



Arch Petroleum Inc.

OIL CONSERVATION DIVISION
11-1-77

APR 2 1990

March 28, 1990

State of New Mexico
Energy and Minerals Department
Oil Conservation Commission
P.O. Box 2088
Santa Fe, New Mexico 87504

Attn: Mr. David R. Catanach

Re: Downhole Commingling

Dear David:

Pursuant to our telephone conversation of March 26, 1990 concerning downhole commingling of two productive zones in a new well, I am requesting administrative approval for Exception to Rule 303-A which would permit same.

The required information for this request follows:

- (a) Name of Operator: Arch Petroleum Inc.
777 Taylor Street, Suite II-A
Ft. Worth, Texas 76102
- (b) Lease Name & No.: E.C. Hill "D" Federal No. 6
Location: Unit I, Section 34, T23S, R37E
Lea County, New Mexico
Pools to be Commingled: Teague Devonian, South Teague Abo
- (c) See attached plat for acreage dedication and offset lease ownership, Exhibit C.
- (d) See attached well completion history, Exhibit D.
- (e) See attached prognostication of future production from each zone, Exhibit E.
- (f) See attached bottom hole pressure tests, Exhibit F.
- (g) See attached fluid analysis for oil and water swabbed from Devonian, Exhibit G.
See attached gas analysis for gas flowing from Abo. (Zone does not produce fluids - have not recovered load as yet.) Exhibit H.
- (h) Commingled production values will not be less than the sum of the values of the individual streams. These zones are already permitted for surface commingling and are in a common tank battery by commingling order PC-764.

Page 2
State of New Mexico
March 28, 1990

- (i) See attached formula for the allocation of production to each zone, Exhibit I.
- (j) All offset operators and the BLM have been notified in writing of this proposed commingling, Exhibit J.

Sincerely,

ARCH PETROLEUM INC.



David Miller
Operations Manager

DM/ps

Enclosures

Submit 2 copies to Appropriate
District Office.
DISTRICT I
P.O. Box 1980, Hobbs, NM 88240
DISTRICT II
P.O. Drawer DD, Artesia, NM 88210
DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-116
Revised 1/1/89

OIL CONSERVATION DIVISION

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

GAS - OIL RATIO TEST

Operator Arch Petroleum Inc.		Pool South League Abo		County Lea											
Address 777 Taylor St., Suite II-A, Ft. Worth, Texas 76102		TYPE OF TEST - (X)		Completion <input checked="" type="checkbox"/> Special <input type="checkbox"/>											
LEASE NAME	WELL NO.	LOCATION			DATE OF TEST	CHOKE SIZE	TBG. PRESS.	DAILY ALLOW- ABLE	LENGTH OF TEST HOURS	PROD. DURING TEST			GAS - OIL RATIO CU.FT/BBL.		
		U	S	T						R	WATER BBL.S.	GRAV. OIL		OIL BBL.S.	GAS M.C.F.
E.C. Hill "D" Federal	6	I	34	23S	37E	3/25/90	F	12/64	175	24	0	--	0	115	---

Instructions:

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.

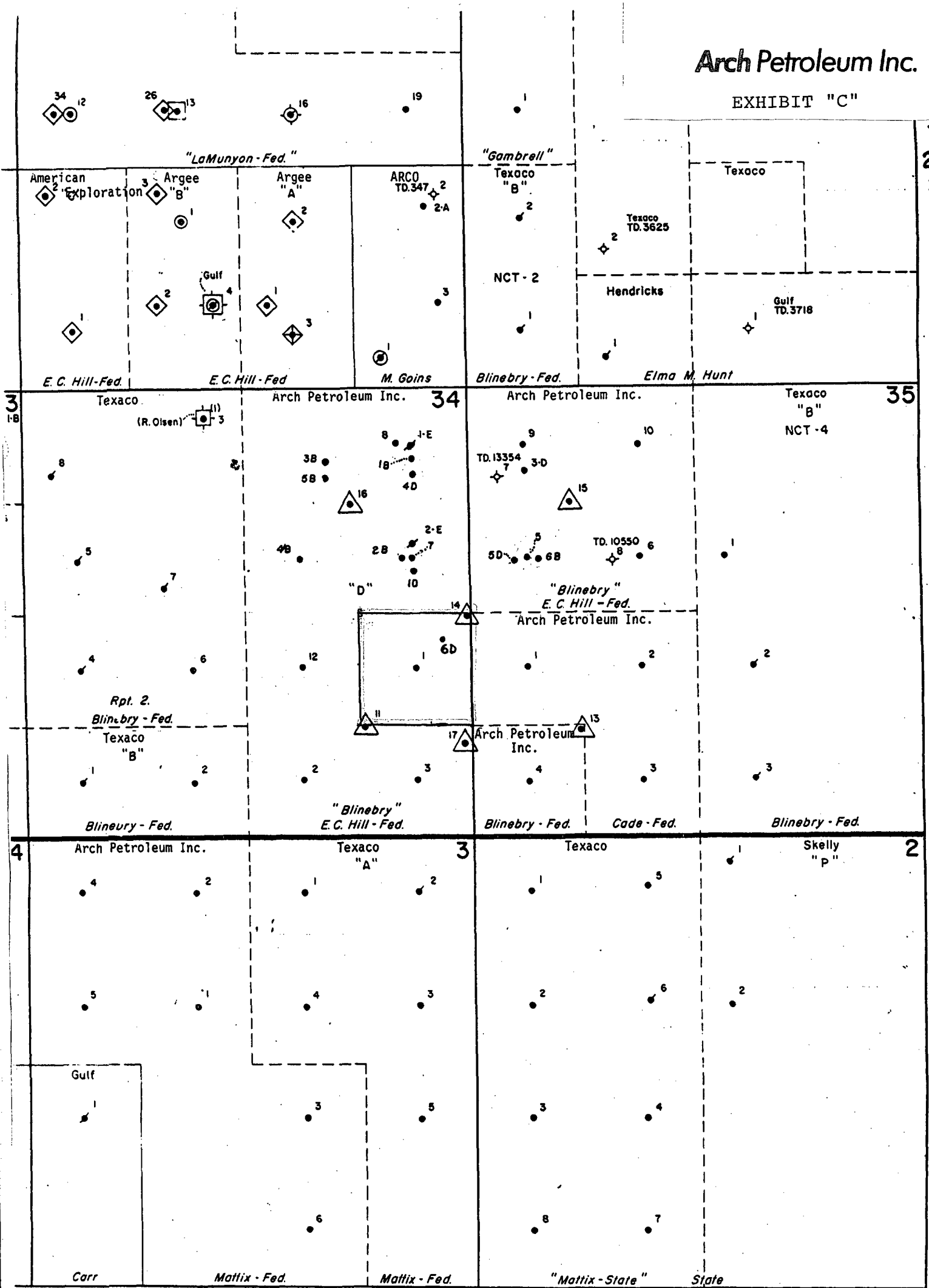
(See Rule 301, Rule 1116 & appropriate pool rules.)

I hereby certify that the above information is true and complete to the best of my knowledge and belief.

Signature David Miller

Printed name and title
David Miller, Operations Manager

Date
3-29-90
915-685-1961
Telephone No.



AGUE (Multi-Pay) FIELD AREA
LEA COUNTY, NEW MEXICO

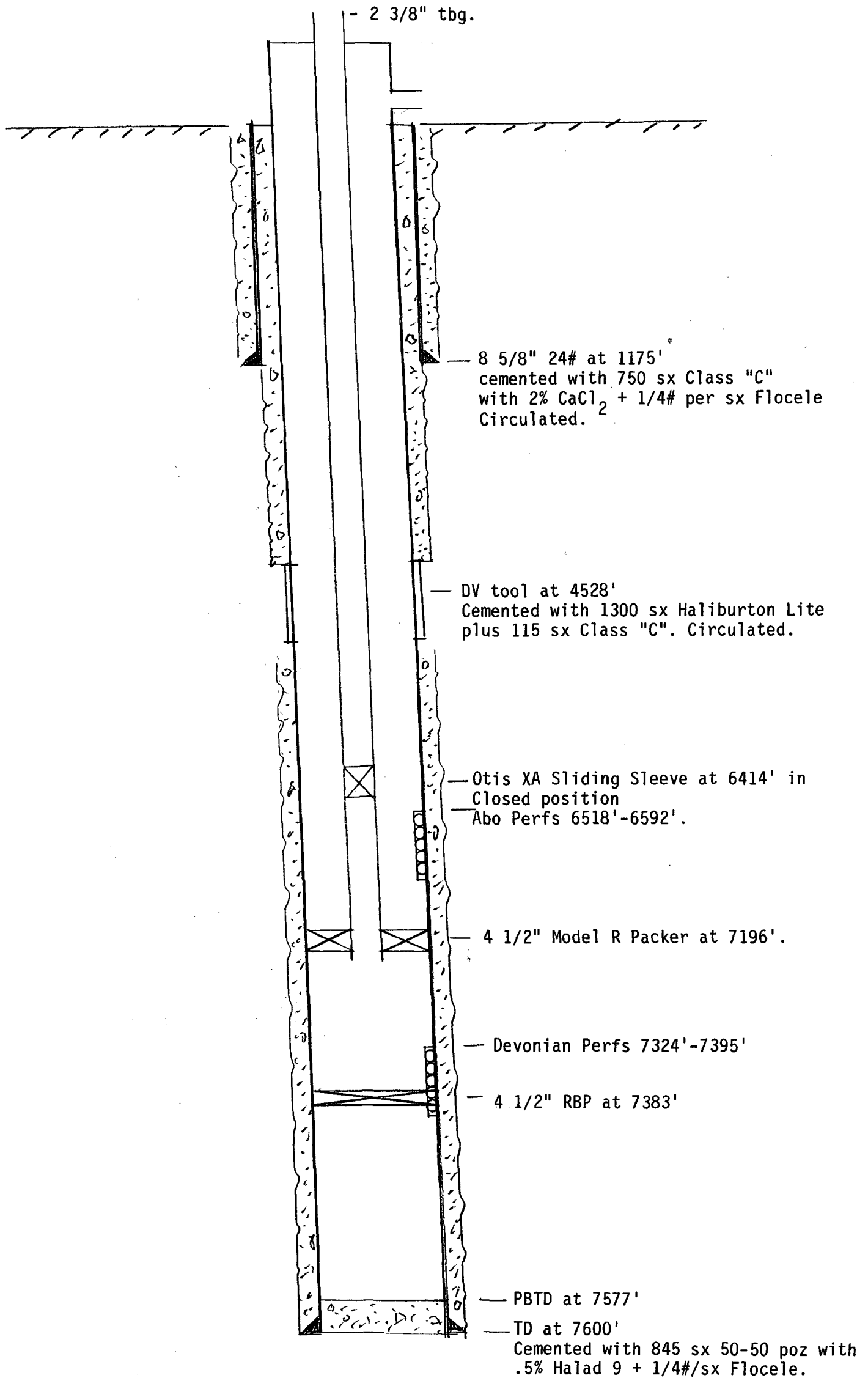
WELL COMPLETION HISTORY

E. C. HILL "D" FEDERAL NO. 6
UNIT I, SECTION 34, T23S, R37E
LEA COUNTY, NEW MEXICO

- 02-17-90 - Drilled cement and DV tool. Pressured csg to 1000#.
- 02-18-90 - TD at 7577'. Ran gamma ray correlation log from 7577-4600'. Perforated with 2 JSPF at 7324-26', 7354', 7372-77', 7380', 7386', 7389-93', 7395'. (36 holes total). Swabbed well.
- 02-21-90 - Acidized with 4000 gallons 20% regular acid and 8000 gallons 20% gelled acid in stages with 25 ball sealers. ISIP: 2000#. 5 SIP: 1900#. 10 SIP: 1450#. 15 SIP: 1360#. Swabbed well.
- 02-27-90 - Bottom Hole Pressure test. Surface TP: 792#. BHP of 1583# at mid-point of perforations, 7360'. No water indicated. Set 4 1/2" CIBP at 7290'. Dumped 1 sx sand on CIBP. Pressured csg to 500#. Perforated 1 JSPF at 6518', 6534-36', 6539-42', 6544', 6546-49', 6551-54', 6560-71', 6573', 6581', 6583-92'. (41 holes total). Swabbed well.
- 02-28-90 - Acidized. Pumped 6000 gallons 15% NEFE acid. Dropped 60 ball sealers. ISIP: 1800#. 5 SIP: 1620#. 10 SIP: 1520#. 15 SIP: 1440#. 45 SIP: 1000#. Swabbed. Well started flowing.
- 03-01-90 - Well flowing on 18/64" choke. TP: 175#. Opened choke up to 42/64" choke. Fluid hit in 5 minutes. Closed to 24/64" choke. Did not recover any fluid for 1 hour. TP: 100#. Opened well up to 32/64" choke. Bled off to 15#. Swabbed. Did not tag any fluid. Put well on 16/64" choke. Pressure increased to 210#.
- 03-02-90 - Bottom Hole Pressure test on Abo zone. Perfs 6518-6592'. Pressure at 6555' - 2361#. Ran 1.781 BFC plug to 6416'. Set plug in profile nipple. Jayed off seal assembly. Perforated 2 JSPF at 6314-6318' (9 holes), 6321-25' (9 holes). Swabbed well.

Well Completion History
Hill "D" Federal No. 6
Lea County, New Mexico
Page 2

- 03-04-90 - Ran cement retainer at 6220'. Unable to pump into formation at 3000#. Spotted 300 gallons 15% NEFE acid. ISIP: 1550#. 5 SIP: 1050#. Swabbed well.
- 03-06-90 - Mixed 50 sx cement with .5% Halad 322 and 50 sx with 2# per sx salt. Squeezed perfs to 3000#.
- 03-07-90 - Drilled cement, cement retainer to 6330'. Pressured csg to 1000#. Circulated sand off bridge plug.
- 03-08-90 - Pulled RBP.
- 03-09-90 - Drilled CIBP at 7290'. Ran 4 1/2" RBP, 4 1/2" model R packer, seating nipple, 24 jts tbg, Otis XA sliding sleeve, 216 jts tbg to 7383'. Set RBP. Pulled 6 jts tbg. Set model R packer at 7196'. Swabbed well (Devonian).
- 03-10-90 - Opened sliding sleeve. Swabbed well (Both zones).
- 03-21-90 - Closed sliding sleeve. Swabbed well (Devonian).
- 03-23-90 - Started selling gas from the Abo on 12/64" positive choke at 6:00 p.m., March 22, 1990.
- 03-24-90 - Swabbed Devonian. SI waiting on downhole commingling permit.

E.C. HILL "D" FEDERAL No. 6
WELLBORE DIAGRAM

E. C. HILL "D" FEDERAL NO. 6
UNIT I, SECTION 34, T23S, R37E
LEA COUNTY, NEW MEXICO

ESTIMATE OF FUTURE PRODUCTION

ABO ZONE - SOUTH TEAGUE ABO POOL
=====

Based on current production:

100 - 110 MCFD gas
0 Barrels Oil
0 Barrels Water

DEVONIAN ZONE - TEAGUE DEVONIAN POOL
=====

Based on Swabbing reports as follows:

Date	Hours Swabbed	Oil & Water Recovered	Est. 24 Hours Recovered	Est. Recovery Artificial Lift
2/22	9	25 + 87	66 + 232	33 + 115
2/23	9	38 + 73	101 + 196	50 + 98
3/21	10	57 + 32	137 + 77	68 + 39
3/22	10	35 + 20	84 + 48	42 + 24

Estimated Production range 40-50 BO + 25-30 BWPD.

Please note: The oil recovered during 4 days of swabbing indicates an increase in oil cut and decrease in water cut for the first 3 days. However, the oil began to decline on the 4th day as did total volume recovered. The last 4 hours of swabbing on day 4 recovered only 3 BO plus 12.7 BW while pulling from the seating nipple. This indicates that fluid entry has slowed drastically and the well has continued to decline in oil production which would indicate that production by artificial lift could be much lower than the chart predicts.

Arch Petroleum Inc.

EXHIBIT "E"

P. O. BOX 5254
MIDLAND, TEXAS 79704

PHONE
915/682-7580

BOTTOM HOLE PRESSURE REPORT

Operator Arch Petroleum Lease Hill "D" Well No. 6
Field _____ Reservoir ABO Datum _____
Test Date 03/01/90 Well Status Static Hours Shut In ± 19 ✓
Tubing 2 3/8 Depth 6416 End open Packer 6416 S. N. 6415
Casing _____ Depth _____ Perf. 6518 - 6592 Total Depth _____

	Depth	Press. Lbs/Sq. In.	△ Press.	Gradient Lbs/Ft.
✓ Tubing Press.....	1872			
Casing Press.....	0	1872		
✓ Top of Fluid.....	1000	1939	67	0.067
Top of Water.....	2000	2011	72	0.072
Temp. @.....°F.....	3000	2083	72	0.072
Elev. KB.....Gl.....	4000	2156	73	0.073
Last Test Date.....	5000	2232	76	0.076
Press. Last Test.....	5500	2272	40	0.080
Change.....0 Per Day.....0.000	6155	2326	54	0.082
Inst. No. 55748 Cal. 1.0.....	6355	2343	17	0.085
Tested By...Allen.....	6555	2361	18	0.090
Calcu. By...Allen.....				
Prod. Index.....Bbls/day/lb.....				
Drop.....	6555	✓2361	Ctr. of Perfs. 0.090	
Cumulative prod.....				

Remarks:

Arch Petroleum Inc.


EXHIBIT "F"
Page 1 of 2

P. O. BOX 5254
MIDLAND, TEXAS 79704

PHONE
915/682-7580

BOTTOM HOLE PRESSURE REPORT

Operator Arch Petroleum Lease Hill "D" Well No. 6
Field _____ Reservoir Devonion Datum _____
Test Date 02/26/90 Well Status Static Hours Shut In _____
Tubing 2 3/8 Depth 7226 End open Packer 7226 S. N. 7225
Casing _____ Depth _____ Perf. 7324 - 7396 Total Depth _____

	Depth	Press. Lbs/Sq. In.	 Press.	Gradient Lbs/Ft.
Tubing Press.....		792		
Casing Press.....	0	792		
Top of Fluid.....	1000	814	22	0.022
Top of Water.....	2000	837	23	0.023
Temp. @.....°F.....	4000	883	46	0.023
Elev. KB.....Gf.....	6000	1159	276	0.138
Last Test Date.....	6500	1314	155	0.310
Press. Last Test.....	6960	1457	143	0.311
Change.....0 Per Day.....0.000	7160	1520	63	0.315
Inst. No...63592...Cal....1.2887	7360	1583	63	0.315
Tested By...Allen.....				
Calcu. By...Allen.....				
Prod. Index.....Bbls/day/lb.....	7360	1583	Ctr. of Perfs. 0.315	
Drop				
Cumulative prod.....				

Remarks:

On Bottom @ 7:45 A.M.

Arch Petroleum Inc.

EXHIBIT "F"
Page 2 of 2

Dickey**Analytical Laboratory, Inc.****P.O. Box 2163
Midland, Texas 79702
915 - 687-2240****ARCH PETROLEUM
10 DESTA DRIVE, SUITE 420 EAST
MIDLAND, TEXAS 79705****MARCH 29, 1990****WELL, LEASE: HILL D #6
REFERENCE NUMBER: DL-9547****API OIL GRAVITY = 36.5 @ 60°F****R. S. DICKEY
DICKEY ANALYTICAL LABORATORY, INC.****Arch Petroleum Inc.**
EXHIBIT "G"
Page 1 of 2

Dickey**Analytical Laboratory, Inc.**P.O. Box 2163
Midland, Texas 79702
915 - 687-2240ARCH PETROLEUM
HILL D #6
DL-9547MARCH 29, 1990
FORMATION: DEVONIAN
SUBMITTED BY: D. HALE

DISSOLVED SOLIDS

CATIONS	MG/L	ME/L
SODIUM, Na (calc.)	31372	1364
CALCIUM, Ca	7619	380
MAGNESIUM, Mg	2673	220

ANIONS

CHLORIDE, Cl	68160	1922
SULFATE, SO4	1670	35
CARBONATE, CO3	0	0
BICARBONATE, HCO3	439	7

TOTAL DISSOLVED SOLIDS (calc.)

111933

IRON, (DISSOLVED) 1
SULFIDE, as H2S NONE DETECTED

OTHER PROPERTIES

pH	7.6
SPECIFIC GRAVITY, 60/60 F.	1.076
RESISTIVITY (ohm-meters) 75 F.	.0725
HARDNESS, mg/L CaCO3	30032

REMARKS:

SI @ 100 F = 1.72
SI @ 140 F = 2.40
CALCIUM SULFATE DEPOSITION @ 100F = POSITIVE
CALCIUM SULFATE DEPOSITION @ 140F = POSITIVE

The Stiff-Davis equation indicates that a positive Stability Index (SI) has a tendency toward calcium carbonate deposition.

R.S. DICKEY
DICKEY ANALYTICAL LABORATORY, INC.**Arch Petroleum Inc.**

EXHIBIT "G"

Page 2 of 2



Laboratory Services

1331 Tasker Drive
Hobbs, New Mexico 88240

Telephone: (505) 397-3713

FOR: Arch Petroleum Corp.
Attention: Mr. Don Hale
10 Desta Suite 420 East
Midland, Texas 79705

SAMPLE
IDENTIFICATION: Hill D #6
COMPANY: Arch Petroleum
LEASE:
PLANT:

SAMPLE DATA: DATE SAMPLED: 03/27/90 1:45 PM GAS (XX) LIQUID ()
ANALYSIS DATE: 03-27-90 SAMPLED BY: Rolland Perry
PRESSURE - PSIG 28 ANALYSIS BY: Rolland Perry
SAMPLE TEMP. °F
ATMOS. TEMP. °F 62

REMARKS: Sampled At The North Meter Run.
H2S = 0 PPM Mercaptan Sulfur = 1.5 PPM

COMPONENT ANALYSIS

COMPONENT	MOL PERCENT	GPM
Hydrogen Sulfide (H2S)	0.00	
Nitrogen (N2)	2.38	
Carbon Dioxide (CO2)	0.30	
Methane (C1)	81.32	
Ethane (C2)	9.19	2.443
Propane (C3)	4.31	1.182
I-Butane (IC4)	0.38	0.122
N-Butane (NC4)	1.25	0.392
I-Pentane (IC5)	0.21	0.076
N-Pentane (NC5)	0.28	0.099
Hexane (C6)	0.38	0.165
Heptanes Plus (C7+)	0.00	0.000
	100.00	4.479

BTU/CU.FT. - DRY	1183	MOLECULAR WT	20.1296
AT 14.650 DRY	1186		
AT 14.650 WET	1166	26# GASOLINE -	0.471
AT 15.025 DRY	1157		
AT 15.025 WET	1137		

SPECIFIC GRAVITY -
CALCULATED 0.695
MEASURED

Arch Petroleum Inc.

EXHIBIT "H"



Arch Petroleum Inc.

ALLOCATION FOR PRODUCTION TO EACH ZONE

ABO - Currently producing and allocation to be based on 100-110 MCFD gas only. No fluids have been or are expected to be produced at this point.

DEVONIAN - All other gas produced plus oil and water produced will be allocated to the zone.

Arch Petroleum Inc.

EXHIBIT "I"



Arch Petroleum Inc.

EXHIBIT "J"

PAGE 1 OF 8

Arch Petroleum Inc.

March 29, 1990

Bureau of Land Management
P.O. Box 1778
Carlsbad, New Mexico 88220

RE: E.C. Hill "D" Federal No. 6
Unit I, Sec. 34, T23S, R37E
Lea County, New Mexico
Waiver of Objection to Rule
303-A Exception

Dear Sir:

Arch Petroleum Inc. has applied to the New Mexico Oil Conservation Commission for an Exception to Rule 303-A which would allow Arch to downhole commingle the Devonian Zone at 7300'-7400' in the Teague Devonian Pool with the Abo zone at 6500'-6600' in the South Teague Abo Pool.

If you have no objections to this request please sign and date the attached waiver and send one copy to Mr. David Catanach and one copy to Arch in the envelopes provided.

Sincerely,

David Miller

DM/slw
Attachments



Arch Petroleum Inc.

March 29, 1990

Arch Petroleum Inc.

EXHIBIT "J"

PAGE 2 of 8

Mr. David Catanach
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: Arch Petroleum Inc.
E.C. Hill "D" Federal No. 6
Unit I, Sec 34, T23S, R37E
Lea County, New Mexico

WAIVER OF OBJECTION TO RULE 303-A EXCEPTION

Bureau of Land Management has no objections to Arch Petroleum's request to downhole commingle the South Teague Abo and the Teague Devonian pools in the referenced well bore.

NAME _____

SIGNATURE _____

DATE _____



Arch Petroleum Inc.

EXHIBIT "J"

PAGE 3 of 8

Arch Petroleum Inc.

March 29, 1990

Argee Oil Co.
810 Midland American Bank Bldg.
401 W. Texas
Midland, Texas 79701

RE: E.C. Hill "D" Federal No. 6
Unit I, Sec. 34, T23S, R37E
Lea County, New Mexico
Waiver of Objection to Rule
303-A Exception

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Sincerely,

David Miller

DM/slw
Attachments



Arch Petroleum Inc.

March 29, 1990

Mr. David Catanach
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: Arch Petroleum Inc.
E.C. Hill "D" Federal No. 6
Unit I, Sec 34, T23S, R37E
Lea County, New Mexico

WAIVER OF OBJECTION TO RULE 303-A EXCEPTION

Argee Oil Co. has no objections to Arch Petroleum's request to downhole commingle the South Teague Abo and the Teague Devonian pools in the referenced well bore.

NAME _____

SIGNATURE _____

DATE _____



Arch Petroleum Inc.

March 29, 1990

ARCO Oil & Gas Co.
Box 1610
Midland, Texas 79702

RE: E.C. Hill "D" Federal No. 6
Unit I, Sec. 34, T23S, R37E
Lea County, New Mexico
Waiver of Objection to Rule
303-A Exception

Dear Sir:

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If you have no objections to this request please sign and date the attached waiver and send one copy to Mr. David Catanach and one copy to Arch in the envelopes provided.

Sincerely,

David Miller

DM/slw
Attachments



Arch Petroleum Inc.

March 29, 1990

Mr. David Catanach
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: Arch Petroleum Inc.
E.C. Hill "D" Federal No. 6
Unit I, Sec 34, T23S, R37E
Lea County, New Mexico

WAIVER OF OBJECTION TO RULE 303-A EXCEPTION

ARCO Oil & Gas Co. has no objections to Arch Petroleum's request to downhole commingle the South Teague Abo and the Teague Devonian pools in the referenced well bore.

NAME _____

SIGNATURE _____

DATE _____



Arch Petroleum Inc.

EXHIBIT "J"

PAGE 7 of 8

Arch Petroleum Inc.

March 29, 1990

Texaco Inc.
Box 3109
Midland, Texas 79702

RE: E.C. Hill "D" Federal No. 6
Unit I, Sec. 34, T23S, R37E
Lea County, New Mexico
Waiver of Objection to Rule
303-A Exception

Dear Sir:

Arch Petroleum Inc. has applied to the New Mexico Oil Conservation Commission for an Exception to Rule 303-A which would allow Arch to downhole commingle the Devonian Zone at 7300'-7400' in the Teague Devonian Pool with the Abo zone at 6500'-6600' in the South Teague Abo Pool.

If you have no objections to this request please sign and date the attached waiver and send one copy to Mr. David Catanach and one copy to Arch in the envelopes provided.

Sincerely,

David Miller

DM/slw
Attachments



Arch Petroleum Inc.

March 29, 1990

Mr. David Catanach
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: Arch Petroleum Inc.
E.C. Hill "D" Federal No. 6
Unit I, Sec 34, T23S, R37E
Lea County, New Mexico

WAIVER OF OBJECTION TO RULE 303-A EXCEPTION

Texaco, Inc. has no objections to Arch Petroleum's request to downhole commingle the South Teague Abo and the Teague Devonian pools in the referenced well bore.

NAME _____

SIGNATURE _____

DATE _____

OIL CONSERVATION DIVISION
RECEIVED

'90 APR 4 AM 8 48



Arch Petroleum Inc.

March 29, 1990

Mr. David Catanach
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: Arch Petroleum Inc.
E.C. Hill "D" Federal No. 6
Unit I, Sec 34, T23S, R37E
Lea County, New Mexico

WAIVER OF OBJECTION TO RULE 303-A EXCEPTION

Argee Oil Co. has no objections to Arch Petroleum's request to downhole commingle the South Teague Abo and the Teague Devonian pools in the referenced well bore.

NAME

SIGNATURE

DATE

Argee Oil Company
R. D. Mueller
April 2 1990



Arch Petroleum Inc.

March 29, 1990

OIL CONSERVATION DIVISION
RECEIVED

'90 APR 20 AM 8 52

Mr. David Catanach
New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: Arch Petroleum Inc.
E.C. Hill "D" Federal No. 6
Unit I, Sec 34, T23S, R37E
Lea County, New Mexico

WAIVER OF OBJECTION TO RULE 303-A EXCEPTION

Bureau of Land Management has no objections to Arch Petroleum's request to downhole commingle the South Teague Abo and the Teague Devonian pools in the referenced well bore.

NAME Shannon J. Shaw

SIGNATURE Shannon J. Shaw

DATE 4/17/90



STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

HOBBS DISTRICT OFFICE

4-12-90 90 APR 16 AM 9 34

GARREY CARRUTHERS
GOVERNOR

POST OFFICE BOX 1980
HOBBS, NEW MEXICO 88241-1980
(505) 393-6161

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

RE: Proposed:

MC _____
DHC X _____
NSL _____
NSP _____
SWD _____
WFX _____
PMX _____

Gentlemen:

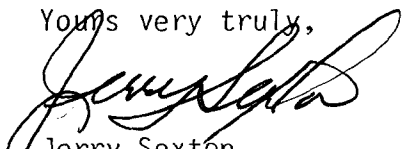
I have examined the application for the:

Arch Pet. Inc. E.C. Hill Federal #6-I 34-23-37
Operator Lease & Well No. Unit S-T-R

and my recommendations are as follows:

NO RECOMMENDATION

Yours very truly,


Jerry Sexton
Supervisor, District 1

/ed