

Contractor Four Corners Drlg. Co. Top Choke 1/4"
Rig No. 3 Bottom Choke 1"
Spot 2150' FNL-1980'FWL Size Hole 8 3/4"
Sec. 20 Size Rat Hole --
Twp. 19 N Size & Wt. D. P. 4 1/2" 16.60
Rng. 8 W Size Wt. Pipe --
Field -- I. D. of D. C. 2 1/8"
County San Juan Length of D. C. 307'
State New Mexico Total Depth 5845'
Elevation 6580' "K.B." Interval Tested 4586-4606'
Formation Dakota Type of Test Inflate
Straddle

Flow No. 1 15 Min.
Shut-in No. 1 60 Min.
Flow No. 2 120 Min.
Shut-in No. 2 120 Min.
Flow No. 3 -- Min.
Shut-in No. 3 -- Min.

Bottom
Hole Temp. 140°F
Mud Weight 8.8
Gravity --
Viscosity 69

Tool opened @ 10:05 AM.

Outside Recorder

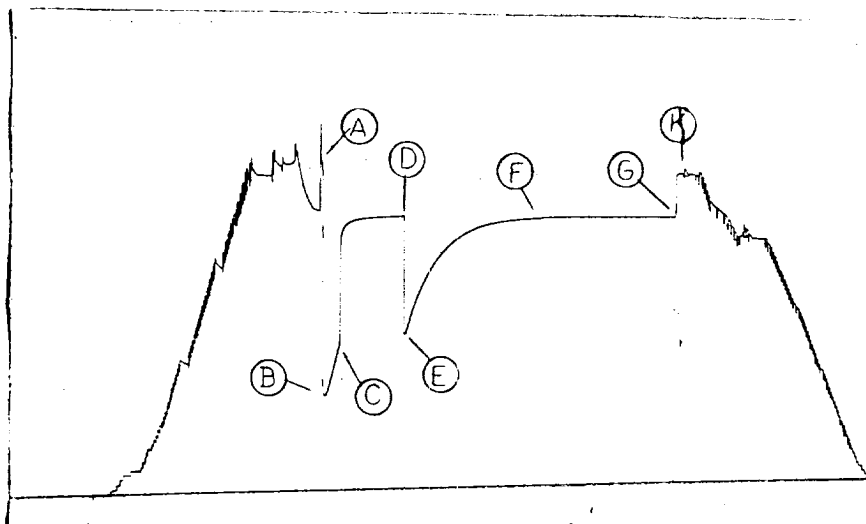
PRD Make Kuster K-3
No. 13139 Cap. 3000 @ 4590'

	Press	Corrected
Initial Hydrostatic	A	2094
Final Hydrostatic	K	2029
Initial Flow	B	669
Final Initial Flow	C	1003
Initial Shut-in	D	1828
Second Initial Flow	E	1065
Second Final Flow	F	1816
Second Shut-in	G	1828
Third Initial Flow	H	--
Third Final Flow	I	--
Third Shut-in	J	--

Lynes Dist.: Oklahoma City, Ok.

Our Tester: George McKee

Witnessed By: C. Moor



Did Well Flow — Gas yes Oil No Water No

RECOVERY IN PIPE: 4284' Total fluid
2260' Gas & oil cut water = 32.09 bbl.
2024' Water = 25.73 bbl.

REMARKS:

1st Flow- Tool opened with blow to bottom of bucket and remained
thru flow period. Gas to surface 5 minutes into initial
shut-in.

2nd Flow- Gas to surface, see gas volume report.

Operator Dome Petroleum Corporation
Address See Distribution

Well Name and No. Santa FE 20 #2
Ticket No. 5058

Date 6-3-77

DST No. 2
No. Final Copies 10

LYNES, INC.

Operator Dome Petroleum Corporation Lease & No. Santa FE 20 #2 DST No. 2

Recorder No. 13139 @ 4590'

FIRST SHUT IN PRESSURE:

TIME(MIN) PHI	(T"PHI) /PHI	PSIG
0.0	0.0000	1003
6.0	3.5000	1763
12.0	2.2500	1799
18.0	1.8333	1813
24.0	1.6250	1821
30.0	1.5000	1824
36.0	1.4167	1826
42.0	1.3571	1827
48.0	1.3125	1828
54.0	1.2778	1828
60.0	1.2500	1828

EXTRAPLN OF FIRST SHUT IN : 1830.4

SECOND SHUT IN PRESSURE:

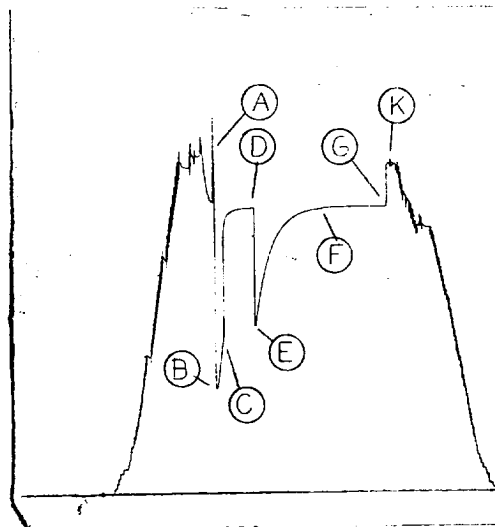
TIME(MIN) PHI	(T"PHI) /PHI	PSIG
0.0	0.0000	1816
12.0	12.2500	1825
24.0	6.6250	1827
36.0	4.7500	1828
48.0	3.8125	1828
60.0	3.2500	1828
72.0	2.8750	1828
84.0	2.6071	1828
96.0	2.4063	1828
108.0	2.2500	1828
120.0	2.1250	1828

EXTRAPLN OF SECOND SHUT IN : 1828.1 M : 0.1

Extrapolations of reservoir pressures should
be used as indicators only.

LYNES, INC.

Operator Dome Petroleum Corporation Lease & No. Santa FE 20 #2 DST No. 2



Outside Recorder

PRD Make Kuster K-3
No. 13138 Cap. 3000 @ 4590'

Press		Corrected
Initial Hydrostatic	A	2100
Final Hydrostatic	K	2029
Initial Flow	B	677
Final Initial Flow	C	1005
Initial Shut-in	D	1835
Second Initial Flow	E	1073
Second Final Flow	F	1827
Second Shut-in	G	1835
Third Initial Flow	H	--
Third Final Flow	I	--
Third Shut-in	J	--

Pressure Below Bottom
Packer Bled To

PRD Make _____
No. _____ Cap. _____ @ _____

Press		Corrected
Initial Hydrostatic	A	
Final Hydrostatic	K	
Initial Flow	B	
Final Initial Flow	C	
Initial Shut-in	D	
Second Initial Flow	E	
Second Final Flow	F	
Second Shut-in	G	
Third Initial Flow	H	
Third Final Flow	I	
Third Shut-in	J	

Pressure Below Bottom
Packer Bled To

Gas Volume Report

2nd Flow:

Remarks:

LYNES, INC.

Fluid Sample Report

Date 6-3-77 Ticket No. 5058
Company Dome Petroleum Corporation
Well Name & No. Santa FE 20 #2 DST No. 2
County San Jaun State New Mexico
Sampler No. -- Test Interval 4586-4606'
Pressure in Sampler -- PSIG BHT 140 OF

Total Volume of Sampler: 2800 cc.
Total Volume of Sample: 2800 cc.
Oil: None cc.
Water: 2800 cc.
Mud: None cc.
Gas: None cu. ft.
Other: None

Resistivity

Water: @ of Chloride Content ppm.
Mud Pit Sample @ of Chloride Content ppm.
Gas/Oil Ratio Gravity °API @ OF
Where was sample drained

Remarks:
.....
.....
.....
.....
.....

LYNES, INC.

Distribution of Final Reports

Operator Dome Petroleum Corporation Lease Santa FE 20 Well No. 2

Original & 1 copy: Dome Petr. Corp., 1500 Colorado State Bank Bldg., Denver, Colorado,
80202.

1 copy: Minerals Management, Inc., 105 Petr. Center Bldg., Farmington, New Mexico,
87401.

2 copies: Filon Exploration Corp., 2216 United Bank Center, Denver, Colorado, 80202.

2 copies: Trend Exploration Corp., 600 Capitol Life Bldg., Denver, Colorado, 80203.

1 copy: New Mexico Oil & Gas Commission, 1000 Rio Brazos Rd., Aztec, New Mexico, 87410.

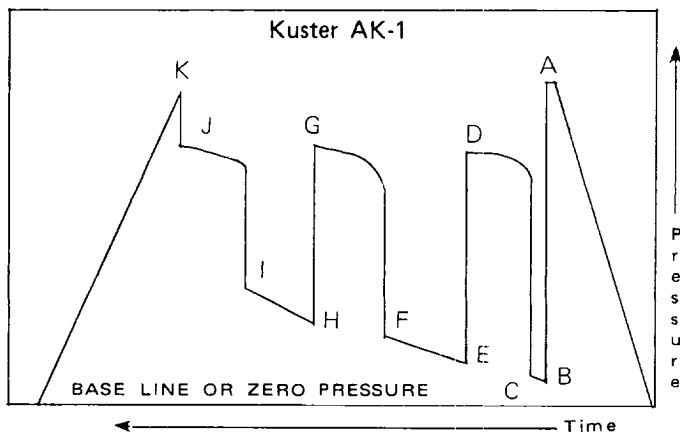
1 copy: Oil Development Co., Attn: G. Blasdel, Box 12058, Amarillo, Texas, 79101.

1 copy: Dave Walsh, Suite 310, Citizens Bank Bldg., Albuquerque, New Mexico, 87110.

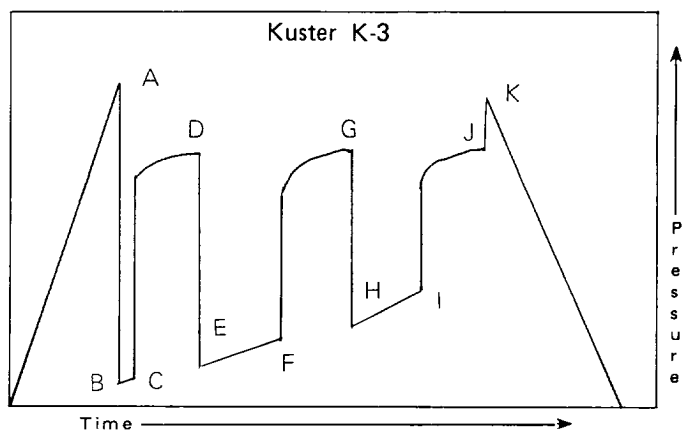
GUIDE TO INTERPRETATION AND IDENTIFICATION OF LYNES DRILL STEM TEST PRESSURE CHARTS

In making any interpretation, our employees will give Customer the benefit of their best judgment as to the correct interpretation. Nevertheless, since all interpretations are opinions based on inferences from electrical, mechanical or other measurements, we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not be liable or responsible, except in the case of gross or wilful negligence on our part, for any loss, costs, damages or expenses incurred or sustained by Customer resulting from any interpretation made by any of our agents or employees.

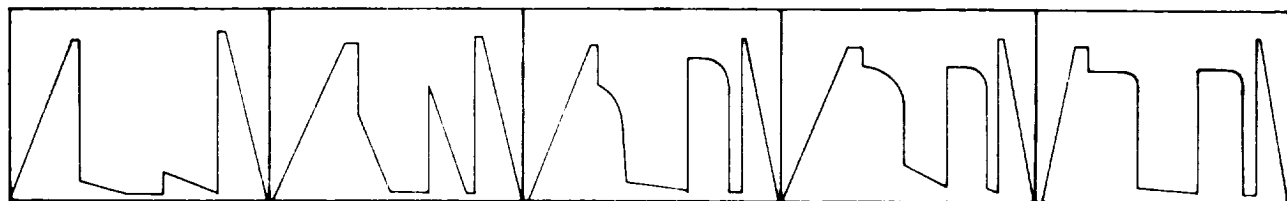
AK-1 recorders. Read from right to left.



K-3 recorders. Read from left to right.



- A – Initial Hydrostatic
- B – First Initial Flow
- C – First Final Flow
- D – Initial Shut-in
- E – Second Initial Flow
- F – Second Final Flow
- G – Second Shut-in
- H – Third Initial Flow
- I – Third Final Flow
- J – Third Shut-in
- K – Final Hydrostatic



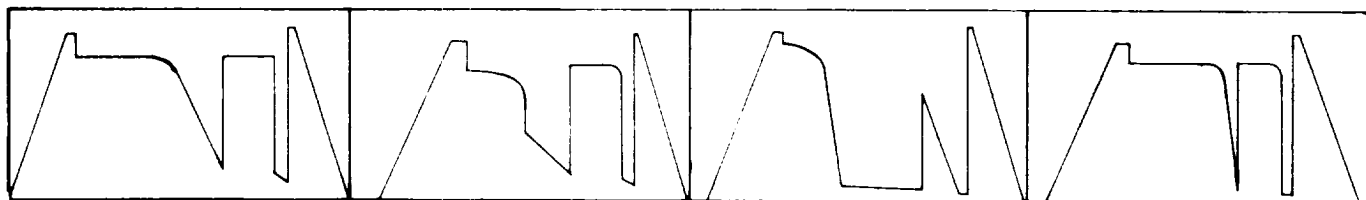
Very low permeability. Usually only mud recovered from interval tested. Virtually no permeability.

Slightly higher permeability. Again usually mud recovered.

Slightly higher permeability. Small recovery, less than 200 ft).

Average permeability. Final and initial shut-ins differ by 50 psi.

Average permeability. Strong damage effect. High shut-in pressure, low flow pressure.



Excellent permeability where final flow final shut-in pressure.

High permeability where ISIP and FSIP are within 10 psi.

Deep well bore invasion or damage. Final shut-in higher than the initial shut-in.

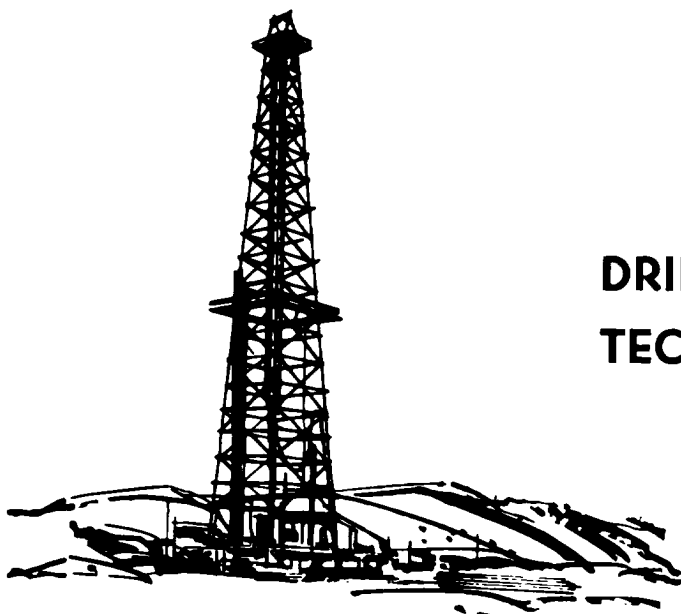
Tight hole chamber tester. Permeability very difficult to interpret unless the recovery is less than chamber length. Flow pressure builds up rapidly if recovery is large, similar to a shut-in.



LYNES

BRIGHT NAME IN THE OIL PATCH

Inflatable and Conventional Packer Tools



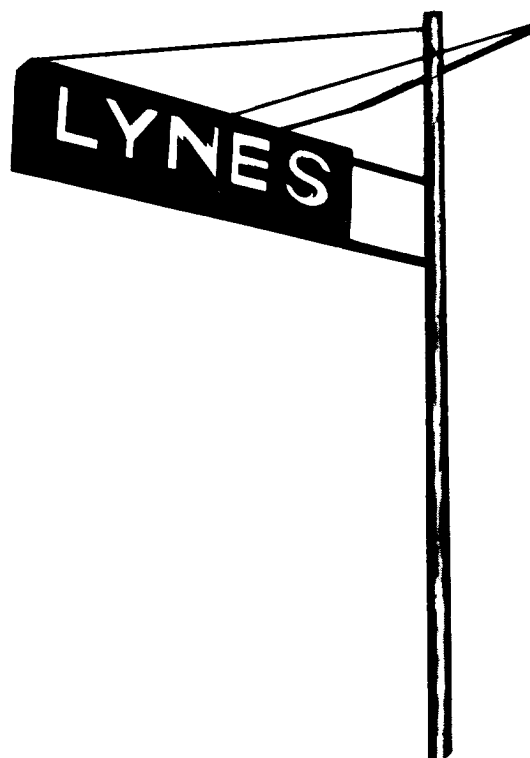
**DRILL STEM TEST
TECHNICAL SERVICE REPORT**

NOMENCLATURE (Definition of Symbols)

Q	= average production rate during test, bbls./day
Q_r	= measured gas production rate during test, MCF/day
k	= permeability, md
h	= net pay thickness, ft. (when unknown, test interval is chosen)
μ	= fluid viscosity, centipoise
Z	= compressibility factor
T_r	= reservoir temperature, ° Rankine
m	= slope of final SIP buildup plot, psig/cycle (psig ² /cycle for gas)
b	= approximate radius of investigation, feet
r_w	= wellbore radius, feet
t_o	= total flowing time, minutes
P_o	= Extrapolated maximum reservoir pressure, psig
P_r	= final flowing pressure, psig
$P.I.$	= productivity index, bbls./day/psi
$P.I._t$	= theoretical productivity index with damage removed, bbl./day/psi
$D.R.$	= damage ratio
$E.D.R.$	= estimated damage ratio
AOF	= absolute open flow potential, MCF/D
AOF_t	= theoretical absolute open flow if damage were removed
Z	= subsea depth
W	= water gradient based on salinity
H_w	= potentiometric surface

INTERPRETATION CALCULATIONS (OIL/WATER)			
AVERAGE PRODUCTION RATE DURING TEST $Q = \frac{1440 \text{ (drill collar capacity} \times \text{recovery} + \text{drill pipe capacity} \times \text{recovery})}{\text{initial flow time} + \text{final flow time}}$ $= 1440 \left[\frac{(\quad)}{(\quad)} + \frac{(\quad)}{(\quad)} \right]$ $= 1440 \{ 0.0145 \text{ or } .0073 \} (\quad)$ $= \dots$ bbls./day			
FLUID PROPERTIES Estimated Bottom Hole Temperature °			
API Gravity @ 60° F. ° Specific Gravity @ 60° F. Est. Viscosity cp			
TRANSMISSIBILITY $\frac{kh}{\mu} = \frac{162.6Q}{m} = 162.6 \left(\frac{\quad}{\quad} \right) = \dots$ md-ft/cp			
IN SITU CAPACITY $kh = (\quad) (\quad) = \dots$ md-ft.			
AVERAGE EFFECTIVE PERMEABILITY Estimated Pay Thickness Ft. Actual Pay Thickness Ft. $k = \left(\frac{\quad}{\quad} \right) = \dots$ md.			
PRODUCTIVITY INDEX $PI = \frac{Q}{P_o - P_r} = \frac{(\quad)}{(\quad) - (\quad)} = \dots$ bbl./day-psi			
DAMAGE RATIO $D.R. = \frac{0.183 (P_o - P_r)}{m} = 0.183 \left[\frac{(\quad)}{(\quad)} \right] = \dots$			
PRODUCTIVITY INDEX WITH DAMAGE REMOVED $P.I._t = P.I. \times D.R. = (\quad) (\quad) = \dots$ bbl./day-psi			
APPROXIMATE RADIUS OF INVESTIGATION $b = \sqrt{\frac{kh}{2\pi}} = \sqrt{(\quad) (\quad)} = \dots$ ft.			
Drawdown Factor = $\frac{I.S.I.P. - F.S.I.P.}{I.S.I.P.} \times 100 = \left(\frac{\quad}{\quad} \right) \times 100 = \dots$ % (4% to 5% is considered serious or substantial)			
Potentiometric Surface = $H_w = Z + \frac{P_o}{W}$ $H_w = \dots + \frac{(\quad)}{(\quad)} = \dots \pm \dots$ ft.			

INTERPRETATION CALCULATIONS (GAS)			
ESTIMATED GAS PROPERTIES Gravity @ 60° F. Viscosity (Res.) cp. Estimated Bottom Hole Temperature ° Compressibility Factor (Z)		$R(T_d) = \dots$ °	
TRANSMISSIBILITY Measured D.S.T. Gas Rate = mcf/d. $\frac{kh}{\mu} = \frac{1637 Q_r Z T_r}{m} = \frac{1637 (\quad) (\quad) (\quad)}{(\quad)} = \dots$ md-ft/cp.			
IN SITU CAPACITY $kh = (\quad) (\quad) = \dots$ md-ft.			
AVERAGE EFFECTIVE PERMEABILITY Estimated Pay Thickness Ft. Actual Pay Thickness Ft. $k = \left(\frac{\quad}{\quad} \right) = \dots$ md.			
APPROXIMATE RADIUS OF INVESTIGATION $b = 0.02 \sqrt{k h P_o} = 0.02 \sqrt{(\quad) (\quad) (\quad)} = \dots$ ft.			
ACTUAL CAPACITY $kh = \frac{3270 Q_r \mu Z T_r \log \left(\frac{b}{P_o^2 - P_r^2} \right)}{P_o^2 - P_r^2} = \frac{3270 (\quad) (\quad) (\quad) (\quad)}{(\quad) - (\quad)} = \dots$ md-ft.			
DAMAGE RATIO E.D.R. = $\frac{(P_o^2 - P_r^2)}{m (\log T_o + 2.65)}$ $D.R. = \frac{\text{In Situ Capacity}}{\text{Actual Capacity}} = \left(\frac{\quad}{\quad} \right) = \dots$ E.D.R. =			
ESTIMATED RANGE OF AOF POTENTIAL Max. AOF = $\frac{Q_r P_o^2}{P_o^2 - P_r^2} = \frac{(\quad) (\quad)}{(\quad) - (\quad)} = \dots$ MCF/D Min. AOF = $\frac{Q_r P_r}{\sqrt{P_o^2 - P_r^2}} = \frac{(\quad) (\quad)}{\sqrt{(\quad) - (\quad)}} = \dots$ MCF/D			
ESTIMATED RANGE OF AOF POTENTIAL, DAMAGE REMOVED Max. AOF _t = (Max. AOF) (D.R.) = $(\quad) (\quad) = \dots$ MCF/D Min. AOF _t = (Min. AOF) (D.R.) = $(\quad) (\quad) = \dots$ MCF/D			
Drawdown Factor = $\frac{I.S.I.P. - F.S.I.P.}{I.S.I.P.} \times 100 = \left(\frac{\quad}{\quad} \right) \times 100 = \dots$ % (4% to 5% is considered serious or substantial)			
Potentiometric Surface = $H_w = Z + \frac{P_o}{W}$ $H_w = \dots + \frac{(\quad)}{(\quad)} = \dots \pm \dots$ ft.			



LYNES, INC.

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