Application of

El Paso Natural Gas Company
and Western Gas Company

for exemption of certain wells
under Gas-Oil Ratio Order

ILLEGIBLE

El Paso Natural Gas Company

TENTH FLOOR BASSETT TOWER

El Paso, Texas

August 29, 1940

New Mexico Oil Conservation Commission,
Santa Fe, New Mexico.

Gentlemen:

At a meeting of the New Mexico Oil Conservation Commission and the Lea County Operators Committee, held in Santa Fe, New Mexico, on July 29, 1940, a proposed final Order governing gas-oil ratios for the various fields in the State of New Mexico was submitted.

The restrictions imposed by the application of this proposed Order to the subject wells owned by Western Gas Company (a wholly owned subsidiary of El Paso Natural Gas Company) and the wells owned by other producers from which El Paso Natural Gas Company purchases gas under contract, renders it physically impossible and economically infeasible for said El Paso Natural Gas Company to secure sufficient gas to operate its transmission pipe line system. Therefore, El Paso Natural Gas Company and Western Gas Company beg to petition the Commission for a permanent exemption from the application of the Gas-oil Ratio Order, submitted to the Commission for its acceptance on July 29, 1940, in so far as such Order affects the following described wells owned and operated by Western Gas Company:

Wells	Located in Lea County
Stuart #1-A	Northeast quarter of Northwest quarter ($NE\frac{1}{4}NW\frac{1}{4}$) of Sec. 14, Twp. 25 South, Rge. 37 East.
State #1-B	Northeast quarter of Northwest quarter ($NE\frac{1}{4}NW\frac{1}{4}$) of Sec. 2, Twp. 25 South, Rge. 37 East.
Woolworth #1	Northeast quarter of Northeast quarter ($NE\frac{1}{4}NE\frac{1}{4}$) of Sec. 17, Twp. 25 South, Rge. 37 East.
Wells #1	Southwest quarter of Northeast quarter ($SW\frac{1}{4}NE\frac{1}{4}$) of Sec. 6, Twp. 25 South, Rge. 37 East.
Harrison #1	Northwest quarter of Northwest quarter ($NW\frac{1}{4}NW\frac{1}{4}$) of Sec. 7, Twp. 25 South, Rge. 37 East.

Harrison #2	Northwest quarter of Northwest quarter ($NW\frac{1}{4}NW\frac{1}{4}$) of Sec. 29, Twp. 24 South, Rge. 37 East.
Harrison #3	Northwest quarter of Southwest quarter ($NW\frac{1}{4}SW\frac{1}{4}$) of Sec. 20, Twp. 24 South, Rge. 37 East.
Harrison #4	Northwest quarter of Southwest quarter ($NW\frac{1}{4}SW\frac{1}{4}$) of Sec. 29, Twp. 24 South, Rge. 37 East.
Jim Camp #1	Southwest quarter of Southwest quarter ($SW\frac{1}{4}SW\frac{1}{4}$) of Sec. 6, Twp. 24 South, Rge. 37 East.
Curry #1	Southeast quarter of Southeast quarter ($SE\frac{1}{4}SE\frac{1}{4}$) of Sec. 1, Twp. 24 South, Rge. 36 East.
Guthrie #1	Southwest quarter of Southeast quarter ($SW\frac{1}{4}SE\frac{1}{4}$) of Sec. 34, Twp. 23 South, Rge. 36 East.
Matkins #1	Southeast quarter of Southeast quarter ($SE\frac{1}{4}SE\frac{1}{4}$) of Sec. 15, Twp. 23 South, Rge. 36 East.

Also, El Paso Natural Gas Company begs to petition the Commission for a permanent exemption from the application of said Gas-oil Ratio Order in so far as such Order affects the following described wells, owned by the companies indicated, from which it purchases gas under contract with the producing companies:

Wells	Located in Lea County
Culbertson & Irwin, Inc.:	
Stuart #1	Northeast quarter of Southeast quarter ($NE\frac{1}{4}SE\frac{1}{4}$) of Sec. 10, Twp. 25 South, Rge. 37 East.
Stuart #2	Southeast quarter of Southeast quarter ($SE\frac{1}{4}SE\frac{1}{4}$) of Sec. 10, Twp. 25 South, Rge. 37 East.
Martin #2	Northeast quarter of Northeast quarter ($NE\frac{1}{4}NE\frac{1}{4}$) of Sec. 31, Twp. 24 South, Rge. 37 East.
Cities Service Oil Company:	
Dabbs #1	Northwest quarter of Northwest quarter ($NW\frac{1}{4}NW\frac{1}{4}$) of Sec. 23, Twp. 25 South, Rge. 37 East.
Two States Oil Company:	
Calley #1	Southeast quarter of Southwest quarter ($SE\frac{1}{4}SW\frac{1}{4}$) of Sec. 20, Twp. 24 South, Rge. 37 East.

New Mexico Oil Conservation Commission Aug. 29, 1940

In support of such petition, Western Gas Company offers the attached geological data and pertinent information respecting its above mentioned wells, and El Paso Natural Gas Company submits similar data prepared by the producers, mentioned above, from whom it purchases gas in the Lea County, New Mexico, field.

In view of the facts substantiated by the enclosed data, we respectfully request that the wells listed above be permanently exempted from the application of the aforesaid Gas-oil Ratio Order.

Respectfully submitted,

EL PASO NATURAL GAS COMPANY

By _____
Vice Pres. and Gen. Mgr.

WESTERN GAS COMPANY

By _____
Vice Pres. and Gen. Supt.

Order of data contained in following report

prepared by WESTERN GAS COMPANY

1. Yates information.
2. Stuart #1-A well.
3. State #1-B well.
4. Woolworth #1 well.
5. Wells #1 well.
6. Harrison #1 well.
7. Harrison #2 well.
8. Harrison #3 well.
9. Harrison #4 well.
10. Jim Camp #1 well.
11. Curry #1 well.
12. Guthrie #1 well.
13. Matkins #1 well.

DESCRIPTION OF THE YATES FORMATION

The Yates formation is principally a lenticular sand with shale, anhydrite and lime stringers and is fairly continuous over the entire area in question. It lies immediately below the Tansil formation and above the Seven Rivers formation, all of which are of Permian Age. In some localities it is a well developed sand with large frosted quartz grains which usually carries large volumes of gas and in other localities the well developed sand is absent and only the large frosted quartz grains in anhydrite and shale are present and is usually non-productive. The thickness varies from 125' to 175'.

The Yates is predominantly a gas bearing formation and in practically all of the wells in this area the oil production string of casing is set through the Yates and cemented back to the base of the salt. The top of the Yates formation is readily recognized by the abundance of large frosted quartz grains and is used extensively in contouring and subsurface work.

We believe that after a study of the logs and geological information, that there is sufficient proof that the Yates formation is predominantly a gas bearing formation and we, therefore, respectfully request that any wells completed as gas wells in this formation be given exemption from the permanent gas-oil ratio order.

The following attached information will substantiate the above request.

FORMATION TESTS and LOGGED SHOWS OF GAS
(Confidential Information)

LANGLIE AREA

Anderson-Prichard Oil Corp. - Stuart #3
NW/4 NW/4 Sec. 9, T-25-S, R-37-E.
The approximate top of the Yates formation is 2860'.
Show of gas was logged at 2900'-22'.

Anderson-Prichard Oil Corp. - Jal #1
NE/4 NE/4 Sec. 8, T-25-S, R-37-E.
The approximate top of the Yates formation is 2880'.
Show of gas was logged at 2880'.

Anderson-Prichard Oil Corp. - Lanehart #1
SW/4 NW/4 Sec. 21, T-25-S, R-37-E.
The approximate top of the Yates formation is 2740'.
Show of gas was logged at 2738' to 2827'. Blew out and estimated open flow 25,000 MCF gas per day.

Anderson-Prichard Oil Corp. - Wells #2
SW/4 SE/4 Sec. 5, T-25-S, R-37-E.
The approximate top of the Yates formation is 2850'.
Show of gas was logged at 2909'.

Anderson-Prichard Oil Corp. - Wells #4
NW/4 NW/4 Sec. 5, T-25-S, R-37-E.
The approximate top of the Yates formation is 2900'.
Show of gas was logged at 2915' to 2937'.

Western Gas Company - Woolworth #1
NE/4 NE/4 Sec. 17, T-25-S, R-37-E.
The approximate top of the Yates formation is 2840'.
Show of gas was logged at 2940'. Estimated open flow 5,000 MCF dry gas per day.

Western Gas Company - Wells #1
SW/4 NE/4 Sec. 6, T-25-S, R-37-E.
The approximate top of the Yates formation is 2850'.
The well was plugged back into 7" casing and perforated with 177 shots from 2830' to 3170'. Best pay at 2850' to 3070'. Initial production after perforation of 7" casing was 15,000 MCF of dry gas per day.

Langlie Area (cont'd)

Western Gas Company - Harrison #1
NW/4 NW/4 Sec. 7, T-25-S, R-37-E.
The approximate top of Yates formation is 2850'.
The well was plugged back into 7" casing and perforated with 17 shots from 2870' to 2910'. Initial production after perforation of 7" casing was 3,600 MCF dry gas per day.

Italo Petroleum Corp. of America - Wells B-5-#2
SE/4 NE/4 Sec. 5, T-25-S, R-37-E.
The approximate top of the Yates formation is 2880'.
Show of gas was logged at 2900'-20'.

MATTIX AREA

Atlantic Oil & Refining Co. - State "24" #1
SE/4 SW/4 Sec. 32, T-24-S, R-37-E.
The approximate top of the Yates formation is 2920'.
Show of gas was logged at 2960'.

Skelly Oil Company - Sherrel #1
SE/4 SE/4 Sec. 31, T-24-S, R-37-E.
The approximate top of the Yates formation is 2890'.
Show of gas was logged at 2898' to 2916'.

Anderson-Prichard Oil Corp. - State A-32 #1
SE/4 NW/4 Sec. 32, T-24-S, R-37-E.
The approximate top of the Yates formation is 2910'.
Show of gas was logged at 2965' to 2996'.

Culbertson & Irwin, Inc. - Martin #1
SE/4 NE/4 Sec. 30, T-24-S, R-37-E.
The approximate top of the Yates formation is 2880'.
Show of gas was logged at 2893' to 2910'.

Culbertson & Irwin, Inc. - Martin #2
NE/4 NE/4 Sec. 30, T-24-S, R-37-E.
The approximate top of the Yates formation is 2870'.
Show of gas was logged at 2900'.

Schermerhorn Oil Company - Woolworth #1
NW/4 NE/4 Sec. 28, T-24-S, R-37-E.
The approximate top of the Yates formation is 2780'.
Show of gas was logged at 2780' to 2975'. Estimated open flow of 3,000 MCF dry gas per day.

Mattix Area (cont'd)

Schermerhorn Oil Co. - Woolworth #3
NW/4 SE/4 Sec. 28, T-24-S, R-37-E.
The approximate top of the Yates formation is 2870'.
Show of gas was logged at 2930'-35'. Estimated open flow of 3,000 MCF dry gas per day.

Western Gas Company - Harrison #2
NW/4 NW/4 Sec. 29, T-24-S, R-37-E.
The approximate top of the Yates formation is 2900'.
Formation tested from 2900' to 3040'. Open flow gauge was 18,000 MCF dry gas per day.

Western Gas Company - Harrison #4
NW/4 SW/4 Sec. 29, T-24-S, R-37-E.
The approximate top of the Yates formation is 2900'.
Open flow test at total depth 2965'. Gauged 24,000 MCF dry gas per day.

Continental Oil Company - Jack B-29-#1
SE/4 SE/4 Sec. 29, T-24-S, R-37-E.
The approximate top of the Yates formation is 2920'.
Show of gas was logged at 2945'-65'.

C. T. McLaughlin - Polhamus #1
NW/4 NE/4 Sec. 9, T-24-S, R-37-E.
The approximate top of the Yates formation is 2680'.
Show of gas was logged at 2680'-90'.

Stanolind Oil and Gas Company - Myers B-#5
NE/4 SW/4 Sec. 9, T-24-S, R-37-E.
The approximate top of the Yates formation is 2640'.
Show of gas was logged at 2646' to 2687'.

Western Gas Company - Jim Camp #1
SW/4 SW/4 Sec. 6, T-24-S, R-37-E.
The approximate top of the Yates formation is 2910'.
Open flow test at total depth 3210'. Gauged 16,000 MCF of dry gas per day.

COOPER AREA

Western Gas Company - Toby #1
SE/4 SE/4 Sec. 12, T-24-S, R-36-E.
The approximate top of the Yates formation is 2940'.
Show of gas was logged at 2960' to 3010'.

Western Gas Company - Toby #2
NE/4 SE/4 Sec. 12, T-24-S, R-36-E.
The approximate top of the Yates formation is 2920'.
Show of gas was logged at 2940'.

Continental Oil Company - Vaughn B-12 #1
SE/4 NE/4 Sec. 12, T-24-S, R-36-E.
The approximate top of the Yates formation is 2910'.
Show of gas was logged at 2960' to 3010'. The well blew out at total depth 3010' and was estimated to be making 50,000 MCF of dry gas per day.

Western Gas Company - Curry #1
SE/4 SE/4 Sec. 1, T-24-S, R-36-E.
The approximate top of the Yates formation is 2890'.
Show of gas was logged at 2915' to 2955'.

LYNN AREA

Texas & Pacific Coal & Oil Company - State Account 1-A #7
NW/4 NW/4 Sec. 22, T-23-S, R-36-E.
The approximate top of the Yates formation is 3140'.
Show of gas was logged at 3135' to 3165'.

Western Gas Company - Matkins #1
SE/4 SE/4 Sec. 15, T-23-S, R-36-E.
The approximate top of the Yates formation is 3005'.
The 5-1/2" casing was perforated from 3030' to 3150'. Initial production after perforation of casing was 14,000 MCF. During drilling of this well an open flow test was made of this; gas was taken which gauged 30,000 MCF of dry gas.

Western Gas Company - Lankford #1 (drilled by Culbertson & Irwin, Inc.)
NE/4 NW/4 Sec. 25, T-23-S, R-36-E.
The approximate top of the Yates formation is 2930'.
Shows of gas were logged from 2930' to 3030'.
At total depth, 3030', the well blew out making an estimated 100,000 MCF of dry gas.

The foregoing data was taken from actual tests made on the wells or shows of gas logged while the wells were being drilled.

In so far as our records indicate, the only production from the Yates formation is gas and in no wells has it been found productive of oil; therefore, it is our conclusion that the Yates formation is definitely a gas bearing formation.

Western Gas Company

Stuart #A-1 - NE/4 NW/4 Sec. 14, T-25S, R-37E.
State #B-1 - NE/4 NW/4 Sec. 2, T-25S, R-37E.

These wells are situated high on the structure and the producing zones in these wells are predominantly gas bearing; these same zones in offsetting wells are also predominantly gas bearing. The gas producing zones of these wells are lenticular sands identified as a part of the lower Queen's formation.

The gas being produced from these wells may be coming from the same zone which is producing oil in the wells to the west, as the wells to the west are lower on the structure. However, the nearest oil wells producing from this zone are two or three locations away.

Western Gas Company owns approximately 1,280 acres of gas rights in this immediate area. It is our belief that we should be granted the right to withdraw an amount of gas equal to the total gas produced plus a volume of gas equal to the reservoir space voided by oil produced from producing oil wells on the acreage on which we have purchased gas rights and, also, our undeveloped acreage which is being drained by offsetting wells. In no event will Western Gas Company withdraw a daily average amount of gas more than 25% of the open flow capacity of the gas wells in question.

If the requested relief is not granted and the wells are prorated to a withdrawal of gas equivalent to an amount of gas produced plus a volume of gas equivalent to the reservoir space voided by oil from one oil producing well, or a 40 acre unit, then production from these wells would cease to be profitable, causing premature abandonment and direct injury to the operator and royalty owners.

Attached you will find all necessary geological and other pertinent data covering these wells which substantiates our request for exemption from the permanent gas-oil ratio order.

Western Gas Company

Stuart A #1

NE/4 NW/4 of Sec. 14, T-25, R-37

Well History

This well was drilled and completed by the Carl B. King Drilling Company and was purchased by Western Gas Company. It was spudded on Feb. 2, 1938, and completed on Mar. 15, 1938.

On Feb. 18, 1938, 961' of 7-5/8" casing was cemented with 250 sacks of cement and on Feb. 26, 1938, 3271' of 4-3/4" casing was cemented with 150 sacks of cement. Shows of gas were logged at 2380'-93'; 2410'-30'; 2550'-60'; 3095' to 3121' and 3282'-96'. At 3359' the well gauged 4,790 MCF of gas.

The initial production, after shot of 140 quarts at 3326'-95' with a packer at 3300', was about 5 to 8 barrels of oil per day. In March, 1940, the well was reworked and sold to Western Gas Company. The tubing was pulled and the well was cleaned out to 3336' and it tested 650 MCF of gas and about 10 barrels of oil per day where it had originally tested 4,790 MCF. Lane-Wells shot gas pay below casing and increased the gas to 2,500 MCF with about the same amount of oil. The casing was perforated and the well tested 7,000 MCF total.

Tubing and packer were run back in the hole and packer set at 3238' in the casing below the perforations, and the well tested 2,500 MCF of gas with 14 barrels of oil per day.

Casing Record:

Size		Depth	Sacks Cement
7-5/8"	@	921'	300
4-3/4"	@	3271'	150

2" tubing @ 3336' with packer 3238'
2" side door choke @ 3208' with perforations below packer.

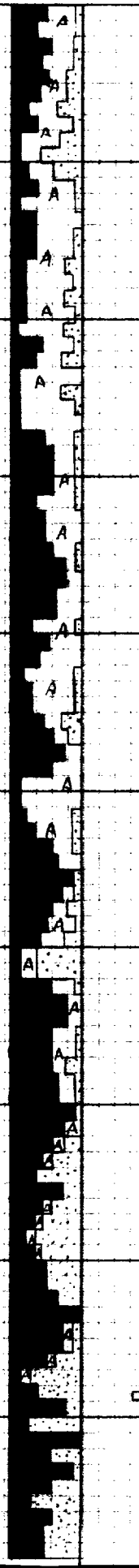
Perforation Record:

20 Shots	3171' to 3191'	
23 Shots	3131' to 3146'	
4 Shots	3275' to 3285'	in gas sand below casing.

Geological Points:

Elevation	3129'
Base salt	2270'
Top brown lime	2320'
Top Yates	2400'

WESTERN GAS CO. "1 STUART "A"



Spud 2-2-38
Comp. 3-15-38
Elev. 3129

KEY

- LIME
- SAND
- ANHYDRITE
- SHALE

CASING

SIZE	DEPTH	CEMENT
7 5/8	921	300
4 1/2	3271	150

2" tbg @ 3288 w/Pkr @ 3238

ANHYDRITE TOP	890	or 2240
SALT BASE	2270	or +859
LIME TOP	2820	or +309
YATES TOP	2400	or +730

GAS SHOWS

2380 - 93
2410 - 30
2950 - 60
3095 - 3121
3282 - 96

WORKOVER, MARCH 1940

Cleaned out to 3336. After pulling tbg & packer, gauged 650 Mcf gas. Perf. formation w/45 shots @ 3275-88 & gauged 2,500 Mcf gas; perf. casing 20 shots 3172-91 & 23 shots 3131-46; gauged

I.P. 7,000 Mcf gas, 789

Was then reran with packer @ 3238 & well flowed 14 Bbls Oil daily with 2,500 Mcf gas

A.F.T.D. 3359, Gas Gauged 4,790 M.C.F.

Shot 140 qts: 3326-85 &

I.P. Fl. 5 to 8 Bbls Oil daily w/Packer @ 3300.

Western Gas Company

State B #1

NE/4 NW/4 of Sec. 2, T-25, R-37

Well History

The well was spudded Mar. 22, 1939, by Parker Drilling Company, which company was the operator and owner until the well was drilled to total depth. After it was shot, it was purchased by Western Gas Company.

Fresh water was encountered at 450' to 516' in sand. A 15" casing was set at 61' but was pulled when 12-1/2" was cemented at 176' with 100 sacks of cement. A 10-3/4" casing was landed at 810' to shut off water but was pulled when 8-1/4" was cemented with 100 sacks of cement at 1294'.

A slight show of gas was found at 2390' in the brown lime. The 7" casing was set at 3200' on July 5, 1939, and cemented with 150 sacks of cement. A show of gas was encountered at 3180' to 85' in sand.

At 3205' to 15' in sand, an estimated 1,000 MCF gas was encountered in sand, and the hole was loaded with salt water to continue drilling. No more shows were logged, except a possible show of oil from 3386' to 3389'; however, between 3200' and 3383' there were several good sand breaks which were carrying gas.

The well was bridged back with gravel from 3439' to 3415' and shot with 140 quarts from 3415' back to 3383'. After shot, the well tested 12,789 MCF gas.

A steel line was run in the hole, and bridge was found at 3297'. The master valve was closed and nothing more was done to the well until it was bought by Western Gas Company.

Otis Pressure Control Company was employed to snub tubing into the hole and Beckman Process, Inc. cleaned the well out to the total depth.

An Exner-Dodge underset packer was set at 3372' with an Otis side-door choke above it and a three-foot perforated nipple below. After unloading the hole, it was found that there was a slight leak around the packer. It

(cont'd)

is believed that the leak is through the formation, due to the shot, which was close to the packer seat, making it impossible to perfectly seat the packer. It was impossible to raise the packer any without leaving a gas sand below it. Therefore, it was decided that the partial shut-off which existed was the best result that could be obtained under present conditions.

The well was completed as a gas well making 2,500 MCF gas with a light spray of oil. It will be tied in to El Paso Natural Gas Company's line and, if there is enough oil with the gas production, separator and tanks will be installed.

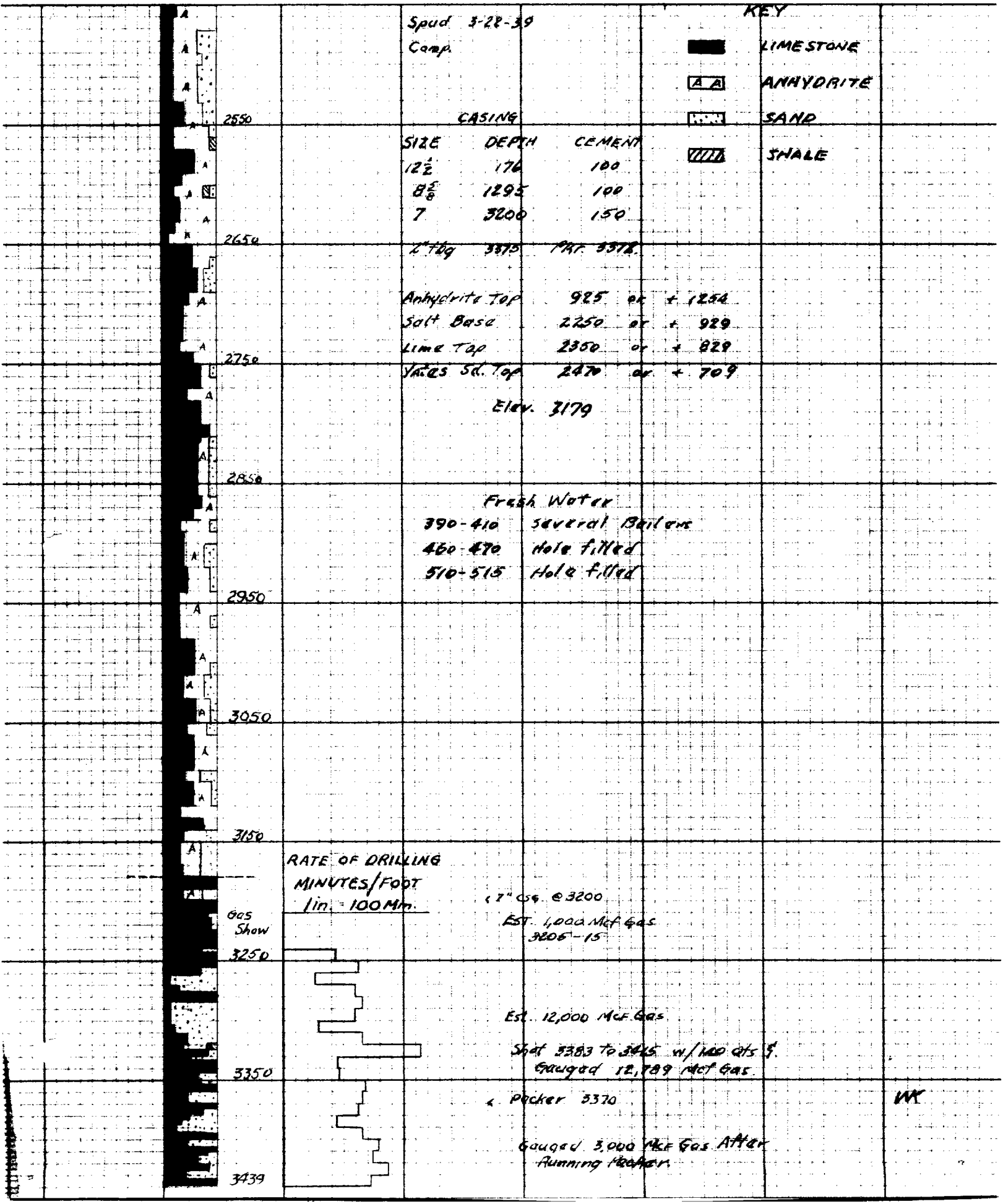
Casing Record:

Size	Depth	Sacks Cement	
12-1/2"	176'	100	
8-5/8"	1295'	100	
7"	3200'	150	
2-1/2"	3375'	with Exner-Dodge underset packer at 3372' and lower 3' perforated, and an Otis side-door choke above packer.	

Geological Points:

Anhydrite top	925	≠	1254
Salt base	2250	≠	929
Brown lime top	2350	≠	829
Yates sand top	2470	≠	709
Elevation	3179	0	

WESTERN GAS CO #1 STATE "B"



Spud 3-28-39
Comp.

CASING

SIZE	DEPTH	CEMENT
12½	176	100
8⅝	1295	100
7	3200	150
2" tbg	3375	PKr. 3318.

Anhydrite Top	925	or + 1254
Salt Base	2250	or + 929
Lime Top	2350	or + 829
Yates Sd. Top	2470	or + 709

Elev. 3179

Fresh Water

390-410	several Bailers
460-470	Hole filled
510-515	Hole filled

KEY

- LIMESTONE
- ANHYDRITE
- SAND
- SHALE

RATE OF DRILLING
MINUTES/FOOT
1 in. = 100 Min.

Gas Show

7" Csg. @ 3200
EST. 1,000 Mcf Gas
3206-15

Est. 12,000 Mcf Gas

Shot 3383 To 3445 w/ 140 qts S.
Gauged 12,789 Mcf Gas

Packer 3370

Gauged 3,000 Mcf Gas After Running Packer.

WK

Western Gas Company

Woolworth #1

NE/4 NE/4 of Sec. 17, T-25, R-37

This well was drilled through the Langlie producing zone. The production from this zone was found not to be of commercial value due to the presence of water in the small amount of production obtained. The well was plugged back and perforated in the Yates gas zone and completed as a dry gas well.

It is our opinion that the Yates sand zone in this area is predominantly a gas reservoir and we, therefore, respectfully request that this well be excepted from the gas-oil ratio order.

Attached you will find geological and other pertinent information substantiating this request.

Western Gas Company

Woolworth #1

NE/4 NE/4 of Sec. 17, T-25, R-37

Well History

This well was spudded on Feb. 25, 1939, and completed on May 7, 1939, by Anderson-Prichard Oil Corp. and was later sold to Western Gas Company. The initial flow was 8,080,000 cu. ft. of sour gas.

On Feb. 30, 1939, 1192' of 9-5/8" casing was cemented with 500 sacks of cement. The well was cored from 2901'-21' and from 2953'-73'. At 3000' to total depth, 2-1/2" tubing was run in open hole and the well tested 5,000,000 cu. ft. On Mar. 26, 1939, 3199' of 7" casing was cemented with 300 sacks of cement.

At total depth, 3454', the well flowed 15 barrels of oil per 24 hours. Shows of oil were logged at 3354'-74', 3382'-87', 3394' to 3412', 3416'-21' and 3445'-52', all in sand. The well later tested 17 barrels of fluid per day and 4% water with 200,000 cu. ft.

The well was then plugged back into the casing and perforated with casing ripper.

CORE RECORD

2901' to 2921½' - Recovered 16½': 8' saturated sand and 7' sandy shale, spotted saturation; 14% porosity, 0.8 milidarcies permeability.

2950' to 2970' - Lime, anhydrite, sand; 17% porosity, 3.0 milidarcies permeability.

3081' to 3092' - 10' 7" recovery: 3½' fine grey sand with sweet gas odor; 1½' black shale with sand breaks; 5' fine grey sand with sweet gas odor; 7" grey chert with black shale breaks; 13% porosity 1.0 milidarcies permeability.

3100' to 3121' - 19' 1" recovery: 6½' fine grey sand with sweet gas odor; 3½' grey chert and black shale breaks; 9' fine grey sand, sour gas odor, good color; 27.2% porosity and 450.0 milidarcies permeability at 3100' to 08'; 12.1% porosity and 0.6 milidarcies permeability at 3110' to 21'.

Casing Record:

Size	Depth	Sacks Cement
9-5/8"	1192'	500
7"	3199'	300
2-1/2" tubing at total depth		

Perforation Record:

No gas	3075' to 3090'
692 MCF	2963' to 2975'
692 MCF	2954' to 2961'
692 MCF	2923' to 2911'
692 MCF	2893' to 2911'
8,400 MCF	3100' to 3120'

WESTERN GAS CO. #1 WOOLWORTH

KEY
- LIME
- SAND
- SHALE
- ANHYDRITE

Spud 2-17-39
Comp.
Elev. 3150

CASING SIZE	DEPTH	CEMENT
9⅝	1152	500
7	3159	300
2½" liner	3170	

2800

ANHYDRITE TOP 1110 or +2040
SALT BASE 2560 or +590
LIME 2710 or +440
YATES TOP 2840 or +310

2900

3000

@ T.D. 3000, Gauged 5,000 Mcf Gas.

Perforations After Plug Back

	Top	Bottom	Results
1.	3075	3090	No Gas
2.	2963	2975	692 Mcf Sweet Gas
3.	2954	2961	No Increase
4.	2911	2923	No Increase
5.	2895	2911	No Increase
6.	3100	3122	8,400 Mcf Sour Gas

3100

Plugged Back To 3170

3200

3300

Oil Show 3358-78 In 3rd
" " 3382-87 " "
" " 3398-3412 " "
" " 3416-21 " "
" " 3445-52 " "

3400

A.T.D. Flowed 15 Bbls Oil - 24 Hrs thru 1/4" Bean with 200 Mcf gas.

Well was then plugged back & casing was perforated

3450

Western Gas Company

Wells #1

SW/4 NE/4 of Sec. 6, T-25, R-37

This well was drilled through the Langlie producing zone. The production from this zone was found not to be of commercial value due to the presence of water in the small amount of production obtained. The well was plugged back and perforated in the Yates gas zone and completed as a dry gas well.

It is our opinion that the Yates sand zone in this area is predominantly a gas reservoir and we, therefore, respectfully request that this well be excepted from the gas-oil ratio order.

Attached you will find geological and other pertinent information substantiating this request.

Western Gas Company

Wells #1

SW/4 NE/4 of Sec. 6, T-25, R-37

Well History

The well was drilled and completed as Anderson-Prichard Oil Corp.'s Wells #9, and is located in the center of the Southwest quarter of the Northeast quarter of Sec. 6-25S-37E. It was purchased by Western Gas Company after completion as a 15,000,000 cu. ft. gas well.

Drilling was commenced June 19, 1939, and was completed Oct. 19, 1939. On June 22nd, 1196' of 9-5/8" casing was cemented with 500 sacks, and on July 9th, 3381' of 7" casing was cemented with 300 sacks of cement.

At total depth, 3540', after a shot of 380 quarts from 3416' to 3505', the well tested 76 barrels of fluid per day, 95% salt water. At plug-back depth of 3530', it tested 27 barrels of fluid, 30% salt water. At plug-back depth of 3395', it was treated with 1000 gallons of acid and tested 20 barrels of fluid, 40% salt water.

The well was then plugged back to 3370' and perforated with 177 shots from 2830' to 3150'. It then tested 15,000,000 cu. ft. of gas.

Casing Record:

Size	Depth	Sacks Cement
9-5/8"	1196'	500
7"	3381'	300
7" Master valve, no tubing.		

Perforation Record:

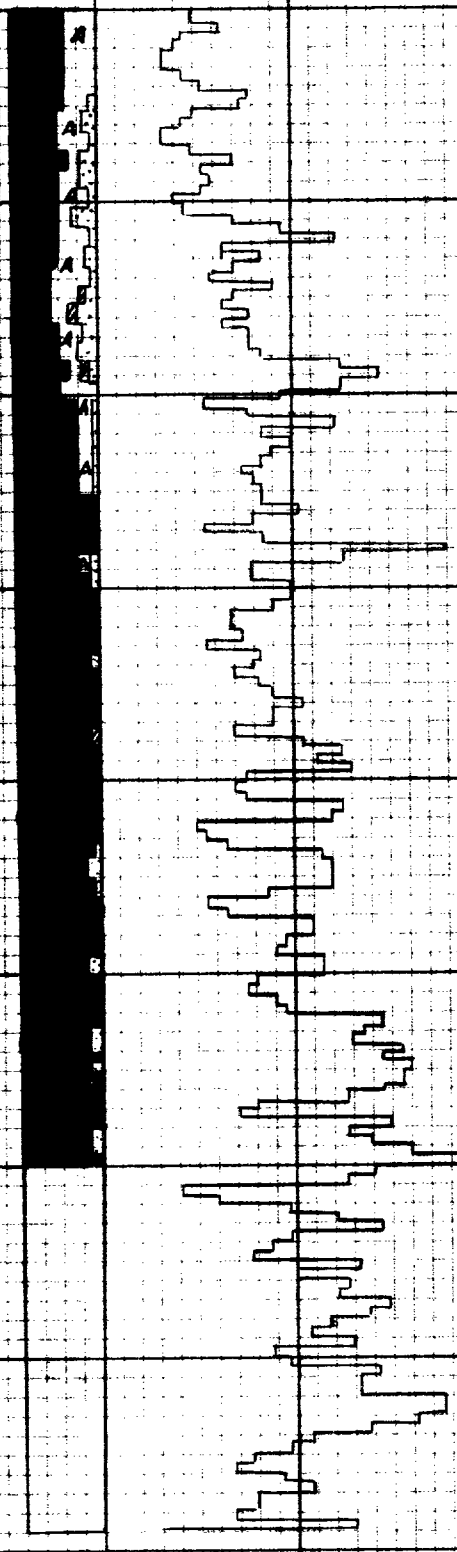
162 Shots	2830' to 3070'
5 Shots	3085' to 3095'
10 Shots	3130' to 3150'

Geological Points:

Elevation	3240'	
Anhydrite	1120'	∠ 2120'
Salt base	2660'	∠ 580'
Brown lime	2690'	∠ 550'
Yates sand	2850'	∠ 390'

Spud 6-19-39

Comp. 10-19-39



CASING		
SIZE	DEPTH	CMTD
9-5/8"	1196	500
7"	3381	300

Elevation	3240		
Anhydrite Top	1120	or	plus 2120
Salt Base	2660		plus 580
Brn. Lime	2690		plus 550
Yates Sand	2850		plus 390

At T. D. 3540, shot 380qts: 3416 to 3505 & flowed 76 bbls fluid daily, 95% salt water. Plugged back to 3530 & flowed 22 bbls fluid daily, 30% salt water, gas lift; P. B. to 3395, treated 1000 gals acid & flow 20 bbls fluid, 40% salt water, lift.

Plugged back to 3370 & perforated casing with 127 shots at 2830 to 3150.

Initial production: Gauged 15,000,000 cubic feet of sweet gas

SHOT RECORD

162 Holes : 2830 to 3070
5 Holes : 3085 to 3095
10 Holes : 3130 to 3150

ILLEGIBLE

Western Gas Company

Harrison #1

NW/4 NW/4 of Sec. 7, T-25, R-37

This well was drilled through the Langlie producing zone. The production from this zone was found not to be of commercial value due to the presence of water in the small amount of production obtained. The well was plugged back and perforated in the Yates gas zone and completed as a dry gas well.

It is our opinion that the Yates sand zone in this area is predominantly a gas reservoir and we, therefore, respectfully request that this well be excepted from the gas-oil ratio order.

Attached you will find geological and other pertinent information substantiating this request.

Western Gas Company

Harrison #1

NW/4 NW/4 of Sec. 7, T-25, R-37

Well History

This well was completed Mar. 3, 1937, as a 3,600,000 cu. ft. gas well.

An open flow test on Yates sand zone and 7 Halliburton cone packer tests were made on the lower formations.

The well was drilled to 3,558' when sulphur water was encountered and the hole was plugged back to 3,300'.

After plugging back to 3,300', the casing was perforated 17 times from 2870' to 2910' in the Yates gas zone. The well was treated with 3,000 gallons of acid to clean out the perforations and mud that might have been pumped back into the formation during the drilling of the well.

The initial open flow test was 3,600,000 cu. ft. of sour gas.

Tests made on

Western Gas Company's Harrison No. 1

#1	1-28-37.	Open flow with drill pipe in hole 2728' to 2990'. Initial show 6,700 MCF and, after 2 hrs., showed 2,400 MCF of sweet gas. (Yates sand)
#2	1-31-37.	Halliburton cone packer test from 2990' to 3100'. Showed 300 MCF of sweet gas.
#3	2-3-37.	Halliburton cone packer test from 2990' to 3229'. Open 15 min. Showed 200 MCF sweet gas.
#4	2-5-37.	Halliburton cone packer test from 2990' to 3338'. Open 15 min. Showed 360 MCF sweet gas.
#5	2-6-37.	Halliburton cone packer test from 2990' to 3376'. Open 15 min. Showed 400 MCF of gas and 200' of fluid with no oil. 3366' to 3376' first show of oil in cuttings.
#6	2-12-37.	Halliburton cone packer test from 3355' to 3515'. Open 15 min. Showed 200 MCF of sweet gas and 250' of fluid with no oil.
#7	2-13-37.	Halliburton cone packer test from 3355' to 3540'. Open 15 min. Showed no increase in gas.
#8	2-14-37.	Halliburton cone packer test from 3355' to 3558'. Open 15 min. Showed 360' of mud in pipe and no increase in gas.
#9	2-24-37.	Opened up 7" to 9" and after 2 hrs. showed 3,600 MCF of gas.
#10	2-25-37.	Open 9 hrs. thru the tubing and by-passed thru 7" to 9". Showed 3,600 MCF of gas, 12 bbl. water per hr. and show of cut oil.

Casing Record:

Size	Weight	Depth	Sacks Cement
13" O.D.	40#	198' 6"	125
9-5/8" O.D.	36#	2722' 6"	750
7" O.D.	24#	3353'	100

Geological Points:

Elevation	3171'
Base salt	2660'
Top brown lime	2710'
Top Yates	2850'

Harrison #1

Western Gas Co.
Harrison #1
NW¼ of NW¼
Sec. 2 T12S R26E
El. 3977

Spud 1-4-37
Comp. 3-3-37

DRILLING CURVE
Minutes per 10ft.
1000

Surface Material
Shale
Anhydrite
Salt
Gypsum
Sand
Limestone

Top Anhydrite

13⅜" casing set at 198'6" with 125 sacks El Toro cement

1500

Top Salt

2000

Base Salt

Top Brown Lime

9⅝" casing 751 Sacks
Base Anhydrite

2500

2-24-37 Opened 7" to 9" and after 2 hours showed 8.6 M²CF.

2-25-37 Open 9 hrs. thru tubing and By-passed thru 7" to 9" Showed 3.6 M²CF. 12 bbl. water per hour and 3 bbl. of cut oil.

Open Flow Initial Show 67 M² After 24 hrs. 2.4 M²CF Sweet gas

Treated by Halliburton with 3000 gallons HCl. 3-1-37 Press 2870 to 2900, No increase in production

3000

Plugged back to 3300 by Halliburton with 25 sacks of El Toro Cement 3-20-37

Treated by Dowell with 3000 gal. HCl at 7:0 2-27-37 No increase in production.

3300

IP: 3.6 MM CF
RP: 1425 #

TD 3378

ILLEGIBLE

Western Gas Company

Harrison #2 - NW/4 NW/4 Sec. 29, T-24, R-37
Harrison #3 - NW/4 SW/4 Sec. 20, T-24, R-37
Harrison #4 - NW/4 SW/4 Sec. 29, T-24, R-37

These wells are producing gas from sand and sandy lime zones in the upper part of the Queen formation. The oil production in this area is coming from lenticular sands in the lower part of the Queen formation. Structurally these wells have about the same position as do the producing oil wells to the east and are about 10' to 20' higher than the producing oil wells to the south and southeast.

From sample determination and careful study of well data, we have come to the conclusion that the zones producing gas in the above mentioned wells are also carrying gas in the wells to the south and east; however, in the wells to the east the character of the horizon has changed from sand and porous sandy lime to sandy shale which is very tight and in most wells only a small volume of gas is present.

The gas in most of the offset wells is open in the hole and is being used to flow oil which is coming from the lower sand pay. The above condition in most wells cannot be remedied because of various well conditions; however, this situation is causing continuous drainage of gas from the upper sand zone in this area.

In the lower sand zone of the Queen formation the condition mentioned above seems to be reversed and the sand zone is well developed to the south and east and the character changes to tight, impervious and non-productive sandy shale in the area around the Harrison wells.

Due to the fact that only a very slight structural variation is present it is our belief that a gas reservoir exists in this area which is entirely independent from the oil producing zone in the offset wells because of the change in character of the sand zone to the east and the slight dip in the formation to the south and southeast.

Based on information submitted in this report, we respectfully request that the above wells be exempt from the permanent gas-oil ratio order.

Western Gas Company

Harrison #2

NW/4 NW/4 of Sec. 29, T-24, R-37

Well History

The well was spudded on Jan. 3, 1937, by Herschbach Drilling Company with a rotary. A 13" casing was run the next day to 402' and cemented with 270 sacks of cement.

Brown lime was topped at 2760' and 9-5/8" casing was landed at 2765' and cemented with 700 sacks of cement.

In a 15 minute Halliburton drill stem test, 280,000 cu. ft. of gas was gauged at 2820' to 25'. Yates sandstone was topped at 2900', and a drill stem test from 2765' to 3040' showed 18,000,000 cu. ft. of gas on Jan. 23rd. As drilling continued, the following Halliburton drill stem tests were made:

#3	-	3040' to 3150'	-	4,500 MCF gas
#4	-	3150' to 3255'	-	800 MCF gas
#5	-	3255' to 3365'	-	225 MCF gas
#6	-	3255' to 3460'	-	5,700 MCF gas, 200' of drlg. fluid
#7	-	3255' to 3520'	-	No increase
#8	-	3255' to 3595'	-	No increase
#9	-	3495' to 3630'	-	186 MCF gas, 270' fluid
#10	-	3580' to 3650'	-	Small gas, 60' drlg. fluid

At 3356', 7" casing was cemented and drilling resumed.

At total depth, 3650', the initial production was 14,600,000 cu. ft. of gas gauged through open 7" casing; this was on Feb. 8, 1937. In December, 1937, the well started making about 5 barrels of condensate while about 4,000,000 cu. ft. of gas was being taken from the well.

WGCO.

Casing Record: Size	Depth	Sacks Cement
13"	401	270
9-5/8"	2764	700
7"	3356	100

Geological Points:			
Top anhydrite	1180'	+	2110
Base salt	2700'	+	590
Top brown lime	2760'	+	530
Top Yates	2900'	+	390
Top pay	3390'	-	100
Elevation	3290'		

WESTERN GAS Co.
Harrison #2
NW¼ NW¼ Sec 29
T26S R37E
El 3290

DRILLING TIME
Minutes to Drill
10 Feet
0 10 20 30 40 50 60 70 80 90 100

KEY
Surface Material
Sand
Anhydrite
Salt
Shale
Gypsum
Limestone

1000
1500
2000
2500
3000
3500

Spud - 1-8-37
Comp - 2-18-37

TOP ANHYDRITE
TOP SALT
BASE SALT
TOP BROWN LIME
9⅝" casing
700 sacks
TOP YATES SAND
7" casing
100 sacks
Main Gas Zone
Harrison #2

#1 DST
15 min
280 MCF

#2 DST 1-23-37
18M²CF

#3 DST 1-25
4.5M²CF

#4 DST 1-29
15 Min.
900 M

#5 DST 2-5
open 15 Min
225 MCF

#6 DST 2-5
15 Min. 5.7M²
240' Fluid

#7 DST 2-7
open 15 Min
No increase

#8 DST 2-9
open 15 Min
No increase

Open Flow Test
Through 2" In.
Casing Showed
19M²CF Sweet
gas. Shut in
pressure was
1410 pounds.

#9 DST 2-10
open 15 min
186 MCF
210' Fluid

#10 DST 2-17
open 45 Min
Small GAS
60' Ft. No oil

1M²=14.8M²CF
ROCK PR. 1410#

SEA LEVEL

TD 3650

ILLEGIBLE

Western Gas Company

Harrison #3

NW/4 SW/4 of Sec. 20, T-24, R-37

Well History

The well was spudded on May 31, 1937, by Milhoan Drilling Company. At 311', 13" casing was set and cemented with 200 sacks of cement and 9-5/8" casing was set at 2779' and cemented with 700 sacks of cement. Several Halliburton tests were run from 2820' to 3420' and only small amounts of gas were found. A Halliburton test from 3420' to 3470' showed 12,000,000 cu. ft. of gas and 1300# bottom hole pressure.

At 3624', 7" casing was cemented with 100 sacks of cement. The well made one barrel of oil per hour natural and, after acid, Aug. 2, 1937, initial production test was 288 barrels per day. After producing 4229 barrels of oil, the daily production was 100 barrels of fluid per day - 96% sulphur water.

On Sept. 7, 1938, the hole was plugged back to 3595' in the casing and perforated with 20 shots from 3439'-3460'. Initial production after perforation was 14,000,000 cu. ft. of sweet dry gas.

DRILL STEM TESTS

#1 - Halliburton drill stem test 7-5-37, 2920'-70', 10 min., 50 MCF, 35' mud.
Rathole 2970'-85' 7-6-37
Rathole 3023'-30' 7-7-37

#2 - Halliburton drill stem test 7-7-37, 2970'-3030', 13 min., 50 MCF, 50' mud.
Show of oil 3212'-3215'
Acid test 3250' - 1/2° 7-11-37, tested Okay.
Rathole 3362'-3472' 7-13-37.

#3 - Halliburton drill stem test 7-15-37, 3362'-3420', 16 min., 500 MCF, 90' mud.
Ream 3362'-72' 7-14-37
Rathole 3421'-71'
Ream 3421'-35'

#4 - Halliburton drill stem test, 3420'-70', open 7 min., 12,000 MCF, 22' mud, 1300#.
Pay 3439'-60'
Rathole 3435'-72'
Coring 3472'-89', 11' recovery, 6-1/4 head.
Coring 3489'-3505', 15' recovery, last 3' sand show of oil, 6-1/4 head.
Ream 3472'-3505' 7-17-37
Coring 3625'-33', 8' recovery 7-19-37
Coring 3633'-45', 7' recovery 7-19-37
Coring 3652'-55', 9' recovery 7-19-37

#5 - Halliburton drill stem test, 3625'-74', 18 min., 487 MCF, 90' fluid 7-23-37.

#6 - Halliburton drill stem test, 3625'-94', 15 min., 487 MCF, 90' fluid - 7-25-37.
Killing well to acidize 8-2-37.
Killing well and swabbing 8-3-37.

Casing Record:

Size	Depth	Sacks Cement
13" O.D.	311'	200
9-5/8" O.D.	2779'	700
7" O.D.	3624'	100

Geological Points:

Surface elevation	3294'
Top anhydrite	1190'
Base salt	2735'
Top brown lime	2775'
Top Yates	2910'


WESTERN Gas Co.
Harrison #3
NW¼ SW¼
Sec 20 T24S R37E
Spud 5-31-37
Elev. 3294
Surface Material
Sand
Shale
Anhydrite
Salt
Limestone
13" casing at 311
100
500
DRILLING TIME CURVE
30 60 90 120 150 180 210 240
TIME IN MINUTES TO DRILL FIVE FEET
1000
TOP ANHYDRITE
1500
Harrison #3
TOP SALT
6-21-37
2000
2500
BASE SALT
6-24-37
TOP BROWN LIME
6-30-37
at 2779
Show gas
7-5-37
Drill Stem Test #1
Open 10M
50 MCF
30' mud
Drill Stem Test #2
Open 13M
50 MCF
60' mud
7-7-37
3000
D.S.T. #3
Open 16M.
500 MCF
90' mud
7-15-37
D.S.T. #4
Open 7M.
12M MCF
22' mud
1300 Lbs.
Perforated with 20 Shot
Gauged 12 M MCF (Sweet)
3500
Treated with
3000 gal. HCL
3625-3694
8-2-37
D.S.T. #5
Open 12 Min.
627 MCF
125' mud
D.S.T. #6
Open 15M.
487 MCF
90' mud
D.S.T. #7
Open 15M.
487 MCF
90' fluid
Before P.B. Lower Pay Produced
4225 B.O.
P.B. 3595
with 20 shots
TEST
12 M MCF
coring 3625 to bottom
casing at 3624
T.D. 3694
Comp. 8-8-37
Before P.B. Pumped
100 Bbls. Water / Day

Western Gas Company

Harrison #4

NW/4 SW/4 of Sec. 29, T-24, R-37

Well History

The well was spudded on June 23, 1937, by American Drilling Company, and drilled to total depth with rotary tools. Next day 13" casing was set at 304' with 250 sacks of cement.

On July 5th, 9-5/8" casing was cemented at 2766' with 750 sacks of cement. A split at 1417' was cemented with 500 sacks of cement on July 17th.

Yates sand was topped at 2900' and an open flow test through the casing showed 24,600 MCF gas at total depth, 2980'.

On Aug. 9th, a 3,000 gallon acid treatment at total depth, 3699', failed to show any results. The well was then retreated with 5,000 gallons and swabbed sulphur water with a little oil. It was then plugged back with cement to 3500' and 7" casing was perforated from 3360' to 3400' and from 3465' to 3500'. A 3000 gallon acid treatment was then made and the production was gauged at 6500 MCF of sweet gas.

In November, 1937, the well started making about 5 barrels of condensate with 2,000 MCF of gas daily.

DRILL STEM TESTS

The following results were shown by drill stem tests made on the well:

#1 - 3360'-3415', open 15 min., 1500 MCF gas, 270' mud.

#2 - 3409'-3465', open 20 min., no gas, 30' mud.

#3 - 3465'-00, open 48 min., no gas, 95' mud.

#4 - 3465'-3525', open 20 min., no gas, 75' mud.

#5 - 3465'-3550', open 15 min., no gas, 60' mud.

#6 - 3548'-3598', open 15 min., no gas, 5' mud.

7" casing was run to 3598' and cemented with 100 sacks on 8-7-37. Subsequent Halliburton drill stem tests were as follows:

#7 - 3598'-3628', open 15 min., no gas, 5' mud.

#8 - 3598'-3671', open 20 min., no gas, 10' mud.

#9 - 3598'-3699', open 20 min., no gas, 8' mud.

Casing Record:

Size	Depth	Sacks Cement
13"	303'	250
9-5/8"	2766'	750
7"	3598'	100

Geological Points:

Top anhydrite	1150'	≠	2120
Base salt	2710'	≠	560
Top lime	2670'	≠	599
Top Yates	2920'	≠	350
Top pay	3360'	-	90
Elevation	3269'		

WESTERN GAS CO.
Harrison # 4
NW¼ SW¼
Sec. 29 T24S R37E
Lea County, N. Mex.
Spud 6-23-37
Elev. 3269
Surface Material
Sand
Shale
Anhydrite
Salt
Limestone
100
13" casing @ 303' 6"
500
1000
TOP ANHYDRITE
1500
TOP SALT
Harrison #4
2000
2500
DRILLING CURVE
Minutes to drill
Five Feet
150 120 90 60 30
BASE SALT
TOP BROWN LIME
9⅝" casing @ 2766
750 sacks cement
Open Flow Test
10 Min. 24.6 M²CF
B.P. 250#
3000
Show Oil
Treated with
3000 gal HCl.
Open Flow:
10 Min. 6M²CF
450 Bbl. Fluid.
Later Test:
10Min. BP600#
7-19-37
DST
15 Min.
1500 m
270'
7-21-37
DST
15 Min BP400#
7.2 M²CF, Fluid
Open 30 Min. Fl.
B.P. 350# 6M²CF
Open 20 min.
no gas
30' mud.
PERFORATED
20 Shots
PB 60 Sacks
DST - 7-22-37
Open 18 min + 10 min
No gas
95' Fluid
oil colored.
3500
DST - No gas, 75' mud
open 20 min - 7-23-37
DST - No gas 65' mud.
open 15 min - 7-25-37
CORED
DST open
15 Min - 7-26-37
no gas 5' mud
7" casing, 100 sacks
@ 3599
Treated with 3000 gal. HCl. Sulfur
water, Little oil. Retreat with
5000 gal. HCl. Same result.
PB - 15 sacks.
TD 3699
7-27-37 DST
open 15 Min
no gas
5' mud
7-28-37 DST
open 20
no gas,
10' mud
7-31-37 DST
open 20 Min.
no gas
8' mud.

Western Gas Company

Jim Camp #1

SW/4 SW/4 of Sec. 6, T-24, R-37

The initial production from this well was 16,000,000 cu. ft. of dry sweet gas with the major portion of the gas coming from sands logged from 3270' to 3370' which is predominantly a gas reservoir in this area.

As is indicated from the information above, the major portion of the gas being produced from this well is coming from sands which are approximately 100' higher in the geological section than the oil producing sands and in no way affects the oil producing horizon.

Therefore, we respectfully request that this well be exempt from the permanent gas-oil ratio order.

Western Gas Company

Jim Camp #1

SW/4 SW/4 of Sec. 6, T-24, R-37

Well History

This well was spudded on Apr. 18, 1937, by Milhoan Drilling Company. A 13" casing was set at 272' with 200 sacks of cement, and 9-5/8" casing was set at 2780' and cemented with 700 sacks of cement.

At total depth, 3210', with open hole from 2780' to 3210', the hole was allowed to unload and gas tested 16,000,000 cu. ft. The major part of this gas was coming from the Yates sand zone, 2940' to 3100'.

After testing, the well was conditioned with mud and was drilled to 3250', where 3246' of 7" casing was cemented with 100 sacks of cement.

The well was deepened to total depth, 3656', and, from sample determinations and core descriptions, the bottom 75' to 100' of the hole was carrying sour gas and sulphur water and the hole was plugged back to 3500'.

Casing Record:

Size	Depth	Sacks Cement
13"	272'	200
9-5/8"	2780'	700
7"	3246'	100

Geological Points:

Surface elevation	3341'
Top anhydrite	1160'
Base salt	2740'
Top brown lime	2775'
Top Yates sand	2910'

EL PASO NATURAL GAS CO.
JIM CAMP #1
SW¼ or SW¼ Sec 6
T24S R37E
El. 3341

KEY
Surface
Shale
Gypsum
Anhydrite
Salt
Sand
Limestone

13⅜" Casing @ 257' with 200 sacks.

1000

Drilling Curve
Minutes for 10 Ft.
0 20 40 60 80 100 120

1500

2000

2500

Drilling Curve
0 20 40 60 80 100 120

Base Salt
Jim Camp #1
9⅝" Csg @ 2760 200 sacks
Top Brn. Lime
Smell of Gas @ 2810
Top Yates

Open Flow Test through 2" tubing set at 3205. From 3780. to 3210. 16 Million C.F.

3000

7" Csg @ 3030 150 sacks
Main Gas Pay

3500 T.A. 3500

DST #1
3540-3560
Open 12 min
No show

DST #2
3540-3605
Open 18 min
Rec 10' mud
No show

IP: 16 MMCF
RP: 1330

TD 3656

Western Gas Company

Curry #1

SE/4 SE/4 of Sec. 1, T-24, R-36

This well is located on the top of the structure and is the highest well, structurally, of any in this area and the producing zones immediately surrounding this well are predominantly gas. However, the gas being produced from this well may be coming from the same zone that is producing oil in wells to the south, which are lower on the structure. The nearest wells to produce oil from this zone are two or three locations away and in the offset wells this zone is still predominantly gas bearing.

Western Gas Company owns gas rights on approximately 320 acres in this immediate area. It is our belief that we should be granted the right to withdraw an amount of gas equal to the total gas produced plus a volume of gas equal to the reservoir space voided by oil produced from producing oil wells on the acreage on which we have purchased gas rights and also on undeveloped acreage which is being drained by offsetting wells. In no event will Western Gas Company withdraw a daily average amount of gas more than 25% of the open flow capacity of the gas well in question.

If the requested relief is not granted and the well is prorated to a withdrawal of gas equivalent to an amount of gas produced plus a volume of gas equivalent to the reservoir space voided by oil from one oil producing well, or a 40-acre unit, then production from this well would cease to be profitable causing premature abandonment and direct injury to the operator and royalty owner.

Attached you will find all necessary geological data pertinent to this well which substantiates our request for exemption from a permanent gas-oil ratio order.

Western Gas Company

Curry #1

SE/4 SE/4 of Sec. 1, T-24, R-36

Well History

The well was spudded Mar. 18, 1938, by Roy Jeeter with a Fort Worth spudder, and drilled to a total depth of 140'. There, Herschbach Drilling Company moved in rotary equipment and took over all of Western Gas Company's obligations to Roy Jeeter for previous drilling. On Apr. 2, 1938, second-hand 12-1/2" casing was landed at 210' and cemented with 225 sacks of El Toro cement.

On Apr. 14th, new 8-5/8" casing was landed at 2776' and set with 850 sacks of El Toro cement. The well was then drilled to 3385', and a Schlumberger Electrolog was made of the formation. The survey showed first gas at 2914', second at 2955', third at 3103', fourth at 3162', fifth at 3288', and sixth at 3358' to total depth.

On Apr. 24th, 5-1/2" casing was landed at 3310' and set with 20 sacks of El Toro cement. An open flow test on Apr. 29th, from 3310' to 3400', showed 22,000,000 cu. ft. of sweet gas.

Coring was commenced at 3400' and continued to 3575'. On May 2nd, a packer was set at 3402' and the formation was tested to total depth, 3496'. The test showed 8,000,000 cu. ft. of sweet gas. Later the packer was set at 3440' with a total depth of 3575', and tested 10,000,000 cu. ft. of sweet gas through 2-1/2".

The well was drilled from 3575' to 3670' and a Halliburton drill stem test was then made. The tool was open 16 minutes and showed a little sweet gas, 120' of drilling fluid, and a slight show of oil. The drill pipe was then pulled and tubing was run with the packer at 3590'. The well then made 120 barrels of fluid per day for two days.

The well was then cored from 3670' to 3697' and a packer was run; however, the hole was caving and the packer would not go down. Another rubber was used but the packer again stopped too high. Another packer

(cont'd)

was then run into the hole and set at 3590'. The well was swabbed for two days, making about 400 barrels of fluid per day, 50% of which was water and base sediment. Later tests showed 300 barrels of fluid per day, 87% sulphur water and base sediment, and 13% oil. The water contained 11 grains of sulphur per gallon and the oil was 27.2 gravity, corrected.

On May 26th, tubing was pulled out of the hole but the packer pulled in two, leaving 106' of 2-1/2" tubing in the hole from 3590' to 3697'. Halliburton then plugged the hole back to 3550' on top of the tubing in the bottom of the hole. After allowing the cement to set for three days, the top of the plug was found to be at 3538'.

On June 1st, 2-1/2" tubing was run to the plug-back depth with a formation anchor packer on the tubing at 3440'. The tubing was landed at 7:00 P.M. and preparations were made to test the well.

The well unloaded at 4:00 A.M., June 2nd, and, after blowing open and cleaning itself for seven hours, was tested and found to be making 8,000,000 cu. ft. per day. It was allowed to clean itself for another four hours and was again tested and found to be making the same amount of sweet gas.

SPECIAL TESTS MADE ON WELL

Type and Depth	Results
Schlumberger, 2776'-3385'	The temperature curve showed the following bases of gas zones: 2914', 2955', 3103', 3162', 3288', 3358', and gas showing at bottom of hole. Porosity was shown in the following zones: 2780'-2860'; 3012'-39'; 3049'-95'; 3130'-3280', streaks; 3295'-3335', fair; 3335'-3340'; 3350' to total depth.
Open flow, 3310'-3400'	22,000,000 cu. ft. of sweet gas with 200# back pressure.
Halliburton, 3590'-3670'	Showed a small amount of sweet gas, 120' of drilling fluid, and a show of oil.
Tubing-packer, 3402'-96'	With packer at 3402', and total depth 3496', test showed 8,000,000 cu. ft. of sweet gas.
Tubing-packer, 3440'-3575'	With packer at 3440', and total depth 3575', test showed 10,000,000 cu. ft. of sweet gas.
Tubing-packer, 3590'-3670'	With packer at 3590', and total depth 3670', tested two days. Made approximately 120 barrels of fluid per day.
Tubing-packer, 3575'-3697'	Swabbed well 5/18 and 5/19/38. Swabbed and flowed approximately 400 barrels of fluid per day, 50% of which was sulphur water. Then flowed as follows: 5/20/38 - 450 bbls. of fluid, 40% water. 5/21/38 - 400 bbls. of fluid, 45% water. 5/22/38 - 300 bbls. of fluid, 60% water. 5/23/38 - 300 bbls. of fluid, 72% water. 5/24/38 - 250 bbls. of fluid, 85% water. 5/25/38 - 300 bbls. of fluid, 87% water. 5/26/38 - 260 bbls. of fluid, 87% water. 5/27/38 - 300 bbls. of fluid, 87% water. 5/28/38 - 300 bbls. of fluid, 87% water. The gravity of this oil was 27.2, corrected, and the water contained 11 grains per gal.
Initial Production	With Robinson packer set at 3440', and the plug-back depth of 3538', tested 8,000,000 cu. ft. of sweet gas through 2-1/2" upset tubing.

CORE RECORD

#1 3400'-20' - 6' recovery.
3400'-02' - Layers of sand and shale.
3402'-06' - Hard lime.
6" streaks of porous lime at 3404' with show of oil.

#2 3420'-39' - 8' recovery.
3420'-26' - Hard porous lime.
3426'-27' - Shale.
3427'-28' - Soft dark sand.
3428'-29' - Lime.
Very soft, 3429'-37', probably gas sand.

#3 3439'-59' - 15' recovery.
3439'-42' - Hard lime.
3432'-43' - Porous lime, shale.
3443'-44' - Porous lime with sand streaks.
3444'-48' - Hard lime.
3448'-9½' - Sand with show of oil and gas.
3449½'-51' - Hard lime.
3451'-53' - Hard lime with sand and shale streaks.

#4 3459'-76' - 10' recovery.
3459'-63' - Hard lime.
3463'-64' - Lime with streaks of shale.
3464'-65' - Sand with show of oil and gas.
3465'-69' - Lime with sand and shale streaks.

#5 3476'-84' - 9' recovery.
3476'-84' - Lime with shale streaks and sand breaks.

#6 3484'-96' - 12' recovery.
3484'-88' - Lime, shale streaks.
3488'-90' - Sandy lime.
3490'-92' - Lime with shale streaks.
3492'-95' - Sand with show of oil and gas.
3495'-96' - Lime.

(Cont'd.)

Core Record (Cont'd.)

#7	3506'-26'	-	16' recovery. (SLM 3496'-3506')
	3506'-07'	-	Lime.
	3507'-09'	-	Sand with show of oil.
	3509'-10'	-	Sandy lime.
	3510'-11'	-	Sand with show of oil.
	3511'-13'	-	Lime.
	3513'-15'	-	Hard sand with show of oil.
	3515'-19'	-	Lime with sand streaks.
	3519'-20'	-	Sand with show of oil.
	3520'-22'	-	Lime with show of dead oil.
#8	3526'-46'	-	16' recovery.
	3526'-27'	-	Sand with show of oil and gas.
	3527'-33'	-	Lime.
	3533'-34'	-	Shale.
	3534'-35'	-	Lime.
	3535'-37'	-	Sandy lime.
	3537'-40'	-	Lime with shale streaks.
	3540'-43'	-	Sand with show of oil and gas.
	3543'-44'	-	Sandy lime.
	Good show bottom 4' of core.		
#9	3546'-66'	-	9' recovery.
	3546'-50'	-	Sandy lime.
	3550'-52'	-	Lime.
	3552'-54'	-	Sandy lime with show of oil and gas.
	3554'-55'	-	Lime.
#10	3566'-78'	-	9' recovery.
	3566'-68'	-	Sandy lime.
	3568'-69'	-	Lime.
	3569'-70'	-	Sand with show of oil.
	3570'-73'	-	Lime.
	3573'-75'	-	Sand with show of oil and gas.
#11	3672'-82'	-	2' recovery.
	3672'-2½'	-	Porous lime.
	3672½'-74'	-	Hard lime with shale streaks.
#12	3682'-97'	-	1' recovery.
	3682'-2½'	-	Hard lime.
	3682½'-83'	-	Porous hard lime showing dark heavy oil.

Casing Record:

Size	Depth	Amount	Plus Threads	Charged
13"	210'	193'5"	2"	195'5"
8-5/8"	2776'	2761'	18'	2779'
5-1/2"	3310'	3300'	20'	3320'
2-1/2"	3538'	3530'	24'	3660'
		(106' cemented in bottom of hole)		

Geological Points:

Surface elevation	3344'
Top anhydrite	1190' or 2154'
Top salt	1300' or 2044'
Base salt	2730' or 614'
Top brown lime	2760' or 584'
Top Yates sand	2890' or 454'

ILLEGIBLE

WESTERN GAS CO.
#1 CURRY
SE-SE 1-24-36
ELEV 5344
KEY
SHALE
SAND
ANHYDRITE
SALT
GYPSUM
LIMESTONE
SANDY LIME
W.K.
1000
Spud - 3-18-38
Comp. - 6-2-38
13" Csg. @ 210' WITH 225 SAX.
DRILLING TIME TEN FOOT INTERVAL
TOP ANHYDRITE
MINUTES
0 20 40 60 80
TOP SALT
1500
CORING TIME 1 FOOT INTERVAL MINUTES
0 10 20 30 40 50
CORE
3400
3420
3440
3460
3480
3500
3520
3540
3560
3580
3600
3620
3640
3660
3680
Porous Lime
No Recovery
S/O+G
N.R.
S. L. M.
DRILLED
2000
2500
DRILLING TIME 5 FT. INTERVAL
BASE SALT
TOP BROWN LIME
8-5/8" Csg. @ 2300 WITH 350 SAX.
TOP YATES SAND
3000
Schlumberger & Temperature
5 1/2" Csg. @ 3310 WITH 25 SAX.
OPEN FLOW 22 MCF per Day
Cored 3400-3626
Driller
Elder-Dodge
Packer Set at 3440
Tubing & Packer
TD-3697

Western Gas Company

Guthrie #1

SW/4 SE/4 of Sec. 34, T-23, R-36

From the presented information, it is evident that the gas in this well is coming from 3431' to 3531', which is approximately 50' higher in the section than the oil producing zone to the west which is a lime pay. Therefore, the withdrawal of gas in no way affects the production of oil and we request that this well be exempt from the permanent gas-oil ratio order.

Western Gas Company

Guthrie #1

SW/4 SE/4 of Sec. 34, T-23, R-36

Well History

The well was spudded Dec. 19, 1936, by Oilwell Drilling Company's rotary, and was operated by Shell Oil Company until after its completion Feb. 17, 1937.

A 12-1/2" surface casing was run to 271' and cemented with 200 sacks of cement. A 9-5/8" salt string was cemented at 1380' with 400 sacks of cement. The production string, 7", was run 200' below the top of the Yates sand and cemented at 3300' with 275 sacks of cement. As drilling continued, Halliburton drill stem tests were made as follows:

#1 - 3431'-3531', 6,600 MCF gas, 100' drlg. mud, open 18 min., 3/4" choke.

#2 - 3526'-3581', 1,220 MCF gas, 45' mud, open 25 min.

#3 - 3581'-3606', failed.

#4 - 3582'-3606', 6' drlg. mud, 18 min.

#5 - 3582'-3653', 5' drlg. mud, 15 min.

#6 - 3582'-3678', 5' drlg. mud, 15 min.

#7 - 3582'-3703', 5' drlg. mud, 20 min.

#8 - 3582'-3728', 5' drlg. mud, 15 min.

#9 - 3582'-3778', 5' drlg. mud, 20 min.

#10 - 3773'-3828', 10' drlg. mud, 20 min.

#11 - 3773'-3878', 60' drlg. mud, 15 min.

#12 - 3773'-3928', 3030' sulphur water, open 20 min.

Upon reaching total depth, 3928', where 3030' of sulphur water rose in the drill stem, the well was plugged back to 3780', and completed as a gas well by Shell Oil Company. It was then sold to El Paso Natural Gas Company and was later taken over by Western Gas Company. The initial production, gauged through open 7" casing, was 24,192,000 cu. ft. of sour gas.

Casing Record:

Size	Depth	Sacks Cement
12-1/2"	271'	200
9-5/8"	1374'	300
7"	3300'	275

Geological Points:

Surface elevation	3381'		
Top anhydrite	1280'	≠	2100
Top salt	1320'	≠	2060
Base salt	2910'	≠	470
Top lime	2980'	≠	400
Top Yates	3100'	≠	280

[redacted]
W.B. Guthrie N°1
COOPER-JAL DIST.
Loc. 660 ft. S.L. & 1980 ft. E.L. of Sec.
Sec. 34, T23S-R36E
Lea County, N.M.
Elev. 3381
11-9-36
Rot.
KEUFFEL & ESSER CO.
100
12½" 271 C 200
500
1000
1280 TOP ANHYDRITE
1320 TOP SALT
9⅝" 1374 C 300
1500
Guthrie #1
2000
2500
2910 BASE SALT
2960 TOP BROWN LIME
3000
3100 TOP YATES SAND
7" Casing
DRILLING TIME CURVE
Time in Minutes to drill 5' intervals
3431
3531
3526
3567
3606
3653
P.E. 3780
3773
3828
3878
3928
1-16-37 3928
Caliche
Bentonite
Red Beds
Anhydrite
Salt
Lime
Sand

Western Gas Company

Matkins #1

SE/4 SE/4 of Sec. 15, T-23S, R-36E

This well was drilled through the Langlie producing zone. The production from this zone was found not to be of commercial value due to the presence of water in the small amount of production obtained. The well was plugged back and perforated in the Yates gas zone and completed as a dry gas well.

It is our opinion that the Yates sand zone in this area is predominantly a gas reservoir and we, therefore, respectfully request that this well be excepted from the gas-oil ratio order.

Attached you will find geological and other pertinent information substantiating this request.

Western Gas Company

Matkins #1

SE/4 SE/4 of Sec. 15, T-23, R-36

Well History

The well was spudded Mar. 18, 1938, by Herschbach Drilling Company. On Mar. 19th, 311' of 12-1/2" casing was set at 328' with 250 sacks of common El Toro cement and 25 sacks of special cement.

An air pocket was drilled into at 1720' and the drilling mud blew out of the hole, causing a loss of two hours, killing the well.

At total depth, 2915', 2895' of 8-5/8" casing was landed at 2911' on Mar. 30th and set with 850 sacks of common El Toro cement and 50 sacks of special cement.

On April 7th, the first core was started with a 4-3/4" core barrel at 3370'. At total depth, 3382', with open hole from 2911', an open flow test was made through the 8-5/8" casing with the drill pipe in the hole. The well was tested and found to be making 30,900,000 cu. ft. of sweet gas per day.

On Apr. 8th, the 4-3/4" hole was reamed to 7-7/8" size from 3370' to 3387'. A core was then taken from 3387' to 3402' and the hole was then reamed to 7-7/8" size and drilled to 3571'.

A core was then taken from 3571' to 3580' with a 4-3/4" barrel; the hole was reamed to 7-7/8" size and a 6-1/4" core barrel was used from 3580' to 3613'.

A Halliburton testing tool was run into the hole at total depth, 3613', with a packer set at 3402'. The packer rubber failed to hold and no test was made. Coring was then started with a 6-1/4" barrel and continued to 3638'.

On Apr. 15th, a Schlumberger electrical survey was made of the well to the total depth, 3638'. The resulting graph showed the first gas at 3056', second at 3095', third at 3295', fourth at 3469', with main gas pay at 3056'.

(cont'd)

On Apr. 16th, 3424' of 5-1/2" casing was run to 3440' and set with 25 sacks of special El Toro cement. On the 20th, the well was unloaded between the 8-5/8" and 5-1/2" casing. This gas was turned into the drill pipe and the well was unloaded and tested from 3440' to 3638'. The test showed 1,500,000 cu. ft. of sweet gas with a slight spray of oil. The well was then killed with oil and drilled to 3665'. The drill pipe was then removed and preparations were made for shooting the well with nitro-glycerine.

The well unloaded oil and, on running gauge, the well was found to be bridged at 3570'. E. L. Farmer was then called on Apr. 22, 1938, and his swabbing unit was used to bail the well until 8:00 A.M., Apr. 23rd.

On Apr. 23rd, the well was shot dry with 200 quarts of nitro-glycerine from 3540' to 3640', and the last two shells from 3640' to 3665' with cement to plug the bottom of the hole. Four Bakelite shells full of gravel were placed on top of the shot to bridge the well above the shot and protect the 5-1/2" casing. The shot went off at 12:20 P.M. and the hole bridged. Running the measuring line, the bridge was found to be at 859'. Otis was then called for snubbing equipment and control heads and drilling on the bridge commenced. Three feet were drilled and an impression block was run and showed the well to be all right so far. Four more feet were made and the well blew in. The pressure between the 8-5/8" and 5-1/2" dropped from 1300# to 500#, showing that the 5-1/2" casing had a hole in it. Another impression block was run on Apr. 28th and the casing was found to be flattened on one side. On Apr. 29th, a tubing head was put on and the well was ready for production.

The well started producing on May 2, 1938, and produced until May 16th. During that time, it made 41,647,000 cu. ft. of gas.

On May 16, 1938, Herschbach began to rig up and prepare to drill the bridge from the 5-1/2" casing. The well was killed on the 21st after pumping against it for two days. A reed swedge tool was put above the 4" bit and drill collar. The 5-1/2" casing was rolled out and the bridge was drilled through. The well was again killed and a second bridge was found to be at 3415'-53'. The hole was then circulated in preparation for a squeeze job on the split casing.

(cont'd)

On May 23, 1938, a Baker retainer plug was set at 3390' and 5-1/2" casing was plugged with 175 sacks of El Toro cement. The plug was drilled on the 26th at 785' and found about 400' of cement in the hole. The squeeze job was satisfactory. Cleaned out and found bridge at 3570', circulated hole and began testing.

On May 30th the hole was cleaned out to the bottom. Drill pipe was then removed and 2-1/2" tubing was run to 3630', and then the well cleaned itself behind the tubing. It would not flow through the tubing. On June 1st, the tubing was raised two joints to 3565' and the well cleaned itself through the tubing.

An open flow test through the tubing showed 7,500,000 cu. ft. of gas. After blowing open for two days, a test showed the well to be making 5,000,000 cu. ft. of gas with 1-1/4 barrels of oil per hour after shot.

Due to contract requirements the well was drilled deeper and no other producing zones were encountered. At total depth, 3853', the well flowed 216 barrels of fluid which was 90% salt water and 10% basic sediment and oil, and the hole was plugged back to 3642' with cement.

On production test, with open hole from 3440' to 3642', the well made only 500,000 cu. ft. of gas with no oil, so the casing was perforated with Lane-Wells gun perforator from 3275' to 3300' with 24 shots and there was no increase in the volume of gas.

The casing was then perforated with 24 shots from 3030' to 3150' and the well tested 14,000,000 cu. ft. of sweet gas.

This well was completed Dec. 23, 1938, with an initial open flow test of 14,000,000 cu. ft. of gas and 8 barrels of condensate per 24 hours, and was tied into El Paso Natural Gas Company's high pressure gathering system.

The gas being produced from this well is coming from the Yates sand zone from 3030' to 3150'.

SPECIAL TESTS MADE ON PRODUCTION

Type and Depth	Results
Open flow, 2911'-3382'	Tested through open 8-5/8" casing with drill pipe in hole. Made 30,900,000 cu. ft. of sweet gas.
Halliburton, 3402'-3613'	Packer failed to hold and no test was made.
Schlumberger, to TD 3638'	Gas: (1) 3056', (2) 3095', (3) 3295', (4) 3469'; main gas pay at 3056'.
Drill stem, 3440'-3638'	Before shot, made 1,500,000 cu. ft. of sweet gas with a light spray of oil.
Gas production	While on production 5/2 to 5/16/38, made 41,647,000 cu. ft. of gas.
Tubing test, after shot.	With 2-1/2" tubing at 3630' would not flow, but cleaned itself behind the tubing. The tubing was then raised to 3565' and then showed 7,500,000 cu. ft. of gas. After allowing well to flow for two days, it tested 5,000,000 cu. ft. of gas per day, and 1-1/4 barrels of oil per hour through open tubing.

CORE RECORD

3370'-80' - 10' recovery.
3370'-2½' - Porous lime with show of oil and gas.
3372½'-5' - Hard lime showing oil.
3375'-82' - Hard lime.

3382'-85' - 2' recovery.
3382'-85' - Hard lime with slight show of oil. Cutter head locked.

3385'-92' - 6' recovery.
3385'-92' - Hard lime, no shows of any importance. Slight porosity in bottom 1 ft. of core.

3392'-02' - 7' recovery.
3398'-00' - Small porosity and slight show of oil. Core very broken. All recovery was limestone.

3570'-80' - 8' recovery.
3570'-73' - Hard lime.
3573'-74' - Sandy shale.
3574'-78' - Hard lime.
3578'-79' - Sand with shale streaks.
3579'-80' - Lime, no shows, very hard core.

3580'-88' - 7½' recovery.
3580'-82' - Lime.
3582'-83' - Sand with shale streaks.
3583'-85' - Hard lime.
3585'-87' - Hard lime with small porosity and slight show of oil.

3588'-98' - 5½' recovery.
3588'-89' - Limestone.
3589'-90' - Shale.
3590'-91' - Sand with shale streaks and show of oil and gas.
3591'-92' - Sand with show of gas and oil.

3598'-04' - 6' recovery.
3598'-00' - Sand with smell of oil and gas.
3600'-01' - Sandy shale.
3601'-04' - Hard lime with shale streaks.

3604'-13' - 7½' recovery.
3604'-08' - Hard lime.
3608'-10' - Sandy lime with shale streaks.
3610'-11' - Hard lime.

(Cont'd.)

Core Record (Cont'd.)

3613'-19' - 1' recovery.
3613'-19' - Lime.

3619'-28' - 9' recovery.
3619'-21' - Sandy shale.
3621'-4½' - Hard lime with shale streaks.
3624½'-8' - Hard lime with small porosity and bleeding core.

3628'-38' - 10' recovery.
3628'-29' - Lime with shale streaks.
3629'-32' - Sand with good show of oil.
3632'-38' - Lime with shale streaks.

3638'-58' - 14' recovery.
3638'-47' - Lime with shale streaks.
3647'-48' - Sand with odor.
3648'-50' - Lime with shale streaks.
3650'-51' - Sand with odor, probably water.

Casing Record:

(Total depth 3853'; Plug back 3644'.)

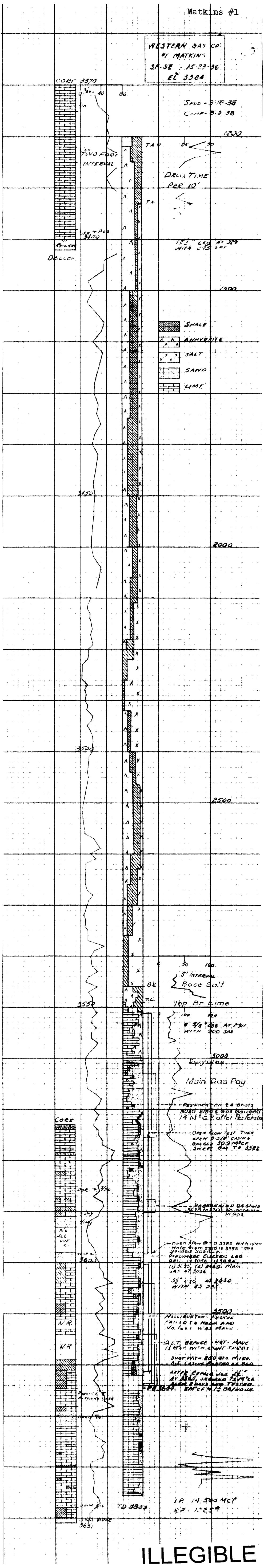
Size	Amount	Depth	Sacks Cement
12-1/2"	311	329'	275
8-5/8"	2895	2911'	900
5-1/2"	3424	3440'	100
2-1/2"	3618	3630'6"	12' off bottom

Perforated bottom 10' of bottom joint.

Geological Points:

Elevation of derrick floor	3384'
Top anhydrite by drilling time	1330'
Top salt	1330'
Base salt	2860'
Top brown lime	2910'
Top Yates sand	3005'

Matkins #1



ILLEGIBLE

REPORT

prepared by

CULBERTSON & IRWIN, INC.

Copy

CULBERTSON & IRWIN, INC.

Culbertson & Irwin, Inc. & R. K. Stovall, #1 Stuart, SW/4 SE/4 Section 10, T-25-S, R-37-E.

Culbertson & Irwin, Inc. & R. K. Stovall, #2 Stuart, SE/4 SE/4 Section 10, T-25-S, R-37-E.

R E P O R T

We submit the following evidence and history of these wells to show that there is no actual waste being committed by the present method of producing these wells.

Culbertson & Irwin, Inc., & R. K. Stovall #1 Stuart is located in the eastern portion of what is now designated as the Langlie Pool. This well was the discovery producer of the portion of the pool and was spudded February 12, 1936, and completed May 2, 1936. The well was drilled with Cable tools, 12-1/2" casing was set at 114', 10" casing at 603' and 8" casing at 1305'. The well was then drilled open until a depth of 3295' was reached. The test blew out at this depth, a string of tools were lost in the hole and never recovered. It required some three days to bring the well under control and kill the oil and gas flow with mud and water. After the well was killed, 7" casing was set at 3060' and cemented with 300 sacks of cement. The hole was then unloaded and allowed to clean up and on an open flow into the pits was estimated making 6000 barrels of oil daily with 25,000,000 cubic feet of gas. Tubing was run and set at 3204' and a test made through a 3/4" choke on a two hour test, the well made 139 barrels of oil with the casing pressure remaining at 1050 pounds, and tubing pressure at 750 pounds.

Subsequent drilling in this area shows that the producing sand in this well is a lenticular sand which grades out to the west and thins up structure to the east. It is our belief that this is the only well producing oil from this particular sand horizon in this area, although the gas-oil ratio is fairly high on this well we feel that the withdrawal of the gas necessary to produce the top allowable from the well is not injurious to the regular

producing horizon of the Langlie field or the offsets to this particular well. The flowing pressure on this well has always been abnormally high, due we believe, to the development of the lenticular sand at a sub-sea depth well above the regular sub-sea producing datam of the field. Inasmuch as we were able to produce this well under high pressure, we were able to secure a market for all the gas produced in making the daily allowable oil production. This well is produced against a separator pressure of 600# and the gas taken into the high pressure gas line of the El Paso Natural Gas Co. and sold for domestic purpose.

We attach hereto a cross section through this well to show that the producing horizon in this well is a lenticular sand and is a separate reservoir and has no connection with the main producing horizon of the Langlie pool, and as is noted, the sub-sea datum on this sand is well above the oil producing datum in the main pay zones, which in our opinion explains the high flowing pressure in this well.

Culbertson & Irwin, Inc., & R. K. Stovall #2 Stuart was spudded September 7, 1936, and completed March 13, 1938. The test was started with cable tools and drilled to a depth of 3277'. However, being some 49' higher structurally than the #1 Stuart, the well encountered a large volume of gas in the sand, which produced oil in the #1 well, and it was necessary to move in a rotary to complete the well. The 7" oil string of casing had been set and cemented at 3100; however, with a large amount of gas encountered in the Stuart sand it was necessary to run a string of 5" casing below this sand, which was set and cemented at 3296'. The well was then drilled to 3421' and completed for 330 barrels of oil daily with a gas-oil ratio of approximately 300/1. As oil was produced from this well the gas-oil ratio gradually increased. This well is located on the extreme eastern side of the Langlie pool, and is shown on the cross section A-B, the producing horizon in this well is one of the lower most sands on the structure and is too low structurally to produce in the main part of the Langlie pool. This sand is the producing horizon in most of the wells on the east side of the Langlie structure and it is our belief that this sand is a higher pressure sand and that the normal gas-oil ratio of this sand is much higher than in the regular Langlie zone.

It is our conclusion that the producing sand in this well is not producing in the main part of the Langlie pool and has been tested by a few wells in the main portion of the field, but was encountered too low to produce and was either dry or carried water. That it is the main producing

zone on the extreme eastern side of the pool and the zone of production from the sand is approximately two locations wide and strikes NW-SE, parallel to the strike of the structure. That it is a higher pressure sand than the regular producing sand in the Langlie pool and that it is necessary to produce a large volume of gas in order to obtain the daily allowable oil production from wells in this sand, and that the withdrawal of gas from this sand does not deplete the pressure in the main producing horizon in the Langlie pool and that wells producing from this sand should be exempt from any gas-oil ratio order which may be applied to the Langlie pool.

CULBERTSON & IRWIN, INC.

#2 W. H. Martin, located 990' from N line and 330' from E. line, Section 31, Twp. 24-S, Rge. 37-E, Lea Cty, New Mex.

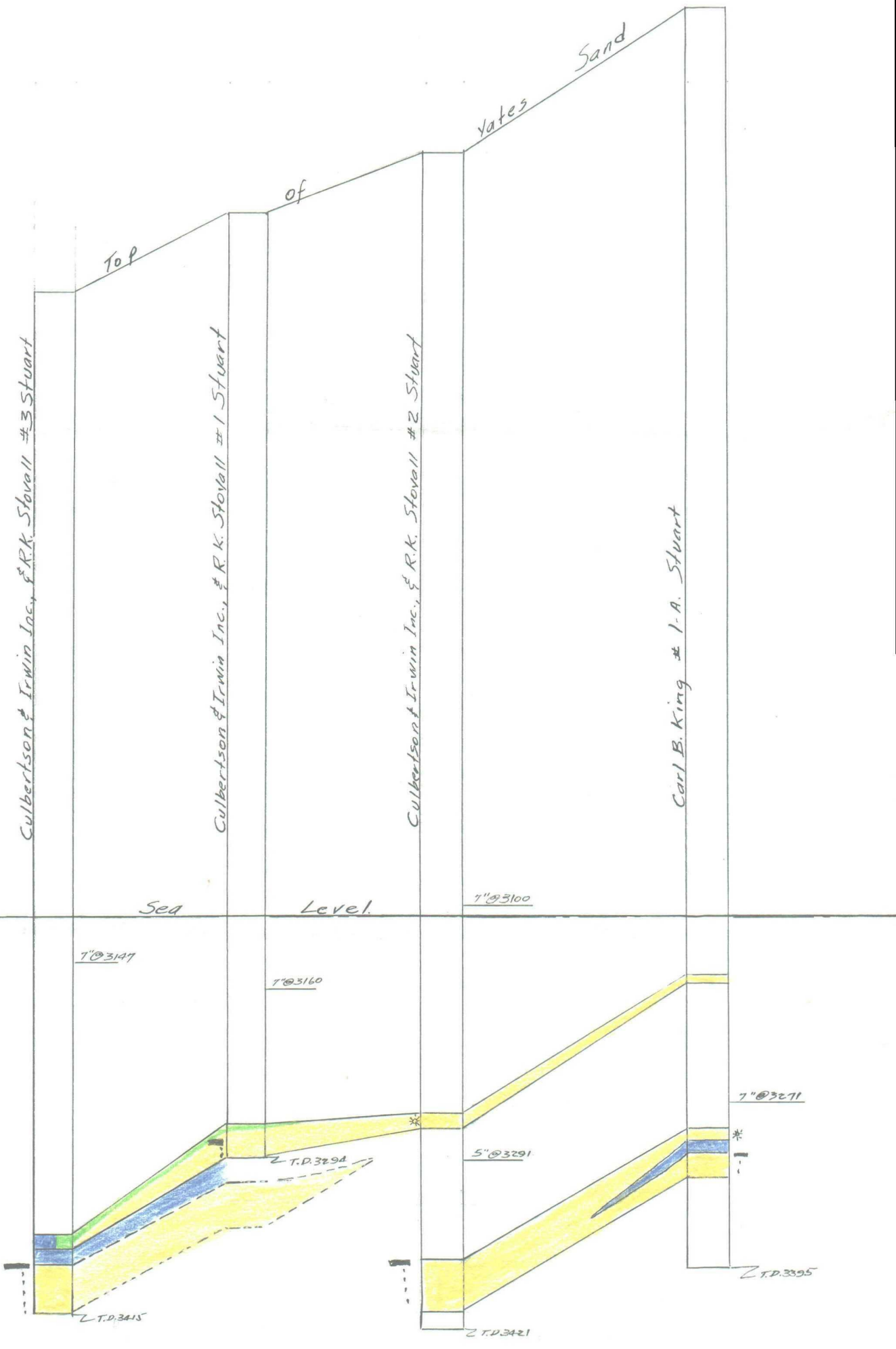
This well was commenced on August 11, 1939, and completed October 21, 1939. The 10-inch surface pipe was set at 394' and cemented with 150 sacks of cement, and the 7-inch oil string cemented with 250 sacks at 3385'. The plug was drilled and well drilled to 3414', at which depth the well blew out and gas gauged at 36-million cubic feet per day. The well was then killed with mud and drilled 3447', at which depth a 5-inch liner was run and cemented. The entire 36-million feet of gas was shut off with the liner and the hole was then drilled to 3545', at which depth it tested 121 barrels of oil in 24 hours, natural. The well was then shot with 120 quarts of solidified nitro from 3545' to 3467', and after cleaning out tested 192 barrels of oil in 24 hours.

It is our opinion that the oil and gas in this well are coming from the same sand horizon and since the entire section has been shot within 25' of the bottom of the liner, we feel that it is impossible to do any type of remedial work to successfully reduce the gas-oil ratio.

We also have a market for the gas from this well and, inasmuch as we are not blowing any excess gas into the air, we do not feel that there is any actual waste. This well is flowing against a separator pressure in excess of 500# and the gas taken directly into the El Paso Natural Gas Company's high pressure gas line.

CULBERTSON & IRWIN, INC.

WWI/ile


Top of Yates Sand
Culbertson & Irwin Inc., & R.K. Stovall #3 Stuart
Culbertson & Irwin Inc., & R.K. Stovall #1 Stuart
Culbertson & Irwin Inc., & R.K. Stovall #2 Stuart
Carl B. King #1-A Stuart
Sea Level
7"@3147
7"@3160
7"@3100
7"@3271
5"@3291
T.D. 3294
T.D. 3415
T.D. 3421
T.D. 3395

REPORT

prepared by

CITIES SERVICE OIL COMPANY

REPORT

prepared by

CITIES SERVICE OIL COMPANY

C
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P
Y

CITIES SERVICE OIL COMPANY

Geological Dept.

Hobbs, New Mex.

August 3, 1940

Mr. W. K. Davis,
El Paso Natural Gas Co.,
Jal, New Mexico

Dear Mr. Davis:

Enclosed herewith are copies of well history on Cities Service Dabbs #1, Section 23-25S-37E, and Cities Service Lindley "B" #2, Section 13-25S-36E, Lea County.

It is believed, after considering the use that you wished to put this information to, that a more concise resume might be of more benefit than to go into too much detail which might be confusing, hence we have summarized considerable detail in trying to give only pertinent data which the commission could consider with the least trouble.

After checking my log strips it is not believed that they would photostat to any advantage and if new ones were to be made it would take more time and should be gone into in more detail should conditions warrant a hearing.

Trusting that the enclosed will be what you needed, I am

DRG/JB

Yours very truly,

(SIGNED--DELMAR R. GUINN)

Delmar R. Guinn,
District Geologist,
New Mexico District.

Encl-

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WELL HISTORY OF CITIES SERVICE

DABBS #1

Cities Service Oil Company Dabbs #1, C NWNW Section 23-25S-37E, Langlie Area, Lea County, New Mexico, was completed 11/28/36 at a total depth of 3361 feet as a gas well with a volume of 37 million cubic feet per day. The 7 inch casing was set and cemented at a depth of 2450 feet. After setting casing the well was drilled with oil as the circulating fluid to a depth of 3216 feet where it became necessary to use mud to hold down the large volume of gas. The well was tested at various depths between 3121 and 3216 feet and the gas gradually increased until the volume gauged 37 million cubic feet per day at 3216. The well was cored from 3216 to 3361 and the cores were predominately a dense dolomite and tight sandstone with some dark shale streaks, indicating a section too tight to produce. The well was again opened up and tested at the total depth, showing the same amount of gas as when tested at a depth of 3216 feet and no oil.

Results of testing this well and information gained on offsets leads to the belief that it is quite probable that the gas sand above 3216 in this well is a lens and therefore is not definitely connected with oil producing zones at lower depths. Offsets to this well which are producing oil, have the casing set below the sand producing gas in this well and therefore are producing from a definitely lower sand zone than this well. Moreover, should it be considered possible that this sand is a continuous bed and producing oil lower structurally, it would seem that there would be no possibility of obtaining oil in this bed so high on the structure. By being forced to shut in such a well when a market for gas is available would tend toward premature abandonment of wells without allowing the operator a fair return on the investment and a loss to the state and individuals by not being allowed to recover royalties justly due them from resources located under their lands.

In view of the above facts it is believed that this well should be excepted from Section 22 of the Permanent Gas-oil ratio order recommended to the New Mexico Conservation Commission by the Lea County New Mexico operators. It is believed that this well should be governed by Section 21 which provides for reservoirs which are predominately gas bearing.

REPORT

prepared by

TWO STATES OIL COMPANY

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Y

TWO STATES OIL COMPANY

Dallas, Tex.

August 5, 1940

Mr. W. K. Davis
El Paso Natural Gas Company
10th Floor Bassett Tower
El Paso, Texas

Dear Mr. Davis:

With reference to the permanent gas-oil ratio order, to be issued in lieu of order No. 250, we call to your attention the damage which may result by the reduction of allowable on our Calley No. 1 well, located in the SE/4 SW/4 of Section 20-24S-37E, Lea County, New Mexico.

As you know, we are very anxious to sell you as much gas as possible from this well, as the gas sales constitute a most important part of the income from this well. For the well to continue being operated, we are dependent on this sale of gas and, as a consequence, we are disturbed over the possibility of the permanent order. We feel that if the facts of the wells in the area are recognized that the Commission will grant the necessary relief from the stringent provisions of the law, within the order itself. For this reason, we are making a part of this letter a completion report on our well, so that you may readily recognize that there is no physical remedy for the high ratio involved. We should like to join with other operators in the area in presenting our problem to the Commission and respectfully request that exception to the order be written in the order. Inasmuch as you are more effected than we are by this order, we are joining you in your petition to the Commission.

Very truly yours,

TWO STATES OIL COMPANY

By: (SIGNED: W. K. POWELL)

WKP:S
Encl.

Copy

R E P O R T

TWO STATES OIL COMPANY,
SOUTHERN PETROLEUM EXPLORATION, ET AL,

L. J. Calley No. 1-A.

Location: 660 feet from the South line and 2310 feet from the West line of Section 20, Township 24 South, Range 37 East, Mattix Field, Lea County, New Mexico.

Elevation: 3283' derrick floor.

Contractor: Two States Drilling Company - Rotary Tools.

Spudded: August 10, 1939.

Completed as a producer: September 8, 1939.

Pipe: 8 5/8" 387' - with 150 sacks of cement.
5 1/2" 17# 3360' - with 200 sacks of cement.
2" upset tubing 3635'.

Packer: Guiberson spiral packer 4-3/4" set at 3496' on tubing.

Total Depth: 3635'.

Oil Pay: 3495-3515'; 3540-3565'; 3574-3578'; 3580-3635'.

Gas: Main gas 3375' to 3390'; more gas 3495-3515'.

Acid Record: At total depth of 3590' treated with 2000 gallons acid with 2 pumps attempting to hold acid below 3500'.

Shot Record: 160 quarts nitro-glycerin 3533-3615', American Glycerin Company, 20' of anchor.

Initial Production: 1 barrel of oil per hour - 1,150,000 cubic feet of gas.

Completion History: The well was first drilled to total depth of 3590' September 3, 1939. The well tested natural 1 barrel of oil per hour, with 375,000 cubic feet of gas. On September 4th it was treated with 2000 gallons of acid and tested 2-1/2 barrels of oil per hour, with 700,000 cubic feet of gas. On September 6th

it tested 1 barrel of oil per hour, with 800,000 cubic feet of gas. On September 7th it was drilled deeper to 3635'. On September 8th it was swabbed through tubing with packer set at 3505', swabbing 3-1/2 barrels of oil per hour but would not flow. On September 9th the packer was lifted and the well flowed 35 barrels of oil per hour, with 1,000,000 cubic feet of gas, but eventually made nearly all gas with 1 barrel of oil per hour. September 11th the well was killed with mud and shot with 160 quarts of nitro-glycerin 3533-3615', with 20' of anchor. Tubing was re-run with no packer and well tested 1 barrel of oil per hour, with 1,100,000 cubic feet of gas. Tubing with packer at 3740' was later run but packer did not hold and well tested 1 barrel of oil per hour, with 1,150,000 cubic feet of gas and completed as such.

Subsequent History: Connection was made with the Texas-New Mexico Pipe Line Company pipe line, and eventually a contract was made with the El Paso Natural Gas Company for gas purchase. The El Paso Natural Gas Company installed a high pressure separator and the well has subsequently tested 7,000,000 cubic feet of gas per day, with 16 barrels of oil. El Paso is taking an average of 1,000,000 cubic feet of gas per day.

The following is the drilling time from 3000 feet to total depth:

FEET	MINUTES	FEET	MINUTES
3000-02	35	3032-34	5
04	36	36	11
06	38	38	28
08	35	40	35
10	37	42	12
12	36	44	18
14	9	46	20
16	4	48	15
18	7	50	6
20	40	52	3
22	39	54	3
24	25	56	2
26	30	58	3
28	18	60	2
30	21	62	3
32	9	64	3

FEET	MINUTES
3064-66	4
68	5
70	13
72	35
74	22
76	6
78	24
80	35
82	35
84	41
86	54
88	45
90	53
92	42
94	26
96	44
98	65
3100	55
02	26
04	31
06	35
08	23
10	20
12	20
14	22
16	12
18	9
20	3
22	6
24	11
26	21
28	5
30	7
32	6
34	2
36	3
38	10
40	15
42	52
44	47
46	51
48	16
50	14
52	9
54	10
56	10

FEET	MINUTES
3156-58	9
60	38
62	38
64	26
66	18
68	28
70	26
72	31
74	35
76	51
78	79
80	65
82	65
84	30
86	48
88	32
90	33
92	43
94	31
96	28
98	36
3200	48
02	50
04	50
06	25
08	25
10	41
12	19
14	11
16	20
18	30
20	69
22	90
24	45
26	32
28	42
30	52
32	42
34	30
36	60
38	29
40	44
42	43
44	33
46	31
48	33

FEET	MINUTES
3248-50	26
52	30
54	25
56	18
58	32
60	33
62	40
64	33
66	43
68	62
70	47
72	42
74	40
76	58
78	45
80	47
82	47
84	64
86	49
88	46
90	57
92	40
94	39
96	45
98	33
3300	32
02	42
04	43
06	45
08	31
10	31
12	28
14	27
16	38
18	23
20	21
22	21
24	21
26	35
28	26
30	23
32	33
34	40
36	39
38	28
40	41
42	75
44	39
46	61
48	58
50	49

FEET	MINUTES
3350-52	40
54	38
56	46
58	54
60	46
3361-62	11
64	19
66	16
68	14
70	20
72	19
74	24
76	23
78	19
80	18
82	17
84	10
86	13
88	11
90	20
92	35
94	51
96	25
98	44
3400	50
02	86
04	124
06	78
08	81
10	39
12	24
14	19
16	51
18	64
20	65
22	59
24	22
26	17
28	23
30	80
32	32
34	33
36	33
38	21
40	43
42	21
44	32
46	38
48	37
50	34
52	28

FEET	MINUTES
3452-54	10
56	31
58	41
60	48
62	48
64	38
66	74
68	124
70	80
72	89
74	54
76	35
78	13
80	6
82	11
84	60
86	71
88	41
90	36
92	91
94	77
96	20
98	16
3500	45
02	48
04	46
06	55
08	48
10	45
12	22
14	8
16	10
18	28
20	65
22	57
24	51
26	33
28	71
30	74
32	20
34	31
36	37
38	32
40	24
42	49
44	32

FEET	MINUTES
3544-46	30
48	33
50	39
52	40
54	32
56	51
58	51
60	45
62	40
64	13
66	54
68	44
70	38
72	45
74	47
76	11
78	29
80	60
82	42
84	18
86	40
88	47
90	47 TD 9/3/39
92	19
94	20
96	18
98	17
3600	22
02	19
04	44
06	42
08	24
10	32
12	38
14	42
16	45
18	26
20	47
22	42
24	42
26	53
28	52
30	25
32	59
34	28
35	15 TD

The following is the driller's log:

0 -	35	Caliche
	135	Sand and shells
	1165	Red beds and red rock - medium
	1265	Anhydrite - hard
	2715	Broken anhydrite and salt
	2775	Solid anhydrite - hard
	2830	Anhydrite and brown lime
	2920	Lime
	3014	Lime, anhydrite and shale
	3070	Lime and sand - Gas 3014-16 and 3050-70
	3090	Lime
	3164	Lime and anhydrite
	3635	Lime - TD

The following are formation tops picked from the samples:

Top Anhydrite:	1160
Top Salt:	1261
Base Salt:	2715
Top Br. Lime:	2740
Top of Pay:	3495

Respectfully submitted,

(SIGNED: H. B. HEADLEY)

Andy:
El Paso Natural has no gas-oil ratio exception as such but did make the attached application not for an exception but for an exemption as being within an area predominately a gas area. In Case 21, order not yet completed, engineers and operators at a Ft. Worth meeting proposed an order which you, Glenn, Hansen, Kraus and I have wrestled with a lot but have not quite made completion. The proposed order by the engineers and operators at Ft. Worth provided for the setting aside "areas as predominately gas areas" and assuming that this provision would be adopted, the El Paso Natural Gas Co and several others filed applications for exemptions thereunder and this is what is attached in so far as the El Paso Natural Gas Co is concerned.

Carl.

Re: Case #21, recessed hearing Aug 29, 1940 Lea County Division

map supplied by Lloyd Gray of Gulf oil corp., not introduced as evidence but for information only.

RE: Case #21, Recessed Hearing
held August 29, 1940 --
Lea County Division.

MAP SUPPLIED BY MR. LLOYD GRAY REPRESENTING THE GULF OIL CORPORATION AND DISCUSSED IN COURSE OF HEARING BUT WAS NOT INTRODUCED IN EVIDENCE AS AN EXHIBIT. THIS MAP WAS LATER DELIVERED BY MR. GRAY TO MR. A. ANDREAS, STATE GEOLOGIST AND MEMBER OF THE OIL CONSERVATION COMMISSION, AND IS LODGED IN THIS PARTICULAR DIVISION OF THE HEARING IN THIS CASE FOR SAFEKEEPING BUT NOT AS AN EXHIBIT IN THE CASE.

C. B. L.