

DOE/BC/14960--11

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3rd Quarter, Fiscal Year 1995

POST WATERFLOOD CO2 MISCIBLE FLOOD IN LIGHT OIL
FLUVIAL - DOMINATED DELTAIC RESERVOIRS.

DE - FC22 - 93BC14960

TEXACO EXPLORATION AND PRODUCTION INC.

July 15, 1995

Award Date: June 1, 1993.
Completion Date: December 31, 1997

Government Award for Current Fiscal Year

\$ 1,042,421.00

Project Manager (Texaco)	Sami Bou-Mikael
COR (DOE)	Chandra Nautiyal
Contract Specialist (DOE)	John Augustine

Reporting Period : April 1, 1995 through June 30, 1995

U.S./DOE Patent Clearance is not required prior to the publication of this document

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POST WATERFLOOD CO₂ MISCIBLE FLOOD IN LIGHT OIL
FLUVIAL DOMINATED DELTAIC RESERVOIRS"

"DE-FC22-93BC14960"
TECHNICAL PROGRESS REPORT

3rd QUARTER, 1995.

EXECUTIVE SUMMARY.

Production from the Marg Area 1 at Port Neches is averaging 337 BOPD for this quarter. The production drop is due to fluctuation in both GOR and BS&W on various producing wells, low water injectivity in the reservoir and shut-in one producing well to perform a workover to replace a failed gravel pack setting. Coil tubing work was performed on 2 injection wells in order to resume injection of water and CO₂ in the reservoir. The Marg Area 2 did not respond favorably to CO₂ injection in the Kuhn #6 well. For this reason Texaco will not pursue any further development of this section of the reservoir due mainly to low target reserves. Instead Texaco will reallocate the money to a new Marg segment (Marg Area 3) in order to test a new process that will utilize the CO₂ to accelerate the primary production rates and reduce cycle time. Also the process should reduce water disposal cost, cash lifting cost, operating cost and increase the NPV of the reserves.

3rd QUARTER (1995) OBJECTIVES.

* Monitor and optimize reservoir performance.

The reservoir production during this quarter declined from 392 BOPD to about 337 BOPD due to mechanical problems in two major producers in the reservoir (Kuhn #38 and Kuhn #15R). The gravel pack settings in the wells have failed as evidenced by the surface chokes and by subsequent wireline runs that indicated some sand fill inside the screen. Texaco is planning to workover the wells to correct this problem. Additionally, Texaco is planning to bring a coil tubing rig to the field to clean out the injection wells in order to increase the water and CO₂ injection rates to maintain reservoir pressure. A second WAG cycle is planned in an attempt to reduce the total GOR and improve the oil production rate. The monthly allocated production is illustrated in figure 1.

- * Workover well Kuhn #42 to plug it down to the Marg Area 1 to increase the reservoir production.

The workover for well Kuhn #42 was postponed until September 1995 due to well utilization in the C-1 reservoir. The well will be plugged down as soon as it becomes available. This well is anticipated to recover additional oil from the reservoir that can not be recovered otherwise. However, it may become necessary to workover the injection well Kuhn #36 to reinstate injection in this part of the reservoir.

- * Discuss with the DOE the addition of the Marg Area 3 to the project.

The Marg Area 3 segment is a natural extension to the rest of the Marg reservoir. The proposed project to test the CO₂ utilization to improve the primary production rates was based on the high production rates encountered in the Marg Area 1 reservoir during tertiary production as compared to primary production. Similar observations were noticed in other CO₂ floods. The Marg Area 3 project was presented to the DOE personnel in Bartlesville and will be incorporated into the current project area. All other contract conditions will remain unaffected. The project will have a significant contribution in determining the need to begin CO₂ flooding early in the life of a particular reservoir while the primary oil bank is available. This test will evaluate the economic impact of combining the tertiary and primary production while reducing the operating cost due to water disposal, artificial lift and cycle time.

DISCUSSION OF RESULTS - FIELD OPERATIONS.

The separation between Area 1 and Area 2 of the reservoir was confirmed by reservoir pressure difference between well Kuhn #6 and the rest of the reservoir. The Stratamodel built for this reservoir suggested similar conclusions. For this reason Texaco recommended the following actions:

- * Cancel the drilling of the Polk B#39 injection well, in Area 2 of the reservoir.
- * Expend the project to a new area that can impact the project economics positively.
- * Workover Kuhn #42 in Area 1 to increase the reservoir production.

CO₂ purchases from Cardox was temporarily interrupted during the 3rd quarter. However, The daily CO₂ purchases averaged 1850 MCFD. CO₂ purchases are illustrated in figure 2. The following is a list of the most recent well tests taken during the month of June 1995 for the producing wells:

Kuhn #15R	172	BOPD,	636	BWPD,	1645	MMCFD,	17	CHOKE.
Kuhn #38	88	BOPD,	818	BWPD,	1427	MMCFD,	22	CHOKE.
KUHN #33	--	BOPD,	--	BWPD,	--	MMCFD,	--	CHOKE.
STARK #8	46	BOPD,	636	BWPD,	2134	MMCFD,	28	CHOKE.
KUHN #6	--	BOPD,	--	BWPD,	--	MMCFD,	--	CHOKE.
KUHN #14	--	BOPD,	--	BWPD,	--	MMCFD,	--	CHOKE.
POLK #B5	--	BOPD,	--	BWPD,	--	MMCFD,	--	CHOKE.

The Financial Status Report, Management Summary Report, Milestone Schedule and the Federal transaction report are included in Figure 3 through 8.

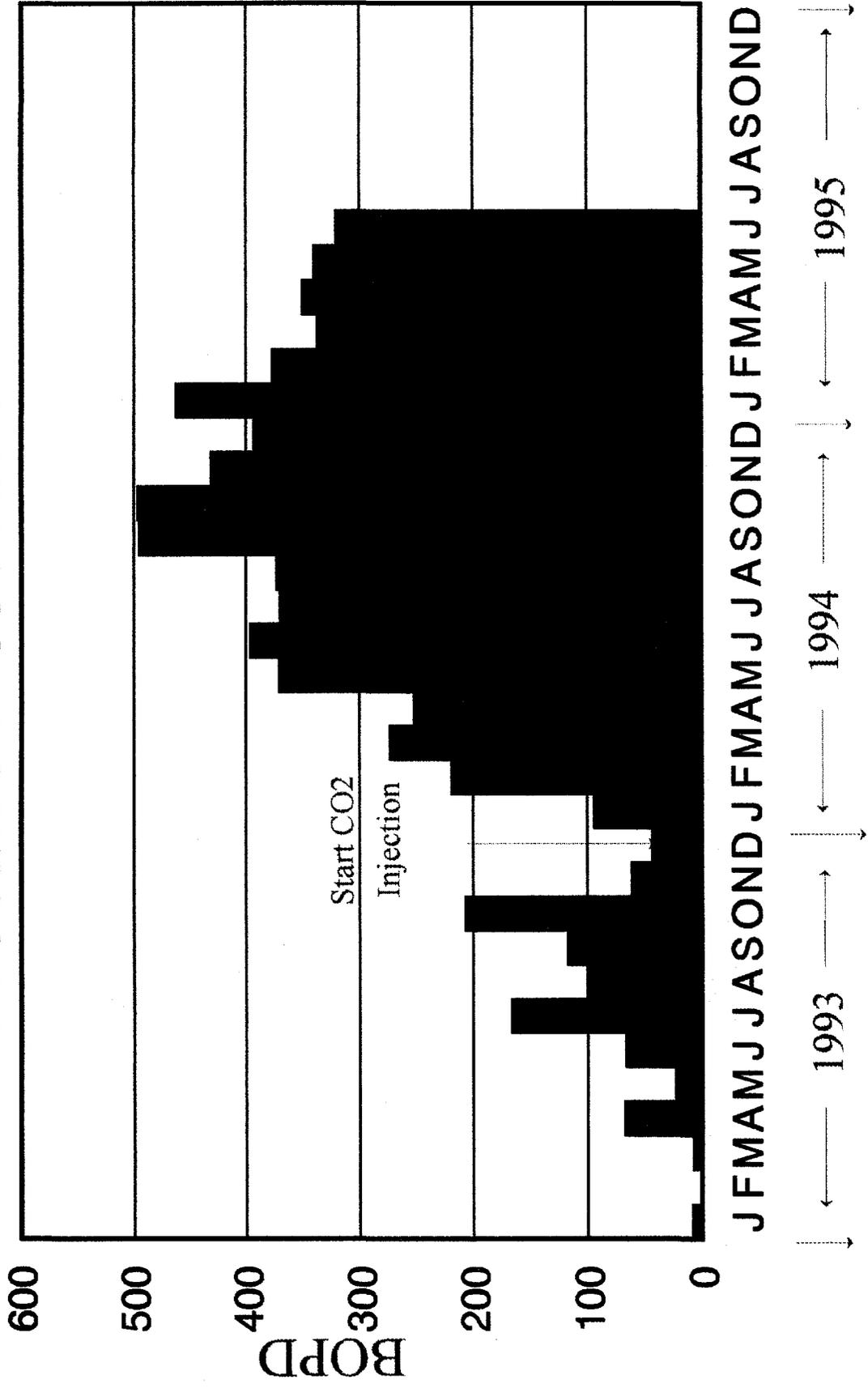
DISCUSSION OF RESULTS - TECHNOLOGY TRANSFER.

Texaco and SAIC are planning to submit two papers for consideration to the annual SPE/DOE symposium on IOR, to be held in Tulsa in April of 1996. LSU is also planning on submitting a separate SPE paper.

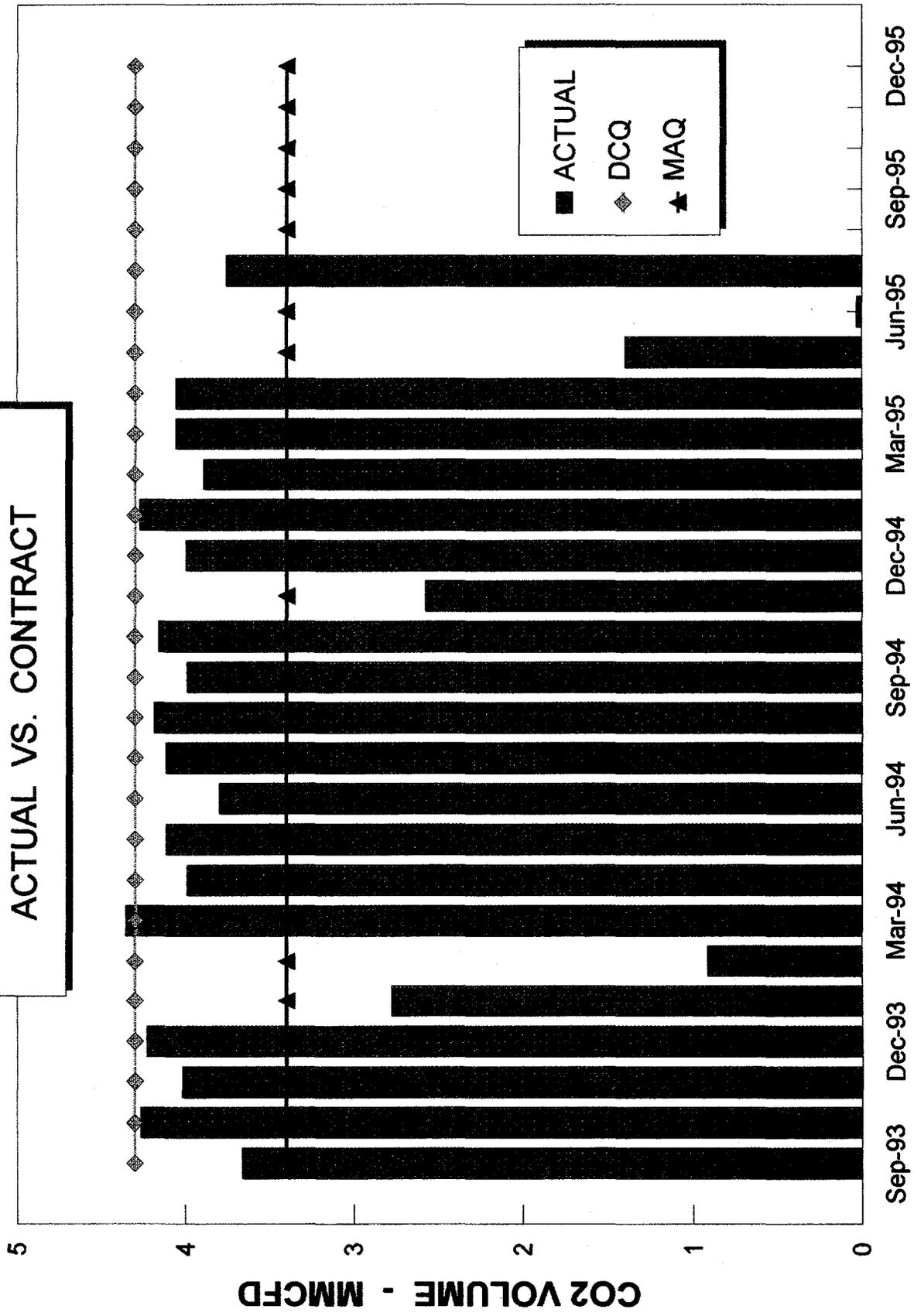
4th Quarter (1995) Objectives.

- * Continue monitoring and optimizing reservoir performance.
- * Workover well Kuhn #42 to the Marg Area 1 reservoir to increase production.
- * Drill Polk B#39 as a CO₂ injection well to the Marg Area 3, after a successful completion of the discovery well Polk B#40 as a producer in the same reservoir. Upon well completion commence CO₂ injection by the OWC.

Port Neches CO2 Project Allocated Production



**PORT NECHES - CO2 DELIVERY
ACTUAL VS. CONTRACT**



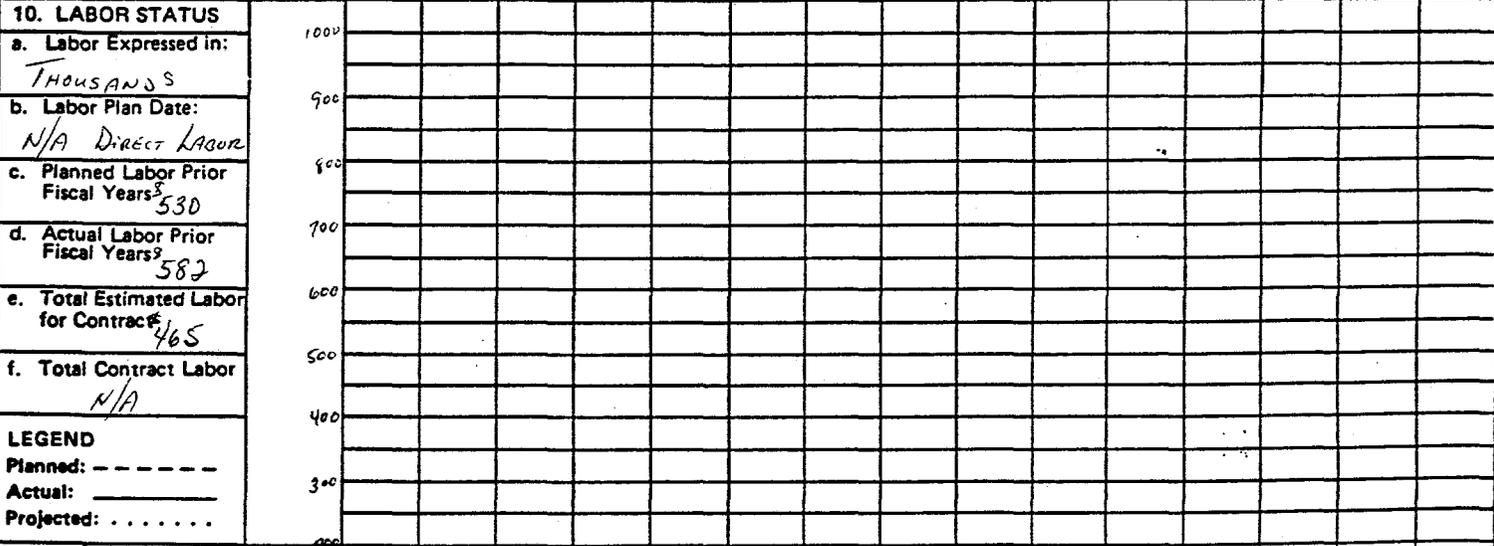
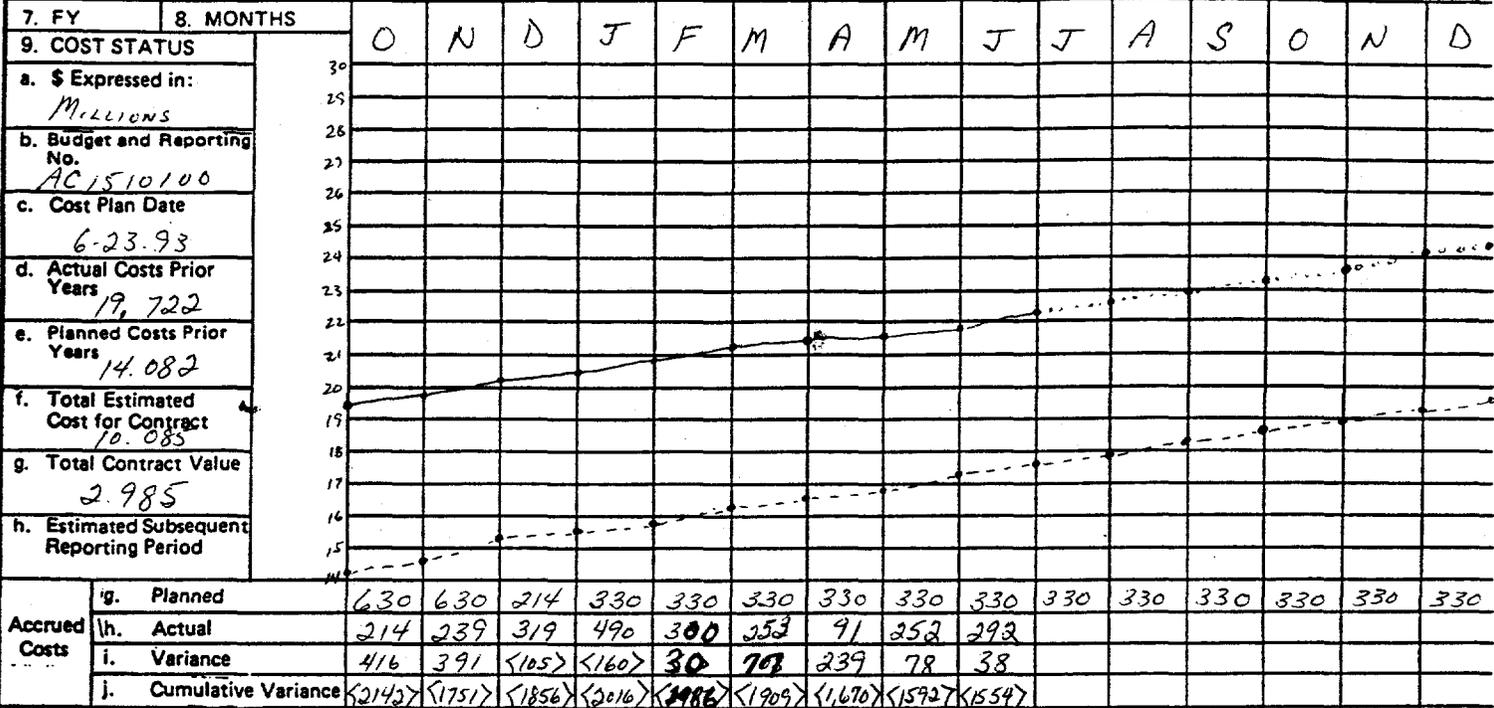
U.S. DEPARTMENT OF ENERGY
SUMMARY REPORT

DOE F1332.2
(11-84)

FORM APPROVED
OMB NO. 1901-1400

1. IDENTIFICATION NUMBER DE-FC22-93BC14960	2. PROGRAM/PROJECT TITLE CLASS I	3. REPORTING PERIOD 4/1/95 to 6/30/95
--	--	---

4. PARTICIPANT NAME AND ADDRESS TEXACO Exploration AND PRODUCTION 400 Poydras St. NEW ORLEANS, LA 70130	5. START DATE: 6/1/93
6. COMPLETION DATE 12/31/97	



	g. Planned	15	15	15	13	13	13	13	13	13	13	13	13	13	13	13	
Labor	h. Actual	15	11	9	5	15	18	19	8	17							
	i. Variance	2	4	6	8	<2>	<5>	<6>	5	<4>							
	j. Cumulative Variance	<43>	<39>	<33>	<25>	<27>	<32>	<38>	<33>	<37>							

11. MILESTONES	STATUS	COMMENTS
a.		
b.		
c.		
d.		
e.		
f.		
g.		

12. SIGNATURE OF PARTICIPANT'S PROJECT MANAGER AND DATE 6

U.S. DEPARTMENT OF ENERGY
MILESTONE SCHEDULE [] PLAN [X] STATUS REPORT

FORM APPROVED
OMB NO. 1901-1400

DOE F1332.3
(11-84)

1. TITLE	2. REPORTING PERIOD		3. IDENTIFICATION NUMBER												10. PERCENT COMPLETE		
	Apr. 1, 1995 - Jun. 30, 1995		DE-FC22-93BC14960														
	4. PARTICIPANT NAME AND ADDRESS		5. START DATE														
Texaco Exploration and Production Inc. 400 Poydras St. New Orleans, LA 70130		June 1, 1993												10. PERCENT COMPLETE			
7. ELEMENT CODE		6. COMPLETION DATE															
8. REPORTING 9. DURATION		CURRENT FISCAL YEAR												10. PERCENT COMPLETE			
ELEMENT		1993															
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	1Q	2Q	3Q	4Q
1.1	Geologic & Engineering	▲															
1.2	Extraction Technology	▲															
2.1	Recording Daily																
2.2	Production Reservoir Characterization																
2.3	Site Operation & Field Work																
2.4	CO2																
2.5	EH&S Monitoring & Compliance																
3.1	CO2 Screening Model																
3.2	Environmental Analysis																
3.3	FDD Database & Model																
3.4	Technical Publications																

11. SIGNATURE OF PARTICIPANT'S PROJECT MANAGER AND DATE

U.S. DEPARTMENT OF ENERGY
MILESTONE SCHEDULE [] PLAN [X] SCHEDULE
(ATTACHMENT)

DOE F1332.3 ATTACHMENT
(11-84)

1. TITLE Post Waterflood CO2 Miscible Flood in a Light Oil Fluvial Dominated Deltaic Reservoir		2. REPORTING PERIOD Apr. 1, 1995 - Jun. 30, 1995	3. IDENTIFICATION NUMBER DE-FC22-93BC14960
4. PARTICIPANT NAME AND ADDRESS Texaco Exploration and Production Inc. 400 Poydras St. New Orleans, LA 70130		5. START DATE June 1, 1993	6. COMPLETION DATE December 31, 1997

MAJOR EVENTS	DATE	DESCRIPTION	STATUS
1	10/15/92	TASK 1.1 - GEOLOGICAL RESERVOIR DESCRIPTION AND LAB TESTS	COMPLETED
2	10/15/92	TASK 1.2 - PHASE 1 RESERVOIR SIMULATION	COMPLETED
3	08/01/93	TASK 2.1 - RECEIVE DOE APPROVAL TO INJECT CO2	COMPLETED
4	08/01/93	TASK 2.2 - RESERVOIR PRESSURE IS RAISED TO 2700 PSI BY WATER INJECTION	COMPLETED
5	08/15/93	TASK 2.3 - CO2 INJECTION AND PRODUCTION FACILITY IS COMPLETED	COMPLETED
6	08/15/93	TASK 2.4 - CO2 PIPELINE IS INSTALLED	COMPLETED
7	08/15/93	TASK 2.5 - NEPA CATEGORICAL EXCLUSION IS RECEIVED	COMPLETED
8	12/31/95	TASK 3.1 - SPE PAPER AND RELEASE OF CO2 SCREENING MODEL	COMPLETED
9	12/31/94	TASK 3.2 - TOPICAL REPORT ON ENVIRONMENTAL CONSTRAINTS	COMPLETED
10	12/31/95	TASK 3.3 - TOPICAL REPORT ON FDD DATABASE	PROJECT 75% COMPLETE
11	12/31/97	TASK 3.4 - SPE PAPER ON RESERVOIR CHARACTERIZATION	TO BE PRESENTED 1997

INTERMEDIATE EVENTS	DATE	DESCRIPTION	STATUS
A	12/31/97	TASK 2.1 - FINAL PROJECT REPORT	TO BE COMPLETED DURING 1997
B	12/31/93	TASK 2.2 - UPDATED RESERVOIR MODEL COMPLETED	COMPLETED
C	12/01/94	TASK 2.2 - CONVENTIONAL CORE ANALYZED IN POLK "B" #39 WELL	DEFERRED
D	04/30/93	TASK 2.3 - 10 WELL WORKOVER PROGRAM COMPLETED	COMPLETED
E	10/01/93	TASK 2.3 - HORIZONTAL CO2 INJECTION WELL DRILLED, POLK "B" #2 W/O PERFORMED	HORIZ. WELL COMPLETE, POLK "B" W/O CANCELLED
F	12/01/94	TASK 2.3 - VERTICAL CO2 INJECTION WELL DRILLED (POLK "B" #39)	CANCELLED
G	06/10/93	TASK 2.5 - PERMIT FOR CO2 PIPELINE RECEIVED FROM ARMY CORPS OF ENGINEERS	COMPLETED
H	06/30/93	TASK 2.5 - HAZARDOUS SUBSTANCE PLAN SUBMITTED TO DOE	COMPLETED
I	12/31/97	TASK 2.5 - FINAL HAZARDOUS SUBSTANCE PLAN SUBMITTED TO DOE	TO BE COMPLETED DURING 1997
J	12/31/94	TASK 3.1 - CO2 SCREENING MODEL FINAL REPORT SUBMITTED TO DOE	COMPLETED
K	12/31/94	TASK 3.3 - FDD DATABASE STUDY IS COMPLETED BY LSU	LSU WORK WILL BE COMPLETED IN SPRING, 1996
L	04/18/94	TASK 3.5-1ST SPE PAPER PRESENTED-PROJECT IMPLEMENTATION	COMPLETED

11. SIGNATURE OF PARTICIPANT'S PROJECT MANAGER AND DATE

FINANCIAL STATUS REPORT
(Short Form)

1. Federal Agency and Organizational Element to Which Report is submitted U. S. Department of Energy		2. Federal Grant or Other Identifying Number Assigned By Federal Agency DE-FC22-93BC14960		OMB Approval No. 0348-0039	Page 1	of 1 pages
3. Recipient Organization (Name and complete address, including ZIP code) Texaco Exploration and Production Inc. 400 Poydras St. New Orleans, LA 70130						
4. Employer Identification Number 51-0265713		5. Recipient Account Number or Identifying Number 323037151		6. Final Report <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		7. Basis <input checked="" type="checkbox"/> Cash <input checked="" type="checkbox"/> Accrual
8. Funding/Grant Period (See Instructions) From: (Month, Day, Year) January 1, 1995		To: (Month, Day, Year) December 31, 1997		9. Period Covered by this Report From: (Month, Day, Year) 04-01-95		To: (Month, Day, Year) 06-30-95
10 Transactions				I Previously Reported	II This Period	III Cumulative
a. Total outlays				\$1,042,421.36	\$634,657.80	\$ 1,677,079.16
b. Recipient share of outlays (64.39%)				\$671,215.11	\$408,656.16	\$ 1,079,871.27
c. Federal share of outlays (35.61%)				\$371,206.25	\$226,001.64	\$ 597,207.89
d. Total unliquidated obligations				0.00	0.00	0.00
e. Recipient share of unliquidated obligations				0.00	0.00	0.00
f. Federal share of unliquidated obligations				0.00	0.00	0.00
g. Total Federal share (Sum of lines c and f)				\$371,206.25	\$226,001.64	\$ 597,207.89
h. Total Federal funds authorized for this funding period				\$2,984,599.00	\$0.00	\$ 2,984,599.00
i. Unobligated balance of Federal funds (Line h minus line g)				\$2,613,392.75	(\$226,001.64)	\$ 2,387,391.11
11. Indirect Expense (Labor)		a. Type of Rate (Place "X" in appropriate box) <input checked="" type="checkbox"/> Provisional <input type="checkbox"/> Predetermined <input type="checkbox"/> Final <input type="checkbox"/> Fixed				
		b. Rate 89.34%		c. Base \$ 43,849.90		d. Total Amount \$ 39,175.50
						e. Federal Share \$ 13,950.40
12. Remarks: Attach any explanations deemed necessary or information required by Federal sponsoring agency in compliance with governing legislation						
13. Certification: I certify to the best of my knowledge and belief that this report is correct and complete and that all outlays and unliquidated obligations are for the purposes set forth in the award documents.						
Typed or Printed Name and Title Sami Bou-Mikael - Project Manager				Telephone (Area code, number and extension) (504) 593-4565		
Signature of Authorized Certifying Official				Date Report Submitted August 17, 1995		

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Standard Form 269A (REV 4-88)
Prescribed by OMB Circulars A-102 and A-110

FEDERAL CASH TRANSACTIONS REPORT <i>(See instructions on the back. If report is for more than one grant or assistance agreement, attach completed Standard Form 272-A.)</i>		Approved by Office of Management and Budget No 80-80182	
		1. Federal sponsoring agency and organizational element to which this report is submitted U. S. Department of Energy	
2. RECIPIENT ORGANIZATION		4. Federal grant or other identification number	5. Recipient's account number or identifying number
Name	Texaco Exploration and Production Inc.	DE-FC22-93BC14960	323037151
Number and Street	400 Poydras St.	6. Letter of credit number	7. Last payment voucher number
	New Orleans, Louisiana 70130	NA	-
City, State and Zip Code:		<i>Give total number for this period</i>	
3. FEDERAL EMPLOYER IDENTIFICATION NO> 51-0265713		8. Payment Vouchers credited to your account	9. Treasury checks received (whether or not deposited)
		-	0
		10. PERIOD COVERED BY THIS REPORT	
		FROM (month,day,year)	TO (month,day,year)
		04/01/95	06/30/95
11. STATUS OF FEDERAL CASH	a. Cash on hand beginning of reporting period	\$ 0.00	
	b. Letter of credit withdrawals	0.00	
	c. Treasury check payments	\$ 709,940.24	
	d. Total receipts (Sum of lines b and c)	\$ 709,940.24	
	e. Total cash available (Sum of lines a and d)	\$ 709,940.24	
	f. Gross disbursements	\$ 709,940.24	
	g. Federal share of program income	0.00	
	h. Net disbursements (Line f minus line g)	\$ 709,940.24	
	i. Adjustments of prior periods	0.00	
	j. Cash on hand end of period	\$ 0.00	
12. THE AMOUNT ON LINE j. REPRESENTING	13. OTHER INFORMATION		
	k. Interest income	\$ 0.00	
	l. Advances to subgrantees or subcontractors	\$ 0.00	
14. REMARKS			
15. CERTIFICATION			
AUTHORIZED CERTIFYING OFFICIAL	SIGNATURE		DATE REPORT SUBMITTED
	TYPED OR PRINTED NAME AND TITLE		TELEPHONE (Area Code, Number, Extension)
	Sami Bou-Mikael - Project Manager		08/17/95 (504) 593-4565

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