Lowry et al Operating Account

Factual Data Report

Pettigrew-Tocito Pool

2

Lowry

POOL INFORMATION

So. Blanco

~~PETTIGREW~~-TOCITO POOL

Rio Arriba County, New Mexico

1. History of Pettigrew-Tocito Pool

The discovery well of the Pettigrew-Tocito Oil Pool was the Lowry et al Operating Account Federal 2-179, located in the center of the NW/4, SE/4, Section 9, T26N, R6W, Rio Arriba County, New Mexico. This well was completed in the Tocito formation on July 10, 1951, at a total depth of 6,692 feet. Initial potential was 720 barrels of oil per day through a 3/4" tubing choke.

At present there are 10 producing oil wells completed in this Pool. From inception through April 30, 1953, the total oil production amounted to 522,972 barrels. The crude oil gravity averages 43.8° API. Cumulative oil and gas production from inception, by wells, is as follows:

	Cumulative Production	
	Oil - Barrels	Gas - MCF
Federal 1-134	5,215	15,389
Federal 2-179	182,659	263,827
Federal 4-13-132	69,063	76,047
Federal 19-34-157	89,257	100,834
Federal 7-35-109	25,952	45,404
Federal 21-40-182	64,321	174,981
Federal 22-45-207	58,023	99,349
Federal 23-49-129	19,865	14,730
Federal 24-50-177	7,764	18,773
Federal 25-51-127	853	698
	522,972	810,032

So Blanco

Crude oil from the ~~Pettigrew~~-Tocito Field is purchased by Malco Refineries, Inc. and transported by pipeline to their refinery located at Prewitt, New Mexico. The crude oil is sweet, green color, paraffin type, and is considered very high quality, best suited for topping and cracking to give a high yield of good quality gasoline and heavier burning oils.

at $2.90/bbl

2. Physical Properties of Reservoir Rock:

a. Approximate average porosity, percent:

Upper Portion: 13.90 percent
Lower Portion: 11.00 percent

b. Approximate average permeability, millidarcys:

Upper Portion:
Horizontal: 121.1 millidarcys
Vertical: 31.6 millidarcys

Lower Portion:
Horizontal: 1.1 millidarcys
Vertical: 0.4 millidarcys

c. Approximate average interstitial water saturation, percent:

Upper Portion: 23 percent
Lower Portion: 45 percent

3. Structural Features of the Reservoir:

a. General Geological Description of the Reservoir:

The Pettigrew-Tocito Pool is a lenticular sand reservoir of Upper Cretaceous Geologic age. The sand lentil trends in a northwest-southeast direction, with the pool limits not yet defined by drilling. The upper portion of the Tocito Sand is a fairly porous, permeable, medium grain sand, presently considered productive for an approximate 2,535-acre area. The lower portion of the Tocito sand is of limited areal extent, and is a low porosity, low permeability sand, considered productive because of a fracture system of drainage.

b. Original Gas-Oil Contact:

No gas cap is believed present.

c. Original Water-Oil Contact:

Not yet determined, if present.

d. Ratio of Gas-Cap Volume to Oil Zone Volume:

No gas cap.

e. Dip of Producing zone:

Approximately 90 feet per mile toward northeast.

4. Characteristics of Reservoir Fluid:

a. Average Gravity of Stock Tank Oil: 43.8° API

b. Estimated Saturation Pressure: 2,052 P.S.I.

c. Formation Volume Factor:

at original pressure:	1.508 @ 2,197 P.S.I.
at saturation pressure:	1.512 @ 2,052 P.S.I.
at 2,001 P.S.I.	:1.505

d. Viscosity of Reservoir Oil - Centipoise:

at original pressure:	0.40 @ 2,197 P.S.I.
at saturation pressure:	0.39 @ 2,052 P.S.I.
at 2,001 P.S.I.:	0.39

e. Dissolved Gas-Oil Ratio @ 0 P.S.I. Separator Pressure - Cu. Ft. / Barrel Stock Tank Oil:

at original Pressure:	862
at saturation Pressure:	862
at 2,001 P.S.I.	840

5. Pressures and Temperatures:

a. Estimated Original Reservoir Pressure @ -100 feet: 2,197 P.S.I.

b. Estimated Reservoir Temperature @ -100 feet: 175° Fahrenheit

c. Reservoir Pressure History: See attached data and graph.

d. Average Shut-In Time Prior to Pressure Survey: 72 hour minimum

e. Productivity Index - Bbls./Day/P.S.I. Pressure Drop:

Maximum:	1.162 (Federal 2-179)
Minimum:	0.842 (Federal 2-179)
Average:	0.985 (Federal 2-179)

6. Statistical Data

a. Oil Production - barrels per day: See attached data and graph.

b. Average weighted gas-oil ratio: See attached data and graph.

c. Water production - percent of total fluid: Approximately 10 percent

d. Number of producing wells: 10 (as of April 30, 1953)

e. Approximate Developed acreage: 920 acres

f. Volume of Gas Production: See attached data and graph.

g. Stage of Depletion: Primary.

7. Individual Well Problems:

During the completion of the well, care must be exercised to keep the drilling fluid as light as possible to prevent damaging the permeable Tocito sand sections. To assure a successful completion, a 60 percent oil emulsion mud is used, and casing is set above the producing zone to keep the weight of the cement off formation during the cementing operation. Paraffin accumulation in tubing and flow lines necessitates remedial treatment on occasions. The crude oil has a pour point of approximately 25° F., and the oil must be heated in the storage tank to a temperature of approximately 60° F. in order to keep the oil fluid enough to flow through pipelines.

8. General Reservoir Mechanics

The Pettigrew-Tocito Pool produces from a solution gas drive. To date, there is no evidence of an initial gas cap or any extraneous water influx into the reservoir. Because of the high shrinkage of the reservoir crude and the large solution gas-oil ratio, it can be assumed that the Field will produce with a relatively high gas-oil ratio during its depletion life.

PRODUCTION
INFORMATION

PRODUCTION DATA

Pettigrew-Tocito Field - Rio Arriba County, N.M.

Month & Year	Monthly Oil Production, Barrels	Monthly Gas Production, M.C.F.	Gas-Oil Ratio Cu.Ft./Bbl.	Daily Average Oil Production, Barrels	Daily Average Gas Production M.C.F.	Cumulative Oil Production, Barrels	Cumulative Gas Production M.C.F.
1951							
July	5,970	8,991	1506	193	290	5,970	8,991
August	10,143	15,215	1500	327	491	16,113	24,206
September	10,973	16,460	1500	366	549	27,086	40,666
October	11,027	16,541	1500	356	533	38,113	57,207
November	12,599	18,233	1447	420	608	50,712	75,440
December	13,215	16,658	1260	426	537	63,927	92,098
1952							
January	9,761	12,474	1278	315	402	73,688	104,572
February	21,540	26,183	1216	743	903	95,228	130,755
March	11,245	14,555	1294	363	470	106,473	145,310
April	23,535	31,129	1323	785	1038	130,008	176,439
May	32,772	42,603	1300	1057	1374	162,780	219,042
June	27,426	35,316	1288	914	1177	190,206	254,358
July	27,425	34,604	1262	885	1116	217,631	288,962
August	35.135	48,866	1391	1133	1576	252,766	337,828
September	35,428	50,642	1429	1181	1688	288,194	388,470
October	38,510	69,510	1805	1242	2242	326,704	457,980
November	34,827	69,030	1982	1161	2301	361,531	527,010
December	31,572	61,770	1956	1018	1993	393,103	588,780
1953							
January	28,199	48,939	1735	910	1579	421,302	637,719
February	33,394	55,459	1661	1193	1981	454,696	693,178
March	36,552	60,788	1663	1179	1961	491,248	753,966
April	31,724	56,066	1767	1057	1869	522,972	810,032
May							

NO. 41120. FIVE YEARS BY MONTHS X 100 DIVISIONS. CODEX BOOK COMPANY, INC. NORWOOD, MASSACHUSETTS

PETTIGREW TOCITO POOL
RIO ARRIBA COUNTY, N. M.

RESERVOIR PRESSURE — HUNDRED P. S. I. AT -100 FT.

DAILY AVERAGE OIL PRODUCTION — HUNDRED BARRELS

NUMBER OF WELLS

ACCUMULATIVE PRODUCTION

MILLION BARRELS

1951 — DEC. JAN. FEB. MAR. APR. MAY JUN. JUL. AUG. SEP. OCT. NOV. DEC.

1952 — JAN. FEB. MAR. APR. MAY JUN. JUL. AUG. SEP. OCT. NOV. DEC.

1953 — JAN. FEB. MAR. APR. MAY JUN. JUL. AUG. SEP. OCT. NOV. DEC.

1954 — JAN. FEB. MAR APR. MAY JUN. JUL. AUG. SEP. OCT. NOV. DEC.

1955 — JAN. FEB. MAR. APR. MAY JUN. JUL. AUG. SEP. OCT. NOV. DEC.

GAS OIL RATIO

RESERVOIR PRESSURE

OIL PRODUCTION

NO. OF WELLS

ACCUMULATIVE PRODUCTION

GAS PRODUCTION

DAILY AVERAGE GAS PRODUCTION — THOUSAND M. C. F.

PRODUCING GAS OIL RATIO — THOUSAND CU. FT. PER BARREL

BHP INFORMATION

BOTTOMHOLE PRESSURE TESTS

Pettigrew-Tocito Field

Rio Arriba County, N.M.

Well No.	Date	Hours Shut In	Bottomhole Pressure
Federal 1-134	8-20-52	120	1904
	1-12-53	99	1759
	4-27-53	94	1721
Federal 2-179	7-26-51	43	2197
	12-17-51	100	2158
	5-1-52	76½	2112
	9-2-52	73	2093
	1-12-53	145	2043
	4-27-53	73	2014
Federal 4-13-132	12-17-51	46	2125
	1-3-52	73	2138
	1-1-52	24	2111
	5-1-52	76½	2069
	8-20-52	123	2045
	1-13-53	97	1996
	4-27-53	72	1959
Federal 19-34-157	3-3 0-52	91	2123
	5-1-52	99	2115
	8-18-52	78	2053
	1-14-53	67	1959
	4-27-53	92	1931
Federal 7-35-109	5-1-52	193	2103
	8-20-52	117	2014
	1-13-53	100	1922
	4-28-53	104	1856
Federal 21-40-182	6-5-52	76	2108
	8-19-52	90	2080
	1-13-53	78	1988
	4-27-53	99	1967

Well No.	Date	Hours Shut In	Bottomhole Pressure
Federal 22-45-207	8-2-52	79	2111
	8-20-52	116	2099
	1-13-53	80	1977
	4-27-53	96	1939
Federal 23-49-129	1-12-53	85	2111
	4-27-53	81	2061
Federal 24-50-177	3-15-53	87	2091
	4-27-53	82	2079
Federal 25-51-127	4-28-53	116	2108

Weighted Average Reservoir Pressure

Datum -100 feet

	Date	Bottomhole Pressure, p.s.i.
Original reservoir pressure:	July 26,1951	2197
1st General survey:	May 1, 1952	2130
2nd General survey:	August 18-20,1952	2095
3rd General survey:	January 12-14,1952	2037
4th General survey:	April 27-28, 1952	2001

LOWRY OIL COMPANY

T 26 N — R 6 W

RIO ARRIBA COUNTY, N. M.

PETTIGREW TOCITO POOL

ISOBARIC MAP

APRIL 27–28, 1953

4 TH GENERAL SURVEY

AVG. RESERVOIR PRESS.
2001 PSI -100 FT.

LOWRY OIL COMPANY

T 26 N — R 6 W

RIO ARRIBA COUNTY, N. M.

PETTIGREW TOCITO POOL

ISOBARIC MAP

JANUARY 12-14, 1953

3 RD GENERAL SURVEY

AVG. RESERVOIR PRESS.

2037 PSI. -100 FT

LOWRY OIL COMPANY

T26N — R6W

RIO ARRIBA COUNTY, N. M.

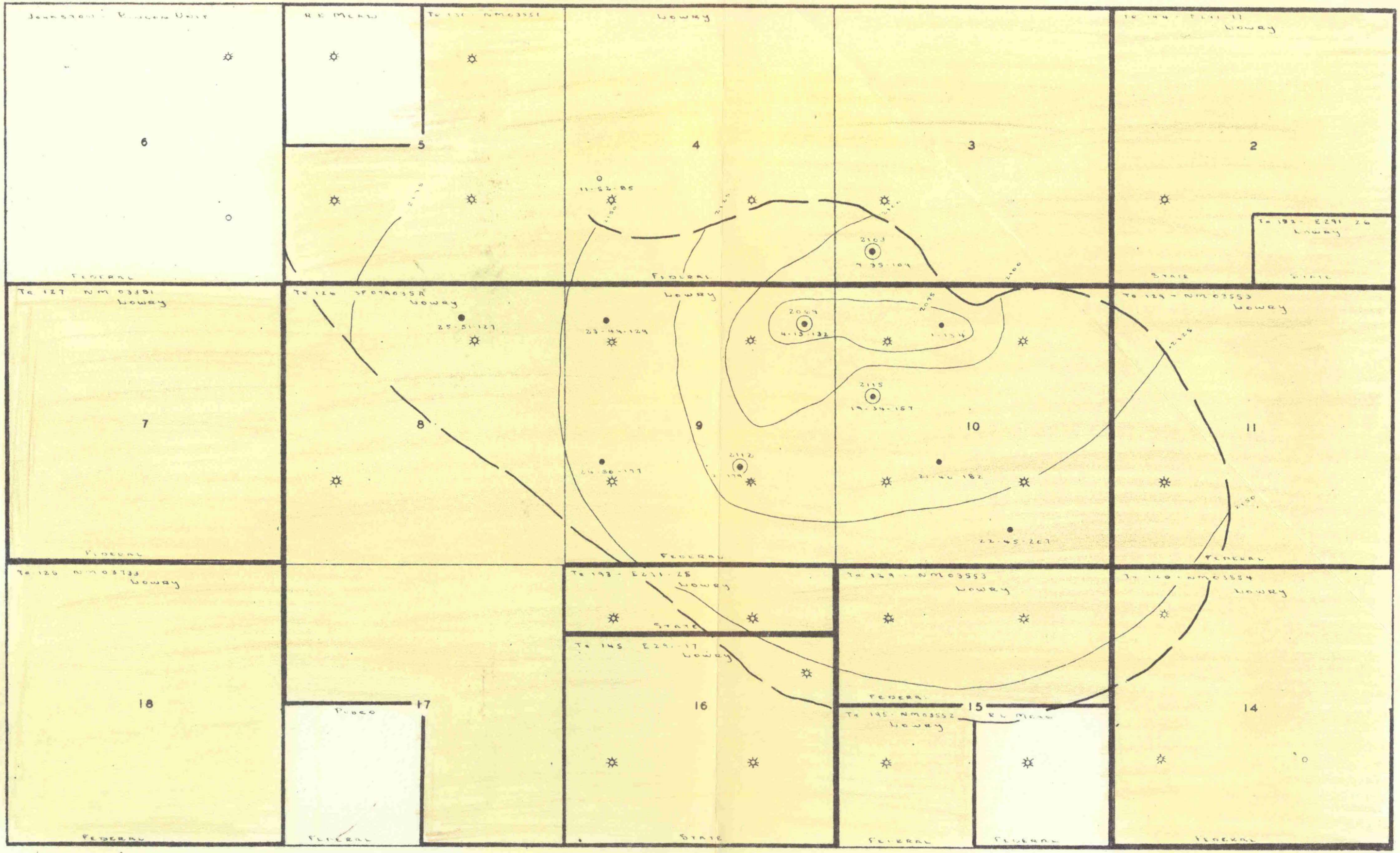
PETTIGREW TOCITO POOL

ISOBARIC MAP

AUGUST 18-20, 1952

2 ND GENERAL SURVEY

AVG. RESERVOIR PRESS.
2095 PSI -100 FT.



LOWRY OIL COMPANY

T 26 N — R 6 W

RIO ARRIBA COUNTY, N. M.

PETTIGREW TOCITO POOL

ISOBARIC MAP

MAY 1, 1952

1 ST GENERAL SURVEY

AVG. RESERVOIR PRESS.
2130 PSI - 100 FT.

GOR INFORMATION

Gas-Oil Ratio Tests

Well No.	Date	Gas-Oil Ratio	Accumulative Oil Production
Federal 1-134	9-4-52	2127:1	2,271
	1-20-53	3385:1	4,073
	3-2-53	3045:1	4,566
	4-13-53	2805:1	4,905
Federal 2-179	7-28-51	1506:1	4,481
	5-8-52	1498:1	99,822
	8-29-52	1529:1	132,852
	10-12-52	1607:1	144,070
	12-28-52	1231:1	161,611
	2-1-53	852:1	166,396
	2-11-53	878:1	168,388
	4-12-53	1022:1	180,010
Federal 4-13-132	1-4-52	797:1	5,449
	5-21-52	817:1	29,635
	9-12-52	1166:1	44,691
	12-19-52	1648:1	56,011
	1-24-53	1570:1	59,475
	4-14-53	1548:1	67,748
Federal 19-34-157	4-20-52	1080:1	3,867
	5-24-52	1176:1	13,945
	9-6-52	1083:1	39,902
	1-23-53	990:1	71,157
	2-28-53	940:1	78,135
	4-13-53	1519:1	86,883
Federal 7-35-109	4-20-52	1577:1	1,245
	5-17-52	1570:1	3,109
	9-5-52	1213:1	9,762
	1-20-53	2191:1	18,488
	4-14-53	2164:1	25,073
Federal 21-40-182	7-9-52	1194:1	5,700
	9-9-52	1558:1	21,372
	12-23-52	4261:1	45,885
	1-25-53	3606:1	51,606
	2-9-53	3713:1	54,810
	3-26-53	3724:1	61,093
	4-12-53	3923:1	6 2,803

Well No.	Date	Gas Oil Ratio	Accumulative Oil Production
Federal 22-45-207	9-11-52	1632:1	10,134
	1-27-53	1655:1	40,395
	3-3-53	1796:1	47,360
	4-24-53	1998:1	57,465
Federal 23-49-129	1-31-53	790:1	3,768
	2-15-53	736:1	6,541
	4-13-53	723:1	17,816
Federal 24-50-177	4-11-53	2418:1	5,114
Federal 25-51-127	5-4-53	818:1	1,721

WELL DATA

Federal 1-134

Location :	660 FNL, 1980 FWL, Section 10, T26N, R6W
Elevation:	6,550' DF
Drilling Commenced:	April 29, 1950
Drilling Completed:	July 19, 1950
Commenced Producing:	August 21, 1952
Surface Pipe:	13 3/8" OD casing set @ 312', with 350 sks cement
Intermediate Pipe:	9 5/8" OD casing set @ 2,990' with 500 sks cement
Production Pipe:	7" OD casing set @ 7,210' with 300 sks cement. Milled out 7" casing 6,728' - 6,770' to produce from Tocito formation.
Total Depth:	7,562 feet
Plugged back total depth:	6,770 feet

Acid Treatment:	1st treatment: 500 gallons mud acid 2nd treatment: 2,000 gallons acid after shot
Shot record:	120 quarts SNG
Initial Potential:	37.9 barrels of oil per day

Federal 2-179

Location:	1,980' FSL, 1,980' FEL, Section 9, T26N, R6W
Elevation:	KB 6,507'
Drilling Commenced:	May 22, 1951
Drilling Completed:	July 12, 1951
Commenced Producing:	July 11, 1951
Surface Pipe:	1 0 - 3/4" OD casing set @ 500' with 250 sks cement
Production Pipe:	7" OD casing set @ 6,615' with 150 sks cement
Tubing:	2" EUE set @ 6,630'
Total depth:	6,692'
Acid Treatment:	None
Shot Record:	Not shot
Initial Potential:	720 barrels of oil per day

Federal 4-13-132

Location:	660' FNL, 760' FEL, Section 9, T26N, R6W
Elevation:	GL 6,502'
Drilling Commenced:	September 24, 1951
Drilling Completed:	December 13, 1951
Commenced Producing:	December 9, 1951
Surface Pipe:	10 3/4" set @ 522' with 350 sks cement (10 3/4" OD casing)
Production Pipe:	7" OD casing set @ 6,670' with 200 sks cement
Tubing:	2" EUE set at 6,693'
Total Depth:	6,731'
Acid Treatment:	None
Shot Record:	Not shot
Initial Potential:	407 barrels of oil per day

Federal 19-34-157

Location:	1,980' FNL, 660' FWL, Section 10, T26N, R6W
Elevation:	GL 6,643'
Drilling Commenced:	February 2, 1952
Drilling Completed:	March 24, 1952
Commenced Producing:	March 26, 1952
Surface Pipe:	10 3/4" OD casing set @ 610' with 325 sks cement
Production Pipe:	7" OD casing set @ 6,812' with 170 sks cement
Tubing:	2" EUE set @ 6,840'
Total depth:	6,873'
Acid Treatment:	None
Shot Record:	Not shot
Initial Potential:	662 barrels of oil per day

Federal 7-35-109

Location:	660' FSL, 660' FWL, Section 3, T26N, R6W
Elevation:	GL 6,484'
Drilling Commenced:	February 23, 1952
Drilling Completed:	March 30, 1952
Commenced Producing:	May 5, 1952
Surface Pipe:	10 3/4" OD casing set @ 480' with 250 sks cement
Production Pipe:	7 5/8" OD casing set @ 6,674' with 175 sks cement
Tubing:	2" EUE set @ 6,700'
Total depth:	6,735'
Acid Treatment:	None
Shot record:	Not shot
Initial Potential:	135 barrels of oil per day

Federal 21-40-182

Location:	1740' FSL, 1800' FWL, Section 10, T26N, R6W
Elevation:	GL 6,552'
Drilling Commenced:	April 6, 1952
Drilling Completed:	May 26, 1952
Commenced Producing:	May 31, 1952
Surface Pipe:	10 3/4" OD casing set @ 575' with 310 sks cement
Production Pipe:	7 5/8" OD casing set : 6,700' with 175 sks cement
Tubing:	2½" EUE set @ 6,720'
Total depth:	6,761'
Acid Treatment:	None
Shot Record:	Not shot
Initial Potential:	1,743 barrels of oil per day

Federal 22-45-207

Location:	660' FSL, 1980' FEL, Section 10, T26N, R6W
Elevation:	6,506' DF
Drilling Commenced:	June 9, 1952
Drilling Completed:	July 25, 1952
Commenced Producing:	July 29, 1952
Surface Pipe:	10 3/4" OD casing set @ 409' with 175 sks cement
Production Pipe:	7 5/8" OD casing set @ 6,635' with 200 sks cement
Tubing:	2½" EUE set @ 6,661'
Total depth:	6,688'
Acid Treatment:	None
Shot Record:	Not shot
Initial Potential:	570 barrels of oil per day

Federal 23-49-129

Location:	660' FNL, 760' FWL, Section 9, T26N, R6W
Elevation:	6,423' DF
Drilling Commenced:	October 31, 1952
Drilling Completed:	January 5, 1953
Commenced Producing:	January 8, 1953
Surface Pipe:	10 3/4" OD casing set @ 426' with 175 sks cement
Production Pipe:	7" OD casing set @ 6,568' with 200 sks cement
Tubing:	2" EUE set @ 6,618'
Total depth:	6,628'
Acid Treatment:	None
Shot Record:	Not shot
Initial Potential:	870 barrels of oil per day

Federal 24-50-177

Location:	1,980' FSL, 660' FWL, Section 9, T26N, R6W
Elevation:	6,477' DF
Drilling Commenced:	January 29, 1953
Drilling Completed:	March 8, 1953
Commenced Producing:	March 11, 1953
Surface Pipe:	10 3/4" OD casing set @ 406' with 200 sks cement
Production Pipe:	7" OD casing set @ 6,591' with 200 sks cement
Tubing:	2" EUE set at 6,642'
Total depth:	6,645'
Acid Treatment:	None
Shot Record:	Not shot
Initial Potential:	932.98 barrels of oil per day

Federal 25-51-127

Location:	660' FNL, 1,980' FEL, Section 8, T26N, R6W
Elevation:	6,493'
Drilling Commenced:	March 17, 1953
Drilling Completed:	April 17, 1953
Commenced Producing:	April 20, 1953
Surface Pipe:	10 3/4" OD casing set @ 499.5' with 200 sks cement
Production Pipe:	7" OD casing set @ 6,620' with 200 sks cement
Tubing:	2" EUE set @ 6,649'
Total depth:	6,677'
Acid Treatment:	None
Shot Record:	Not shot
Initial Potential:	714.72 barrels of oil per day

CORING RECORD

CORING RECORD

Pettigrew-Tocito Pool

Rio Arriba County, N.M.

- -

Federal 4-13-132

Core No. 1: 6650' - 6673'. Cored 23 feet - recovered 18'; 2" of hard black shale.

Core No. 2: 6673' - 6687'. Recovered 15½'. 9' hard black, macro fossiliferous marine shale. 6½' coarse, angular, highly porous and permeable coaly sandstone, slightly calcareous, strong oil odor and stain, slightly fluorescent.

Core No. 3: 6687' - 6702'. Recovered 15'. 10' coarse angular, highly porous and permeable coaley sandstone, strong oil odor and stain. 1' shaly sand with good odor, vertically-fractured sandy shale with no appreciable odor.

Core No. 4: 6706' - 6722'. Recovered 17'2" of core. 4' hard black medium grained shaley sand. Strong oil odor and stain. All saturated. Fair porosity and permeability. Vertically fractured. 13' hard dark gray medium to coarse grained sandstone with occasional thin shale streaks. Fair to excellent porosity and permeability. Strong oil odor and stain, oil saturated, vertically fractured. Bottom 2" black shale, no odor, no stain.

Federal 22-45-207

Core No. 1: 6638' - 6688'. Cored 50 feet. Recovered 50 feet. 3 3/4 feet dense black shale, 19 1/4 feet sand, and 27 feet dense black Mancos shale.

Federal 23-49-129

Core No. 1: 6571' - 6592'. Recovered 21'. 13½' shale; 1' tight shaley sand with some odor and stain; 3½' permeable oil sand with some shale streaks, good odor and stain; 3' shaley oil sand, some permeable oil sand in streaks, good odor and stain.

Core No. 2: 6592' - 6621'. Recovered 26½'. 2½' fairly porous and permeable saturated sand with thin shale streaks. 1/2' good porous and permeable saturated sand with thin shale streaks. Some vertical fractures; 2½' fairly porous and permeable saturated sand with thin shale streaks; 1/2' shale; 4' good porous and permeable saturated sand with thin shale streaks; 16½' tight shaley sand with oder and saturation.

Core No. 3: 6621' - 6628'. Recovered 7 1/4 feet. 2' fairly light sandstone with odor and saturation; 3' tight shaly sandstone with fair odor and stain; 1' interbedded shale and tight sandstone; 1 1/4' shale with very thin shale streaks.

Federal 24-50-177

Core No. 1: Cored from 6594' to 6645'. Recovered 51' as follows:
10 1/4' black Mancos shale.
12 1/2' Toeito sandstone
28 1/4' black Mancos shale.

DST RECORD

RECORD OF DRILL STEM TESTS

Pettigrew-Tocito Pool

Rio Arriba County, N. M.

Federal 1-134

Drill stem test 6720' - 6956'. Tool open 3 hours. Gas to surface in 10 minutes. Heavy blow 1 hour. Small blow 2 hours. Estimated 50 MCF gas per day. Recovered 250' gas-cut mud. Bottomhole flowing pressure 600 PSI; 20 minute shut in bottomhole pressure 800 PSI.

Federal 2-179

Drill stem test 6605' - 6700'. Tool open 40 minutes. Gas to surface in 5 mintues. Mud to surface 15 minutes. Oil to surface in 18 minutes. Estimated flow 40 barrels per hour. Shut in bottomhole pressure 2250 PSI. Bottomhole flowing pressure 1500 PSI.

Federal 25-51-127

Drill stem test 6648½' - 6676'. Tool open 3 hours, 45 minutes. Good blow of air immediately decreasing to slight blow of air. Recovered 35 feet drilling mud - no oil or gas recovered. Bottomhole flowing pressure 10 PSI. One hour shut in pressure 10 PSI.

State 1-268

Drill stem test 6554' - 6655'. Tool open 1 hour through 1/2" choke. Fair blow of air for 35 minutes. Died at end of 50 minutes. Recovered 390 feet gas-cut mud. Flowing pressure 115 PSI. 20-minute shut in pressure 125 PSI.

Drill stem test 6566' - 6745'. Tool open 1 hour through 1/2" choke. Gas to surface in 20 minutes. Estimated 60 MCF. Recovered 450' of gas-cut mud. Flowing pressure 350 PSI. 20-minute shut in pressure 500 PSI.