

MULTI-POINT BACK PRESSURE TEST

TEST DATE- 4/ 3/75

STA.NO 8000060

OPERATOR- TEXAS OIL & GAS CORP

LEASE & WELL- HARPER RANCH

LOCATION- 12 34 21 COUNTY- CLARK

STATE- KANSAS

CASING- ID= 0.000 IN. DEPTH= 0 FT. ID= 0.000 IN. DEPTH= 0 FT.

PERFORATION INTERVALS- START 5416 FT. END 5426 FT. BHT= 127.F.

TUBING- ID= 1.995 IN. OD= 0.000 IN. DEPTH= 5421 FT. PROD.THROUGH- TUBING

TYPE COMPLETION-SINGLE GAS PACKER DEPTH- 0 AVERAGE DEPTH- 5421

FIELD-N/A

RESERVOIR-MORROW

0000

GATH.SYST-HARPER RANCH

STIMULATION- NATURAL COMPLETION

GAS GRAVITY- 0.670 N2- 0.0000 CO2- 0.0000 H2S- 0.0000

API GRAVITY- 0 WATER RESISTIVITY- 0.0000

METERING DEVICE-CH FLW SIZE- 2 TYPE TAPS- 00000 BAROMETRIC PRESSURE- 14.40

1.0 FOUR SHUT IN PRESSURE

SURFACE 1407.4 PSIA

B HOLE 1639.7 PSIA

RATE NO.	ORIFICE SIZE	PSIA	DIFFERENTIAL	TEMP F	***	BT HOLE PSIA	STATIC PSIA	FLOWING PSIA	DURATION HOURS
1	0.438	311.4	0.0	86		1513.0	1301.4	1301.4	1
2	0.438	446.4	0.0	88		1492.8	1284.5	1284.4	1
3	0.438	567.4	0.0	94		1442.8	1242.6	1242.4	1
4	0.438	632.4	0.0	96		1403.5	1209.6	1209.4	1
5	0.438	218.4	0.0	94		1542.9	1326.4	1326.4	24

	PC2 PRCD, BELS	LIQUID PETR BBLS	GOR MCF/REL	PC2-PW2	Q MCF/D	PC2-PT2	PF2-PS2
1	0.0	0.0	0	287.0	1331	287.1	399.2
2	0.0	0.0	0	330.9	1926	331.1	460.1
3	0.0	0.0	0	436.8	2455	437.2	606.9
4	0.0	0.0	0	517.7	2744	518.1	718.7
5	0.0	0.0	0	221.4	918	221.4	0.0

NORTHERN NATURAL GAS COMPANY
MULTI-POINT BACK PRESSURE TEST

SHEET NO-2

TEST DATE 4- 2-75
STATION NO 8000060

1.0 HOUR SHUT IN PRESSURE SURFACE 1407.4 PSIA - B HOLE 1639.7 PSIA

	WELLHEAD	ABSOLUTE
EXPONENT N OF BACKPRESSURE CURVE ¹	0.804	0.804
1.3 HCLR 4-POINT POTENTIAL	8145. MCF/D	8155. MCF/D
24.3 HCLR 1-POINT POTENTIAL	5341. MCF/D	5347. MCF/D
72 HCLR POTENTIAL	4807. MCF/D	
STABILIZED POTENTIAL	3846. MCF/D	

72 HCLR DELIVERABILITY ² @ 0.8PC	2115. MCF/D
STABILIZED DELIVERABILITY @ 194. PSIA	3787. MCF/D

STABILIZATION FACTORS ³	24.3 HOUR TO 72 HOURS	0.900
	72 HOURS TO STABILIZATION	0.800

EVALUATIVE COMMENTS

(1) WELLHEAD CURVE: FIRST POINT OUT OF ALIGNMENT

ABSOLUTE CURVE: FIRST POINT OUT OF ALIGNMENT

(2) ASSUMED QUALIFICATION PROVISIONS OF GAS PURCHASE CONTRACT

(3) ESTIMATED

TESTED BY FTH&DG

INPUT BY RLN

APPROVED BY

INITIAL TEST INFORMATION

NNG TESTER Ted Hoskinson DATE OF TEST 4-3-75
 TYPE TEST CONDUCTED Four Point & One Point CONDUCTED BY N.N.G.
 OPERATOR Texas Oil & Gas Co. WELL NAME Harper Ranch NO. 1
310' NL 2310' W 2
 LOCATION: Sec. 12-34-21 County Clark State Kansas
 FIELD PLOTTED WHO? 5700 @ 24 hrs. MCF/D. POT. @ 80% S.I. 2450 @ 24hrs MCF/D.
 NNG LINE PRESS. 180 PSIG, APPRX. DISTANCE 1 1/2 miles. INITIAL SIP 1393
 LINE PRESS. & APPROX. DISTANCE OF OTHER COMPANIES: None

TYPE OF CROSSINGS: None

TYPE OF TERRAIN: All rolling pasture land.

STABILIZATION CHARACTERISTICS: Good.

LIQUIDS PRODUCED: 0 Bbls Oil; 0 Bbls Water; 24 Hrs. API GR.

BOTTOM HOLE PRESS. TEST CONDUCTED BY: None

TYPE OF COMPLETION: (X) SINGLE-GAS, () DUAL GAS-GAS, () DUAL GAS-OIL.

CASING SIZE: 4 1/2", O.D. 10.7 #/FT., SET @ 5416 ^{open hole below} FT. _{TD OR PBSD}

TUBING SIZE: 2 3/8", O.D. 4.7 #/FT., SET @ 5390 ' ; PACKER SET @ 5360 '

FORMATION Morrow SYSTEM FIELD New Well

PERFORATIONS: FROM 5416 FT. TO 5426 FT., FROM FT. TO FT.

[illegible]

STIMULATION DATA:

TREATED WITH _____ GAL. OF _____ % Natural completion-10 ft. ACID.
open hole.

GAL. OF		\$	ACID.
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32
33	34	35	36
37	38	39	40
41	42	43	44
45	46	47	48
49	50	51	52
53	54	55	56
57	58	59	60
61	62	63	64
65	66	67	68
69	70	71	72
73	74	75	76
77	78	79	80
81	82	83	84
85	86	87	88
89	90	91	92
93	94	95	96
97	98	99	100

FRAC'D WITH	GAL. OF	%	ACID.
1	10	100	100
2	10	100	100
3	10	100	100
4	10	100	100
5	10	100	100
6	10	100	100
7	10	100	100
8	10	100	100
9	10	100	100
10	10	100	100
11	10	100	100
12	10	100	100
13	10	100	100
14	10	100	100
15	10	100	100
16	10	100	100
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18	10	100	100
19	10	100	100
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89	10	100	100
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91	10	100	100
92	10	100	100
93	10	100	100
94	10	100	100
95	10	100	100
96	10	100	100
97	10	100	100
98	10	100	100
99	10	100	1

GAL. OF	8	ACID.
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
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94	94	94
95	95	95
96	96	96
97	97	97
98	98	98
99	99	99
100	100	100

OF SAND, # OF GLASS BEADS, # OF COTTON HULLS.

REMARKS:

Well appears to be an exceptiona1 well, however, I do not feel at ease.

The well was loaded up before the test and started loading up immediately

after being shut-in, but made no liquids during one-point. The well is

completed open hole with both casing and tubing set above the producing

zone.

NORTHERN NATURAL GAS COMPANY
OBSERVED SURFACE DATA WORKSHEET
SHEET 1

ORM 983
REV. 4-22-65)

TYPE TEST: 4 Pt. & 1 Pt. ☒ INITIAL ☐ ANNUAL ☐ RETEST ☐ SPECIAL TEST DATE: _____

OPERATOR TEXAS OIL & GAS LEASE HARPER RANCH WELL NO. 1

EC. 12 TWP. 34 RING. 21 COUNTY CLARK STA. NO. _____ PIPELINE CONN. _____

A SYSTEM _____ FIELD _____ RESERVOIR _____

SG. 4 1/2 @ 5416 WT. _____ TBG. SIZE 2 3/8 @ 5490 WT. _____ PERFS. _____ TO _____

TYPE COMPLETION: SINGLE () GAS-GAS () GAS-OIL () PACKER @ 5390 ft. FLOW STRING @ _____ ft.

DATE ON _____ DATE _____ LENGTH _____ AVG. PREFLOW _____
REFLOW _____ TIME _____ SHUT IN _____ TIME _____ OF PREFLOW _____ RATE _____

DATE SHUT IN _____ LENGTH OF _____ SHUT IN _____ SHUT IN _____
PRESS. TAKEN _____ TIME _____ SHUT IN _____ CSG. PRESS. _____ psig TBG. PRESS. _____ psig

AS GRAVITY (Gm) _____ API GRAVITY _____ PROVER _____ METER _____ ORIFICE _____ TYPE _____
(Gg) _____ OF LIQUID @ 60°F _____ SIZE _____ RUN SIZE _____ SIZE _____ TAPS _____

DATE TIME OF READING	ELAP TIME HRS.	W.H. PRESSURE DATA				WELL HEAD TEMP	METER OR PROVER DATA			LIQUID HYDRO- CARBONS BBLs.	WATER PRODUCED BBLs.	REMARKS PERTINENT TO TEST DATA QUALITY
		CASING psig	Δ P CSG.	TUBING psig	Δ P TBG.		PRESS psig	DIFF.	TEMP.			
		WEDNESDAY	4-2-75									
1030		Pkr		798.0								
1045		WELL ON TEST WITH 2" C.F. PROVER AND 7/16" PLATE INSTALLED DOWSTREAM OF SEPERATOR										
		WELL DIRTY - LIQUIDS HIT-OUT PROVER AND BOTH DUMP LINES.										
1115				1342			196		58			
1130				1350	+8.0		121		40			FIRE OUT
1145				1305	-45.0		204		51			
1200	1.2	Pkr		1279	-26		228		64	Trace	4.0	COMPLETION LOAD
1200		WELL ON SECOND RATE @ 300#										
1215				1275	-4.0		293		82			
1230				1285	+10.0		307		82			
1245				1286	+1.0		302		82			
1300	2.4	Pkr		1287	+3.0		297		86	Trace	Trace	1331 mcf/d
1300		WELL ON THIRD RATE @ 420#										
1315				1236	-51		411		88			
1330				1255	+19		422		88			
1345				1261	+6		428		88			
1400	3.6	Pkr		1270	+9		432		88	Trace	Trace	1926 mcf/d -
1400		WELL ON FOURTH RATE @ 530#										
1415				1204	-66		536		94			
1430				1217	+13		542		94			
1445				1222	+5		547		94			
1500	4.8	Pkr		1228	+6		553		94			2455 mcf/d -
1500		WELL ON FIFTH RATE @ 620#										
1515				1190	38		616		96			
1530				1195	+5		618		96			
1545				1195	-0-		618		96			
1600	5.2			1195	-0-		618		96			2744 mcf/d -
1600		WELL ON ONE POINT @ 200#										
1610				1413			211		94			

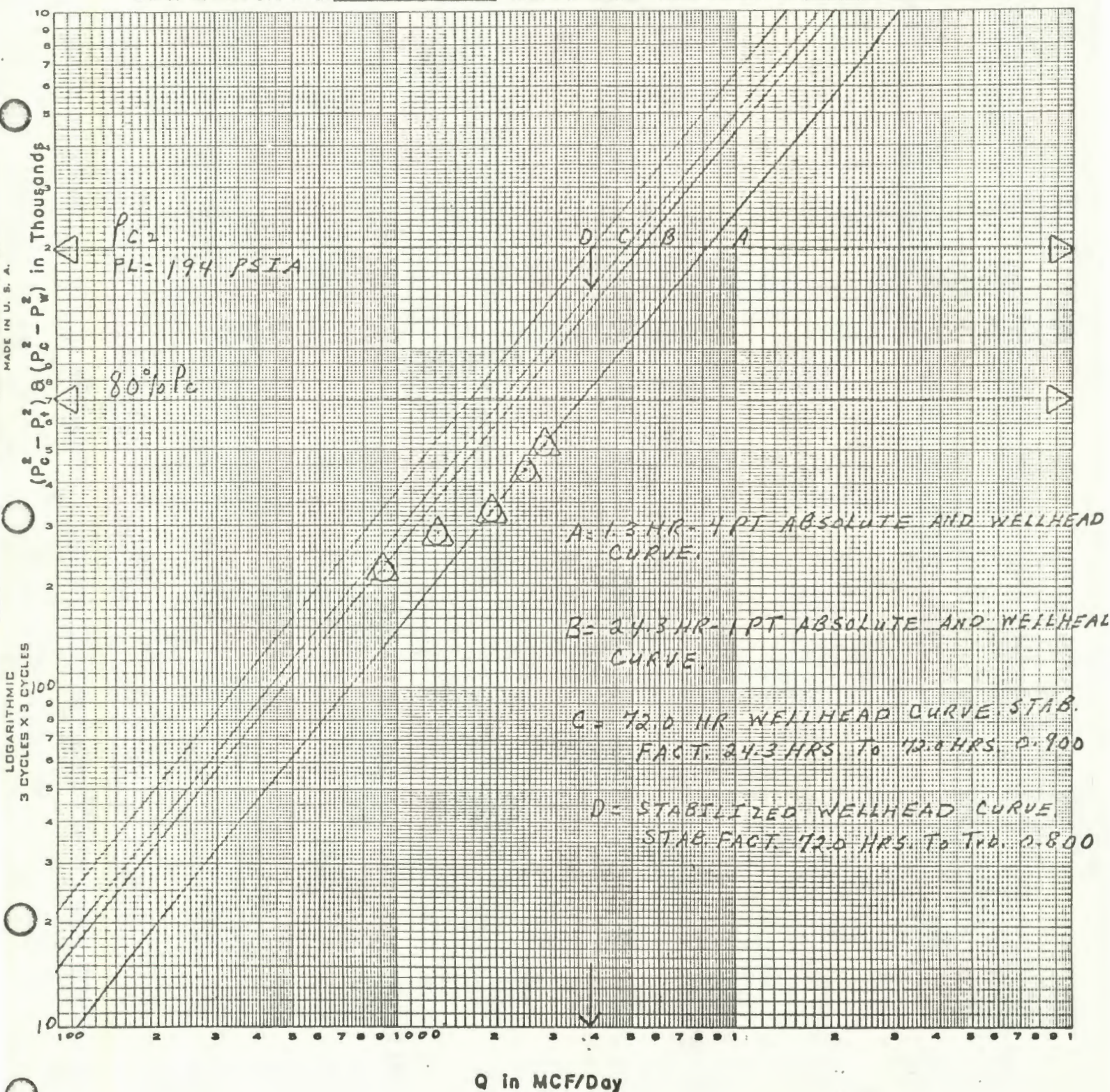
TESTED BY: TED HOSKINSON WITNESSED BY: _____

PAGE 1 OF 2

OPERATOR TEXAS OIL & GAS COMPANY LEASE HARPER RANCH WELL NO. 1
STA. NO. _____

DATE	ELAP.	W.H. PRESSURE DATA				WELL HEAD TEMP.	METER OR PROVER DATA			LIQUID HYDRO-CARBONS BBLs	WATER PRODUCED BBLs	REMARKS PERTINENT TO TEST DATA QUALITY
		CASING psig	Δ P CSG.	TUBING psig	Δ P TBG.		PRESS psig	DIFF.	TEMP.			
		THURSDAY	4-3-75									
1000				1313.3			204		93		0	
1015				1312.0			204		94			
1030				1313.0			204		94			
1045				1313.3			204		94			
1100				1312.0			204		94		0	918 mcf/d - 24 Hrs
		WELL SHUT IN										
1115				1393.0								
1130				1388.0								
1330				1376.0								
1400				1375.5								
1430				1375.0								
1500				1375.2								

BACK PRESSURE CURVE

Operator TEXAS OIL & GAS Lease HARPER RANCH Well No. #1County CLARK Field _____ Location 12-34S-21WDate of Test 4-3-75 Slope "n" 0.804 W.H. 0.804 Abs.Calc. W.H. Potential 8145 MCF/D Calc. Abs. Potential 8155 MCF/D

TYPE TEST: State ☐ INITIAL ☒ ANNUAL ☐ RETEST ☐ SPECIAL TEST DATE: _____

OPERATOR Tex. Oil & Gas LEASE Harper Ranch #1 WELL NO. _____

SEC. 12 TWP. 34 RNG. 21 COUNTY Clark STA. NO. 322001 PIPELINE CONN. _____

GA SYSTEM _____ FIELD _____ RESERVOIR _____

CSG. _____ WT. _____ TBG. SIZE _____ WT. _____ PERFS. _____ TO _____
TYPE COMPLETION: SINGLE () GAS-GAS () GAS-OIL () PACKER@ _____ ft. FLOW STRING@ _____

DATE ON PREFLOW		DATE SHUT IN	LENGTH OF PREFLOW	AVG. PREFLO RATE
TIME	TIME	TIME	TIME	TIME

DATE SHUT IN _____ LENGTH OF SHUT IN _____ SHUT IN SHUT IN
PRESS. TAKEN _____ TIME _____ SHUT IN _____ CSG. PRESS. _____ psig TBG. PRESS. _____ psig

GAS GRAVITY (Gm) _____ API GRAVITY _____ PROVER _____ METER _____ ORIFICE _____ TYPE _____
(Gg) _____ OF LIQUID @ 60°F _____ SIZE _____ RUN SIZE _____ SIZE _____ TAPS _____

[illegible]

WITNESSED BY: _____

PAGE _____ OF _____

ONM 983
REV 4-22-65)

TEST: State ☐ INITIAL ☒ ANNUAL ☐ RETEST ☐ SPECIAL TEST DATE: _____

OPERATOR Wesley Oil & Gas LEASE Harper Road WELL NO. 1

EC 12 TWP. 34 RNG. 21 COUNTY _____ STA. NO. 322011 PIPELINE CONN. _____

IA SYSTEM _____ FIELD _____ RESERVOIR _____

SG. _____ WT. _____ TBG. SIZE _____ WT. _____ PERFS. _____ TO _____

TYPE COMPLETION: SINGLE () GAS-GAS () GAS-OIL () PACKER @ _____ ft. FLOW STRING @ _____

DATE ON _____ DATE _____ LENGTH _____ AVG. PREFLO _____

PREFLOW _____ TIME _____ SHUT IN _____ TIME _____ OF PREFLOW _____ RATE _____

DATE SHUT IN _____ LENGTH OF _____ SHUT IN _____ SHUT IN _____

PRESS. TAKEN _____ TIME _____ SHUT IN _____ CSG. PRESS. _____ psig TBG. PRESS. _____ psi

GAS GRAVITY (Gm) _____ API GRAVITY _____ PROVER _____ METER _____ ORIFICE _____ TYPE _____

(Gg) 60 OF LIQUID @ 60°F _____ SIZE _____ RUN SIZE 3 SIZE 1.00 TAPS 2

[illegible]

TESTED BY: Harry Young

WITNESSED BY: J. J. Wilson

PAGE _____ OF _____

ANADARKO/PERMIAN RESERVES SECTIONS
GAS SUPPLY EVALUATION DEPARTMENT
GAS SUPPLY DIVISION

INITIAL WELL TEST EVALUATION

~~KLN~~
CC: Mailed 4-25-75

Bill Wells
200 W. Douglas
Anchita, To. 67202

Date 4-22-75

TO: LIBERAL
MIDLAND
HAVRE
COLORADO SPRINGS

WELL DESCRIPTION

Operator TEXAS OIL & GAS CORP. Station No. _____
Well Name & No. HARPER RANCH #1 System HARPER RANCH
Location SEC. 12-34S-21W County CLARK State KANSAS
Reservoir MORROW Field _____
Perfs: 5416 to 5426; _____ to _____; _____ to _____
_____ to _____; _____ to _____; _____ to _____

TEST RESULTS

Shut-in Pressure 1407 psia; Duration 1.0 hours; Date 4-2-75
Wellhead "n" 0.804 Absolute "n" 0.804
Calculated Deliverability: 2115 MCF/d after 72.0 hours at 80%
Stabilized Deliverability: 3787 MCF/d against 194 psia Line Pressure.
1.3 Hour 4 Point Wellhead Potential 8145 MCF/d
1.3 Hour 4 Point Absolute Potential 8155 MCF/d
24.3 Hr. Wellhead Potential 5341 MCF/d; 24.3 Hr. Absolute Potential 5347 MCF/d
72.0 Hr. Wellhead Potential 4807 MCF/d; _____ Hr. Absolute Potential _____ MCF/d
Stabilized Wellhead Potential 3846 MCF/d; Stabilization Time _____ hours.

Stabilization Factors:

24.3 hours to 72 hours: 0.900 72 hours to Trb: 0.804

By: [Signature]
Gas Supply Evaluation Dept.

407.4
3.1484
804
16080
5.0624
3846
115450
"n" = .0333/312

TEST AND RESERVE REQUEST

- ☒ J. D. Walker (2)
☐ H. E. Peterson (1)
☐ R. W. Miller (1)
☐ Liberal Office (1)

Requested by JAMES V. Cox

Date MARCH 31, 1975

Operator: TEXAS OIL & GAS CORP.

Well Name: #1 HARPER RANCH

Location: SEC. 12-34S-21W
CLARK Co., KAH.

Unit Description:

Unit Acres: 640

- Request: ☒ Reserves for connection
☒ Test/evaluate for connection
☒ 5-Year Availability Study based on the lesser of 1:3.65 or 80% of deliverability

Remarks:

Contact -
 Data -

BILL WELLS
(316) 264-9134

TEST AND RESERVE REPLY

REVISED

Fields:

Formation: Morrow

Developed Unit Reserves MMCF 2000

Preliminary

4 Point, one Hour, Abs. Potential; 8145 MCF/

72 Hour Deliverability Against 80% of Wellhead Shut-in Pressure; 2115 MCF/

1.0 Hour Wellhead Shut-in Pressure, 1407 psia

Initial Stabilized Deliverability 3789 Mcf/d against 194 psia Current Line Pressure

Performed by: Ted Hoskinson - NNG Tester

Witnessed by: _____

Remarks: No positive indication of water problems on test, but very possible based on nearby wells tested in this same Morrow sand interval and loading condition prior to, and just after the test. If water can be handled, reserves could be substantially higher.

- ☐ Requestor is not, the well may deplete very early
☐ H. E. Peterson and estimate given above could be
☐ R. W. Miller high
☒ Liberal Office
☐ W. J. Pochling (Tulsa)

W. A. Henry
Tulsa Exp.

Reply By: Lee C. Bernal

RECEIVED

MAY 6 1975

GAS SUPPLY
 OPERATIONS

AVAILABILITY PROJECTION

WELL OPERATOR AND NAME Texas Oil & Gas, No 1 Harper Ranch

LOCATION Sec 12-34S-21W

COUNTY Clark STATE Kansas

<u>Year</u>	<u>Average Day Rate MCF/D</u>	<u>Annual Volume MMCF</u>	<u>Cum. Volume MMCF</u>
1.	548	200	200
2.	548	200	400
3.	548	200	600
4.	548	200	800
5.	548	200	1000

Remaining Reserves 1000 MMCF

Ultimate Recoverable Reserves 2000 MMCF

NOTES:

Morrow. Rates are based on 1/3.65 contract obligation for
first 5 years.