Union Texas Petroleum

375 U.S. Highway 64
Farmington, New Mexico 87401
Telephone (505) 325-3587

May 19, 1987

Mr. William LeMay
N.M. Oil Conservation Division
P.O. Box 2088
Santa Fe, NM 87501-2088

Re: Mangum #5
1721' FSL & 1919' FWL
Section 10, T28N-R11W
San Juan County, NM

Dear Mr. LeMay:

Union Texas Petroleum is applying for a downhole commingling order for the referenced well in the Otero Chacra and Armenta Gallup fields. The ownership of the zones to be commingled is common. The Bureau of Land Management and the offset operators indicated in Exhibits A and B will receive notification of this proposed downhole commingling.

The subject well was completed on July 22, 1983 and fracture stimulated in the Gallup formation with 236,500# sand in 70,518 gallons 70 quality nitrogen foam. The well has produced 90 MMCF and 4 MBO to date and optimistically may produce an additional 100 MMCFG and negligible oil. The pump in this rod pumped well has been stuck since mid April, 1987. Average production prior to pump problems was 55 MCFD and 1 BOPD. The poor production of this well is typical of the Armenta Gallup formation in this area.

The mechanical problems of this well will require a workover to repair. The expense of a workover in the Gallup formation is difficult to justify for the 55 MCFD this well is capable of producing. Therefore, it is proposed to replace the Gallup rod pump with a plunger lift and, at the same time, recomplete this well in the Chacra formation and commingle the two zones. The Chacra zone in this well is expected to be marginal. Recoverable reserves of 120 MMCF are estimated based on the performance of the Witt #1E, a Chacra offset to the north. Drilling an individual well to the Chacra formation is not economically feasible. Commingling both zones is the optimum way to utilize the existing wellbore. The proposed commingling will result in the continued production of the Gallup formation and recovery of additional hydrocarbons from both the Gallup and Chacra formations, thereby preventing waste and will not violate correlative rights. Commingling the two zones will result in a more efficient operation by helping to lift Gallup fluids without the use of the rod pump currently used.

Since the Mangum #5 is not pumping, a Gallup fluid sample was taken from a northwest offset, the Mangum #8. A Chacra fluid sample was obtained from a north offset, the Witt #1E. The attached fluid analysis from these wells indicates the total value of the crude will not be reduced by commingling. The reservoir characteristics of each of the subject zones are such that underground waste would not be caused by the proposed downhole commingling. The calculated bottom hole pressure based on surface pressure and fluid level measurements is 492 psi in the Gallup (from the Mangum #5) and 450 psi in the Chacra (from the Witt #1E), and within the limits of Rule 303-C, Section 1 (b), Part (6). The fluids from each zone are compatible and no precipitates or emulsions will be formed as a result of commingling to damage either reservoir. Current flow tests of 1 BOPD and 0.2 BWPD from the Gallup (Mangum #5) and 1 BWPD from the Chacra (Witt #1E) indicate the daily production will not exceed the limit of Rule 303-C, Section 1 (a), Parts (1) and (3).

The Aztec District Office will be notified anytime the commingled well is shut in for seven consecutive days. To allocate the commingled production to each of the zones, Union Texas Petroleum will consult with the supervisor of the Aztec District Office and determine an allocation formula for each of the producing zones.

Included with this letter are two plats showing ownership of offsetting leases, a production curve of the subject Gallup well, a production curve of anticiptaed Chacra production (from the Witt #1E), Form C-116 (GOR test), Fluid Analysis Report and a wellbore diagram showing the proposed downhole equipment of the subject well.

Yours truly,

S. G. Katirgis

S. G. Katirgis
Production Engineer

SGK:lmg
attachments

cc: Frank Chavez, Aztec OCD
W. K. Cooper
M. E. Wohl

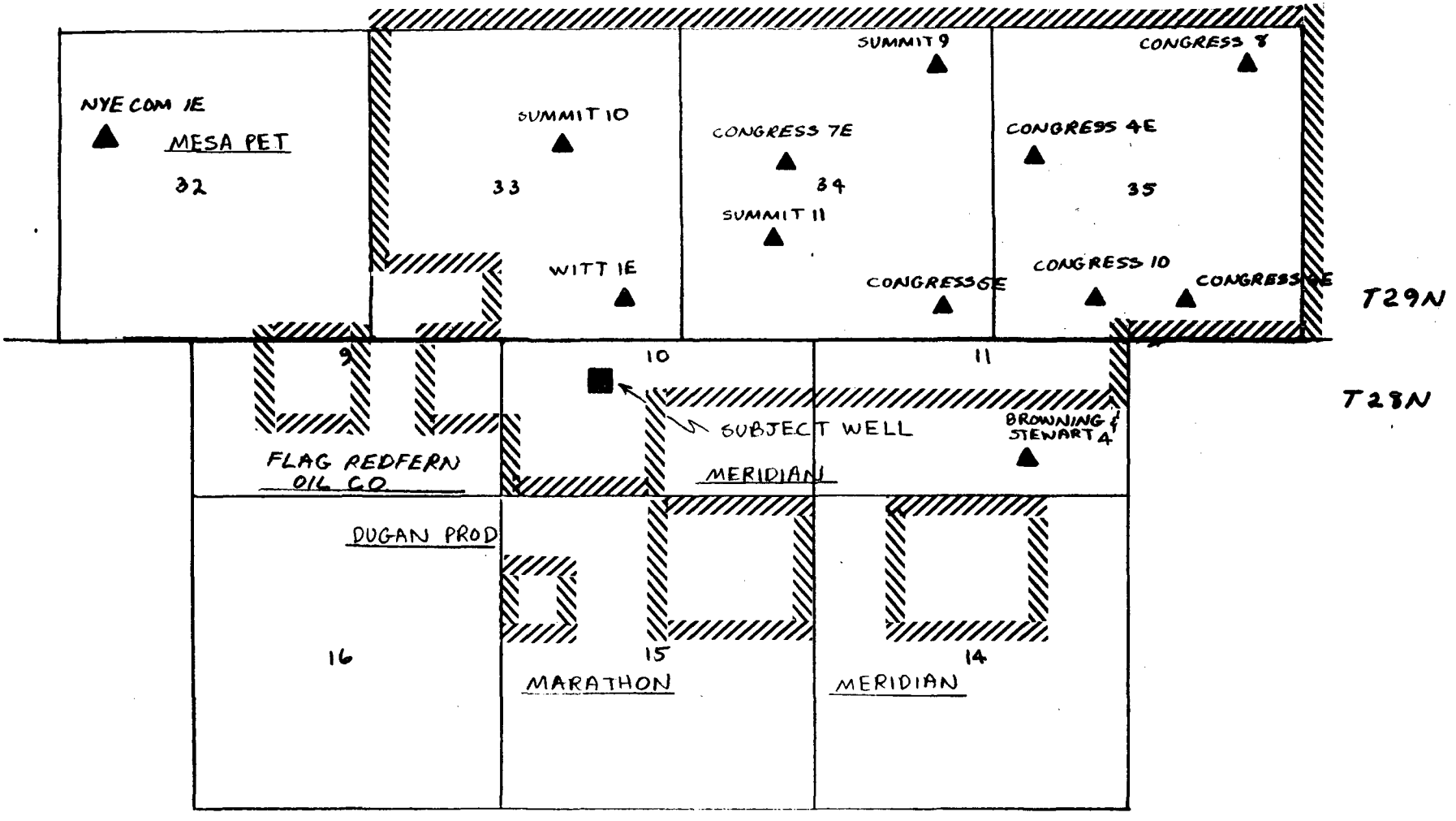


EXHIBIT A - OFFSET CHACRA WELLS

UNION TEXAS PETROLEUM ACREAGE

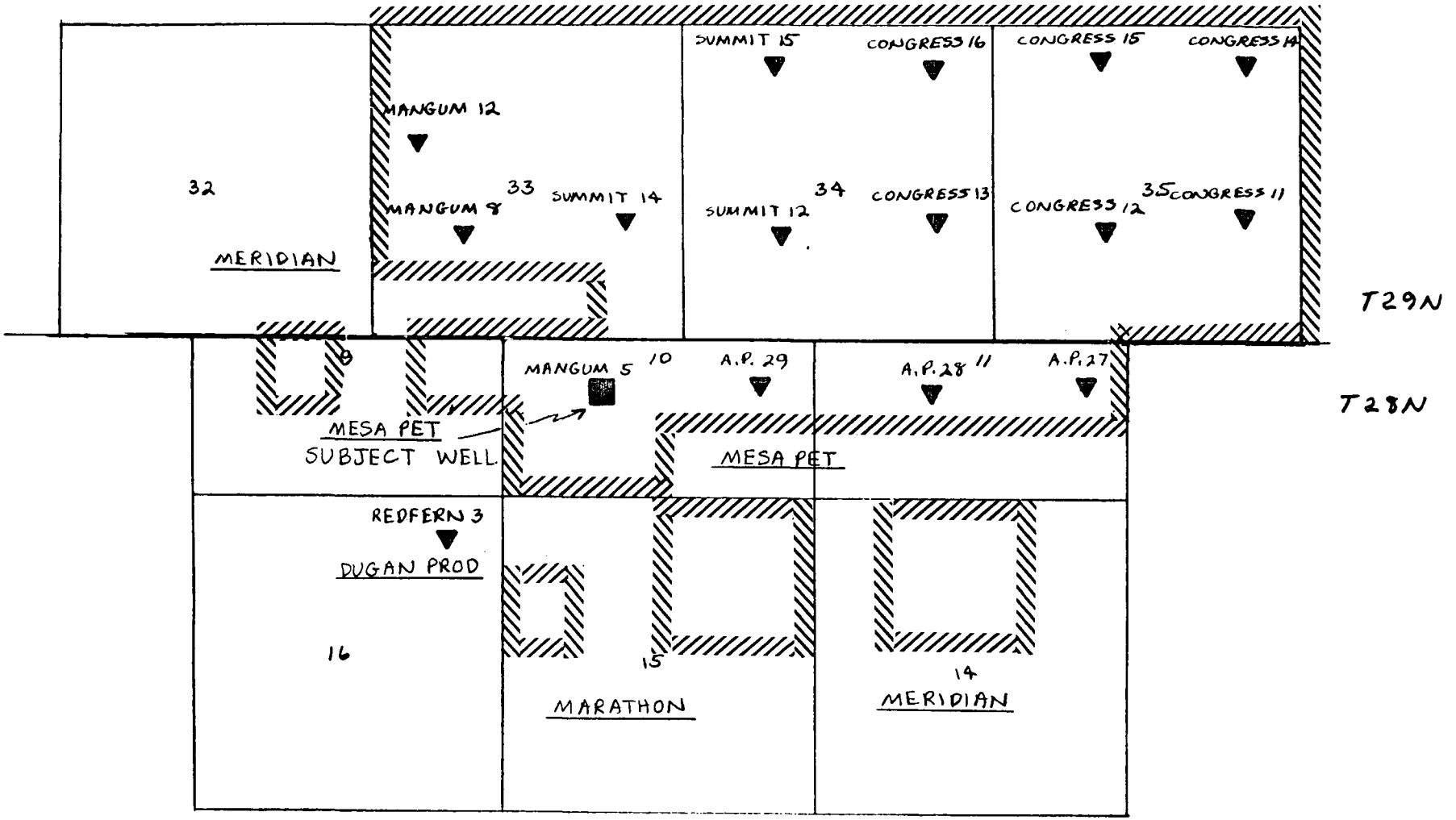
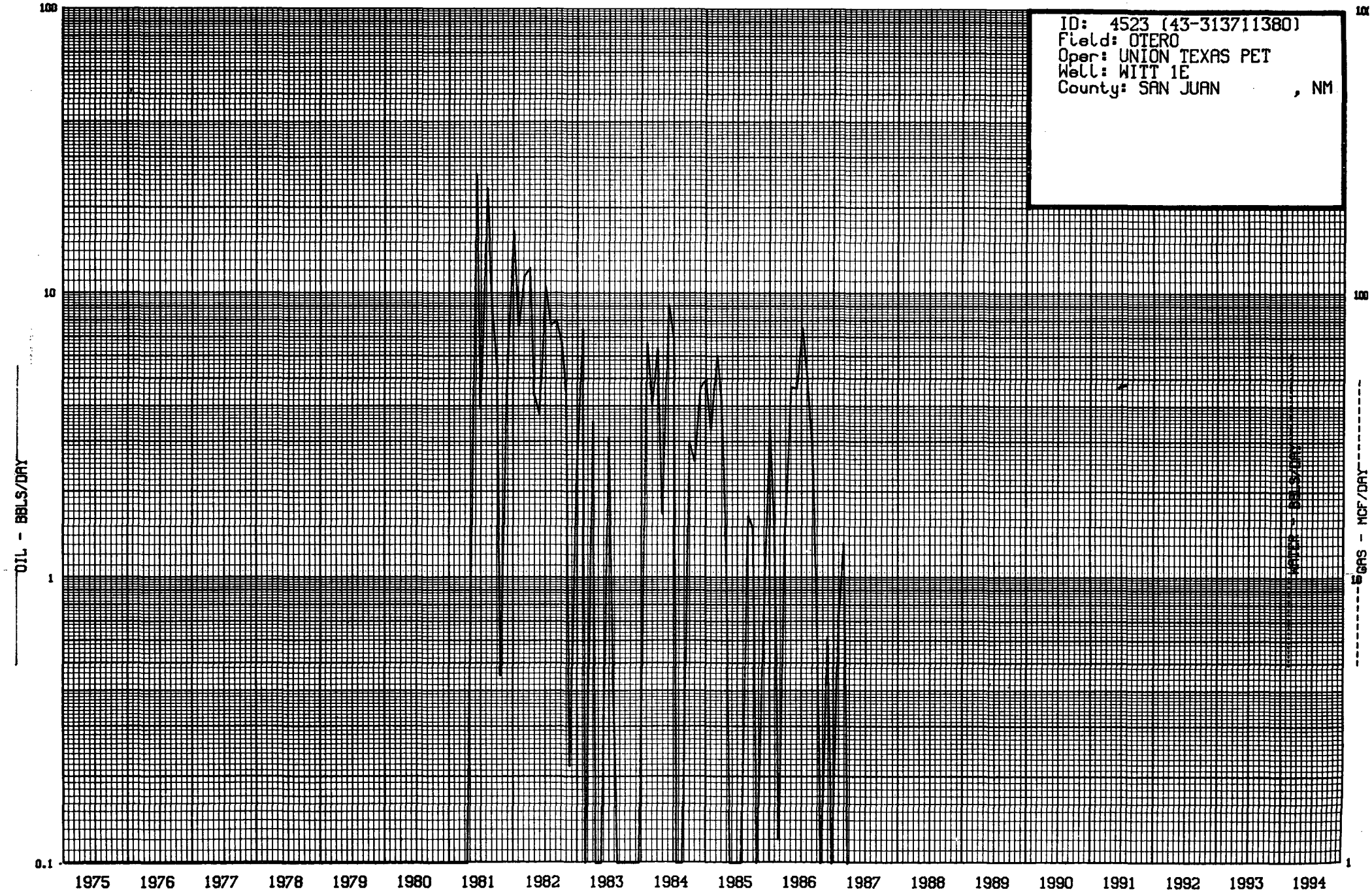
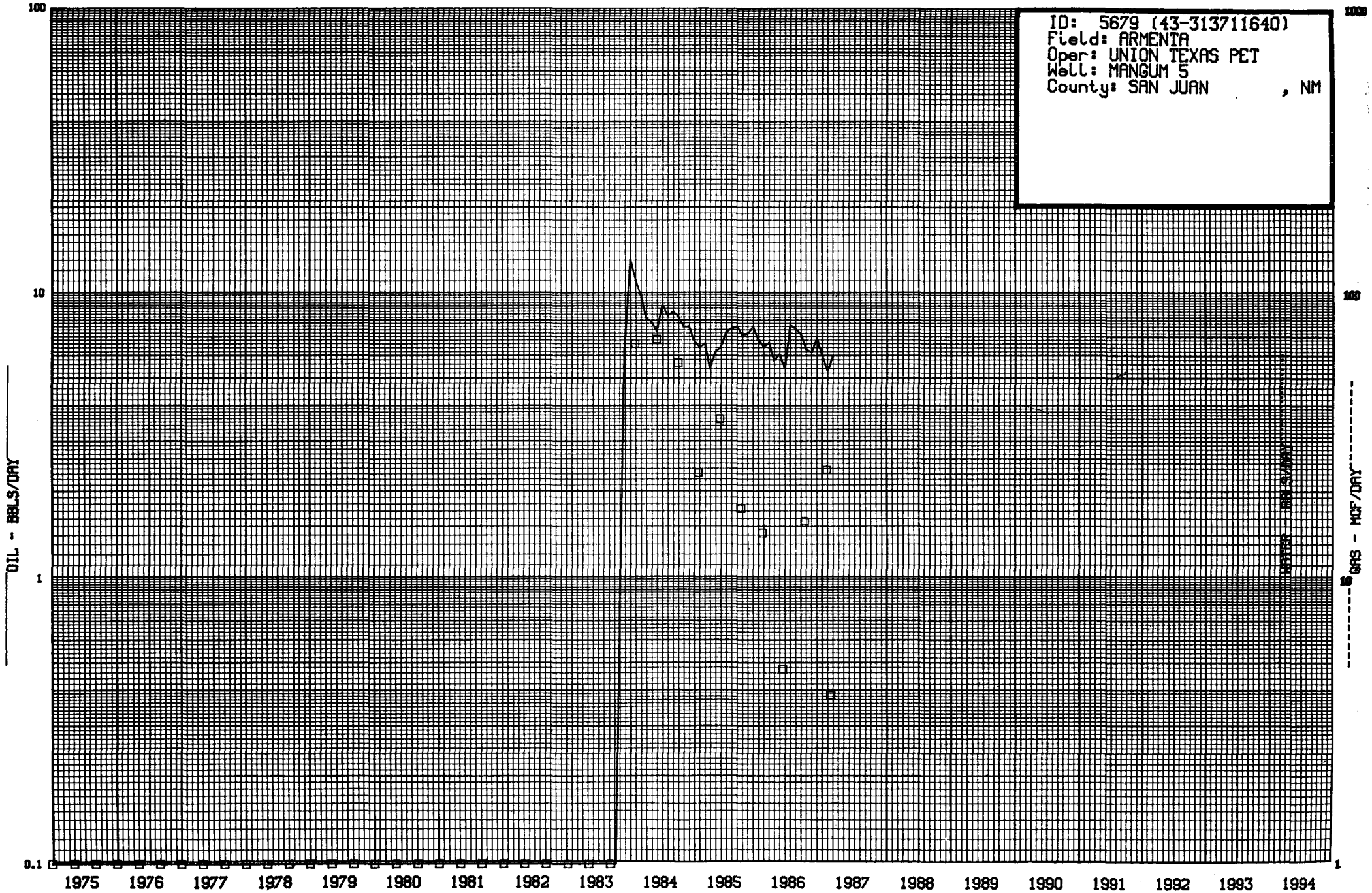


EXHIBIT B - OFFSET GALLUP WELLS

UNION TEXAS PETROLEUM ACREAGE


ID: 4523 (43-313711380)
Field: OTERO
Oper: UNION TEXAS PET
Well: WITT 1E
County: SAN JUAN , NM
100
10
1
0.1
OIL - BBLS/DAY
GAS - MCF/DAY
WATER - BBLS/DAY
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994


ID: 5679 (43-313711640)
Field: ARMENTA
Oper: UNION TEXAS PET
Well: MANGUM 5
County: SAN JUAN , NM
100
10
1
0.1
OIL - BBLS/DAY
1000
100
10
1
GAS - MCF/DAY
WATER - BBLS/DAY
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-116
Revised 10-1-78

GAS-OIL RATIO TESTS

Operator	Pool	County
Union Texas Petroleum	Armenta Gallup/Otero Chacra	San Juan

Address	TYPE OF TEST - (X)			
375 US Highway 64 Farmington, NM 87401	Scheduled [ ]	Completion [ ]	Special [XX]	

LEASE NAME	WELL NO.	LOCATION U	S	T	R	DATE OF TEST	STATUS	CHOKE SIZE	TBG. PRESS.	DAILY ALLOW-ABLE	LENGTH OF TEST HOURS	PROD. DURING TEST WATER BBLS.	GRAV. OIL	OIL BBLS.	GAS M.C.F.	GAS-OIL RATIO CU.FT/B
Mangum (Gallup)	5	K	10	28N	11W	1/18/87			100		24	.2	39	1	55	55,000
Witt (Chacra)	1E	P	33	29N	11W	7/10/86			360		24	1	0	0	30	N/A

No well will be assigned an allowable greater than the amount of oil produced on the official test.

During gas-oil ratio test, each well shall be produced at a rate not exceeding the top unit allowable for the pool in which well is located by more than 25 percent. Operator is encouraged to take advantage of this 25 percent tolerance in order that well can be assigned increased allowables when authorized by the Division.

Gas volumes must be reported in MCF measured at a pressure base of 15.025 psia and a temperature of 60° F. Specific gravity base will be 0.60.

Report casing pressure in lieu of tubing pressure for any well producing through casing.

Mail original and one copy of this report to the district office of the New Mexico Oil Conservation Division in accordance with Rule 301 and appropriate pool rules.

I hereby certify that the above informatio is true and complete to the best of my know ledge and belief.

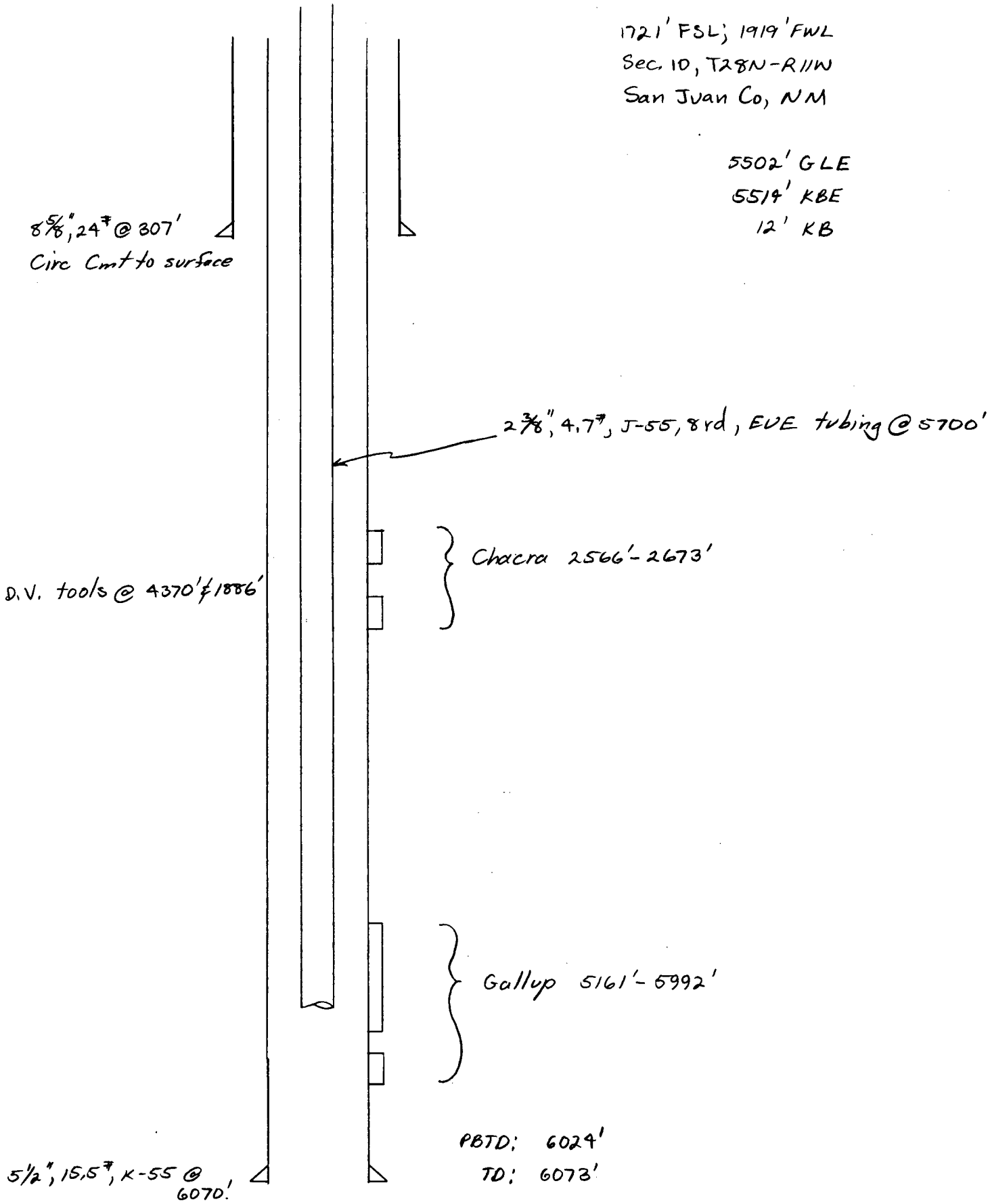
(Signature)

Production Engineer 5/20/87
(Title)

Mangum #5 - Wellbore Diagram
Proposed Completion

1721' FSL; 1919' FWL
Sec. 10, T28N-R11W
San Juan Co, NM

5502' GLE
5514' KBE
12' KB



1st stage: Cmt w/ 640 ft³ 50/50 POZ w/ 2% gel, .6% FLA, 1/4# Flocele, 10# salt/sk:
2nd stage: Cmt w/ 1280 ft³ 65/35 POZ w/ 6% gel, 10# Gils/sk: Tail w/ 100 sx cl "B" w/ 2% CaCl₂
3rd stage: Cmt w/ 1148 ft³ 65/35 POZ w/ 12% gel. 12 1/2# Gils/sk: circ to surface

Southwest Region

LABORATORY INVESTIGATION
OF
ANGEL PEAK AREA PRODUCED FLUIDS
MAY 18, 1987

PREPARED FOR:

UNION TEXAS PETROLEUM
STERG KATIRGIS
PETROLEUM ENGINEER

PREPARED BY:

CLAY TERRY
DISTRICT ENGINEER
THE WESTERN COMPANY

P. O. Drawer 360 • Farmington, N. M. 87401

SUMMARY OF RESULTS:

1. No precipitation of materials was observed from the admixture of produced fluids in question.

2. Emulsion testing indicated no emulsion tendencies apparent.

3. No scaling tendencies of waters is expected upon mixture due to the fact that potentially precipitious ion are diluted upon mixture rather than concentrated. In each mixture concerned further water is being added to dilute existing levels of ion strengths.

TESTS TO BE CONDUCTED:

1. API water analysis.

2. API oil analysis.

3. Emulsion tendency.

4. Scaling tendency.

DISCUSSION:

In the case of a mixture of Chacra formation H_2O with oil and water from the Gallup interval from the Mangum 8 the primary concern to be addressed is emulsion tendency. A 50/50 mixture of fluids from the two wells show a complete 100% breakout of oil and water within 30 minutes at room temperature. No emulsion problem is apparent. Secondarily, the scaling tendency of mixed water is concerning. The Chacra fluid sample is completely aqueous in nature. There is no accompanying hydrocarbon phase. the TDS of that fluid is 30,285 mg/l (of which 94.6% is Na^+ and Cl^- ion) and a resistivity of 0.235 ohm meters at 75° F. Potentially precipitious sulfate and carbonate ions are at extremely low levels. There is no serious concern over precipitations or scale formation when mixed with the Gallup fluid (of which 20.7% is aqueous). It is a very fresh source of water as demonstrated by a TDS of less than 2000 mg/l and resistivity of 4.9 ohm meters at 75° F. Mixing of the two fluids will only serve to dilute Chacra ionic strengths and reduce concentrations farther below scaling thresholds. In the case of the Angel Peak B lease well unit 30 produced water only, and unit 37 produced a 65/35 mix of water and oil, respectively. Concerns include precipitation of solids, scaling and emulsion tendencies. Like the case of Witt 1E and Mangum 8, water admixtures only serve to dilute potentially precipitious ion species. The Angel Peak B 30 has a TDS of 25,044 mg/l (of which 95.2% is contributed by Na^+ and Cl^- species) and a resistibility of 0.260 ohm meters. Mixture of the Angel Peak B 37 fluid (65% of which is water) only serves to dilute concentrations since it apparently presents a TDS less than 1500 mg/l and a resistivity of 10.0 ohm meters.

Oil characteristics speak for themselves and are presented on the oil analysis forms provided. No emulsion problems are apparent.

ANALYSIS NO. 52 06 87

FIELD RECEIPT NO. _____

API FORM 45-1

API WATER ANALYSIS REPORT FORM

Company		Sample No.	Date Sampled
Union Texas Petroleum		1	
Field	**Legal Description**	**County or Parish**	**State**
		San Juan	NM
Lease or Unit	**Well**	**Depth**	**Formation**	**Water, B/D**
Witt	1E		Chacra	
Type of Water (Produced, Supply, etc.)	**Sampling Point**	**Sampled By**
Produced	Well Head	SK

DISSOLVED SOLIDS

CATIONS	mg/l	me/l
Sodium, Na (calc.)	10907	476.3
Calcium, Ca	190	9.5
Magnesium, Mg	248	20.3
Barium, Ba		
Potassium, K^+	342	8.7

ANIONS		
Chloride, Cl	17756	500.9
Sulfate, SO_4	25	0.5
Carbonate, CO_3	0	0
Bicarbonate, HCO_3	817	13.4
Hydroxide 04	0	0

Total Dissolved Solids (calc.) 30,285

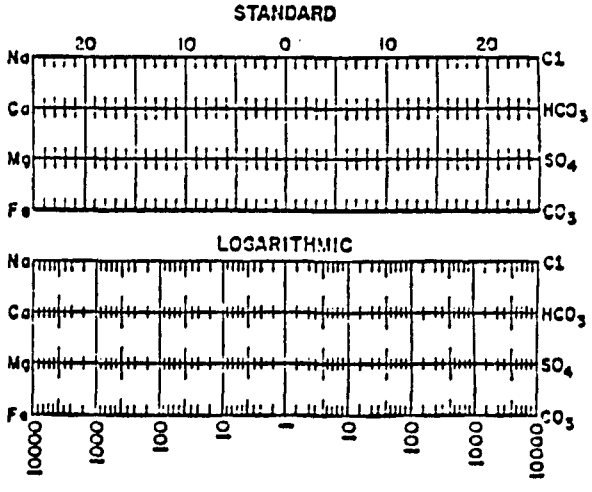
Iron, Fe (total) 0

Sulfide, as H_2S 0

OTHER PROPERTIES

pH	7.2
Specific Gravity, 60/60 F.	1.028
Resistivity (ohm-meters) 75 F.	0.235
Total hardness	1500

WATER PATTERNS — me/l



REMARKS & RECOMMENDATIONS:

1. Fluid is 100% H_2O-No hydrocarbon phase present.
2. Note(s) 50/50 Mix of Witt 1E and Mangum 8 Fluids yielded 98% breakout of 0.7/H_2O within 20 minutes, 100% in 25 minutes. No emulsion problem apparent.

ANALYST: C. Terry

THE WESTERN COMPANY OF
NORTH AMERICA, FARMINGTON, NM
(505) 327-6222

Please refer any questions to: Clay Terry, District Engineer or
Tom Burris, Field Engineer
Russ Pyeatt, Field Engineer

ANALYSIS NO. 52 06 87

FIELD RECEIPT NO. _____

API FORM 45-1

API WATER ANALYSIS REPORT FORM

Company		Sample No.	Date Sampled
Union Texas Petroleum		2	05/03/87
Field	**Legal Description**	**County or Parish**	**State**
		San Juan	NM
Lease or Unit	**Well**	**Depth**	**Formation**	**Water, B/D**
Mangum	8		Gallup	
Type of Water (Produced, Supply, etc.)	**Sampling Point**		**Sampled By**
Produced	Well Head		SK

DISSOLVED SOLIDS

CATIONS	mg/l	me/l
Sodium, Na (calc.)		
Calcium, Ca		
Magnesium, Mg		
Barium, Ba		
Potassium, K^+		

ANIONS		
Chloride, Cl	706	19.9
Sulfate, SO_4	0	0
Carbonate, CO_3		
Bicarbonate, HCO_3		

Total Dissolved Solids (calc.) _____

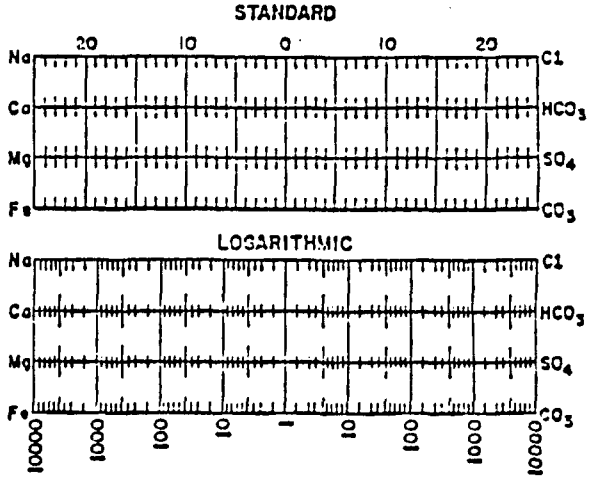
Iron, Fe (total) _____

Sulfide, as H_2S _____

OTHER PROPERTIES

pH	6.8
Specific Gravity, 60/60 F.	1.003
Resistivity (ohm-meters) 75F.	4.9
Total hardness	

WATER PATTERNS — me/l



REMARKS & RECOMMENDATIONS:

Mix of Fluids:

170 ml H_2O

650 ml 0.7

ANALYST: C. Terry

THE WESTERN COMPANY OF
NORTH AMERICA, FARMINGTON, NM
(505) 327-6222

Please refer any questions to: Clay Terry, District Engineer or
Tom Burris, Field Engineer
Russ Pyeatt, Field Engineer

Analysis No. 52 06 87
Date 05/18/87

The Western Company

Oil Analysis

Operator Union Texas Petroleum	Date Sampled 05/03/87
Well Mangum 8	Date Received 05/05/87
Field	Submitted By Sturg Katirgis
Formation Gallup	Worked By Clay Terry
Depth	Sample Description Dark Brown
County San Juan	Gallup Oil
State New Mexico	

API Gravity 37.62 ° at 60°F (39.0° API @ 78° F.)

*Paraffin Content 3.02 % by weight

*Asphaltene Content - % by weight

Pour Point 30 °F

Cloud Point 60 °F

Comments:

Analyst Clay Terry

Amoco Production Company
Post Office Box 68
Hobbs, New Mexico 88240

J.L. Krupka
District Manager

April 10, 1987

File: SGH-277-WF

Re: Downhole Commingling
State "G" Well No. 6
Hobbs Drinkard and Blinebry Oil Pools
1980' FNL x 1650' FWL
Section 33, T-18-S, R-38-E
Lea County, New Mexico

Shell Oil Company
Box 576 Woodcreek
Houston, TX 77001

Amoco Production Company, as operator of the State "G" Well No. 6 (see attached plat), is applying to the New Mexico Oil Conservation Division to downhole commingle the subject well.

If you have no objections to this commingling, please sign in the space provided below and forward one signed copy to the NMOCD in Santa Fe, one copy to the NMOCD in Hobbs, one copy to this office, and retain one for your records. Addressed, stamped envelopes have been provided for your convenience.

J. L. Krupka, mgr

SBB/kih
APRD01-E

Attachment

APPROVAL

Company: SHELL WESTERN E & P INC.

By: J R Reed

Date: 5-18-87

STATE OF NEW MEXICO

ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

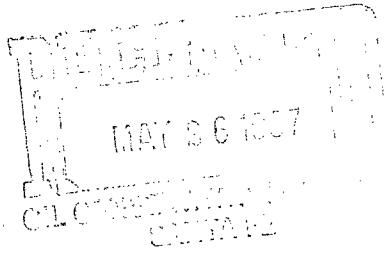
AZTEC DISTRICT OFFICE

1000 RIO BRAZOS ROAD
AZTEC, NEW MEXICO 87410
(505) 334-6178

OIL CONSERVATION DIVISION
BOX 2088
SANTA FE, NEW MEXICO 87501

DATE 5-22-87

RE: Proposed MC _____
Proposed DHC X
Proposed NSL _____
Proposed SWD _____
Proposed WFX _____
Proposed PMX _____



Gentlemen:

I have examined the application dated 5-21-87

for the Union Texas Petroleum Corp. ~~Abe~~ Marquez #5 K-10-28N-11W
Operator Lease and Well No. Unit, S-T-R

and my recommendations are as follows:

Approve

Yours truly,

E. Busch