

MARTIN YATES, III  
1912 - 1985  
FRANK W. YATES  
1936 - 1986



105 SOUTH FOURTH STREET  
ARTESIA, NEW MEXICO 88210  
TELEPHONE (505) 748-1471

S. P. YATES  
CHAIRMAN OF THE BOARD  
JOHN A. YATES  
PRESIDENT  
PEYTON YATES  
EXECUTIVE VICE PRESIDENT  
RANDY G. PATTERSON  
SECRETARY  
DENNIS G. KINSEY  
TREASURER

May 3, 1991

State of New Mexico  
OIL CONSERVATION DIVISION  
P. O. Box 2088  
Santa Fe, NM 87501  
ATTN: Mr. David Catanach

Dear Mr. Catanach,

Enclosed are the necessary documents for obtaining approval for the downhole commingling of the East Apple State Unit #1 located in G of Section 5, Township 26 South, Range 28 East.

Should you have any questions, please feel free to contact me at (505) 748-1471. Thank you.

Sincerely,

Brian Collins  
Petroleum Engineer

BC/th

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TREASURER

May 3, 1991

Marshall & Winston, Inc.  
P. O. Box 874  
Midland, TX 79702  
ATTN: Mr. William S. Marshall

Dear Mr. Marshall:

Enclosed please find a copy of the application for commingling the East Apple State Unit #1 located in G of Section 5-T26S-R28E. This copy of the application to commingle fulfills our requirement to notify offset operators per NMOCD Rule 303 D (10).

Should you have any questions, please feel free to contact me at (505) 748-1471.

Sincerely,

Brian Collins  
Petroleum Engineer

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May 3, 1991

State of New Mexico  
OIL CONSERVATION DIVISION  
P. O. Drawer DD  
Artesia, NM 88210  
ATTN: Mr. Mike Williams

Dear Mr. Williams,

Enclosed are the necessary documents for obtaining approval for the downhole commingling of the East Apple State Unit #1 located in G of Section 5, Township 26 South, Range 28 East.

Should you have any questions, please feel free to contact me at (505) 748-1471. Thank you.

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May 3, 1991

Harvey E. Yates Company  
Explorers Petroleum Corp.  
Spiral, Incorporated  
Heyco Employees LTD.  
P. O. Box 1933  
Roswell, NM 88201  
ATTN: Mr. Bob Bell

Dear Mr. Bell:

Enclosed please find a copy of the application for commingling the East Apple State Unit #1 located in G of Section 5-T26S-R28E. This copy of the application to commingle fulfills our requirement to notify offset operators per NMOC Rule 303 D (10).

Should you have any questions, please feel free to contact me at (505) 748-1471.

Sincerely,

Brian Collins  
Petroleum Engineer

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DENNIS G. KINSEY  
TREASURER

May 3, 1991

Yates Energy Corporation  
Suite 1010  
Sunwest Centre  
Roswell, NM 88201  
ATTN: Mr. Fred G. Yates

Dear Mr. Yates:

Enclosed please find a copy of the application for commingling the East Apple State Unit #1 located in G of Section 5-T26S-R28E. This copy of the application to commingle fulfills our requirement to notify offset operators per NMOC Rule 303 D (10).

Should you have any questions, please feel free to contact me at (505) 748-1471.

Sincerely,

Brian Collins  
Petroleum Engineer

BC/th

'91 MAY 7 AM 11 39

COMMINGLING DATA FOR THE EAST APPLE STATE UNIT #1

1> Name and Address of the Operator:

Yates Petroleum Corporation  
105 South Fourth Street  
Artesia, NM 88210  
ATTN: Brian Collins

2> Lease Name, Well Number, Well Location, Name of the Pools to be commingled:

East Apple State Unit #1  
Unit G Sec 5-T26S-R28E  
1980' FNL & 1980' FEL  
Pools: Delaware River Bone Spring

3> A plat of the area showing the acreage dedicated to the well and the ownership of all offsetting leases.

See Attachment A (map)

4> A current (within 30 days) 24-hour productivity test on Division Form C-116 showing the amount of oil, gas, and water produced from each zone.

Bone Spring

6812'-7955'

See attached monthly production history summary (Attachment B). Typical production is 6-7 BOPD/20-40 MCFGPD.

Delaware

4765'-5145'

See attached workover summary (Attachment C). Delaware interval 5115'-5145' pumped 1 BOPD/99 BOPD. Delaware interval 4981'-4991' swabbed 2 BO/12 BOPD. Interval 4857'-4896' swabbed 78 BFPD with 4-5 % oil cut. Interval 4765'-4772' swabbed 61 BFPD with 3 % oil cut.

5> A production decline curve for both zones showing that for a period of at least one year a steady rate of

decline has been established for each zone which will permit a reasonable allocation of the commingled production to each zone for statistical purposes. (This requirement may be dispensed with in the case of a newly completed or recently completed well which has little or no production history. However, a complete description of treating, testing, etc., of each zone, and a prognostication of future production from each zone shall be submitted.)

See Attachment C (workover history)

See Attachment B (Bone Spring monthly production history)

Prognostication of Bone Spring reserves derived by assuming an exponential decline rate of 50%/yr. (best engineering estimate).

$$\begin{aligned} Q_i &= 6 \text{ BOPD, } 30 \text{ MCFPD} \\ Q_{el} &= 1 \text{ BOPD, } 5 \text{ MCFPD} \\ d &= 50\% / \text{yr.} \end{aligned}$$

$$N \text{ oil} = \frac{365 (Q_{el} - Q_i)}{\ln (1-d)} = \frac{365 (1-6)}{\ln (.5)} = 2633 \text{ BO}$$

$$N \text{ gas} = \frac{365 (5-30)}{\ln (.5)} = 13,165 \text{ MCF}$$

Prognostication of Delaware reserves derived by assuming an exponential decline rate of 70% / yr. for 1 year followed by a 15% / yr. decline (best engineering estimate). An initial production rate of 8 BOPD is derived from swab and pump tests shown in the workover history.

$$\begin{aligned} Q_i &= 8 \text{ BOPD} \\ Q, 1 \text{ yr.} &= 2.4 \text{ BOPD} \quad Q, \text{ E.L.} = 1 \text{ BOPD} \\ d &= 70\% / \text{yr. first year followed by } 15\% / \text{yr.} \end{aligned}$$

$$N = \frac{365 (2.4-8)}{\ln (.3)} + \frac{365 (1-2.4)}{\ln (.85)} = 4842 \text{ BO}$$

Gas was TSTM during testing. Gas reserve = 0.

- 6> Estimated bottom-hole pressure for each artificially lifted zone. A current (within 30 days) measured bottom-hole pressure for each zone capable of flowing.

Estimated BHP of Bone Spring = 2588 psi at 6000' based on direct BHP measurement performed 2-7-90.

Estimated BHP of Delaware = 2137 psi at 4955' from pressure gradient of Bone Spring.

$$\frac{(2588 \text{ psi})}{(6000 \text{ ft.})} (4955 \text{ ft.}) = 2137 \text{ psi}$$

- 7> A description of the fluid characteristics of each zone showing that the fluids will not be incompatible in the well-bore.

Both zones produce sweet oil and gas. There are no incompatibility problems.

- 8> A computation showing that the value of the commingled production will not be less than the sum of the values of the individual streams.

Both zones produce sweet oil and gas. The value of the commingled production will not be less than the sum of the values of the individual streams.

By commingling the Bone Spring with the Delaware, an estimated additional 2633 bbls. of oil and 13,165 MCF of gas reserves will be produced during the life of the well.

- 9> A formula for the allocation of production to each of the commingled zones and a description of the factors or data used in determining such formula.

Oil: Bone Spring -  $\frac{2633}{7475} \text{ BO} = 35.22\%$ , say 35%

Delaware -  $\frac{4842}{7475} \text{ BO} = 64.78\%$ , say 65%

Gas

Bone Spring - 100 %

Delaware - 0 %

- 10> A statement that all offset operators and, in the case of a well on federal land, the US BLM, have been notified in writing of the proposed commingling.

The Offset Operators for this area were notified of the proposed commingling of the East Apple State Unit #1.



## ATTACHMENT A



## DRILLING REPORT - WORKOVER

Page 1

Yates Petroleum Corp. - East Apple State Unit #1 (Unit G) 5-26S-28E  
 \*\*\*\*\*Eddy County, New Mexico\*\*\*\*\*

2-14-91 Dug pit. Set tank. Rigged up unit. Pulled rods and pump. DC \$2007

2-15-91 Pulled 2-7/8" tubing. Laid down excess. WIH with RBP and packer. Set RBP at 6000'. Set packer above and tested to 2000#. Loaded hole with 2% KCL water. POH with packer. Rigged up wireline with lubricator. Perforated 5115-5117', 5121-5124', 5127-5129', 5132-5134', 5138-5140' and 5143-5145' with 19 holes. WIH with packer. Set at 5000'. Tested annulus to 1000#. Started to swab. Could not go below 1700'. Paraffin in tubing. DC \$4304.50; CC \$6311.50

2-16-91 Cleared restriction in tubing. Swabbed dry. Acidized Brushy Canyon perms 5115-5145' with 2000 gals 7-1/2% NEFE HCL acid and 38 ball sealers. Balled out. Treating Pressures: Min 1360#, Max 3000# at 4 BPM, Avg 1360# at 3.9 BPM. ISDP 830#, 5 mins 790#, 10 mins 760#, 15 mins 740#. Total load to recover 82 bbls. Recovered 52 bbls water. Swabbed dry. DC \$5947.62; CC \$12,259.12

2-17-18-91 SITP 0#. Fluid level 2500'. Recovered 14 bbls. Swabbed dry with no show of gas. DC \$1185; CC \$13,444.12

2-19-91 SITP 20#. Initial fluid level 1400'. Recovered 25 bbls fluid. Last 3 runs, 2-3% oil cut. Swabbed dry. Total load to recover 82 bbls. Total load recovered 91 bbls. DC \$1725; CC \$15,169.12

WATER ANALYSIS:	2-15-91	2-16-91	2-18-91
Spec Gravity	1.140	1.170	1.185
Resistivity	.055 @ 70	.048 @ 78	.05 @ 71
pH	3.8	5.3	6.2
Calcium	28500	28000	33000
Magnesium	Nil	4500	1500
Chlorides	143500	183500	202000
Sulfates	Light	Light	Light
Bicarbonates	Nil	244	61
Iron	Heavy	Moderate	Heavy

2-20-91 Shut in.

2-21-91 Frac'd perms 5115-5145' (19 holes) with 5000 gals 40# Purgel with 900# 20/40 sand. Treating Pressures: Max 1370# at 4.6 BPM, Min 880#. Avg 1000# at 4.4 BPM. Total load to recover 163 bbls. ISDP 850#, 5 mins 810#, 10 mins 800#, 15 mins 770#. DC \$5976.07; CC \$21,145.19

2-22-91 SITP 500#. Flowed back 25 bbls. Swabbed 145 bbls. Total load to recover 163 bbls. Recovered 170 bbls. Fluid level 4000'. Swabbing from seating nipple, 2-3% oil cut on last 3 runs. DC \$2325; CC \$23,470.19

2-23-91 SITP 25#. Initial fluid level 1600'. Recovered 52 bbls fluid with 5-10% oil cut on last two runs. Pulled tubing. Went back in hole with tubing, mud anchor, perf joint, seating nipple and anchor. Set at 5009'. DC \$1765; CC \$25,235.19

2-24-25-91 Ran pump and rods. Spaced out. Good pump action. Rigged down. DC \$1050; CC \$26,285.19

2-24-91 - pumped 0 bbls oil and 112 bbls water.

WATER ANALYSIS:	2-22-91
Spec Gravity	1.175
pH	5.9
Calcium	27600
Magnesium	4140
Iron	Light
Resistivity	.0480769 @ 75
Chlorides	194,500
Sulfates	Light
Bicarbonates	Nil

2-25-91 Pumped 4-1/2 bbls oil and 121 bbls water.

2-26-91 Pumped 7 bbls oil and 72 bbls water.

2-27-91 Pumped 2 bbls oil and 112 bbls water.

2-28-91 Pumped 2 bbls oil and 101 bbls water.

3-1-91 Pumped 0 bbls oil and 105 bbls water.

3-2-91 Pumped 4 bbls oil and 75 bbls water.

3-3-91 Pumped 1 bbls oil and 108 bbls water.

3-4-91 Pumped 1 bbl oil and 99 bbls water.

# DRILLING REPORT - WORKOVER

Page 2

Yates Pet. - East Apple State Unit #1 (Unit G) 5-26S-28E Eddy Co., NM

\*\*\*\*\*

3-6-91 Moved on and rigged up. Set tank. Pulled rods and pump. DC \$1560; CC \$27,845.19

3-7-91 POH with tubing and anchor. RIH with RBP with ball catcher and packer. Set RBP at 5050'. Tested to 2000#. POH. Prep to perforate. DC \$2750; CC \$39,034.78

3-8-91 Rigged up wireline. Perforated 4981-4991' (11 shots); 4857', 59', 70', 71', 79', 82', 84', 88', 90', 92', 94', 96' (12 shots) and 4765-4772' (8 shots) - open hole log depths. WIH with packer. Set at 4950'. Acidized Brushy Canyon perforations 4981-4991' with 1000 gals of 7-1/2% NEFE and 24 ball sealers. Treating pressure: Max psi on ball out 3500#, Max rate 3.3 BPM, avg rate 2.7 BPM. ISDP 640#, 5 min 600#, 10 min 570#, 15 min 550#. Load to recover 58 bbls. Recovered 49 bbls. Water sample to Halliburton. DC \$6378.12; CC \$45,412.90

3-9-91 SITP 45#. First fluid level 2400' from surface. Swabbed dry to seating nipple. Recovered 25 bbls (21 bbls water and 4 bbls oil). Water sample to Halliburton. DC \$1682; CC \$47,094.90

3-10-11-91 SITP 25#. First fluid level 3200' from surface. Swabbed dry. Recovered 12 bbls (10 bbls water and 2 bbls oil). Water sample to Halliburton. DC \$1165; CC \$48,259.90

3-12-91 Moved up hole. Reset RBP at 4950'. Tested to 1500#. Set packer at 4820'. Acidized perfs 4857-4896' with 1500 gals 7-1/2% NEFE acid and 24 ball sealers. Balled out 3200#. Max press 2200#, Avg 1400#. ISDP 630#, 5 mins 530#, 10 mins 490#, 15 mins 480#. Load to recover 68 bbls. Recovered 52 bbls water. Swabbed to seating nipple. DC \$3869.12; CC \$52,129.02

3-13-91 SITP 35#. Initial fluid level 1800'. Recovered 66 bbls fluid. Swabbed to seating nipple - 2 to 2-1/2 BPH on hourly runs. Had 1% oil cut on last two runs. DC \$1592.50; CC \$53,721.52

3-14-91 SITP 20#. First fluid level 1800' from surface - 4-5% oil cut on first run. Recovered 78 bbl of fluid. On hour test, 1 gal of oil and 41 gals water. Prep to move to Zone 3 4765-4772' Cherry Canyon. DC \$1862.50; CC \$55,584.02

3-15-91 Reset RBP at 4820'. Tested to 1150#. Acidized Cherry Canyon perfs at 4765-4772' with 1000 gals of 7-1/2" NEFE and 16 ball sealers. Treating pressure: Max psi 3200# on ball out. Avg psi 1850#. Max rate 3.5 BPM, Avg rate 3.0 BPM. ISDP 570#, 5 min 480#, 10 min 430#, 15 min 400#. Load to recover 62.4 bbls. Load recovered 57 bbls of treating fluid. DC \$3633.82; CC \$59,217.84

3-16-91 SITP 95#. First fluid level 1600' from surface. First run 20% oil. Second run 2% oil cut. Recovered 65 bbls (2-1/2 bbls oil). Water sample to Halliburton. DC \$1682.50; CC \$60,900.34

3-17-18-91 SITP 95#. First fluid level 2100' form surface. First run 20% oil. Total fluid recovered 61 bbls (59-1/4 bbls water and 1-3/4 bbls oil). Water sample to Halliburton. DC \$1562.50; CC \$62,462.84

WATER ANALYSIS:	3-15-91	3-16-91
Resistivity	0.04975 @ 72	0.05102 @ 70
Sp. Gravity	1.185	1.187
pH	4.8	5.6
Calcium	29600	31450
Magnesium	4440	4410
Chlorides	192,500	197,500
Sulfates	light	light
Bicarbonates	nil	61
Soluble Iron	moderate	light

3-19-91 Shut in. Prep to frac interval 4981-4991'.

3-20-91 POH with packer and RBP with ball catcher. WIH with RBP and packer. Set RBP at 5050'. Tested to 2000#. Straddled perfs 4981-4991'. Set packer at 4937'. Started pad. Communicated up. Shut down. DC \$2095; CC \$64,557.84

3-21-91 Shut in.

3-22-91 RIH with mud anchor and perf joint, seating nipple anchor. Ran pump and rods. Spaced out. Released to production. DC \$1795; CC \$

# DRILLING REPORT - WORKOVER

Page 3

Yates Pet. - East Apple State Unit #1 (Unit G) 5-26S-28E Eddy Co., NM  
 \*\*\*\*\*

3-23-91	Rigged down. Released tanks to production. Gel in one tank. DC \$975; CC \$67,327.84	
3-24-91	Pumped 0 bbls oil and 96 bbls water.	
3-25-91	Pumped 0 bbls oil and 80 bbls water.	
3-27-91	Pumped 0 bbls oil and 24 bbls water.	Pumped off.
3-28-91	No report.	
3-29-91	Pumped 0 bbls oil and 21 bbls water.	
3-30-91	Pumped 1/2 bbl oil and 48 bbls water.	
3-31-91	Pumped 1 bbl oil and 18 bbls water.	
4-1-91	Pumped 0 bbls oil and 30 bbls water.	Pumped off.
4-3-91	Pumped 0 bbls oil and 21 bbls water.	Pumped off.
4-4-91	Pumped 0 bbls oil and 21 bbls water.	Pumped off.
4-5-91	Pumped 0 bbls oil and 25 bbls water.	
4-6-91	Pumped 0 bbls oil and 24 bbls water.	
4-7-91	Pumped 0 bbls oil and 23 bbls water.	
4-8-91	No report.	
4-9-91	No report.	
4-10-91	No report.	
4-11-91	No report.	
4-12-91	No report.	
4-13-15-91	No report.	
4-16-91	No report.	
4-17-91	No report.	
4-18-91	No report.	
4-19-91	No report.	
4-20-22-91	No report.	
4-23-91	No report.	
4-24-91	No report.	
4-25-91	No report.	
4-26-91	No report.	
4-27-29-91	No report.	
4-30-91	No report.	
5-1-91	No report.	
5-2-91	No report.	

WELL NAME: East Apple State Unit #1 FIELD AREA: \_\_\_\_\_  
LOCATION: 1920' FNL, 1920' FEL G-5-265-28e Eddy NM  
GL: 3026' ZERO: 16' AGL: \_\_\_\_\_  
KB: 3042' ORIG. DRLG./COMPL. DATE: 9/89  
COMMENTS: \_\_\_\_\_

CASING PROGRAM:

SIZE/WT./GR./CONN.	DEPTH SET
13 3/8 54.5 J55 STC	450'
8 7/8 32 J55 STC	2340'
5 1/2 17 J55 LTC	1634'
15.5 J55	7300'
17 J55 LTC	8500'
2 7/8 6.5 J55 EVE	

PROPOSED WELLBORE SCHEMATIC

