



# Arch Petroleum, Inc.

August 2, 1995

Oil Conservation Division Case No. 11344  
Application of Arch Petroleum Inc. for three  
unorthodox infill oil well locations  
C. E. Lamunyon #51, 52, and 53  
Teague Blinebry Pool  
Lea County, New Mexico

William J. LeMay, Director  
Oil Conservation Division  
New Mexico Dept. of Energy, Minerals,  
and Natural Resources  
2040 South Pacheco  
Santa Fe, NM 87505

*Case No. 11344*

Dear Mr. LeMay:

Arch Petroleum Inc. respectfully requests approval to drill and produce the three subject wells at unorthodox locations on it's C. E. Lamunyon lease. Surveyed plats for these wells are included as Attachments 1, 2, and 3. These are the first three of a total of seven wells that Arch will apply for unorthodox locations. The application for the other four wells will soon follow as they are staked. Attachment 4 is a map showing all seven proposed wells and all offsetting leases and operators.

Under Rule 104 (F), we request that the Division approve the unorthodox locations for these wells without notice and hearing because they are not located any closer than 330 feet to the lease lines, nor are they closer than 10 feet to any quarter-quarter section line.

The proposed wells will be drilled as 20 acre infills in the Teague Blinebry pool. These infills are necessary to produce reserves that would not otherwise be recoverable with the existing wells on 40 acre spacing.

The C. E. Lamunyon #50 is the only 20 acre infill well drilled to date. Attachment 5 is an independent analysis by the Ryder Scott Co. of the incremental reserves of this well. This report indicates that a significant amount of oil reserves (55,385 STB) will be produced by the #50 that would not be recovered by the offset wells.

The seven wells currently proposed are expected to perform as well or better than the Lamunyon #50. A field-wide study was performed to evaluate the best locations for infill wells on our leases. Attachment 6 is a structure map of the top of the Blinebry pay. Attachment 7 is an

isopach of the net pay thickness of the Blinbry. Structure and stratigraphy were used to locate these wells in the best pay quality of the field.

Estimated ultimate primary recoveries for all the wells surrounding the seven proposed infills were calculated. These numbers are shown on Attachment 8. The number of acres drained and the drainage radii are also shown. These were calculated using the assumed average volumetric parameters shown on the bottom of the spreadsheet.

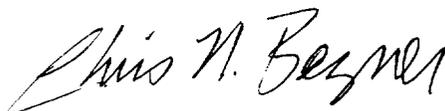
As can be seen on Attachment 8, the average drainage for the existing wells is only a little over 15 acres. This shows that the current 40 acre spacing is not efficiently draining the reserves estimated to be recoverable. Put another way, the existing wells are draining only 15 acres out of 40 acres available. If we are not allowed to drill these proposed infill wells, waste will occur as over half the reserves in this area of the field will be left in the ground.

Using these calculated drainage radii, the bubble map (Attachment 9) was constructed. It shows that none of the proposed seven locations will be drained by the existing wells. Several constraints were used in picking these locations. The wells need to be on undrained acreage, and to produce in economic quantities they need to be in a good pay thickness and structurally high.

Notice of this application has been provided by certified mail to all operators of all offsetting spacing or proration units. The return receipts will be forwarded to you by our counsel, William F. Carr.

If you have any questions please contact me at (915) 685-1961. Your consideration of this administrative application is appreciated.

Sincerely,



Chris N. Bezner, P.E.

Engineer

CNB/

Attachments

cc: William F. Carr - Santa Fe  
Jerry Sexton NMOCD - Hobbs  
BLM - Carlsbad

DISTRICT I  
P.O. Box 1980, Hobbs, NM 88241-1980

State of New Mexico  
Energy, Minerals and Natural Resources Department

Form C-102  
Revised February 10, 1994  
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OIL CONSERVATION DIVISION  
P.O. Box 2088

Santa Fe, New Mexico 87504-2088

DISTRICT IV  
P.O. BOX 2088, SANTA FE, N.M. 87504-2088

□ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code <b>58300</b>	Pool Name <b>Teague Blinebry</b>
Property Code	Property Name <b>C.E. LAMUNYON</b>	Well Number <b>51</b>
OGRID No. <b>902</b>	Operator Name <b>ARCH PETROLEUM, INC.</b>	Elevation <b>3294</b>

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	21	23 S	37 E		1300	NORTH	560	EAST	LEA

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

Dedicated Acres <b>40</b>	Joint or Infill	Consolidation Code	Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

<p><b>ILLEGIBLE</b></p>		<p>OPERATOR CERTIFICATION</p> <p><i>I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.</i></p> <p><i>Bobbie Brooks</i> Signature</p> <p><b>BOBBIE BROOKS</b> Printed Name</p> <p><b>PRODUCTION ANALYST</b> Title</p> <p><b>AUGUST 3, 1995</b> Date</p>
	<p>SEE DETAIL</p>	<p>SURVEYOR CERTIFICATION</p> <p><i>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</i></p> <p><b>JUNE 5, 1995</b> Date Surveyed</p> <p>Signature &amp; Seal of Professional Surveyor <i>Ronald J. Edson</i></p> <p>W.O. Com 95-11-0886</p>
	<p>3302.2' --- 3294.0'</p> <p>3296.6' --- 3292.8'</p> <p>DETAIL</p>	<p>Certificate No. JOHN W. WEST 676 RONALD J. EDSON 3239 GARY EDSON 12641</p>
	<p><b>Attachment 1</b></p>	

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OIL CONSERVATION DIVISION  
P.O. Box 2088  
Santa Fe, New Mexico 87504-2088

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code <b>58300</b>	Pool Name <b>Teague Blinebry</b>
Property Code	Property Name C.E. LAMUNYON	Well Number 52
OGRID No. <b>902</b>	Operator Name ARCH PETROLEUM, INC.	Elevation 3316

Surface Location

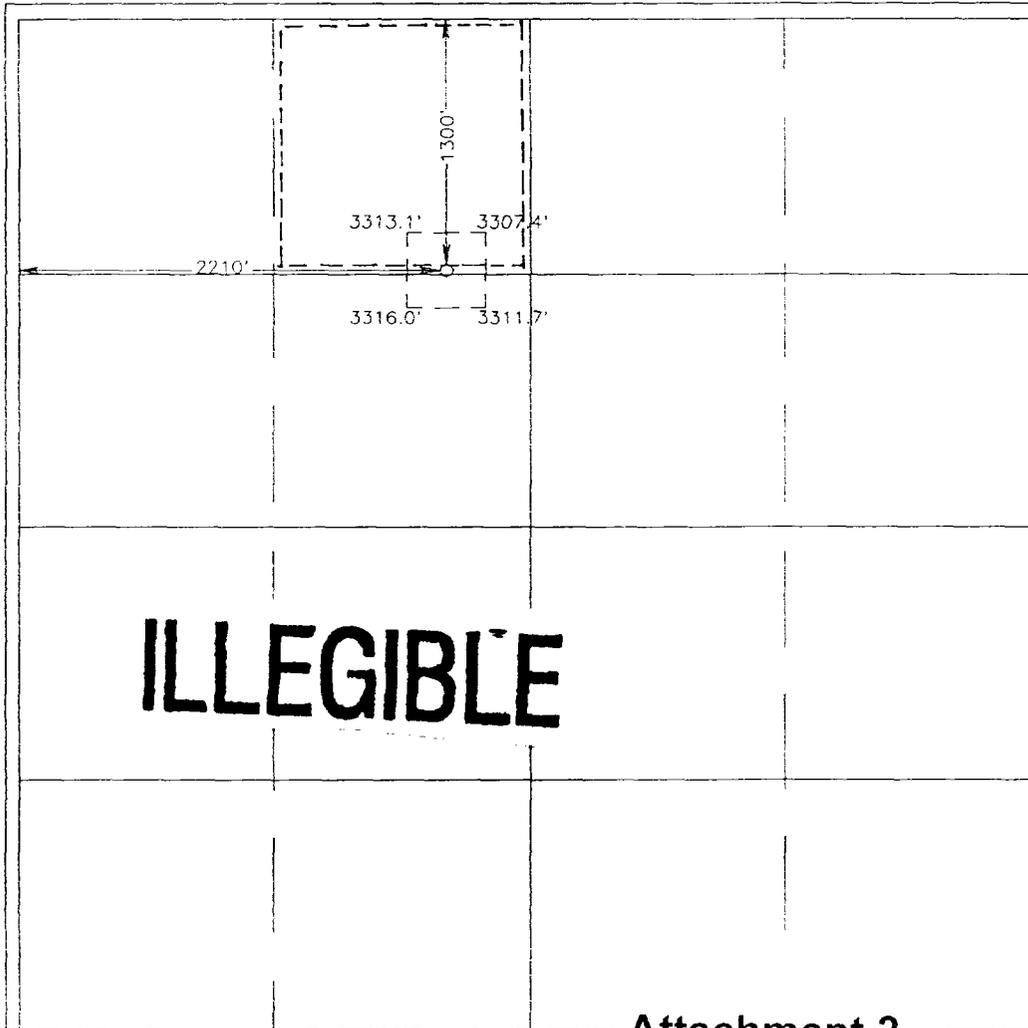
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	21	23 S	37 E		1300	NORTH	2210	WEST	LA

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

Dedicated Acres <b>40</b>	Joint or infill	Consolidation Code	Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



**ILLEGIBLE**

OPERATOR CERTIFICATION

I hereby certify the the information contained herein is true and complete to the best of my knowledge and belief

*Bobbie Brooks*  
Signature

**BOBBIE BROOKS**  
Printed Name

**PRODUCTION ANALYST**  
Title

**AUGUST 3, 1995**  
Date

SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief

**JUNE 6, 1995**

Date Surveyed  
Signature & Seal of Professional Surveyor

*Ronald F. Edison* 6-9-95

W.O. No. 95-11-20887

Certificate No. JOHN W. WEST 678  
RONALD F. EDISON 3230  
DARRY EDISON 12641

DISTRICT I  
P.O. Box 1980, Hobbs, NM 88241-1980

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P.O. Box 2088  
Santa Fe, New Mexico 87504-2088

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code 58300	Pool Name Teague Blinebry
Property Code	Property Name C.E. LAMUNYON	Well Number 53
OGRID No. 962	Operator Name ARCH PETROLEUM, INC.	Elevation 3294

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	22	23 S	37 E		1300	SOUTH	330	WEST	LEA

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
Dedicated Acres 40	Joint or Infill	Consolidation Code	Order No.						

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

<h1>ILLEGIBLE</h1>	<p>OPERATOR CERTIFICATION</p> <p><i>I hereby certify the the information contained herein is true and complete to the best of my knowledge and belief</i></p> <p><i>Bobbie Brooks</i> Signature</p> <p>BOBBIE BROOKS Printed Name</p> <p>PRODUCTION ANALYST Title</p> <p>AUGUST 3, 1995 Date</p>	
	<p>SURVEYOR CERTIFICATION</p> <p><i>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision and that the same is true and correct to the best of my belief.</i></p> <p>JUNE 6, 1995</p> <p>Date Surveyed <span style="float: right;">SJA</span></p> <p>Signature &amp; Seal of Professional Surveyor</p> <p><i>Ronald J. Eidson</i> 6-9-95 W.O. Num. 95-41-0888</p> <p>Certificate No. JOHN W. WEST 876 RONALD J. EIDSON 3239 GARY EIDSON 12641</p>	
<p>Diagram showing well location details:</p> <p>3292.6' — 3294.6'</p> <p>3294.0' — 3293.9'</p> <p>SEE DETAIL</p> <p>330'</p> <p>1300'</p>		

LARGE FORMAT  
EXHIBIT HAS  
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AND IS LOCATED  
IN THE NEXT FILE



RYDER SCOTT COMPANY  
PETROLEUM ENGINEERS

1100 LOUISIANA

SUITE 3800

HOUSTON, TEXAS 77002-5218

FAX (713) 651-0849

TELEPHONE (713) 651-9191

July 28, 1995

## Attachment 5

Arch Petroleum Inc.  
777 Taylor, Suite II-A  
Ft. Worth, Texas 76102

Attention: Mr. Mario E. Maldonado, P.E.

Re: Teague-Blinebry Reservoir  
20 Acre Infill Well Analysis

Gentlemen:

### Background

Arch Petroleum Inc. (Arch) has engaged Ryder Scott Company (Ryder Scott) to evaluate the benefit of drilling a 20 acre infill well within the Blinebry pool, in the Teague Field. The Teague Field is located in southeastern New Mexico in Lea County. The field is located on the northwest edge of the Central Basin Platform and was extensively drilled by the early 1970's with a typical well spacing of 40 acres. In 1989 an infill well (LaMunyon No. 50) was drilled by Chevron as a test well for evaluating future secondary recovery processes. Previous studies have suggested that the field is not being effectively drained on 40 acre spacing. This work evaluates the performance of the LaMunyon No. 50 well, and its effect on the original (40 acre) offset wells, to determine the incremental recovery associated with the drilling of the infill well.

### Summary of Results

An evaluation of the production history of the recently drilled infill well (LaMunyon No. 50) in the Teague Blinebry reservoir indicates that incremental reserves can be recovered when the well spacing is reduced from 40 acres to 20 acres. LaMunyon No. 50, drilled in 1989, is expected to incrementally recover 55,385 STB oil (from the main Blinebry zones) which is approximately 65 percent of the recovery from the original 40 acre offset wells.

### Discussion

Estimated ultimate recovery (EUR) in the main Blinebry reservoir was determined for well 50 and the four direct offset wells (wells 21, 24, 29, and 34). These EUR's were based on decline curve analysis, and the projections are displayed in Figures 1 through 5. The ultimate recovery for each offset well was estimated both before and after the infill well (well 50) was drilled, so that the reduction in EUR for the offsets due to the presence of well 50 could be determined. This amount of reduced recovery in the offset wells was then subtracted from the EUR of well 50, to determine the incremental reserves from well 50.

Two wells (No 21 and 50) have produced from the uppermost lobe of the Blinebry, as well as from the main Blinebry reservoir. Since most wells in the field have not produced from the uppermost lobe, we restricted our analysis of infill potential to the main Blinebry. Thus, the estimated EUR for the uppermost lobe was removed from the total, to calculate the EUR from the main Blinebry, for these two wells.

Fracture stimulations have recently been performed on the main pay for wells 24, 34 and 50. Because there are insufficient performance data at this time to determine the effect of these stimulations on the EUR's of these wells, we limited our analysis to well performance prior to the fracture stimulations.

Table 1 (attached) provides a summary of the expected recoveries from all wells and the expected incremental recovery from well 50. The key results for the main Blinebry reservoir are summarized below:

Average EUR for offset wells (Original 40 acre spacing)	85,130 STB
EUR for Well 50 (20 Acre Infill Well)	62,160 STB
Incremental EUR for Well 50 (Net Increase Due to Well 50)	55,385 STB
Percent of EUR for Infill vs Original Offsets	65%

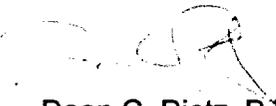
To check the reasonableness of the above results, an average oil recovery factor for the pattern was determined. The recovery efficiency calculations are summarized below:

Total Allocated EUR for Pattern (All Wells)	145,597 STB
Total OOIP for Pattern (38.35 Acres)	1,411,002 STB
Overall Oil Recovery Efficiency	10.3%

The overall recovery efficiency obtained is reasonable for an oil reservoir primarily under depletion drive. Using this average recovery efficiency, drainage areas for the offset wells and the infill well were calculated. These are listed in Table 1 and are graphically displayed, along with the well locations, in Figure 6.

Very truly yours,

RYDER SCOTT COMPANY  
PETROLEUM ENGINEERS



Dean C. Rietz, P.E.  
Petroleum Engineer

DCR/sw

Approved:



Kent A. Williamson, P.E.  
Group Vice President

Table 1

**Arch Petroleum  
C.E. LaMunyon Lease  
20 Acre Infill Well Analysis**

Well	Main Pay	Main Pay	Change in	R.F. = 10.3%	
	EUR without	EUR with		Drainage	Drainage
	Well No. 50	Well No. 50	to well # 50	Radius	Area, R.F.
	(STB)	(STB)	(STB)	(ft)	(acres)
21	75,009	75,150	141	393	11.1
24	46,250	45,936	-314	415	12.4
29	97,316	97,336	20	486	17.0
34	121,946	115,324	-6,622	504	18.3
<b>Average</b>	<b>85,130</b>				
<b>50</b>		62,160	62,160	635	29.1
<b>Total</b>			55,385		
<b>Pattern Allocated</b>		<b>145,597</b>	<b>55,385</b>		

The above recoveries show that the LaMunyon 50 is expected to recover 65% (55,385/85,130) of the EUR for the original 40 acre offset wells.

The pattern OOIP is calculated to be 1,411,002 STB for the 38.35 acre pattern. The OOIP calculations assume  $B_o = 1.23^{rb}/_{STB}$ ,  $S_w = 19.1\%$  and pattern average values of thickness and porosity of 95.6 ft and 7.5%, respectively. With the pattern allocated EUR of 145,597 STB, the recovery factor (R.F.) is calculated to be 10.3%. This pattern R.F. is used to estimate the drainage radius and area of each well.



000024

LEASE : C E LAMUNYON  
FIELD : TEAGUE (BLINEBRY) BL  
COUNTY : LEA  
RESERVOIR : BLINEBRY

RYDER SCOTT COMPANY

STATE : NM

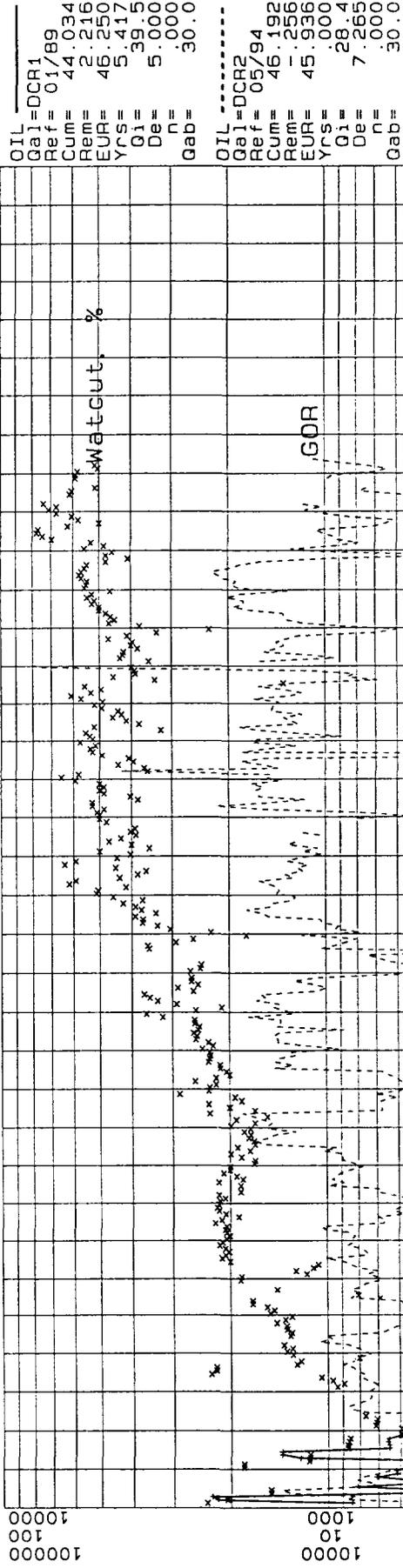


Figure 2

000029

LEASE : C E LAMUNYON  
FIELD : TEAGUE (BLINEBRY) BL  
COUNTY : LEA  
RESERVOIR : BLINEBRY

RYDER SCOTT COMPANY

STATE : NM

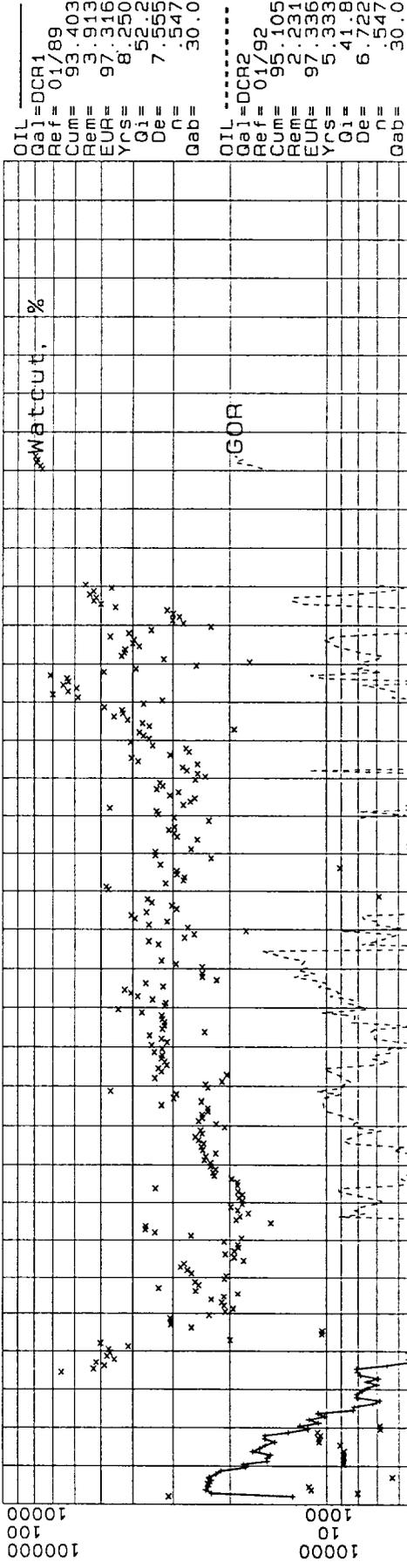


Figure 3

000034

RYDER SCOTT COMPANY  
LEASE : C E LAMUNYON  
FIELD : TEAGUE (BLINEBRY) BL  
COUNTY : LEA  
RESERVOIR : BLINEBRY  
STATE : NM

OIL-----  
Gal=DCR1  
Ref= 01/89  
Cum= 104.886  
Rem= 17.060  
EUR= 121.946  
Yrs= 24.083  
Gi= 104.4  
De= 5.809  
n= .767  
Gab= 30.0

OIL-----  
Gal=DCR2  
Ref= 06/95  
Cum= 114.086  
Rem= 1.238  
EUR= 115.324  
Yrs= 3.000  
Gi= 41.2  
De= 10.296  
n= .000  
Gab= 30.0

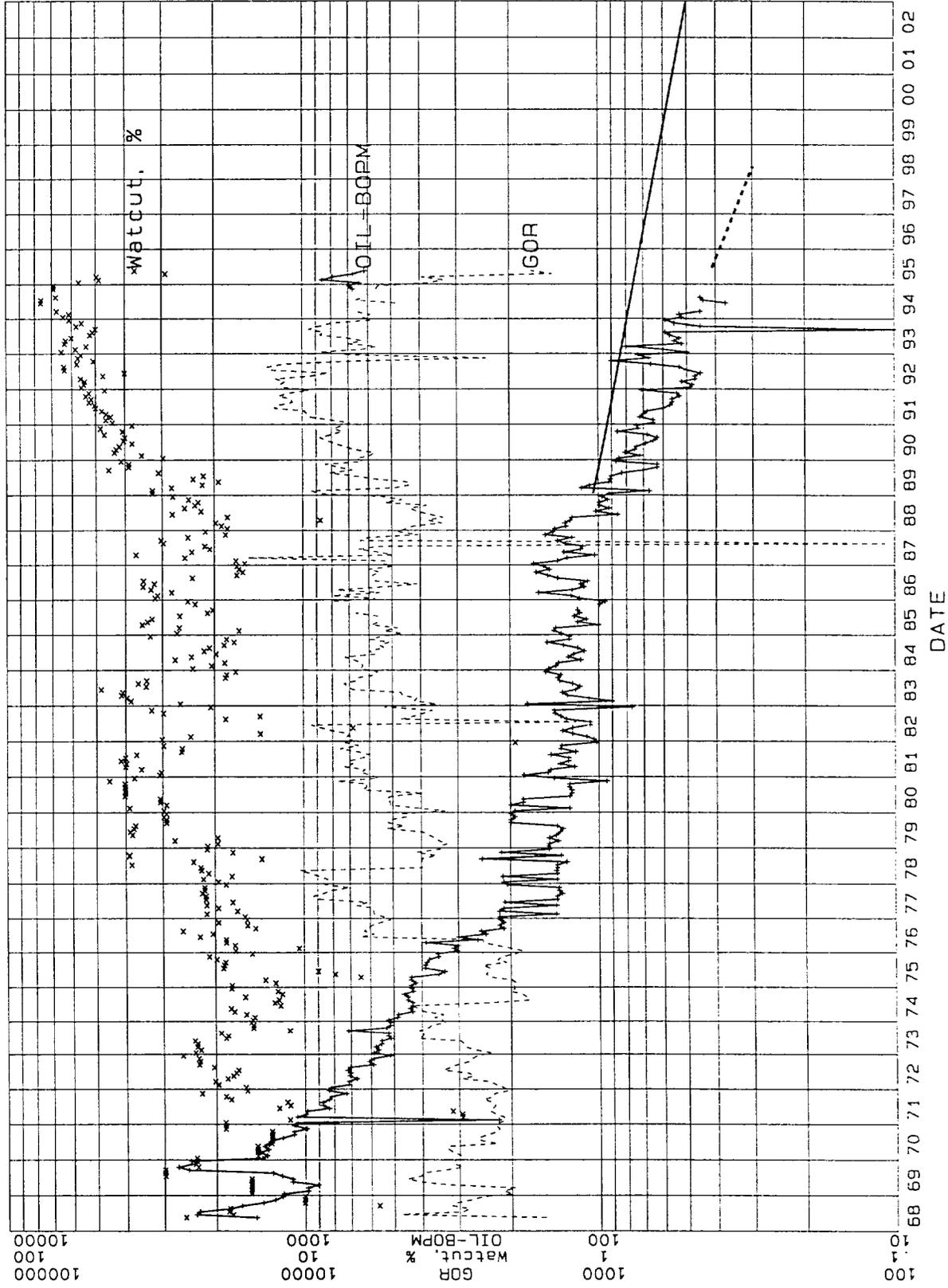


Figure 4

000050  
 LEASE : C E LAMUNYON  
 FIELD : TEAGUE (BLINEBRY) BL  
 COUNTY : LEA  
 RESERVOIR : BLINEBRY  
 STATE : NM

RYDER SCOTT COMPANY

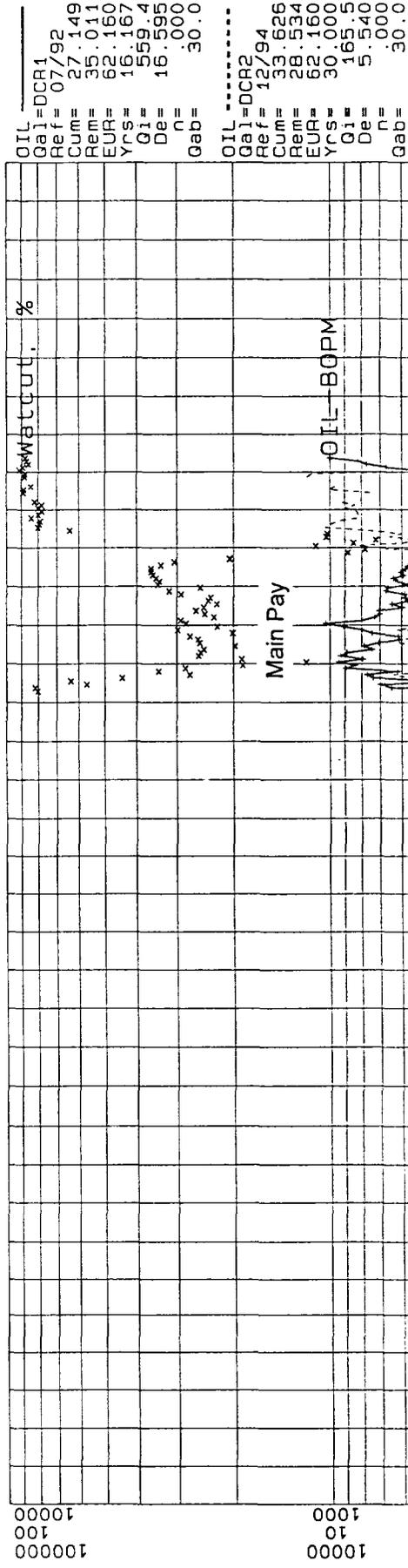
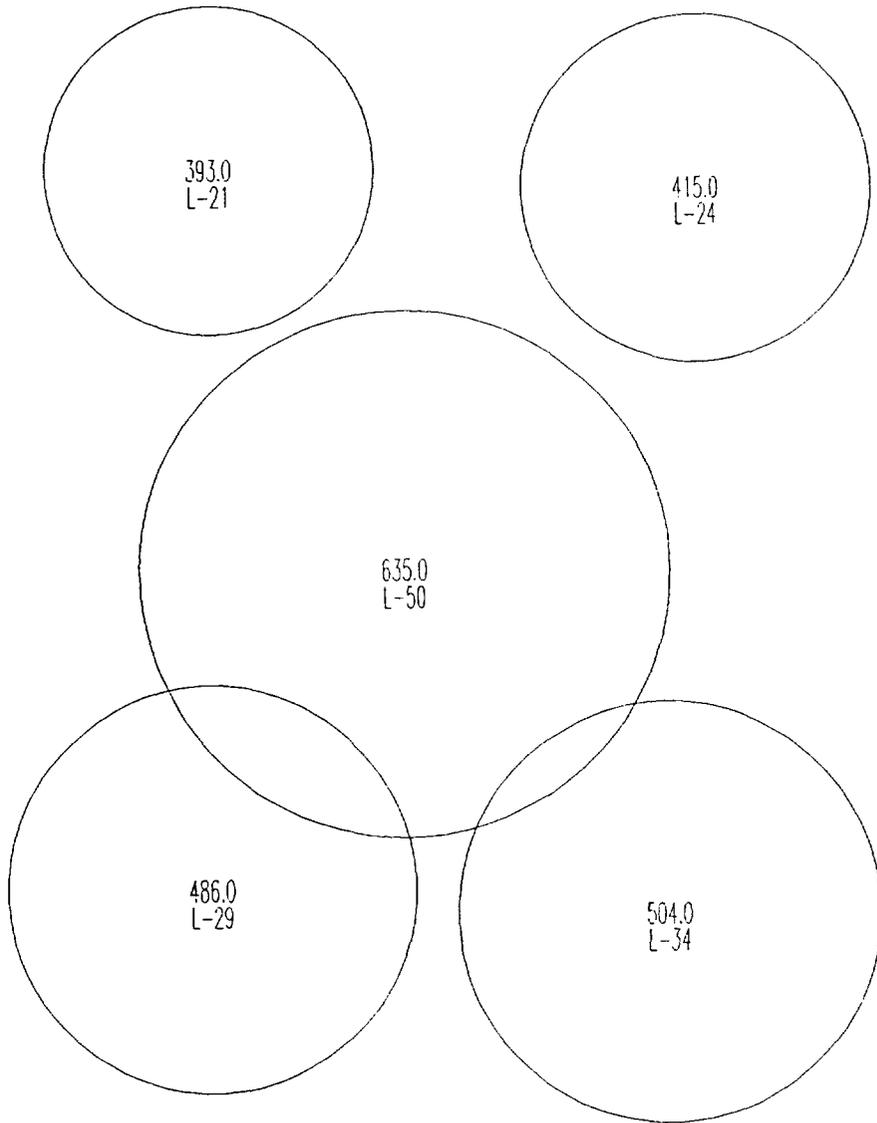


Figure 5



**RYDER SCOTT COMPANY**

**PETROLEUM ENGINEERS**  
HOUSTON, TEXAS

**Figure 6**

**Arch Petroleum Inc.  
C.E. LaMunyon Lease  
20 Acre Infill Well Analysis**

**Drainage Radius (R.F.=10.3%)**

SCALE:

0 |—————| 465 ft

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<b>TEAGUE BLINEBRY FIELD - INFILL WELLS</b>				
<b>Estimated Ultimate Recovery-Drainage Radius</b>				
<b>Current Well</b>	<b>Net Pay, h net, ft.</b>	<b>Est. Ultimate Primary Rec., MSTB</b>	<b>Drainage Acres</b>	<b>Drainage Radius, ft.</b>
GG Travis 2	126	151.3	21.4	545
GG Travis 3	137	112.7	14.7	451
Lamunyon 20	143	58.9	7.3	319
Lamunyon 21	125	111.7	15.9	470
Lamunyon 23	101	76.5	13.5	433
Lamunyon 24	101	55.0	9.7	367
Lamunyon 25	119	134.0	20.1	528
Lamunyon 27	168	177.2	18.8	511
Lamunyon 29	119	95.1	14.3	445
Lamunyon 30	90	109.7	21.7	549
Lamunyon 33	148	114.9	13.9	438
Lamunyon 34	113	137.7	21.7	549
Lamunyon 35	84	37.7	8.0	333
Lamunyon 36	96	59.9	11.1	393
Lamunyon 37	113	184.6	29.1	636
Lamunyon 40	179	158.9	15.8	469
Lamunyon 42	137	124.3	16.2	474
Lamunyon 43	104	24.8	4.3	243
Lamunyon 44	213	135.7	11.4	397
Lamunyon 50*	123	64.6	9.4	360
Saltmount 1	168	124.7	13.2	429
Saltmount 2	119	73.2	11.0	390
Seeton 1	187	221.9	21.2	542
<b>Total/Average</b>	<b>3,013</b>	<b>2,545.0</b>	<b>15.1</b>	<b>457</b>
Assumes: Swi=18%, Avg. Porosity=7.4%, Boi=1.26 RB/STB Recovery Factor=15%				
* Only 20-Acre Infill to date				

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