft cly ltgy. |
| 5360.5-5363 | SH gy w/LS tan and clay plugs (Paleosoil). |
| 5363-5368 | LS tan-crm hd dns massive LS. |
| 5368-5373 | LS tan hd xfxl w/Basal one foot SH gn-gy very fossiliferous wxy plty. |
| 5374.8'(-1250.8') | Base Core NO.2. |



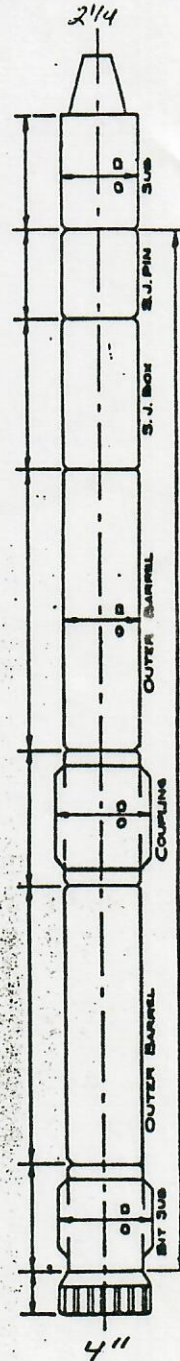
Weatherford

CUSTOMER
Weatherford Coring Services
P.O. Box 899
Pearland, Texas 77588-0899
(713) 485-3264

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Company AMOCO Engineer RONNIE WILLIAMS Date 5-04-96
Well HUILLANCHE 1-14 Field WILDCAT No. 1 Pump Make EMSCO D-375 Size 6x14
Country CHEYENNE State WYO. No. 2 Pump Make _____ Size _____
Company Core No. 2 Homco Core No. _____ Drill Pipe 1 1/2 10.6 XH
Bit No. JG9066 Type M71C Size 7 1/2 3A X 1 1/4 Collars OD 6 1/4 ID 2 1/4
Barrel No. 66 6L Size 6 1/4 x 4 Cut 1 1/4 66 Recovered 66 Mud Weight 9.0 PV 1.4 Type HEIL - DRILL
Contractor KUDU DRILL CO. Rig No. 1 Hole Size 7 7/8 CS# 85/B @ 608'
Inclination Spc. 14. 155. 143W T. Other Tools JARS: X0 ID _____

| Start | Depth | Time | Min. Per Foot | FORMATION | Wt. On Bit % 1000 | Rotary RPM | SPM | GPM | SURFACE PRESS | BIT PRESS DROP | TORQUE |
|-------|-------|-------|---------------------|-----------------------------|-------------------------|---------------|-----|-----|------------------|----------------------|--------|
| 1 | 5316 | 1:51 | | | | | | | | | |
| 2 | 5317 | 55 | 4 | Mud Arrow | 14-16 | 80 | 48 | 276 | 625 | 50 | |
| 3 | 18 | 2:12 | 17 | | | | | | | | |
| 4 | 19 | :27 | 15 | | | | | | | | |
| 5 | 5320 | :53 | 20 | | | | | | | | |
| 6 | 21 | 3:12 | 19 | | | | | | | | |
| 7 | 22 | 33 | 21 | | | | | | | | |
| 8 | 23 | 4:06 | 33 | | | | | | | | |
| 9 | 24 | :40 | 34 | | | | | | | | |
| 10 | 25 | 5:12 | 32 | | | | | | | | |
| 11 | 26 | :44 | 32 | | | | | | | | |
| 12 | 27 | :57 | 13 | | | | | | | | |
| 13 | 28 | 6:09 | 12 | | | | | | | | |
| 14 | 29 | :31 | 22 | | | | | | | | |
| 15 | 30 | 7:00 | 29 | | | | | | | | |
| 16 | 31 | :21 | 21 | | | | | | | | |
| 17 | 32 | :54 | 33 | | | | | | | | |
| 18 | 33 | 8:43 | 43 | TIME CORRECTION LESS 6 min. | | | | | | | |
| 19 | 34 | 9:32 | 49 | | | | | | | | |
| 20 | 35 | 10:11 | 39 | | | | | | | | |
| 21 | 36 | :43 | 32 | | | | | | | | |
| 22 | 37 | 11:11 | 28 | morrow | 16 | 80 | 48 | 276 | 625 | 50 | |
| 23 | 38 | :24 | 13 | | | | | | | | |
| 24 | 39 | :34 | 10 | | | | | | | | |
| 25 | 5340 | :47 | 13 | | | | | | | | |
| 26 | 41 | :56 | 9 | | | | | | | | |
| 27 | 42 | 12:05 | 9 | | | | | | | | |
| 28 | 43 | :14 | 9 | | | | | | | | |
| 29 | 44 | :22 | 8 | | | | | | | | |
| 30 | 45 | :26 | 4 | | | | | | | | |
| 31 | 46 | :34 | 8 | | | | | | | | |
| 32 | 47 | 1:16 | 42 | | | | | | | | |
| 33 | 48 | 2:13 | 57 | Conn: 5348 Less: 10 | | | | | | | |
| 34 | 49 | 3:02 | 39 | | | | | | | | |
| 35 | 5350 | :41 | 39 | | | | | | | | |
| 36 | 51 | 4:11 | 36 | | | | | | | | |
| 37 | 52 | 5:17 | 60 | | | | | | | | |
| 38 | 53 | 6:09 | 52 | | | | | | | | |
| 39 | 54 | :19 | 10 | | | | | | | | |
| 40 | 55 | :27 | 8 | | | | | | | | |
| 41 | 56 | :36 | 7 | | | | | | | | |
| 42 | 57 | :42 | 6 | | | | | | | | |
| 43 | 58 | :47 | 5 | | | | | | | | |
| 44 | 59 | :57 | 10 | | | | | | | | |
| 45 | 5360 | 7:17 | 20 | | | | | | | | |
| 46 | 61 | :45 | 17 | | | | | | | | |
| 47 | 62 | 8:14 | 27 | morrow | 16 | 80 | 48 | 276 | 625 | 50 | |
| 48 | 5363 | :28 | 14 | | | | | | | | |
| 49 | 64 | :33 | 10 | | | | | | | | |
| 50 | 65 | :45 | 7 | | | | | | | | |
| 51 | 66 | :53 | 8 | | | | | | | | |
| 52 | 67 | 9:01 | 8 | | | | | | | | |
| 53 | 68 | :09 | 6 | | | | | | | | |
| 54 | 69 | :16 | 9 | | | | | | | | |
| 55 | 70 | :25 | 9 | | | | | | | | |
| 56 | 71 | :33 | 8 | | | | | | | | |
| 57 | 72 | :41 | 8 | | | | | | | | |
| 58 | 73 | :47 | 6 | | | | | | | | |



SHOW EVALUATION

OVERVIEW

The AMOCO Exploration Company No.1-14 Avalanche [SE NW SEC.14-T15S-R43W, Cheyenne Co., CO] was drilled as a wildcat well in the Las Animas Arch, Colorado. The primary objectives were the Pennsylvanian Morrow Sands, commonly referred to as Upper, Middle, and Lower Sands. The secondary objectives were the Pennsylvanian Topeka, Marmaton and Lansing Kansas City, and the Mississippian and Spergen formations. The offset/control well was the MULL Drilling Company No.1 Rooney [NE SW SEC.14-T15S-R43W], which developed a 33 foot thick UPPER Morrow Sand [5263'-5295'(-1133')] and a 14 foot thick Middle Sand [5310'-5324'(-1180')]. The AMOCO No.1-14 Avalanche developed an 6 foot Upper Sand [5288'-5294'(-1164')]. No Lower Sand developed in the No.1-14 Avalanche. The Morrow Shale section was cored twice [Core No.1 5274'-5316' and Core No.2 5316'-5374.8', see pages 12-15] and was drill stem tested [DST NO.1 5200'-5340', See Pages 9-11]. DST NO.1 recovered 1820 feet of drilling mud and water with no hydrocarbons. No shows of oil were found in the core chips or in the cuttings samples. Both of the Morrow Upper and Middle Sands had thin stringers of 20 percent density porosity with tighter porosities decreasing to 10 percent. The grain size ranged from medium to very coarse grained with some fine grained stringers interbedded. Both sands had a very dirty matrix with kaolinite clay and shale partings. Cement was predominately siliceous with some dolomitic cement associated with the quartz overgrowths. Even though no shows were found in the samples or cores, DST NO.1 was run after electric logs were evaluated to thoroughly evaluate the Morrow sands. For a basic Core description see Pages 12-15.

The Lower Morrow Limestone came in at 5336'(-1212') and no Lower Morrow Sand interval developed. No other drill stem tests were run in the Morrow section and the Morrow Shale section was deemed nonproductive.

STRUCTURE

Structurally, the AMOCO No.1-14 Avalanche [SE NW SEC.14-T15S-R43W] was 22 foot low to the reference offset/control well, the MULL Drilling Company No.1 Rooney [NE SW SEC.14-T15S-R43W] at the top of the Morrow Shale(STRAT) [5230'(-1106') versus 5214'(-1084')].

SECONDARY OBJECTIVES

The other secondary objectives, the Pennsylvanian Topeka, Lansing Kansas City, Marmaton, Atoka, and the Mississippian Spergen developed eight zones with sample shows. None of the warranted testing after electriclogs were evaluated. See SHOWS NO.1-8 listed below.

STATUS

The AMOCO Production Company No.1-14 Avalanche was plugged and abandoned on May 9, 1996 after samples, electric log, core data, and drill stem test data were evaluated.

FORMATION AND SHOW ZONE LISTING

The ensuing Show Evaluation listings are in the order they were drilled. They are categorized either by formation name and or by common zone designation.

SHOW EVALUATION

FORMATION AND ZONE LISTING

The wellsite geologist began sample descriptions at 3800 feet. The interval 3800' to the top of the SHAWNEE/TOPEKA at 4054'(+70'), included the PERMIAN formations, the Red Eagle, Johnson, Foraker, Root, and the Waubunsee at the top of the Pennsylvanian. No sample shows were found in the cuttings from 3800' to 4054', with a few zones of porosity developing. No drill stem tests were run over this interval after samples and electric log were evaluated.

SHAWNEE/TOPEKA 4054'(+70').

PENNSYLVANIAN

The Shawnee/Topeka interval was 260 feet thick with interbedded limestones and shales and an increase in dolomites through the porosity zones. Typically, the Shawnee/Topeka has three porosity zones which can develop shows. These three zones are the Topeka "A", "B", and "C", or upper, middle, and lower [TOPEKA "C"] porosity zones. Background gas was 4-6 units through the entire interval. The drilling rate background was 4.0 min/ft with the drilling breaks at 1.0-2.0 min/ft. Three shows developed in the Shawnee/Topeka section, in the upper "A" Shawnee/Topeka at SHOW NO.1 [4110'-4122'[12'-Thick], the Middle "B" Shawnee at SHOW No.2 [4152'-4168'[14'-Thick], and in the Topeka "C" zone at SHOW No.3 [4268'-4282' [14'-Thick]. None of the zones were drill stem tested either while drilling or after electric logs were evaluated.

SHOW NO.1 4110'-4122'(12')(14'). 2.0'/ft vs 4.0'/ft.

TG=6 U; C1=5 U; C2=None.

LITHOLOGY: LS mot litan-crm & gy vvfri slsly gran & suc occ carb.

POROSITY: G-FR(gran).

OIL STAIN: TR tan sat stn.

FLOR: 20% mot ltyel.

CUT: 20% slow weak mlky diffuse cut.

RESIDUE: None.

SHOW NO.2 4152'-4168'(14')(-28'). 2.0'/ft vs 4.0'/ft.

TG=6 U; C1=4 U; C2=None.

LITHOLOGY: LS bf-crm & occ ltgy gran-litho vvfri sldolo & gran slfos w/chk mtrx shly.

POROSITY: P-occ FR(gran-xfxl).

OIL STAIN: None.

FLOR: 10% myel.

CUT: 10% pale yel crush cut.

RESIDUE: None.

TOPEKA "C" 4234'(-110').

SHOW NO.3 4268'-4282'(14')(-144'). 1.5'/ft vs 4.0'/ft.

TG=6 U; C1=4 U; C2=None.

LITHOLOGY: LS mot bf-crm occ mgy litho-occ gran vfri-firm vfos occ ool text w/chk mtrx sldolo & suc.

POROSITY: P-occ FR(oomold-oocastic).

OIL STAIN: None.

FLOR: TR ltyel.

CUT: TR mlky slow strm.

RESIDUE: None.

FORMATION AND ZONE LISTING

LANSING KANSAS CITY 4314'(-190').

PENNSYLVANIAN

The Lansing Kansas City section was 462 feet thick and contained three show zones [SHOWS NO.4-6]. The Lansing is an interval of interbedded limestones and shales with occasional dolomitic stringers. Lansing porosity zones are usually fossiliferous and oomoldic. Background gas through the Lansing averaged 8-10 units, with drilling rates at 5.0'/ft and drilling breaks at 1.0 to 3.5'/ft. SHOW NO.4 was a poor show with good to fair oomoldic porosity, a trace of oil stain, and 10 percent fluorescence and cut. SHOW NO.5 was a fair show with very good to excellent porosity, no live oil stain, and 20 percent cut and fluorescence. SHOW NO.6 was a poor show and fair to poor oomoldic porosity, no oil stain, and 10 percent fluorescence and cut. None of the Lansing show zones were drill stem tested.

SHOW NO.4 4342'-4356'(14')(-218'). 1.0'/ft vs 5.0'/ft.

TG=8 U; C1=6 U; C2=2 U.

LITHOLOGY: LS mot bf-lttan occ gy litho-xfxl firm m-occ vfos w/occ ool text w/chk mtrx slpyr & dolo.

POROSITY: FR-G(oomold).

OIL STAIN: TR tan sat str.

FLOR: 10% mot myel.

CUT: 10% lt-myel slow cut.

RESIDUE: Pale flor res.

SHOW NO.5 4476-4488'(12')(-352'). 0.5'/ft vs 5.0'/ft.

TG=7 U; C1=6 U; C2=2 U.

LITHOLOGY: LS lttan-crm vvfri gran-litho vvfri vfos ool w/chk mtrx occ slpyr carb.

POROSITY: G-EX(oocastic).

OIL STAIN: None.

FLOR: 20% motyel.

CUT: 20% immed weak pale yel.

RESIDUE: Pale flor res.

SHOW NO.6 4598'-4614'(16')(-474'). 2.5'/ft vs 5.5'/ft.

TG=10 U; C1=8 U; C2=2 U.

LITHOLOGY: LS wh-crm occ ltgy litho-xfxl firm-fri vfos w/chk mtrx occ dolo strgs intbd slty pyr.

POROSITY: FR-P(oomold).

OIL STAIN: None.

FLOR: 10% mot myel.

CUT: 10% Weak myel diffuse strm.

RESIDUE: None.

MARMATON FORMATION 4776'(-652')

PENNSYLVANIAN

The Marmaton Formation was 140 feet thick and contains two members, the middle Pawnee Member [4800'(-676')] and the lower Fort Scott Member [4846'(-722')]. Sometimes an upper Marmaton porosity zone develops with shows. The Marmaton is generally composed of interbedded limestone and thin shales, with an increase in dolomite over the lower section. Background gas through the Marmaton averaged 10 units. One poor show developed in the Fort Scott Member [SHOW No.7 4848'-4858'], but did not warrant testing after electric logs were evaluated.

FORMATION AND ZONE LISTING

MARMATON 4776'(-652').

FORT SCOTT MEMBER 4846'(-722').

SHOW NO.7 4848'-4858'(10')(-724'). 2.5'/ft vs 5.5'/ft.

TG=16 U; C1=12 U; C2=2 U.

LITHOLOGY: LS tan-wh-ltgy litho-xfxl vfri-mfirm w/gran dolo strgs slty pyr.

POROSITY: FR(gran).

OIL STAIN: None.

FLOR: 10% mot pale yel.

CUT: 10% weak ltyel crush cut.

RESIDUE: None.

CHEROKEE 4916'(-792'). PENNSYLVANIAN

The Cherokee Formation was 152 feet thick and contained the usual interbedded black to dark gray-brown, highly organic shales, limestones, and an increase in the amount of limey dolomite, with traces of pyrite and chert. No shows were found in the Cherokee Formation. The usual pattern of gas increases through the Cherokee organic shales developed with background gases ranging from 10 units to a maximum of 28 units.

ATOKA 5068'(-944'). PENNSYLVANIAN

The Atoka Formation was 146 feet thick and was comprised of interbedded black shales with dark limestones and dolomite stringers. An increase in pyrite and chert was noted over the Cherokee interval. The Atoka Formation had high gas readings ranging from 16 to 32 units and was composed primarily of methane. The No.1-14 Avalanche Atoka section also developed one show zone in the Atoka section, in dolomitic limestone intervals. SHOW NO.8 was a very poor show with poor granular porosity. Show No.8 did not warrant testing while drilling or after electric logs were evaluated.

SHOW NO.8 5096'-5118'(22')(-972'). 4.5'/ft vs 6.5'/ft.

TG=32 U; C1=30 U; C2=6 U; C3=TR.

LITHOLOGY: LS mot tan-mgy-brn litho-gran mfri-firm vdolo w/intbd dolo strgs & intbd SH bk carb Ls is occ fos & chky.

POROSITY: P-TT(gran).

OIL STAIN: None.

FLOR: TR mot myel-dkyel.

CUT: TR very weak crush cut on dolo & occ oc bk sh.

RESIDUE: None.

MORROW SHALE(SONIC) 5214'(-1090') LOWER PENNSYLVANIAN

MORROW SHALE(STRAT) 5230'(-1106').

The Morrow Formation was 122 feet thick in the NO.1-14 Avalanche, and was the primary objective. The Morrow Formation consisted of black to gray marine shales and lighter colored shales in the valley fill sequences. The sandstone that does develop in the Morrow is found within these valley fill sequences. The primary objective was the Upper Sand, with the possible potential of the Middle and Lower Sand. The No.1-14 Avalanche developed an 6 foot Upper Sand [5288'-5294'(-1164')], and an 8 foot Middle Sand [5308'-5316'(-1184')]. No Lower sand developed in the No.1-14 Avalanche. Both Upper and Middle Sands were cored.

FORMATION AND ZONE LISTING

MORROW SHALE(STRAT) 5230'(-1106'). LOWER PENNSYLVANIAN

Core No.1 [5274'-5316'(42')] and Core No.2 [5316'-5374.8'(58.8')] were taken just above the Upper Sand to frame the valley fill transition zone above the sands and down into the Lower Morrow Limestone below the Morrow sands. Both the Upper and Middle Sands were medium to coarse grained in the higher porosity zones [up to 20 percent density porosity in stringers] with an average density porosity in the 8-12 percent range]. The Upper and Middle Sands both had very dirty matrices of clay and shale partings with a trace of glauconite and pyrite. Cementation was predominately siliceous with quartz overgrowths and associated dolomitic cement. No shows of oil, fluorescence or cut were found in any core chips or cuttings while coring. A straddle drill stem test [DST No.1 5200'-5340'(140'), See pages 9-11], was run after electric logs were run to fully evaluate the Morrow section. DST No.1 recovered 1820 feet of drilling mud and water, with no trace of oil or gas either in the pipe recovery or in the sampler. After electric log, core sample data were evaluated, the Morrow Shale section was determined to be nonproductive. See Pages 12-15 for Core Descriptions.

LOWER MORROW LIME 5336'(-1212') LOWER PENNSYLVANIAN

The Lower Morrow was 58 feet thick and contained no shows. Background gas ranged from 8 to 12 units. The lithology of the Lower Morrow consisted mainly of chalky and moderately fossiliferous, and sometimes slightly sandy limestone, with a decrease in the amount of shale from the Morrow section. No sample shows were found in the No.1-14 Avalanche.

MISSISSIPPIAN 5394'(-1270'). UPPER MISSISSIPPIAN

The MISSISSIPPIAN was a tan to gray chalky fossiliferous and sandy limestone with thin interbedded shales. Background ranged from 10 to 18 units. No shows were found in the 188 feet penetrated in this section.

SPERGEN 5582'(-1458'). MISSISSIPPIAN

The Spergen Formation consisted of interbedded limestone and granular dolomites with thin shale stringers. The top of the Spergen was marked by the typical increase in chert and in percentage of dolomite. No shows were found in the 128 feet of Spergen penetrated in the No.1-14 Avalanche, which reached a total depth of 5710'(-1586') in the Spergen dolomites.
