

FORMATION TESTING SERVICES

P.O.Box 518,
Hays, Kansas 67601

Hays
(913) 628-1115

Great Bend
(316) 792-6187

Company: Thunderbird Drilling, Inc.

Company Address: P.O. Box 18407
Wichita, Kansas 67218

Company Representative: Mr. Robert Thompson

Contractor: Thunderbird Drilling Co.

Mud P.P.M.Cl⁻ Hydrostatic .51 P.S.I./ft.

Mud Weight 9.8 Viscosity 44 Water Loss

Total Depth: 2937

Anchor Length: 60

Top Packer Depth: 2882

Bottom Packer Depth: 2887

Surface Choke: 1 Bottom Choke: .75

Drill Pipe Size: 4.5 Wt. Pipe Run: 566 I.D. 2.75

Collars Run: I.D.

Main Hole Size: 7 7/8

Internal Rec# 13752 Depth: 2883'

Test# 1

Lease Name: Kisner "G" 1

Location: Sec. 32 Twp. 15S Rng. 17W

County Ellis St. Kansas

Date: 12/30/85

Elevation: 1872 GL

Tester: J.H. Roach

Blow: Initial--Blow strong-bottom of bucket
in 5 minutes. Final Flow--strong-bottom of
bucket in 1/2 minute.

Tool Open: 6:17 am Remarks:

External Rec# 13753 Depth: 2932'

TEST RESULTS & RECOVERY

Interval Tested: 2877-2936'

Zone Tested: Topeka

Initial Hydrostatic Mud: 1514 P.S.I.

Initial Flow Pressure 58 To 58 P.S.I.

Initial Shut-In Pressure 656 P.S.I.

Final Flow Pressure 68 To 78 P.S.I.

Final Shut-In Pressure 552 P.S.I.

Final Hydrostatic Mud 1504 P.S.I.

Initial Flow Period 30 Min.

Initial Shut-In 45 Min.

Final Flow Period 30 Min.

Final Shut-In 45 Min.

130 Feet Total Fluid Recovery Feet Gas In Pipe

Recovered 130 Feet GOCM 30 %Gas 16 %Oil 2 %H₂O 52 %Mud

Recovered Feet %Gas %Oil %H₂O %Mud

Recovered Feet %Gas %Oil %H₂O %Mud

Recovered Feet %Gas %Oil %H₂O %Mud

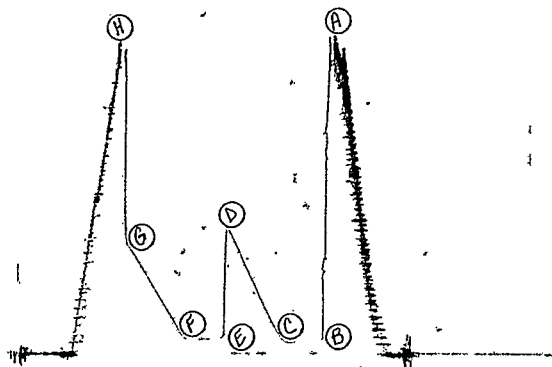
Recovered Feet %Gas %Oil %H₂O %Mud

Recovered Fluid Properties: P.P.M.Cl⁻ Gravity: °A.P.I. Resistivity: Ω/m² BHT 99 °F

Extra Equipment: None

Price of Job: \$550.00

Ticket # 1161 Rec # 13753 Test # 11



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Mud 80K P.P.M.Cl⁻ Hydrostatic .51 P.S.I./ft.

Mud Weight 9.8 Viscosity 41 Water Loss 16.0

Total Depth: 3074'

Anchor Length: 133'

Top Packer Depth: 2936'

Bottom Packer Depth: 2941'

Surface Choke: 1 Bottom Choke: .75

Drill Pipe Size: 4.5 Wt. Pipe Run: 566 I.D. 2.75

Collars Run: I.D.

Main Hole Size: 7 7/8

Internal Rec# 13752 Depth: 3036'

Test# 2

Lease Name: Kisner "G" 1

Location: Sec. 32 Twp. 15S Rng. 17W

County Ellis St. Kansas

Date: 12/31/85

Elevation: 1872 GL

Tester: J.H. Roach

Blow: Initial flow-weak building to 2" in
bucket. Final flow-weak blow 1/4" in
bucket

Tool Open: 12:00 am Remarks:

External Rec# 13753 Depth: 3070'

TEST RESULTS & RECOVERY

Interval Tested: 2941'-3074'

Zone Tested: Oread

Initial Hydrostatic Mud: 1611 P.S.I.

Initial Flow Pressure 87 To 87 P.S.I.

Initial Shut-In Pressure 981 P.S.I.

Final Flow Pressure 107 To 107 P.S.I.

Final Shut-In Pressure 895 P.S.I.

Final Hydrostatic Mud 1591 P.S.I.

Initial Flow Period 30 Min.

Initial Shut-In 45 Min.

Final Flow Period 30 Min.

Final Shut-In 45 Min.

20 Feet Total Fluid Recovery Feet Gas In Pipe

Recovered 20 Feet mud %Gas %Oil %H₂O 100 %Mud

Recovered Feet %Gas %Oil %H₂O %Mud

Recovered Feet %Gas %Oil %H₂O %Mud

Recovered Feet %Gas %Oil %H₂O %Mud

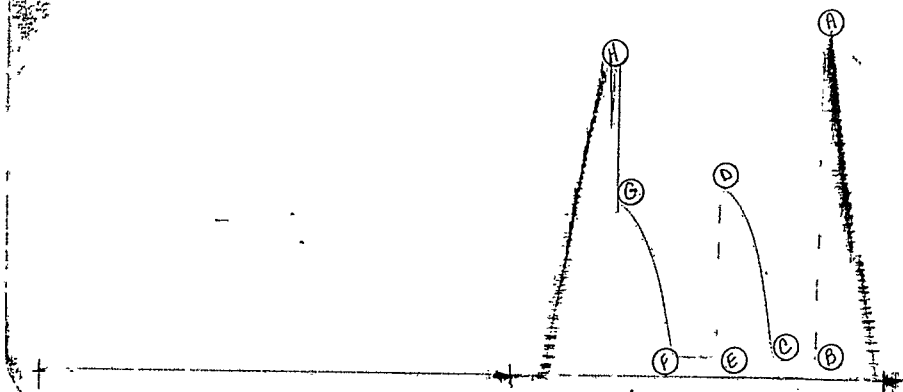
Recovered Feet %Gas %Oil %H₂O %Mud

Recovered Fluid Properties: P.P.M.Cl⁻ Gravity: °A.P.I. Resistivity: Ω/m² BHT 100 °F

Extra Equipment: None

Price of Job: \$550.00

Ticket # 1162 Rec # 13753 TEST # 2



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Contractor: Thunderbird Drilling Co.

Mud 84K P.P.M.CI — Hydrostatic .51 P.S.I./ft.

Mud Weight 9.9 Viscosity 40 Water Loss 10.4

Total Depth: 3300'

Anchor Length: 98'

Top Packer Depth: 3197'

Bottom Packer Depth: 3202'

Surface Choke: 1" Bottom Choke: .75

Drill Pipe Size: 4.5 Wt. Pipe Run: 566 I.D. 2.75

Collars Run: — I.D. —

Main Hole Size: 7 7/8

Internal Rec# 13752 Depth: 3776'

Test# 4

Lease Name: Kisner "G" 1

Location: Sec. 32 Twp. 15S Rng. 17W

County Ellis St. Kansas

Date: 01/01/86

Elevation: 1872 GL

Tester: J.H. Roach

Blow: Initial- weak 1/2" blow

Final-no blow

Tool Open: 12:20 pm Remarks: —

External Rec# 13753 Depth: 3296'

TEST RESULTS & RECOVERY

Interval Tested: 3202-3300'

Zone Tested: Lansing

Initial Hydrostatic Mud: 1805 P.S.I.

Initial Flow Pressure 116 To 116 P.S.I.

Initial Shut-In Pressure 523 P.S.I.

Final Flow Pressure 126 To 126 P.S.I.

Final Shut-In Pressure 213 P.S.I.

Final Hydrostatic Mud 1776 P.S.I.

Initial Flow Period 30 Min.

Initial Shut-In 30 Min.

Final Flow Period 30 Min.

Final Shut-In 30 Min.

25 Feet Total Fluid Recovery — Feet Gas In Pipe

Recovered 25 Feet thin mud — %Gas — %Oil — %H₂O 100 %Mud

Recovered — Feet — %Gas — %Oil — %H₂O — %Mud

Recovered — Feet — %Gas — %Oil — %H₂O — %Mud

Recovered — Feet — %Gas — %Oil — %H₂O — %Mud

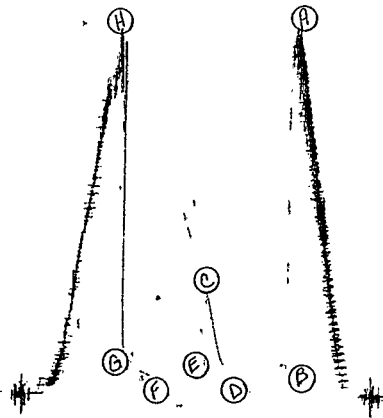
Recovered — Feet — %Gas — %Oil — %H₂O — %Mud

Recovered Fluid Properties: — P.P.M.CI — Gravity: — °A.P.I. Resistivity: — Ω/m² BHT 101 °F

Extra Equipment: None

Price of Job: \$550.00

Ticket # 1164 Rec # 13753 TEST # 4



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Contractor: Thunderbird Drilling Co.

Mud 84K P.P.M.Cl⁻ Hydrostatic .51 P.S.I./ft.

Mud Weight 9.9 Viscosity 44 Water Loss 10.4

Total Depth: 3345'

Anchor Length: 58'

Top Packer Depth: 3282'

Bottom Packer Depth: 3287'

Surface Choke: 1" Bottom Choke: .75"

Drill Pipe Size: 4.5 Wt. Pipe Run: 566 I.D. 2.75

Collars Run: I.D.

Main Hole Size: 7 7/8

Internal Rec# 13752 Depth: 3313'

Test# 5

Lease Name: Kisner "G" 1

Location: Sec. 32 Twp. 15S Rng. 17W

County Ellis St. Kansas

Date: 01/02/86

Elevation: 1872 GL

Tester: J.H. Roach

Blow: Initial-weak that died in 20 minutes

Final-no blow

Tool Open: 1:20 am Remarks:

External Rec# 13752 Depth: 3341'

TEST RESULTS & RECOVERY

Interval Tested: 3287'-3345'

Zone Tested: Lansing

Initial Hydrostatic Mud: 1715 P.S.I.

Initial Flow Pressure 58 To 58 P.S.I.

Initial Shut-In Pressure 78 P.S.I.

Final Flow Pressure 58 To 58 P.S.I.

Final Shut-In Pressure 67 P.S.I.

Final Hydrostatic Mud 1786 P.S.I.

Initial Flow Period 30 Min.

Initial Shut-In 30 Min.

Final Flow Period 30 Min.

Final Shut-In 30 Min.

5 Feet Total Fluid Recovery Feet Gas In Pipe

Recovered 5 Feet mud w/oil specks - %Gas %Oil %H₂O 100 %Mud

Recovered Feet - %Gas %Oil %H₂O %Mud

Recovered Feet - %Gas %Oil %H₂O %Mud

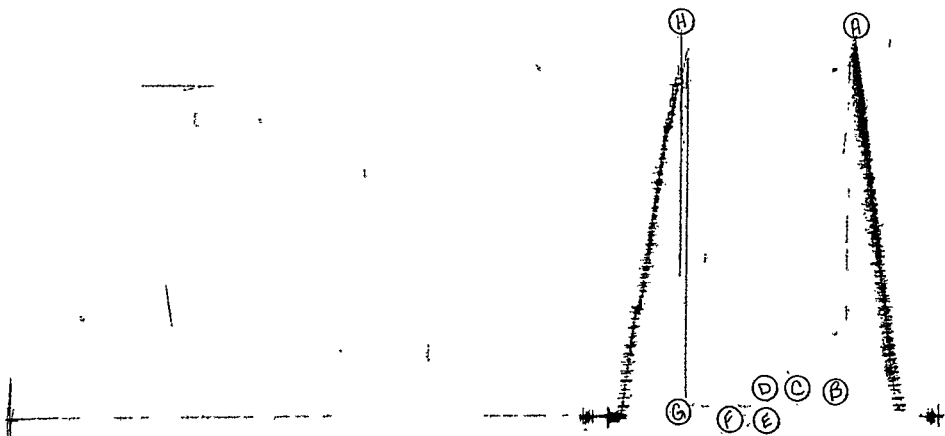
Recovered Feet - %Gas %Oil %H₂O %Mud

Recovered Feet - %Gas %Oil %H₂O %Mud

Recovered Fluid Properties: P.P.M.Cl⁻ Gravity: °A.P.I. Resistivity: Ω/m² BHT 101 °F

Extra Equipment: None Price of Job: \$550.00

Ticket # 1165 Rec# 13753 Test 25



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Contractor: Thunderbird Drilling Co.

Mud 64K P.P.M.Cl⁻ Hydrostatic .51 P.S.I./ft.

Mud Weight 9.8 Viscosity 39 Water Loss 11.2

Total Depth: 3400'

Anchor Length: 64'

Top Packer Depth: 3331'

Bottom Packer Depth: 3336'

Surface Choke: 1" Bottom Choke: .75"

Drill Pipe Size: 4.5 Wt. Pipe Run: 566 I.D. 2.75

Collars Run: I.D.

Main Hole Size: 7 7/8

Internal Rec# 13752 Depth: 3361'

Test# 6

Lease Name: Kisner "G" 1

Location: Sec. 32 Twp. 15S Rng. 17W

County Ellis St. Kansas

Date: 01/02/86

Elevation: 1872 GL

Tester: J.H. Roach

Blow: Initial--weak died in 28 mins.

Final--no blow--waited 5 mins, then
flushed tool.

Tool Open: 6:20 pm Remarks:

External Rec# 13753 Depth: 3396'

TEST RESULTS & RECOVERY

Interval Tested: 3336'-3400'

Zone Tested: Lansing

Initial Hydrostatic Mud: 1767 P.S.I.

Initial Flow Pressure 39 To 48 P.S.I.

Initial Shut-In Pressure 58 P.S.I.

Final Flow Pressure 48 To 48 P.S.I.

Final Shut-In Pressure 48 P.S.I.

Final Hydrostatic Mud 1708 P.S.I.

Initial Flow Period 30 Min.

Initial Shut-In 30 Min.

Final Flow Period 30 Min.

Final Shut-In 30 Min.

20 Feet Total Fluid Recovery Feet Gas In Pipe

Recovered 20 Feet mud %Gas %Oil %H₂O 100 %Mud

Recovered Feet %Gas %Oil %H₂O %Mud

Recovered Feet %Gas %Oil %H₂O %Mud

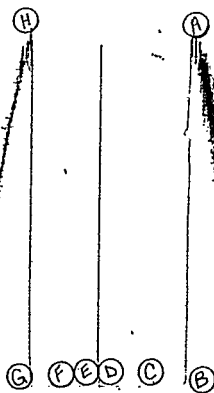
Recovered Feet %Gas %Oil %H₂O %Mud

Recovered Feet %Gas %Oil %H₂O %Mud

Recovered Fluid Properties: P.P.M.Cl⁻ Gravity: °A.P.I. Resistivity: Ω/m² BHT 102 °F

Extra Equipment: None Price of Job: \$550.00

Ticket # 1106 Rev. # 13753 Test # 6



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Wichita, Kansas 67218

Company Representative: Mr. Robert Thompson

Contractor: Thunderbird Drilling Co.

Mud 64K P.P.M. Cl⁻ Hydrostatic .51 P.S.I./ft.

Mud Weight 9.8 Viscosity 44 Water Loss 11.2

Total Depth: 3460'

Anchor Length: 66'

Top Packer Depth: 3389'

Bottom Packer Depth: 3394'

Surface Choke: 1" Bottom Choke: .75"

Drill Pipe Size: 4.5 Wt. Pipe Run: 566 I.D. 2.75

Collars Run: I.D.

Main Hole Size: 7 7/8

Internal Rec# 13752 Depth: 3431'

Test# 7

Lease Name: Kisner "G" 1

Location: Sec. 32 Twp. 15S Rng. 17W

County Ellis St. Kansas

Date: 01/03/86

Elevation: 1872 GL

Tester: J.H. Roach

Blow: Initial-weak building to bottom of
bucket. Final-weak died in 25 min.

Tool Open: 10:50 am Remarks:

External Rec# 13753 Depth: 3456'

TEST RESULTS & RECOVERY

Interval Tested: 3394'-3460'

Zone Tested: Arbuckle

Initial Hydrostatic Mud: 1844 P.S.I.

Initial Flow Pressure 58 To 58 P.S.I.

Initial Shut-In Pressure 107 P.S.I.

Final Flow Pressure 58 To 58 P.S.I.

Final Shut-In Pressure 68 P.S.I.

Final Hydrostatic Mud 1835 P.S.I.

Initial Flow Period 30 Min.

Initial Shut-In 30 Min.

Final Flow Period 30 Min.

Final Shut-In 30 Min.

20 Feet Total Fluid Recovery Feet Gas In Pipe

Recovered 20 Feet mud w/specks of oil - %Gas %Oil %H₂O 100 %Mud

Recovered Feet - %Gas %Oil %H₂O %Mud

Recovered Feet - %Gas %Oil %H₂O %Mud

Recovered Feet - %Gas %Oil %H₂O %Mud

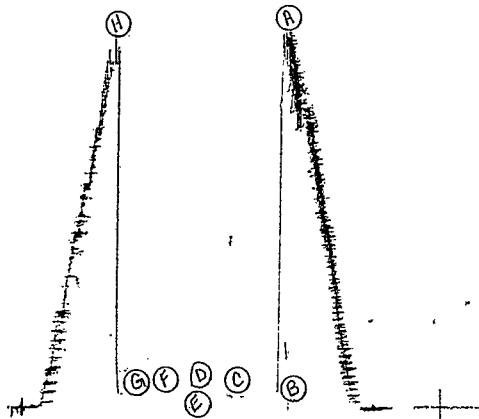
Recovered Feet - %Gas %Oil %H₂O %Mud

Recovered Fluid Properties: P.P.M. Cl⁻ Gravity: °A.P.I. Resistivity: Ω/m² BHT 101 °F

Extra Equipment: None

Price of Job: \$550.00

Ticket # 1167 Rec # 13753 TEST # 7



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Company Representative: Mr. Robert Thompson

Contractor: Thunderbird Drilling Co.

Mud 59K P.P.M.Cl⁻ Hydrostatic .51 P.S.I./ft.

Mud Weight 9.8 Viscosity 48 Water Loss 10.8

Total Depth: 3466'

Anchor Length: 73'

Top Packer Depth: 3388'

Bottom Packer Depth: 3393'

Surface Choke: 1" Bottom Choke: .75"

Drill Pipe Size: 4.5 Wt. Pipe Run: 566 I.D. 2.75

Collars Run: I.D.

Main Hole Size: 7 7/8

Internal Rec# 13752 Depth: 3430'

Test# 8

Lease Name: Kisner "G" 1

Location: Sec. 32 Twp. 15S Rng. 17W

County Ellis St. Kansas

Date: 01/03/86

Elevation: 1872 GL

Tester: J.H. Roach

Blow: Initial--blow fair building to 7" in
bucket. Final--weak building to 3"
in bucket

Tool Open: 9:30 pm Remarks:

External Rec# 13753 Depth: 3462'

TEST RESULTS & RECOVERY

Interval Tested: 3393'-3466

Zone Tested: Arbuckle

Initial Hydrostatic Mud: 1718 P.S.I.

Initial Flow Pressure 68 To 78 P.S.I.

Initial Shut-In Pressure 761 P.S.I.

Final Flow Pressure 87 To 87 P.S.I.

Final Shut-In Pressure 637 P.S.I.

Final Hydrostatic Mud 1718 P.S.I.

Initial Flow Period 30 Min.

Initial Shut-In 45 Min.

Final Flow Period 30 Min.

Final Shut-In 45 Min.

90 Feet Total Fluid Recovery 60 Feet Gas In Pipe

Recovered 90 Feet O & G C M 15 %Gas 10 %Oil 10 %H₂O 65 %Mud

Recovered 60 Feet GIP 100 %Gas %Oil %H₂O %Mud

Recovered Feet %Gas %Oil %H₂O %Mud

Recovered Feet %Gas %Oil %H₂O %Mud

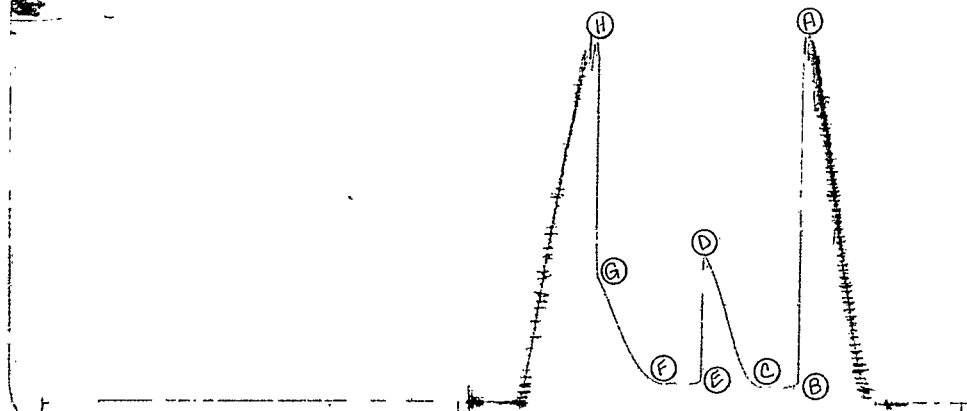
Recovered Feet %Gas %Oil %H₂O %Mud

Recovered Fluid Properties: 90K P.P.M.Cl⁻ Gravity: °A.P.I. Resistivity: Ω/m² BHT 104 °F

Extra Equipment: None

Price of Job: \$550.00

Ticket #1168 Rec #13753 Test #8



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Company Address: P.O. Box 18407

Wichita, Kansas 67218

Company Representative: Mr. Robert Thompson

Contractor: Thunderbird Drilling Co.

Mud 59K P.P.M.Cl⁻ Hydrostatic .52 P.S.I./ft.

Mud Weight 9.9 Viscosity 44 Water Loss 10.8

Total Depth: 3470'

Anchor Length: 78'

Top Packer Depth: 3387'

Bottom Packer Depth: 3392'

Surface Choke: 1" Bottom Choke: .75"

Drill Pipe Size: 4.5 Wt. Pipe Run: 566 I.D. 2.75

Collars Run: I.D.

Main Hole Size: 7 7/8

Internal Rec# 13752 Depth: 3460'

Test# 9

Lease Name: Kisner "G" 1

Location: Sec. 32 Twp. 15S Rng. 17W

County Ellis St. Kansas

Date: 01/04/86

Elevation: 1872 GL

Tester: J.H. Roach

Blow: Initial--fair building to 9 1/2" in bucket

Final flow-weak building to 4" in bucket

Tool Open: 8:05 am Remarks:

External Rec# 13753 Depth: 3466'

TEST RESULTS & RECOVERY

Interval Tested: 3392'-3470'

Zone Tested: Arbuckle

Initial Hydrostatic Mud: 1854 P.S.I.

Initial Flow Pressure 107 To 116 P.S.I.

Initial Shut-In Pressure 895 P.S.I.

Final Flow Pressure 126 To 136 P.S.I.

Final Shut-In Pressure 761 P.S.I.

Final Hydrostatic Mud 1815 P.S.I.

Initial Flow Period 45 Min.

Initial Shut-In 45 Min.

Final Flow Period 45 Min.

Final Shut-In 45 Min.

150 Feet Total Fluid Recovery Feet Gas In Pipe

Recovered 150 Feet G & O CM - 12 %Gas 12 %Oil 4 %H₂O 72 %Mud

Recovered Feet - %Gas %Oil %H₂O %Mud

Recovered Feet - %Gas %Oil %H₂O %Mud

Recovered Feet - %Gas %Oil %H₂O %Mud

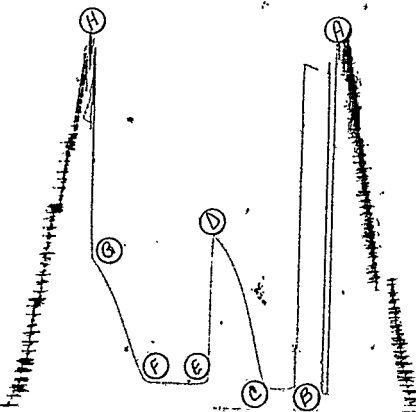
Recovered Feet - %Gas %Oil %H₂O %Mud

Recovered Fluid Properties: 58K P.P.M.Cl⁻ Gravity: °A.P.I. Resistivity: Ω/m² BHT 109 °F

Extra Equipment: None

Price of Job: \$550.00

Ticket # 1169 Rec # 15753 Test # 9



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Contractor: Thunderbird Drilling Co.

Mud 58K P.P.M.Cl⁻ Hydrostatic .52 P.S.I./ft.

Mud Weight 10.0 Viscosity 41 Water Loss 10.4

Total Depth: 3474'

Anchor Length: 79'

Top Packer Depth: 3390'

Bottom Packer Depth: 3395'

Surface Choke: 1" Bottom Choke: .75"

Drill Pipe Size: 4.5 Wt. Pipe Run: 566 I.D. 2.75

Collars Run: I.D.

Main Hole Size: 7 7/8

Internal Rec# 13752 Depth: 3436'

Test# 10

Lease Name: Kisner "G" 1

Location: Sec. 32 Twp. 15S Rng. 17W

County Ellis St. Kansas

Date: 01/04/86

Elevation: 1872 GL

Tester: J.H. Roach

Blow: Initial--fair-bottom of bucket in
30 min (13") Final flow-weak building
to bottom of bucket in 38 min (13")

Tool Open: 8:35 pm Remarks:

External Rec# 13753 Depth: 3470'

TEST RESULTS & RECOVERY

Interval Tested: 3395'-3474'

Zone Tested: Arbuckle

Initial Hydrostatic Mud: 1786 P.S.I.

Initial Flow Pressure 97 To 136 P.S.I.

Initial Shut-In Pressure 1136 P.S.I.

Final Flow Pressure 194 To 242 P.S.I.

Final Shut-In Pressure 1126 P.S.I.

Final Hydrostatic Mud 1796 P.S.I.

Initial Flow Period 45 Min.

Initial Shut-In 30 Min.

Final Flow Period 45 Min.

Final Shut-In 30 Min.

480 Feet Total Fluid Recovery Feet Gas In Pipe

Recovered 480 Feet SO&GCM %Gas %Oil %H₂O %Mud

Recovered Feet top %Gas 14 %Oil 4 %H₂O 2 %Mud 80

Recovered Feet bottom %Gas 26 %Oil 4 %H₂O 6 %Mud 64

Recovered Feet %Gas %Oil %H₂O %Mud

Recovered Feet %Gas %Oil %H₂O %Mud

Recovered Fluid Properties: 58K P.P.M.Cl⁻ Gravity: °A.P.I. Resistivity: Ω/m² BHT 109 °F

Extra Equipment: None

Price of Job: \$550.00

Ticket #1170 Rec #13753 Test #10

