API No. 15-065-22336-1000

Graham

County

C. NE SW Sec. 17 Twp 6 Rge 22 East

1860 Ft from Southeast Corner of Section

Field Name: Bethell 13-17 Well 6

Pen

Producing Formation: N/A

Elevation: Ground

2369 X 2374

Section Plate

WATER SUPPLY INFORMATION

Disposition of Produced Water: Disposal

Docket # N/A Repressuring

INSTRUCTIONS: This form shall be completed in triplicate and filed with the Kansas Corporation Commission, 200 Colorado Derby Building, Wichita, Kansas 67202, within 120 days of the spud date of any well. Rule 82-3-130, 82-3-107 and 82-3-106 apply.

Information on side two of this form will be held confidential for a period of 12 months if requested in writing and submitted with the form. See rule 82-3-107 for confidentiality, in excess of 12 months. One copy of all wireline logs and drillers time log shall be attached with this form. Submit OP-4 form with all plugged wells. Submit CP-11 form with all temporarily abandoned wells.

All requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Signature

W.A. Mielke

Title

Coordinator Reservoir Engineering U.S.

K.C.C. OFFICE USE ONLY

Letter of Confidentiality Attached

KCC Wireline Log Received

Drillers Timelog Received

Distribution

KGS Plug Other (Specify)

Data Commission Expires June 19, 1982

Form ACO-1 (5-86)
### WELL LOG

**INSTRUCTIONS:** Show important tops and base of formations penetrated. Detail all cores. Report all drill stem tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface during test. Attach extra sheet if more space is needed. Attach copy of log.

<table>
<thead>
<tr>
<th>Formation Description</th>
<th>Name</th>
<th>Top</th>
<th>Bottom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stone Corral Anhydrite</td>
<td>2036</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Topeka</td>
<td>3404</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hoebner</td>
<td>3566</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toronto</td>
<td>3592</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lansing-Kansas City</td>
<td>3608</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conglomerate</td>
<td>3853</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CASING RECORD

- **Purpose of String**: Conductor, surf., inter., etc.
- **Size Hole Drilled**: 7.975
- **Size Casing Set (in O.D.)**: 7.975
- **Weight Lbs./Ft.**: 24
- **Setting Depth**: 105 ft
- **Type of Cement Used**: Common
- **% Sacs**: 2
- **Type and Percent Additives**: 

### PERFORATION RECORD

- **Shots Per Foot**: Specify footage of each interval perforated.

### TUBING RECORD

- **Size**: 
- **Set At**: 
- **Packer At**: 
- **Liner Run**: Yes

### Production History

- **Date of First Production**: 
- **Producing Method**: Flowing, Pumping, Gas Lift, Other (explain)
- **Estimated Production Per 24 Hours**: 
  - Oil: Bbls
  - Gas: MCF
  - Water: Bbls
  - Gas-Oil Ratio: 
  - Gravity:

### Disposition of Gas

- **Open Hole**: Yes
- **Perforation**: No
- **Other (Specify)**: 
- **Commingled**: Yes
- **Dually Completed**: No
- **Used on Lease**: Yes
- **Vented**: No
- **Sold**: No

### METHOD OF COMPLETION

- **Production Interval**: 

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**RELEASED**

**FFB 11 1988**

FROM CONFIDENTIAL
DRILL STEM TEST REPORT
NOMENCLATURE

\[ b = \text{Approximate Radius of Investigation} \quad \text{Feet} \]
\[ b' = \text{Approximate Radius of Investigation (Net Pay Zone $h'$)} \quad \text{Feet} \]
\[ \text{D.R.} = \text{Damage Ratio} \]
\[ E_l = \text{Elevation} \quad \text{Feet} \]
\[ GD = \text{B.T. Gauge Depth (From Surface Reference)} \quad \text{Feet} \]
\[ h = \text{Interval Tested} \quad \text{Feet} \]
\[ h' = \text{Net Pay Thickness} \quad \text{Feet} \]
\[ K = \text{Permeability} \quad \text{md} \]
\[ K' = \text{Permeability (From Net Pay Zone $h'$)} \quad \text{md} \]
\[ m = \text{Slope Extrapolated Pressure Plot (Psi$/^2$/cycle Gas)} \quad \text{psi/cycle} \]
\[ \text{OF}^1 = \text{Maximum Indicated Flow Rate} \quad \text{MCF/D} \]
\[ \text{OF}^2 = \text{Minimum Indicated Flow Rate} \quad \text{MCF/D} \]
\[ \text{OF}^3 = \text{Theoretical Open Flow Potential with Damage Removed Max.} \quad \text{MCF/D} \]
\[ \text{OF}^4 = \text{Theoretical Open Flow Potential with Damage Removed Min.} \quad \text{MCF/D} \]
\[ P_s = \text{Extrapolated Static Pressure} \quad \text{Psig.} \]
\[ P_f = \text{Final Flow Pressure} \quad \text{Psig.} \]
\[ P_{ot} = \text{Potentiometric Surface (Fresh Water*)} \quad \text{Feet} \]
\[ Q = \text{Average Adjusted Production Rate During Test} \quad \text{bbls/day} \]
\[ Q'^1 = \text{Theoretical Production w/Damage Removed} \quad \text{bbls/day} \]
\[ Q'^2 = \text{Measured Gas Production Rate} \quad \text{MCF/D} \]
\[ R = \text{Corrected Recovery} \quad \text{bbls} \]
\[ r_w = \text{Radius of Well Bore} \quad \text{Feet} \]
\[ t = \text{Flow Time} \quad \text{Minutes} \]
\[ t_0 = \text{Total Flow Time} \quad \text{Minutes} \]
\[ T = \text{Temperature Rankine} \quad ^\circ \text{R} \]
\[ Z = \text{Compressibility Factor} \]
\[ u = \text{Viscosity Gas or Liquid} \quad \text{CP} \]
\[ \text{Log} = \text{Common Log} \]

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given, Fresh Water Corrected to 100° F.
**CHENEY TESTING COMPANY, INC.**  
P. O. Box 367  
HILL CITY, KANSAS 67842

**DRILL-STEM TEST DATA**

<table>
<thead>
<tr>
<th>Company</th>
<th>Pan Canadian Petroleum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Name &amp; Number</td>
<td>Ber hail # 13-17-6</td>
</tr>
<tr>
<td>Company Address</td>
<td>Box 929 Denver, Colo. 80201</td>
</tr>
<tr>
<td>Company Rep.</td>
<td>Tom Rubis</td>
</tr>
<tr>
<td>Contractor</td>
<td>Murfin Drlg.  Rig #8</td>
</tr>
<tr>
<td>Location: Sec. 17  Twp. 68  Rge. 22W  Co. Graham State KS</td>
<td></td>
</tr>
<tr>
<td>Recorder No.</td>
<td>7456 Type AK-1 Range 4150 PSI</td>
</tr>
<tr>
<td>Recorder Depth</td>
<td>3763 Clock # 30420</td>
</tr>
<tr>
<td>(A) Initial Hydrostatic Mud</td>
<td>1937 PSI</td>
</tr>
<tr>
<td>(B) First Initial Flow Pressure</td>
<td>105 PSI</td>
</tr>
<tr>
<td>(C) First Final Flow Pressure</td>
<td>105 PSI</td>
</tr>
<tr>
<td>(D) Initial Shut-in Pressure</td>
<td>127 PSI</td>
</tr>
<tr>
<td>(E) Second Initial Flow Pressure</td>
<td>84 PSI</td>
</tr>
<tr>
<td>(F) Second Final Flow Pressure</td>
<td>127 PSI</td>
</tr>
<tr>
<td>(G) Final Shut-in Pressure</td>
<td>127 PSI</td>
</tr>
<tr>
<td>(H) Final Hydrostatic Mud</td>
<td>1812 PSI</td>
</tr>
<tr>
<td>Temperature</td>
<td>115</td>
</tr>
<tr>
<td>Mud Weight</td>
<td>9.6</td>
</tr>
<tr>
<td>Viscosity</td>
<td>40</td>
</tr>
<tr>
<td>Fluid Loss</td>
<td>9.6 chl. 2,000 P.P.M.</td>
</tr>
<tr>
<td>Interval Tested</td>
<td>3738-3773</td>
</tr>
<tr>
<td>Anchor Length</td>
<td>35</td>
</tr>
<tr>
<td>Top Packer Depth</td>
<td>3733</td>
</tr>
<tr>
<td>Bottom Packer Depth</td>
<td>3738</td>
</tr>
<tr>
<td>Total Depth</td>
<td>3773</td>
</tr>
<tr>
<td>Drill Pipe Size</td>
<td>4 ½&quot; X.H.</td>
</tr>
<tr>
<td>Wt. Pipe I. D.</td>
<td>2.7 Ft. Run 539</td>
</tr>
<tr>
<td>Recovery-Tot al Feet</td>
<td>5'</td>
</tr>
<tr>
<td>Recovered</td>
<td>5 Feet Of Drilling Mud (no show)</td>
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<tr>
<td>Recovered</td>
<td>Feet Of</td>
</tr>
<tr>
<td>Recovered</td>
<td>Feet Of</td>
</tr>
<tr>
<td>Recovered</td>
<td>Feet Of</td>
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<tr>
<td>Recovered</td>
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<tr>
<td>Recovered</td>
<td>Feet Of</td>
</tr>
<tr>
<td>Extra Equipment</td>
<td></td>
</tr>
<tr>
<td>Test No.</td>
<td>1</td>
</tr>
<tr>
<td>Zone Tested</td>
<td>&quot;I-1&quot; L.K.C.</td>
</tr>
<tr>
<td>Date</td>
<td>11-27-86</td>
</tr>
<tr>
<td>Tester</td>
<td>Dan Bangle</td>
</tr>
<tr>
<td>Elevation</td>
<td>2370 K.B.</td>
</tr>
<tr>
<td>Recorder No.</td>
<td>11091 Type AK-1 Range 4200 PSI</td>
</tr>
<tr>
<td>Recorder Depth</td>
<td>3768 Clock # 25719</td>
</tr>
<tr>
<td>Tool Open Before I.S.I.</td>
<td>15 Mins.</td>
</tr>
<tr>
<td>Initial Shut-in</td>
<td>30 Mins.</td>
</tr>
<tr>
<td>Flow Period</td>
<td>30 Mins.</td>
</tr>
<tr>
<td>Final Shut-in</td>
<td>30 Mins.</td>
</tr>
<tr>
<td>Top Choke Size</td>
<td>1&quot;</td>
</tr>
<tr>
<td>Hole Size</td>
<td>7 7/8&quot;</td>
</tr>
<tr>
<td>Bottom Choke Size</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>Rubber Size</td>
<td>6 3/4&quot;</td>
</tr>
<tr>
<td>Tool Open</td>
<td>6:25 P.M.</td>
</tr>
<tr>
<td>Blow Remarks</td>
<td>I.F. Weak Blow</td>
</tr>
<tr>
<td>F.P. No Blow. Flushed tool.</td>
<td></td>
</tr>
</tbody>
</table>

**Price of Job** $350.00
CHENEY TESTING CO., INC.
P. O. BOX 367 HILL CITY, KANSAS 67642

FLUID SAMPLER DATA

| Ticket No.  | 12242 | Date       | 11-27-86 |
| Company Name| Pan Canadian Petroleum |
| Lease       | Bethel #13-17-6 | Test No.  | 1 |
| County      | Graham County, KS. | Sec. 17 | Twp. 6S | Rge. 22W |

SAMPLER RECOVERY

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>ML</th>
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</thead>
<tbody>
<tr>
<td>Gas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mud</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td></td>
<td></td>
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<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure</td>
<td>250</td>
<td>P.S.I.</td>
</tr>
<tr>
<td>Total</td>
<td>2000</td>
<td>ML</td>
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PIT MUD ANALYSIS

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorides</td>
<td>2,000</td>
<td></td>
</tr>
<tr>
<td>Resistivity</td>
<td>.054 ohms @ 75 °F</td>
<td></td>
</tr>
<tr>
<td>Viscosity</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Wt.</td>
<td>9.6</td>
<td></td>
</tr>
<tr>
<td>Filtrate</td>
<td>9.6</td>
<td>cc</td>
</tr>
<tr>
<td>Other</td>
<td>½#1 M.C.</td>
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</tbody>
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SAMPLER ANALYSIS

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>ohms @ 75 °F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistivity</td>
<td>.162</td>
<td></td>
</tr>
<tr>
<td>Chlorides</td>
<td>2,000</td>
<td>ppm</td>
</tr>
<tr>
<td>Gravity</td>
<td>Corrected @ 60°F</td>
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</tbody>
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PIPE RECOVERY

TOP:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>ohms @ 75 °F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistivity</td>
<td>.054</td>
<td></td>
</tr>
<tr>
<td>Chlorides</td>
<td>2,000</td>
<td>ppm</td>
</tr>
</tbody>
</table>

MIDDLE:

<table>
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<tr>
<th></th>
<th></th>
<th>ohms @ °F</th>
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</thead>
<tbody>
<tr>
<td>Resistivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlorides</td>
<td></td>
<td>ppm</td>
</tr>
</tbody>
</table>

BOTTOM:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>ohms @ °F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlorides</td>
<td></td>
<td>ppm</td>
</tr>
</tbody>
</table>
This is an actual photograph of recorder chart.

<table>
<thead>
<tr>
<th>POINT</th>
<th>Field Reading</th>
<th>Office Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Initial Hydrostatic Mud</td>
<td>1937</td>
<td>PSI</td>
</tr>
<tr>
<td>(B) First Initial Flow Pressure</td>
<td>105</td>
<td>PSI</td>
</tr>
<tr>
<td>(C) First Final Flow Pressure</td>
<td>105</td>
<td>PSI</td>
</tr>
<tr>
<td>(D) Initial Closed-in Pressure</td>
<td>127</td>
<td>PSI</td>
</tr>
<tr>
<td>(E) Second Initial Flow Pressure</td>
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<td>PSI</td>
</tr>
<tr>
<td>(F) Second Final Flow Pressure</td>
<td>127</td>
<td>PSI</td>
</tr>
<tr>
<td>(G) Final Closed-in Pressure</td>
<td>127</td>
<td>PSI</td>
</tr>
<tr>
<td>(H) Final Hydrostatic Mud</td>
<td>1812</td>
<td>PSI</td>
</tr>
</tbody>
</table>
NOMENCLATURE

\(b\)  \(\)  Approximate Radius of Investigation  \(\)  Feet
\(b^1\)  \(\)  Approximate Radius of Investigation (Net Pay Zone \(h^1\))  \(\)  Feet
\(D.R.\)  \(\)  Damage Ratio  
\(E_l\)  \(\)  Elevation  \(\)  Feet
\(G_D\)  \(\)  B.T. Gauge Depth (From Surface Reference)  \(\)  Feet
\(h\)  \(\)  Interval Tested  \(\)  Feet
\(h^1\)  \(\)  Net Pay Thickness  \(\)  Feet
\(K\)  \(\)  Permeability  \(\)  md
\(K^1\)  \(\)  Permeability (From Net Pay Zone \(h^1\))  \(\)  md
\(m\)  \(\)  Slope Extrapolated Pressure Plot (Psi²/cycle Gas)  \(\)  psi/cycle
\(O_F^1\)  \(\)  Maximum Indicated Flow Rate  \(\)  MCF/D
\(O_F^2\)  \(\)  Minimum Indicated Flow Rate  \(\)  MCF/D
\(O_F^3\)  \(\)  Theoretical Open Flow Potential with/Damage Removed Max.  \(\)  MCF/D
\(O_F^4\)  \(\)  Theoretical Open Flow Potential with/Damage Removed Min.  \(\)  MCF/D
\(P_{es}\)  \(\)  Extrapolated Static Pressure  \(\)  Psig.
\(P_F\)  \(\)  Final Flow Pressure  \(\)  Psig.
\(P_{os}\)  \(\)  Potentiometric Surface (Fresh Water*)  \(\)  Feet
\(Q\)  \(\)  Average Adjusted Production Rate During Test  \(\)  bbls/day
\(Q^1\)  \(\)  Theoretical Production w/Damage Removed  \(\)  bbls/day
\(Q^9\)  \(\)  Measured Gas Production Rate  \(\)  MCF/D
\(R\)  \(\)  Corrected Recovery  \(\)  bbls
\(r_w\)  \(\)  Radius of Well Bore  \(\)  Feet
\(t\)  \(\)  Flow Time  \(\)  Minutes
\(t^o\)  \(\)  Total Flow Time  \(\)  Minutes
\(T\)  \(\)  Temperature Rankine  \(\)  °R
\(Z\)  \(\)  Compressibility Factor  
\(u\)  \(\)  Viscosity Gas or Liquid  \(\)  CP
\(Log\)  \(\)  Common Log

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given, Fresh Water Corrected to 100° F.
# DRILL-STEM TEST DATA

<table>
<thead>
<tr>
<th>Company</th>
<th>PanCanadian Petroleum</th>
<th>Test No.</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Name &amp; Number</td>
<td>Bethell #13-17-6</td>
<td>Zone Tested</td>
<td>&quot;K-L&quot; L.K.C.</td>
</tr>
<tr>
<td>Company Address</td>
<td>Box 929 Denver, Co. 80201</td>
<td>Date</td>
<td>11-28-86</td>
</tr>
<tr>
<td>Company Rep.</td>
<td>Tom Rubis</td>
<td>Tester</td>
<td>Dan Bangle</td>
</tr>
<tr>
<td>Contractor</td>
<td>Murfin Drg. Rig #8</td>
<td>Elevation</td>
<td>2370 K.B.</td>
</tr>
<tr>
<td>Location: Sec. 17 Twp. 68 Rge. 22W Co. Graham State KS</td>
<td>Est. Feet of Pay</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recorder No.</th>
<th>7456 Type AK-1 Range 4150 PSI</th>
<th>Recorder No.</th>
<th>11091 Type AK-1 Range 4200 PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recorder Depth</td>
<td>3795 Clock # 30420</td>
<td>Recorder Depth</td>
<td>3799 Clock # 25719</td>
</tr>
</tbody>
</table>

- (A) Initial Hydrostatic Mud | 1937 PSI
- (B) First Initial Flow Pressure | 105 PSI
- (C) First Final Flow Pressure | 105 PSI
- (D) Initial Shut-in Pressure | 116 PSI
- (E) Second Initial Flow Pressure | 105 PSI
- (F) Second Final Flow Pressure | 105 PSI
- (G) Final Shut-in Pressure | 95 PSI
- (H) Final Hydrostatic Mud | 1802 PSI

| Temperature | 115 |
| Fluid Weight | 9.7 |
| Viscosity | 47 |
| Fluid Loss | 9.2 chl. 2,000 P.P.M. |

| Interval Tested | 3768-3803 |
| Anchor Length | 35' |
| Top Packer Depth | 3763 |
| Bottom Packer Depth | 3768 |
| Total Depth | 3803 |
| Drill Pipe Size | 4½" F.H. |
| Wt. Pipe I. D. | 2.7 Ft. Run 539 |
| Recovery-Total Feet | 5 |
| Recovered | 5 Feet Of Drilling Mud (no show) |

| Extra Equipment | Price of Job | $350.00 |

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**MILLER PRINTERS, INC.**
Geist Bend, Kansas
# CHENEY TESTING CO., INC.

**P. O. BOX 367**

**HILL CITY, KANSAS 67642**

## FLUID SAMPLER DATA

<table>
<thead>
<tr>
<th>Ticket No.</th>
<th>12243</th>
<th>Date</th>
<th>11-28-86</th>
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<tbody>
<tr>
<td>Company Name</td>
<td>PanCanadian Petroleum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lease</td>
<td>Bethell #13-17-6</td>
<td>Test No.</td>
<td>2</td>
</tr>
<tr>
<td>County</td>
<td>Graham CO., KS.</td>
<td>Sec. 17</td>
<td>Twp. 6S</td>
</tr>
</tbody>
</table>

## SAMPLER RECOVERY

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity</th>
<th>Unit</th>
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</thead>
<tbody>
<tr>
<td>Gas</td>
<td>-</td>
<td>ML</td>
</tr>
<tr>
<td>Oil</td>
<td>-</td>
<td>ML</td>
</tr>
<tr>
<td>Mud</td>
<td>1950</td>
<td>ML</td>
</tr>
<tr>
<td>Water</td>
<td>-</td>
<td>ML</td>
</tr>
<tr>
<td>Other</td>
<td>-</td>
<td>ML</td>
</tr>
<tr>
<td>Pressure</td>
<td>115</td>
<td>P.S.I.</td>
</tr>
<tr>
<td>Total</td>
<td>1950</td>
<td>ML</td>
</tr>
</tbody>
</table>

## PIT MUD ANALYSIS

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorides</td>
<td>2,000</td>
<td>ppm</td>
</tr>
<tr>
<td>Resistivity</td>
<td>.054 ohms</td>
<td>@ 75 °F</td>
</tr>
<tr>
<td>Viscosity</td>
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<td></td>
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<tr>
<td>Wt.</td>
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<td>Filtrate</td>
<td>9.6</td>
<td>cc</td>
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<tr>
<td>Other</td>
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## SAMPLER ANALYSIS

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<thead>
<tr>
<th>Component</th>
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<tbody>
<tr>
<td>Resistivity</td>
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<tr>
<td>Gravity</td>
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<td>@ 60°F</td>
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## PIPE RECOVERY

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<th>Component</th>
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<tr>
<td>Resistivity</td>
<td>.054 ohms</td>
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<tr>
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<th>Office Reading</th>
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<tr>
<td>(A) Initial Hydrostatic Mud</td>
<td>1937 PSI</td>
<td></td>
</tr>
<tr>
<td>(B) First Initial Flow Pressure</td>
<td>105 PSI</td>
<td></td>
</tr>
<tr>
<td>(C) First Final Flow Pressure</td>
<td>105 PSI</td>
<td></td>
</tr>
<tr>
<td>(D) Initial Closed-in Pressure</td>
<td>116 PSI</td>
<td></td>
</tr>
<tr>
<td>(E) Second Initial Flow Pressure</td>
<td>105 PSI</td>
<td></td>
</tr>
<tr>
<td>(F) Second Final Flow Pressure</td>
<td>105 PSI</td>
<td></td>
</tr>
<tr>
<td>(G) Final Closed-in Pressure</td>
<td>95 PSI</td>
<td></td>
</tr>
<tr>
<td>(H) Final Hydrostatic Mud</td>
<td>1802 PSI</td>
<td></td>
</tr>
</tbody>
</table>
NOMENCLATURE

b = Approximate Radius of Investigation ................................ Feet
b' = Approximate Radius of Investigation (Net Pay Zone h') .......... Feet
D.R. = Damage Ratio .....................................................................
E = Elevation ................................................................................. Feet
GD = B.T. Gauge Depth (From Surface Reference) ......................... Feet
h = Interval Tested .......................................................................... Feet
h' = Net Pay Thickness ................................................................. Feet
K = Permeability ............................................................................ md
K' = Permeability (From Net Pay Zone h') ....................................... md
m = Slope Extrapolated Pressure Plot (Psi²/cycle Gas) .................... psi/cycle
OF₁ = Maximum Indicated Flow Rate .............................................. MCF/D
OF₂ = Minimum Indicated Flow Rate .............................................. MCF/D
OF₃ = Theoretical Open Flow Potential with/Damage Removed Max. MCF/D
OF₄ = Theoretical Open Flow Potential with/Damage Removed Min. MCF/D
Pˢ = Extrapolated Static Pressure ................................................ Psig.
Pᶠ = Final Flow Pressure ............................................................... Psig.
Pˢᵗ = Potentiometric Surface (Fresh Water*) .................................... Feet
Q = Average Adjusted Production Rate During Test ...................... bbls/day
Q₁ = Theoretical Production w/Damage Removed .......................... bbls/day
Q⁰ = Measured Gas Production Rate .............................................. MCF/D
R = Corrected Recovery ............................................................... bbls
rʷ = Radius of Well Bore ............................................................... Feet
t = Flow Time .............................................................................. Minutes
t₀ = Total Flow Time ...................................................................... Minutes
T = Temperature Rankine ............................................................ °R
Z = Compressibility Factor .............................................................
u = Viscosity Gas or Liquid .......................................................... CP
Log = Common Log

* Potentiometric Surface Reference to Rotary Table When Elevation Not Given, Fresh Water Corrected to 100° F.
<table>
<thead>
<tr>
<th>Company</th>
<th>Pan Canadian Petroleum</th>
<th>Test No.</th>
<th>1</th>
<th>Zone Tested</th>
<th>&quot;I-I&quot; L.K.C.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Name &amp; Number</td>
<td>Bethell # 13-17-6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company Address</td>
<td>Box 929 Denver, Colo. 80201</td>
<td>Date</td>
<td>11-27-86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company Rep.</td>
<td>Tom Rubis</td>
<td>Tester</td>
<td>Dan Bangie</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contractor</td>
<td>Murfin Drlg. Rig #8</td>
<td>Elevation</td>
<td>2370 K.B.</td>
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<td></td>
</tr>
<tr>
<td>Location: Sec.</td>
<td>17 Twp. 6S Rge. 22W Co.Graham State KS</td>
<td>Est. Feet of Pay</td>
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<td>Recorder No.</td>
<td>11091 Type AK-1 Range 4200 PSI</td>
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<td>Recorder Depth</td>
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<td>3768 Clock # 25719</td>
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<td>(A) Initial Hydrostatic Mud</td>
<td>1937 PSI</td>
<td>Tool Open Before I.S.I.</td>
<td>15 Mins.</td>
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<tr>
<td>(B) First Initial Flow Pressure</td>
<td>105 PSI</td>
<td>Initial Shut-in</td>
<td>30 Mins.</td>
<td></td>
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<tr>
<td>(C) First Final Flow Pressure</td>
<td>105 PSI</td>
<td>Flow Period</td>
<td>30 Mins.</td>
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<tr>
<td>(D) Initial Shut-in Pressure</td>
<td>127 PSI</td>
<td>Final Shut-in</td>
<td>30 Mins.</td>
<td></td>
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<tr>
<td>(E) Second Initial Flow Pressure</td>
<td>84 PSI</td>
<td>Top Choke Size</td>
<td>1&quot; Hole Size</td>
<td>7 7/8&quot;</td>
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<tr>
<td>(F) Second Final Flow Pressure</td>
<td>127 PSI</td>
<td>Bottom Choke Size</td>
<td>3/4&quot; Rubber Size</td>
<td>6 3/4&quot;</td>
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<tr>
<td>(G) Final Shut-in Pressure</td>
<td>127 PSI</td>
<td>Tool Open</td>
<td>6:25 P.M.</td>
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<tr>
<td>(H) Final Hydrostatic Mud</td>
<td>1812 PSI</td>
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<td>I.F. Weak Blow</td>
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<tr>
<td>Temperature</td>
<td>115</td>
<td>F.F. No Blow, Flushed tool.</td>
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<tr>
<td>Mud Weight</td>
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<td>Viscosity</td>
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<tr>
<td>Fluid Loss</td>
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<td>Top Packer Depth</td>
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<td>Bottom Packer Depth</td>
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<td>Total Depth</td>
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<td>Drill Pipe Size</td>
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<td>Wt. Pipe I. D.</td>
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<tr>
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<tr>
<td>Recovered Feet Of</td>
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<tr>
<td>Recovered Feet Of</td>
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<td>Recovered Feet Of</td>
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<td>Extra Equipment</td>
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This is an actual photograph of recorder chart.

<table>
<thead>
<tr>
<th>POINT</th>
<th>Field Reading</th>
<th>Office Reading</th>
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<tbody>
<tr>
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<td>1937</td>
<td>PSI</td>
</tr>
<tr>
<td>(B) First Initial Flow Pressure</td>
<td>105</td>
<td>PSI</td>
</tr>
<tr>
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<td>105</td>
<td>PSI</td>
</tr>
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<td>(D) Initial Closed-in Pressure</td>
<td>127</td>
<td>PSI</td>
</tr>
<tr>
<td>(E) Second Initial Flow Pressure</td>
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<td>PSI</td>
</tr>
<tr>
<td>(F) Second Final Flow Pressure</td>
<td>127</td>
<td>PSI</td>
</tr>
<tr>
<td>(G) Final Closed-in Pressure</td>
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<td>PSI</td>
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<td>(H) Final Hydrostatic Mud</td>
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## SAMPLER RECOVERY

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## PIT MUD ANALYSIS

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<td>Filtrate</td>
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## SAMPLER ANALYSIS

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<td>Gravity</td>
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<td>Corrected</td>
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## PIPE RECOVERY

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<tbody>
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<td>°F</td>
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<tr>
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<tbody>
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<td>ohms @</td>
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<tr>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHENEY TESTING CO.

DRILL STEM TEST REPORT
NOMENCLATURE

b = Approximate Radius of Investigation ........................................... Feet
b' = Approximate Radius of Investigation (Net Pay Zone h') .................. Feet
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t₀ = Total Flow Time .......................................................................... Minutes
T = Temperature Rankine .................................................................... °R
Z = Compressibility Factor ...................................................................

u = Viscosity Gas or Liquid ................................................................. CP

Log = Common Log

* Potentiometric Surface Reference to Rotary Table When Elevation Not
   Given, Fresh Water Corrected to 100° F.
**CHENEY TESTING COMPANY, INC.**

P. O. Box 367  
HILL CITY, KANSAS 67642

**DRILL-STEM TEST DATA**

<table>
<thead>
<tr>
<th>Company</th>
<th>PanCanadian Petroleum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Name &amp; Number</td>
<td>Bethell #13-17-6</td>
</tr>
<tr>
<td>Company Address</td>
<td>Box 929 Denver, Co. 80201</td>
</tr>
<tr>
<td>Company Rep.</td>
<td>Tom Rubis</td>
</tr>
<tr>
<td>Contractor</td>
<td>Murfin Drlg., Rig #8</td>
</tr>
<tr>
<td>Location: Sec. 17 Twp. 6S Rge. 22W Co.Graham State KS</td>
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</tr>
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<td>Test No.</td>
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<td>Zone Tested</td>
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<tr>
<td>Date</td>
<td>11-28-86</td>
</tr>
<tr>
<td>Tester</td>
<td>Dan Rangle</td>
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<tr>
<td>Elevation</td>
<td>2370 K.B.</td>
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<tr>
<td>Est. Feet of Pay</td>
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**Recorder Data**

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<th>Recorder No.</th>
<th>Type</th>
<th>Range</th>
<th>PSI</th>
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<td>PSI</td>
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<tr>
<td>11091</td>
<td>AK-1</td>
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**Recorder Depth**

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<td>11091</td>
<td>3799</td>
<td>25719</td>
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</tbody>
</table>

**Additional Data**

<table>
<thead>
<tr>
<th>Initial Hydrostatic Mud</th>
<th>1937 PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Initial Flow Pressure</td>
<td>105 PSI</td>
</tr>
<tr>
<td>First Final Flow Pressure</td>
<td>105 PSI</td>
</tr>
<tr>
<td>Initial Shut-in Pressure</td>
<td>116 PSI</td>
</tr>
<tr>
<td>Second Initial Flow Pressure</td>
<td>105 PSI</td>
</tr>
<tr>
<td>Second Final Flow Pressure</td>
<td>105 PSI</td>
</tr>
<tr>
<td>Final Shut-in Pressure</td>
<td>95 PSI</td>
</tr>
<tr>
<td>Final Hydrostatic Mud</td>
<td>1802 PSI</td>
</tr>
<tr>
<td>Temperature</td>
<td>115</td>
</tr>
<tr>
<td>Mud Weight</td>
<td>9.7</td>
</tr>
<tr>
<td>Viscosity</td>
<td>47</td>
</tr>
<tr>
<td>Fluid Loss</td>
<td>9.2 chl. 2,000 P.P.M.</td>
</tr>
<tr>
<td>Interval Tested</td>
<td>3768-3803</td>
</tr>
<tr>
<td>Anchor Length</td>
<td>35'</td>
</tr>
<tr>
<td>Top Packer Depth</td>
<td>3763</td>
</tr>
<tr>
<td>Bottom Packer Depth</td>
<td>3768</td>
</tr>
<tr>
<td>Total Depth</td>
<td>3803</td>
</tr>
<tr>
<td>Drill Pipe Size</td>
<td>4 1/2&quot; F.H.</td>
</tr>
<tr>
<td>Wt. Pipe I. D.</td>
<td>2 7/8&quot;</td>
</tr>
<tr>
<td>Ft. Run</td>
<td>539</td>
</tr>
<tr>
<td>Recovery</td>
<td>5 Feet Of Drilling Mud (no show)</td>
</tr>
<tr>
<td>Price of Job</td>
<td>$350.00</td>
</tr>
</tbody>
</table>

**Remarks**

- Initial Shut-in: 45 Mins.
- Flow Period: 30 Mins.
- Final Shut-in: 30 Mins.
- Top Choke Size: 1" Hole Size: 7 7/8"
- Bottom Choke Size: 3/4" Rubber Size: 6 3/4"
- Tool Open @ 6:07 A.M.
- Blow Remarks: I.F. WEAK 1/2" DECREASING BLOW.
- F.F. NO BLOW.
**FLUID SAMPLER DATA**

<table>
<thead>
<tr>
<th>Ticket No.</th>
<th>12243</th>
<th>Date</th>
<th>11–28–86</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Name</td>
<td>PanCanadian Petroleum</td>
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<td></td>
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<tr>
<td>Lease</td>
<td>Bethell #13–17–6</td>
<td>Test No.</td>
<td>2</td>
</tr>
<tr>
<td>County</td>
<td>Graham CO., KS.</td>
<td>Sec. 17</td>
<td>Twp. 6S</td>
</tr>
</tbody>
</table>

### SAMPLER RECOVERY

| Gas | 0 | ML |
| Oil | 0 | ML |
| Mud | 1950 | ML |
| Water | 0 | ML |
| Other | 0 | ML |
| Pressure | 115 | P.S.I. |
| Total | 1950 | ML |

### PIT MUD ANALYSIS

| Chlorides | 2,000 | ppm |
| Resistivity | 0.054 ohms @ 75 °F |
| Viscosity | 40 |
| Wt. | 9.6 |
| Filtrate | 9.6 cc |
| Other | ½# L.C.M. |

### SAMPLER ANALYSIS

| Resistivity | 0.154 ohms @ 75 °F |
| Chlorides | 2100 ppm |
| Gravity | Corrected @60°F |

### PIPE RECOVERY

**TOP:**

| Resistivity | 0.054 ohms @ 75 °F |
| Chlorides | 2100 ppm |

**MIDDLE:**

| Resistivity | ohms @ °F |
| Chlorides | ppm |

**BOTTOM:**

| Resistivity | ohms @ °F |
| Chlorides | ppm |
This is an actual photograph of recorder chart.

<table>
<thead>
<tr>
<th>POINT</th>
<th>Field Reading</th>
<th>Office Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Initial Hydrostatic Mud</td>
<td>1937 PSI</td>
<td></td>
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<td>105 PSI</td>
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<tr>
<td>(C) First Final Flow Pressure</td>
<td>105 PSI</td>
<td></td>
</tr>
<tr>
<td>(D) Initial Closed-in Pressure</td>
<td>116 PSI</td>
<td></td>
</tr>
<tr>
<td>(E) Second Initial Flow Pressure</td>
<td>105 PSI</td>
<td></td>
</tr>
<tr>
<td>(F) Second Final Flow Pressure</td>
<td>105 PSI</td>
<td></td>
</tr>
<tr>
<td>(G) Final Closed-in Pressure</td>
<td>95 PSI</td>
<td></td>
</tr>
<tr>
<td>(H) Final Hydrostatic Mud</td>
<td>1802 PSI</td>
<td></td>
</tr>
</tbody>
</table>