HEAVY OIL RESERVOIRS RECOVERABLE
BY THERMAL TECHNOLOGY
VOLUME II

ANNUAL REPORT

Patrick Kujawa, Principal Investigator
Science Applications, Inc.
P.O. Box 1303
McLean, VA 22102

H. J. Lechtenberg, Technical Project Officer
San Francisco Operations Office
Fossil Energy Division
1333 Broadway
Oakland, CA 94612

Date Published—February 1981

Work Performed for the Department of Energy
Under Contract DE-AC03-78ET12380

U.S. DEPARTMENT OF ENERGY

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED
DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.
DISCLAIMER

 Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. INTRODUCTION.</td>
<td>1</td>
</tr>
<tr>
<td>2. DATA LISTING: CANDIDATE RESERVOIRS CONTAINING 10 MILLION</td>
<td></td>
</tr>
<tr>
<td>BARRELS OF 8° TO 25° API GRAVITY OIL-IN-PLACE LESS THAN 2500 FEET</td>
<td></td>
</tr>
<tr>
<td>DEEP RECOVERABLE BY STEAM-DRIVE TECHNOLOGY</td>
<td></td>
</tr>
<tr>
<td>Arkansas</td>
<td>4</td>
</tr>
<tr>
<td>California</td>
<td>9</td>
</tr>
<tr>
<td>Kansas</td>
<td>139</td>
</tr>
<tr>
<td>Louisiana</td>
<td>143</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>153</td>
</tr>
<tr>
<td>Texas</td>
<td>161</td>
</tr>
<tr>
<td>Wyoming</td>
<td>165</td>
</tr>
<tr>
<td>3. DATA LISTING: CANDIDATE RESERVOIRS CONTAINING 10 MILLION</td>
<td></td>
</tr>
<tr>
<td>BARRELS OF 8° TO 25° API GRAVITY OIL-IN-PLACE RECOVERABLE BY IN-SITU</td>
<td></td>
</tr>
<tr>
<td>COMBUSTION TECHNOLOGY</td>
<td></td>
</tr>
<tr>
<td>Arkansas</td>
<td>172</td>
</tr>
<tr>
<td>California</td>
<td>187</td>
</tr>
<tr>
<td>Illinois</td>
<td>242</td>
</tr>
<tr>
<td>Kansas</td>
<td>244</td>
</tr>
<tr>
<td>Louisiana</td>
<td>253</td>
</tr>
<tr>
<td>Mississippi</td>
<td>262</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>296</td>
</tr>
<tr>
<td>Texas</td>
<td>312</td>
</tr>
<tr>
<td>Wyoming</td>
<td>406</td>
</tr>
</tbody>
</table>

APPENDIX: OPERATORS, PAST RECOVERY DATA AND PROJECT DATA SOURCES FOR CANDIDATE HEAVY OIL RESERVOIRS
1. INTRODUCTION

This volume contains reservoir, production, and project data for target reservoirs susceptible to recovery by in situ combustion and steam drive. The reservoirs for steam recovery are less than 2500 feet deep to comply with state-of-the-art technology. In cases where one reservoir would be a target for in situ combustion or steam drive, that reservoir is reported in both sections.

Data were collected from three source types: hands-on [A], once-removed [B], and twice-removed [C]. In all cases, data were sought depicting and characterizing individual reservoirs as opposed to data covering an entire field with more than one producing interval or reservoir. The degree of data reliability is a function of two factors. The first is whether the specific reservoir was identified in such a way as to allow ready and clear recognition during review of data from different sources. Vague and otherwise unclear reservoir identification was a disqualifying factor in the use of a source for a particular reservoir. The second factor is the amount of data obtained in source A and the extent to which it agreed with data from sources B and C, for example:

- When more than one category A source contained information pertaining to the same parameter of the same reservoir, the values were scrutinized for consistency and averaged using weighting factors.

- In cases where there was found only one category A source and several category B and C sources, the category A valuations took precedence when those values pertained to a substantial areal extent of the entire reservoir.

- If a wide discrepancy existed between a category A source for a parameter and category B and C sources and the category A source contained data pertinent to only a small portion of the reservoir in question, then the category B and C sources would be compared for consistency and weighted more heavily than the more restricted first category data.
Estimates of parameter values from county or basin-wide composite averages were used when no specific reservoir data were available and the estimated data were labeled as such in the individual reservoir data presentations.

The data sources are listed at the end of each case. The data sheets were left blank where information was not available so that it could be inserted when determined. The following abbreviations are used in the listing to denote degrees of success for projects:

- ME - Moderately Effective
- NE - Not Effective
- UD - Undetermined
- VE - Very Effective

The abbreviations used for fluid injected in projects are:

- A - Air
- CO₂ - Carbon Dioxide
- PG - Flue Gas
- G - Natural Gas
- HW - Hot Water
- P - Polymer
- S - Steam
- SW - Salt Water
- W - Water

Asterisks are used to denote calculated or estimated data.
2. DATA LISTING: CANDIDATE RESERVOIRS CONTAINING 10 MILLION BARRELS
OF 8° TO 25° API GRAVITY OIL-IN-PLACE LESS THAN
2500 FEET DEEP RECOVERABLE BY STEAM-DRIVE TECHNOLOGY

The data for reservoirs recoverable by steam-drive that are less
than 2500 feet deep are presented in this section.

All of the pages for a particular reservoir are denoted by the
same case number.

Source numbers correspond to the references listed in Section 2
of the Appendix.
CASE 004

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: ARKANSAS
COUNTY: NEVADA
DISTRICT:
FIELD NAME: IRMA
NO. OF RESERVOIRS:  7

RESERVOIR INFORMATION

RESERVOIR: OLD NACATOCH
NO. OF ZONES: 
AREA, ACRES: 2300
TOTAL WELLS: 
SHUT-IN WELLS: 
DISCOVERY YEAR: 1921
SPACING, ACRES: 20
PRODUCING WELLS: 97
INJECTION WELLS: 

GEOLOGICAL INFORMATION

FORMATION: NACATOCH
GEOLOGICAL AGE: GULF
BASIN: ARKLA BASIN
TRAP TYPE: STRUCTURAL - FAULTED MONOCLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1150
GROSS PAY, FT: 27
POROSITY, %: 40.0
PERMEABILITY, MD: 1500
BHT, DEF F: 88 *
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 67.0
WTR SAT., %: 33.0
GAS SAT., %:
FVF, BBL/STB: 1.000
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 13
RANGE: TO
RANGE: 300 TO 2500
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 55.0 *
WTR SAT., %: 45.0
GAS SAT., %:
FVF, BBL/STB: 1.000
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

FLUID CHARACTERISTICS

OIL GRAVITY, API: 14.0
VISCOITY @ BHT, CP: 
SAYBOLT VISC (100F), SEC: 6000
SULFUR CONTENT, %: 2.82
CARBON RESIDUE, %: 9.4
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA,PPM;
RESERVES AND PRODUCTION DATA

**CASE 004**

**ORIGINAL OIL IN PLACE, STB:** 62,200,000  **BBL/AC-FT:** 2079

**ORIGINAL GAS IN PLACE, MCF:**

**CUM PROD (DEC 31, 1977):**
- **OIL, BBL:** 10,646,672
- **GAS, MCF:**
- **WATER, BBL:**

**1977 ANNUAL PROD:**
- **OIL, BBL:** 54,071
- **GAS, MCF:**
- **WATER, BBL:**

**OIL REMAINING IN PLACE, STB:** 51,500,000  **BBL/AC-FT:** 1723  **(DEC 31, 1977)**

**RESERVES (DEC 31, )**

**PRIMARY PRODUCTION:**
- **MECHANISM:** SOLUTION GAS
- **RECOVERY FACTOR, %:** 20.0  **BBL/AC-FT:**
- **ANNUAL DECLINE RATE, %:**

**SECONDARY AND TERTIARY RECOVERIES:**

**T.1 IN-SITU COMBUSTION (1964-1966)**

**AREA, ACRES:** 4  **FLUID INJECTED:** A
**NO. PROD WELLS:** 4  **NO. INJ WELLS:** 1
**VOLUME INJECTED:** (EQUIV) WATER, BBL;  **1,300,000**
**GAS, MCF;**
**CUMULATIVE PROD:**
- **OIL, BBL;**
- **GAS, MCF;**
- **WATER, BBL;**
**RECOVERY FACTOR, %:**  **BBL/AC-FT:**
**DEGREE OF SUCCESS:**
**OPERATOR(S):** MOBIL OIL

**T.2 STEAM DRIVE (1967-1968)**

**AREA, ACRES:**  **FLUID INJECTED:** S
**NO. PROD WELLS:**  **NO. INJ WELLS:**
**VOLUME INJECTED:** (EQUIV) WATER, BBL;  **BBL/AC-FT:**
**GAS, MCF;**
**CUMULATIVE PROD:**
- **OIL, BBL;**
- **GAS, MCF;**
- **WATER, BBL;**
**RECOVERY FACTOR, %:** 38.0  **BBL/AC-FT:**
**DEGREE OF SUCCESS:**
**OPERATOR(S):**

**SOURCES:** 5, 12, 13, 14, 21, 24; 18, 23
STATE: ARKANSAS
COUNTY: OUACHITA & UNION
DISTRICT:
FIELD NAME: SMACKOVER (OLD)
NO. OF RESERVOIRS: 8

RESERVOIR INFORMATION

RESERVOIR: NACATOCH
NO. OF ZONES: 3
AREA, ACRES: 43970 *
TOTAL WELLS: 2986
SHUT-IN WELLS: INJECTION WELLS:

DISCOVERY YEAR: 1922
SPACING, ACRES:
PRODUCING WELLS: 2986
INJECTION WELLS:

GEological INFORMATION

FORMATION: NACATOCH
GEOLOGICAL AGE: GULF
BASIN: ARKLA BASIN
TRAP TYPE: STRUCTURAL - ANTICLINE FAULT
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; MOD DIP, DEG.:
HETEROGENEITY; MOD CLAY CONTENT, %: 40.0
FAULTING; NONE INTERBEDDED STREAKS: YES
FRACTURE; MINOR BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2000
GROSS PAY, FT: 50
POROSITY, %: 36.0
PERMEABILITY, MD: 2000
BHT, DEF F: 110
GAS CAP: YES
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 70.0
WTR SAT., %; 30.0
GAS SAT., %;
FVF, BBL/STB; 1.060
WOR, BBL/BBL; 150
GOR, SCF/BBL; 1000
BHP, PSI; 110

NET PAY, FT: 50
RANGE: TO
RANGE: 1000 TO 3000
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 65.0
WTR SAT., %; 35.0
GAS SAT., %;
FVF, BBL/STB; 1.000
WOR, BBL/BBL; 20
GOR, SCF/BBL; 1000
BHP, PSI;

FLUID CHARACTERISTICS

OIL GRAVITY, API: 18.0
VISCOSITY @ BHT, CP: 75.0;
@ 70F, CP: 180.0
SAYBOLT VISC (100F), SEC: 340
SULFUR CONTENT, %: 2.33
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 8.1
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM: 72600
WATER HARDNESS: CA, PPM; 10800 MG, PPM;
RESERVES AND PRODUCTION DATA

CASE 009

ORIGINAL OIL IN PLACE, STB:
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 513,494,904
(DEC 31, 1977) GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 3,724,313
GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB: BBL/AC-FT:
(DEC 31, ) RESERVES (DEC 31, 1977) 16,506,000

PRIMARY PRODUCTION:
MECHANISM: GD & SG
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %: 6.0

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1954- )
AREA, ACRES: 40 FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): PHILLIPS

S.2 WATERFLOOD (1962- )
AREA, ACRES: 320 FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): TINSLEY UNIT
SECONDARY AND TERTIARY RECOVERIES (CONT.)

S.3 WATERFLOOD  (1972-  )

AREA, ACRES:  160
NO. PROD WELLS:  160
VOLUME INJECTED:  (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD:  OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S):  GULF

FLUID INJECTED:  W
NO. INJ WELLS:

T.1 STEAM DRIVE  (1969-  )

AREA, ACRES:  1145
NO. PROD WELLS:  130
VOLUME INJECTED:  (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD:  OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:  30.0
DEGREE OF SUCCESS:  FAIR
OPERATOR(S):  PHILLPS; GULF

FLUID INJECTED:  S
NO. INJ WELLS:  14

T.2 IN-SITU COMBUSTION  (1970-  )

AREA, ACRES:  160
NO. PROD WELLS:  160
VOLUME INJECTED:  (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD:  OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S):  GULF

FLUID INJECTED:  A
NO. INJ WELLS:

REMARKS: AREA, WELLS, PROD, RES INCLUDE NA, MK, GS, BL, TO FMTS.
SOURCES:  5, 12, 13, 14, 21, 24; 11, 17, 18, 22, 27, 293
**Reservoir and Production Data Elements**

**State:** California  
**County:** Monterey  
**District:** Coastal Region, Salinas Valley District  
**Field Name:** King City  
**No. of Reservoirs:** 1

### Reservoir Information

**Reservoir:** Miocene  
**No. of Zones:**  
**Area, Acres:** 110  
**Total Wells:**  
**Shut-In Wells:** 8  
**Discovery Year:** 1959  
**Spacing, Acres:**  
**Producing Wells:** 20  
**Injection Wells:**

### Geological Information

**Formation:** Monterey  
**Geological Age:** Miocene  
**Basin:** Coastal Basin  
**Trap Type:** Structural - Faulted Dome  
**Lithology:** Sand  
**Degree of Consolidation:**  
**Heterogeneity:**  
**Faulting:** Mod  
**Fracture:**  
**Clay Content, %:**  
**Bedding Interbedded Streaks:** Yes  
**Barrier to Flow:**

### Reservoir Characteristics

**Depth, ft:** 2115  
**Gross Pay, ft:**  
**Porosity, %:** 32.0  
**Permeability, MD:**  
**BHT, DEF F:** 112 *  
**Gas Cap:**  
**Gas Cap/Oil Zone Ratio:**  
**Initial:** Oil Sat., %; 72.0  
**WTR Sat., %; 28.0**  
**GAS SAT., %;**  
**FWF, BBL/STB; 1.050 ***  
**WOR, BBL/BBL;**  
**GOR, SCF/BBL;**  
**BHP, PSI;**

**Net Pay, ft:** 100  
**Range:** to  
**Range:** to  
**Sat. Pressure, PSI:**  
**Gas Cap, Acres:**  
**Wetting Phase:**  
**Current:** Oil Sat., %; 64.0 *  
**WTR Sat., %; 36.0**  
**Gas Sat., %;**  
**FWF, BBL/STB; 1.020 ***  
**WOR, BBL/BBL;**  
**GOR, SCF/BBL;** 129  
**BHP, PSI;**
FLUID CHARACTERISTICS

OIL GRAVITY, API: 16.5
VISCOSITY @ BHT, CP: ; @ F, CP:
SAYBOLT VISC (100°F), SEC:
SULFUR CONTENT, %:
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 8500
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 18,700,000 BBL/AC-FT: 1702
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 1,748,636 (DEC 31, 1977)
GAS, MCF; 39,000
WATER, BBL; 26,031
1977 ANNUAL PROD: OIL, BBL; 46,586
GAS, MCF;
WATER, BBL; 5,135,000
OIL REMAINING IN PLACE, STB: 17,000,000 BBL/AC-FT: 1543 (DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SOURCES: 5, 12, 14, 18, 158, 159, 160
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: MONTEREY
DISTRICT: COASTAL REGION, SALINAS VALLEY DISTRICT
FIELD NAME: SAN ARDO
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: AURIGNAC
NO. OF ZONES: 9
AREA, ACRES: 3500 *
TOTAL WELLS: 404
SHUT-IN WELLS: 115
DISCOVERY YEAR: 1948
SPACING, ACRES: 10
PRODUCING WELLS: 390
INJECTION WELLS: 2

GEOLOGICAL INFORMATION

FORMATION: MONTEREY
GEOLOGICAL AGE: MIocene
BASIN: COASTAL BASIN
TRAP TYPE: STRUCT/STRAT - FACIES CHANGE ON ANTICLINE
LITHOLOGY: SAND
DIP, DEG.: 1.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
FRAC TURE:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2350
GROSS PAY, FT: 120
POROSITY, %: 34.0
PERMEABILITY, MD: 2200
BHT, DEP F: 119
GAS CAP:
NET PAY, FT: 100
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI: GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 57.0 *
WTR SAT., %; 43.0
GAS SAT., %:
FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 11.5
RANGE: 11.0 TO 14.0
VISCOSITY @ BHT, CP: 300.0; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: *.*
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 1700
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 641,800,000 BBL/AC-FT: 1834
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977) OIL, BBL; 113,796,475 GAS, MCF; WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 10,707,485 GAS, MCF; WATER, BBL; 64,696,000
OIL REMAINING IN PLACE, STB: 528,000,000 BBL/AC-FT: 1509 (DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 IN-SITU COMBUSTION (1959- )
AREA, ACRES:
NO. PROD WELLS: FLUID INJECTED: AIR/W
VOLUME INJECTED: (EQUIV) WATER, BBL;
VOLWAT, MCF;
CUMULATIVE PROD: OIL, BBL; GAS, MCF;
(THRU ) WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: NE OPERATOR(S): MOBIL OIL

REMARKS: 2ND & 3RD OPERATIONS INCLUDED W LOMBARDI FORMATION SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 17, 18, 49, 77
STATE: CALIFORNIA
COUNTY: MONTEREY
DISTRICT: COASTAL REGION, SALINAS VALLEY DISTRICT
FIELD NAME: SAN ARDO
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: LOMBARDI
NO. OF ZONES: 2
AREA, ACRES: 4200 *
TOTAL WELLS: 301
SHUT-IN WELLS: 4

PRODUCING WELLS: 5
INJECTION WELLS: 4

GEOLOGICAL INFORMATION

FORMATION: MONTEREY
GEOLOGICAL AGE: MIocene
BASIN: COASTAL BASIN
TRAP TYPE: STRUCT/STRAT - FACIES CHANGE ON ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.: 1.0
HETEROGENEITY; CLAY CONTENT, %:
FAULTING; NONE
FRACTURE; BARRIER TO FLOW:

DEPTH, FT: 2122
GROSS PAY, FT: 200
POROSITY, %: 34.0
PERMEABILITY, MD: 5000
BHT, DEF F: 117
GAS CAP:
GAS CAP/OIL, ZONE RATIO:
INITIAL: OIL SAT., %; 73.0
WTR SAT., %; 27.0
GAS SAT., %;
FVF, BBL/STB; 1.050
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

NET PAY, FT: 115
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 54.0 *
WTR SAT., %; 46.0
GAS SAT., %;
FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL; 118
BHP, PSI;

FLUID CHARACTERISTICS

OIL GRAVITY, API: 11.1
VISCOSITY @ BHT, CP: 3000.0;
Saybolt Visc (100F), SEC: 6000
SULFUR CONTENT, %: 2.25
CARBON/HYDROGEN RATIO:
OIL TYPE:
WATER SALINITY, PPM; 6000
WATER HARDNESS: CA, PPM; 6000
MG, PPM;
RESERVES AND PRODUCTION DATA

CASE 015

ORIGINAL OIL IN PLACE, STB: 885,700,000 BBL/AC-FT: 1834
ORIGINAL GAS IN PLACE, MCF: CUM PROD: OIL, BBL: 200,483,244
(DEC 31, 1977) GAS, MCF: WATER, BBL: 1834
1977 ANNUAL PROD: OIL, BBL: 2,421,762 GAS, MCF: 44,745,000
WATER, BBL: 44,745,000 OIL REMAINING IN PLACE, STB: 685,300,000 BBL/AC-FT: 1419
(DEC 31, 1977) RESERVES (DEC 31, 1977)

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %: 13.0

SECONDARY AND TERTIARY RECOVERIES:

S.1 GAS SWEEP (1955-1955)

AREA, ACRES: FLUID INJECTED: G
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL: 416,000
CUMULATIVE PROD: OIL, BBL: GAS, MCF:
(THRU 1977) GAS, MCF:
WATER, BBL: RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S): MOBIL OIL

S.2 WATERFLOOD (1956-)

AREA, ACRES: FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS: 7
VOLUME INJECTED: (EQUIV) WATER, BBL: 418,089,000
CUMULATIVE PROD: OIL, BBL: GAS, MCF:
(THRU 1977) GAS, MCF:
WATER, BBL: RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S): MOBIL OIL
SECONDARY AND TERTIARY RECOVERIES (CONT.)

S.3 CYCLIC STEAM  (1964- )

AREA, ACRES: 3121  FLUID INJECTED: S
NO. PROD WELLS: 1234  NO. INJ WELLS: 1234
VOLUME INJECTED: (EQUIV)WATER, GAS, MCF;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
(THRU 1973)
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): MOBIL OIL

T.1 IN-SITU COMBUSTION  (1963- )

AREA, ACRES: FLUID INJECTED: A
NO. PROD WELLS: 9  NO. INJ WELLS: 9
VOLUME INJECTED: (EQUIV)WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
(THRU 1973)
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: ME
OPERATOR(S): MOBIL OIL

T.2 STEAM DRIVE  (1968- )

AREA, ACRES: FLUID INJECTED: S
NO. PROD WELLS: 97  NO. INJ WELLS: 97
VOLUME INJECTED: (EQUIV)WATER, BBL; 76,695,536
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
(THRU 1973)
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): MOBIL OIL

REMARKS: THERMAL PROJECTS INCLUDE AURIGNAC FORMATION

SOURCES: 5,12,14,37,38,58,113,129,132; 17,18,49
CASE 021

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: SANTA BARBARA
DISTRICT: COASTAL REGION, SANTA BARBARA DISTRICT
FIELD NAME: CAPITAN
NO. OF RESERVOIRS: 4

RESERVOIR INFORMATION

RESERVOIR: VAQUEROS
NO. OF ZONES: 1
AREA, ACRES: 260
DISCOVERY YEAR: 1929
TOTAL WELLS: 16
SPACING, ACRES:
SHUT-IN WELLS: 26
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: VAQUEROS
GEOLOGICAL AGE: MIocene
BASIN: SANTA MARIA BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DIP, DEG.: 6.0
DEGREE OF CONSOLIDATION;
HETEROGENEITY;
FAULTING; NONE
FRACTURE;
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1446
GROSS PAY, FT:
POROSITY, %: 21.0
PERMEABILITY, MD:
BHT, DEF F: 98 *
GAS CAP:
NET PAY, FT: 90
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 67.0 *
WTR SAT., %; 33.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
WETTING PHASE:
CURRENT: OIL SAT., %; 31.0 *
WTR SAT., %; 69.0
GAS SAT., %;
FVF, BBL/STB; 1.000 *
WOR, BBL/BBL;
GOR, SCF/BBL; 225
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 21.8  RANGE: 19.0 TO 23.0
VISCOSITY @ BHT, CP:  @  F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: .69  CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: .7  ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;  700
WATER HARDNESS: CA, PPM;  MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 24,300,000  BBL/AC-FT: 1040
ORIGINAL GAS IN PLACE, MCF:
CUM PROD  : OIL, BBL; 12,397,939
    (DEC 31, 1977) GAS, MCF; 4,009,000
        WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 29,465
        GAS, MCF; 1,000
        WATER, BBL; 1,060,000
OIL REMAINING IN PLACE, STB: 11,900,000  BBL/AC-FT: 510
    (DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
    MECHANISM: WATER DRIVE
    RECOVERY FACTOR, %:  BBL/AC-FT:
    ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATER DISPOSAL  (1967-1970)

AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL; 399,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
    (THRU 1977) GAS, MCF;
        WATER, BBL;
RECOVERY FACTOR, %:  BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S):

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132
STATE: CALIFORNIA
COUNTY: LOS ANGELES
DISTRICT: COASTAL REGION, SANTA CLARA VALLEY DISTR
FIELD NAME: NEWHALL GR - TUNNEL AREA
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: (UNNAMED)
NO. OF ZONES: DISCOVERY YEAR: 1891
AREA, ACRES: 140 SPACING, ACRES:
TOTAL WELLS: PRODUCING WELLS: 19
SHUT-IN WELLS: INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: TOWSLEY-MODELO GEOLOGICAL AGE: Pliocene-Miocene
GEOLOGICAL AGE: PLIOCENE-MIOCENE
BASIN: LOS ANGELES BASIN
TRAP TYPE: STRUCT/STRAT - FACIES CHANGE ON FLTD HOMOCL
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; HIGH DIP, DEG.:
HETERONEITY; HIGH CLAY CONTENT, %:
FAULTING; MOD INTERBEDDED STREAKS: YES
FRATURE; BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1581 NET PAY, FT: 70
GROSS PAY, FT:
POROSITY, %: 35.0 RANGE: TO
PERMEABILITY, MD:
BHT, DEF F: 100 * RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 70.0 *
WTR SAT., %; 30.0 CURRENT: OIL SAT., %; 59.0 *
GAS SAT., %;
FVF, BBL/STB; 1.050 * WTR SAT., %; 41.0
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
**FLUID CHARACTERISTICS**

- **OIL GRAVITY, API:** 18.3, **RANGE:** 13.5 to 25.0
- **VISCOSITY @ BHT, CP:** , **@ F, CP:**
- **SAYBOLT VISC (100F), SEC:**
- **SULFUR CONTENT, %:**
- **CARBON/HYDROGEN RATIO:**
- **CARBON RESIDUE, %:**
- **ACID NUMBER:**
- **OIL TYPE:**
- **WATER SALINITY, PPM:**
- **WATER HARDNESS:** CA, PPM; MG, PPM;

**RESERVES AND PRODUCTION DATA**

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original Oil in Place, STB</td>
<td>17,700,000</td>
<td>BBL/AC-FT: 1810</td>
</tr>
<tr>
<td>Original Gas in Place, MCF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cum Prod (Dec 31, 1977)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CUM PROD: OIL, BBL</td>
<td>2,100,000</td>
<td>*</td>
</tr>
<tr>
<td>GAS, MCF</td>
<td>1,083,000</td>
<td></td>
</tr>
<tr>
<td>WATER, BBL</td>
<td>20,176</td>
<td>*</td>
</tr>
<tr>
<td>1977 Annual Prod: OIL, BBL</td>
<td>2,100,000</td>
<td></td>
</tr>
<tr>
<td>GAS, MCF</td>
<td>1,083,000</td>
<td></td>
</tr>
<tr>
<td>WATER, BBL</td>
<td>23,000</td>
<td></td>
</tr>
<tr>
<td>Oil Remaining in Place, STB</td>
<td>15,600,000</td>
<td>BBL/AC-FT: 1596</td>
</tr>
<tr>
<td>Reserves (Dec 31, )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Production:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanism: Solution Gas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recovery Factor, %</td>
<td></td>
<td>BBL/AC-FT:</td>
</tr>
<tr>
<td>Annual Decline Rate, %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary and Tertiary Recoveries:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S1 Waterflooding (1971-)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area, Acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. Prod Wells</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume Injected: (EQUIV) Water, BBL</td>
<td>779,891</td>
<td></td>
</tr>
<tr>
<td>Gas, MCF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cumulative Prod: OIL, BBL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Thru 1973) Gas, MCF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WATER, BBL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recovery Factor, %</td>
<td></td>
<td>BBL/AC-FT:</td>
</tr>
<tr>
<td>Degree of Success:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operator(S)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sources: 5, 12, 14, 37, 38, 58, 113, 129, 132; 147</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
STATE: CALIFORNIA
COUNTY: VENTURA
DISTRICT: COASTAL REGION, SANTA CLARA VALLEY DISTR
FIELD NAME: OAK PARK
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: SESPE UPPER
NO. OF ZONES: 1
AREA, ACRES: 100
SPACING, ACRES:
TOTAL WELLS: PRODUCING WELLS:
SHUT-IN WELLS:

DISCOVERY YEAR: 1969

GEOLOGICAL INFORMATION

FORMATION: SESPE UPPER
GEOLOGICAL AGE: OLIGOCENE
BASIN: VENTURA BASIN
TRAP TYPE: STRUCTURAL - FAULTED HOMOCLINE
LITHOLOGY: SAND
DIP, DEG.: 30.0
DEGREE OF: CONSOLIDATION;
HETEROGENERITY;
FAULTING; NONE
FRACTURE;
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1420
GROSS PAY, FT: 675
POROSITY, %: 20.0
PERMEABILITY, MD: 235
BHT, DEF F: 97 *
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 45.0
WTR SAT., %: 55.0
GAS SAT., %:
FVF, BBL/STB: 1.050 *
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:
NET PAY, FT: 400
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 44.0 *
WTR SAT., %: 56.0
GAS SAT., %:
FVF, BBL/STB: 1.040 *
WOR, BBL/BBL:
GOR, SCF/BBL: 229
BHP, PSI:
**FLUID CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil Gravity, API</td>
<td>23.0</td>
<td>23.0 TO 24.0</td>
</tr>
<tr>
<td>Viscosity @ BHT, CP:</td>
<td></td>
<td>@ F, CP:</td>
</tr>
<tr>
<td>Saybolt Visc (100F), SEC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfur Content, %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carbon Residue, %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Salinity, PPM</td>
<td>7150</td>
<td></td>
</tr>
<tr>
<td>Water Hardness: Ca, ppm</td>
<td>430</td>
<td>Mg, ppm: 135</td>
</tr>
</tbody>
</table>

**RESERVES AND PRODUCTION DATA**

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original Oil in Place, STB</td>
<td>26,600,000</td>
<td>BBL</td>
</tr>
<tr>
<td>Original Gas in Place, MCF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cum Prod (Dec 31, 1977) OIL, BBL</td>
<td>627,355</td>
<td></td>
</tr>
<tr>
<td>Cum Prod (Dec 31, 1977) GAS, MCF</td>
<td>121,000</td>
<td></td>
</tr>
<tr>
<td>Cum Prod (Dec 31, 1977) WATER, BBL</td>
<td>60,469</td>
<td></td>
</tr>
<tr>
<td>1977 Annual Prod OIL, BBL</td>
<td>60,469</td>
<td></td>
</tr>
<tr>
<td>1977 Annual Prod GAS, MCF</td>
<td>12,000</td>
<td></td>
</tr>
<tr>
<td>1977 Annual Prod WATER, BBL</td>
<td>105,000</td>
<td></td>
</tr>
<tr>
<td>Oil Remaining in Place, STB</td>
<td>26,000,000</td>
<td>BBL</td>
</tr>
<tr>
<td>Reserves (Dec 31, 1977)</td>
<td>420,000</td>
<td></td>
</tr>
</tbody>
</table>

**PRIMARY PRODUCTION**

- Mechanism: Solution Gas
- Recovery Factor, %: BBL/AC-FT:
- Annual Decline Rate, %:

**SECONDARY AND TERTIARY RECOVERY**

**S.1 WATERFLOOD**

- Area, Acres: FLUID INJECTED: W
- No. Prod Wells: NO. INJ WELLS: 1
- Volume Injected: (EQUIV) WATER, BBL: 134,404
  GAS, MCF: 134,404
- Cumulative Prod OIL, BBL: BBL/AC-FT:
  GAS, MCF: BBL/AC-FT:
  WATER, BBL: BBL/AC-FT:
- Recovery Factor, %:
- Degree of Success:
- Operator(s): UNIO OIL CO

**SOURCES:** 5, 12, 14, 37, 38, 58, 113, 129, 132; 53
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: VENTURA
DISTRICT: COASTAL REGION, SANTA CLARA VALLEY DISTR
FIELD NAME: OAKRIDGE
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: MIOCENE
NO. OF ZONES:
AREA, ACRES: 425
TOTAL WELLS:
SHUT-IN WELLS: 14
DISCOVERY YEAR: 1952
SPACING, ACRES:
PRODUCING WELLS: 18
INJECTION WELLS: 17

GEOLOGICAL INFORMATION

FORMATION: MONTEREY: TOPANGA - VAQUEROS
GEOLOGICAL AGE: MIOCENE
BASIN: VENTURA BASIN
TRAP TYPE: STRUCTURAL - FAULTED PLUNGING ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.: CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2450
GROSS PAY, FT: 175
POROSITY, %: 30.0
PERMEABILITY, MD: 135
BHT, DEF F: 119 *
NET PAY, FT: 90
GAS CAP: RANGE: TO
GAS CAP/OIL ZONE RATIO: RANGE: TO
INITIAL: OIL SAT., %: 55.0
WTR SAT., %: 45.0
GAS SAT., %:
FVF, BBL/STB: 1.075
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
CURRENT: OIL SAT., %: 37.0 *
WTR SAT., %: 63.0
GAS SAT., %:
FVF, BBL/STB: 1.000 *
WOR, BBL/BBL;
GOR, SCF/BBL: 271
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 20.4  RANGE: 16.0 TO 25.0
VISCOSITY @ BHT, CP:  ; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: .98  CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: .7  ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 342
WATER HARDNESS: CA,PPM; 41 MG,PPM; 42

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE,STB: 45,500,000  BBL/AC-FT: 1191
ORIGINAL GAS IN PLACE,MCF:
CUM PROD : OIL,BBL; 12,315,442
  (DEC 31, 1977) GAS,MCF; 8,065,000
  WATER,BBL; 23,213,000
1977 ANNUAL PROD: OIL,BBL; 175,721
  GAS,MCF; 83,000
  WATER,BBL; 1,210,000
OIL REMAINING IN PLACE,STB: 33,200,000  BBL/AC-FT: 869
  (DEC 31, )
RESERVES(DEC 31, 1977) 2,700,000

PRIMARY PRODUCTION:
  MECHANISM: SOLUTION GAS
  RECOVERY FACTOR, %:
  ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD  (1956-1959)

AREA, ACRES:  FLUID INJECTED: W
NO. PROD WELLS:  NO. INJ WELLS: 20
VOLUME INJECTED: (EQUIV)WATER, BBL; 670,000
  GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
  (THRU 1977) GAS, MCF;
  WATER, BBL;
RECOVERY FACTOR, %:  BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): UNION OIL CO
SECONDARY AND TERTIARY RECOVERIES (CONT.)

S.2 WATERFLOOD (1956-1958)

AREA, ACRES: FLUID INJECTED: W
NO. PROD WELLS: 17 NO. INJ WELLS: 23
VOLUME INJECTED: (EQUIV) WATER, BBL; 25,793,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): UNION OIL CO

S.3 PRESSURE MAINTENANCE (1956-1958)

AREA, ACRES: FLUID INJECTED: G
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL; 461,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): UNION OIL CO

T.1 CYCLIC STEAM (1964-1965)

AREA, ACRES: FLUID INJECTED: S
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL; 32,121
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: POOR
OPERATOR(S): UNION OIL CO

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 136
STATE: CALIFORNIA  
COUNTY: VENTURA  
DISTRICT: COASTAL REGION, SANTA CLARA VALLEY DISTR  
FIELD NAME: OJAI GR - SISAR AREA  
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: (UNNAMED)  
NO. OF ZONES:  
AREA, ACRES: 190  
TOTAL WELLS:  
SHUT-IN WELLS: 18  
DISCOVERY YEAR: 1900  
SPACING, ACRES:  
PRODUCING WELLS: 25  
INJECTION WELLS:  

GEOLOGICAL INFORMATION

FORMATION: SAUGUS-MONTEREY  
GEological AGE: PLIOCENE-MIOCENE  
BASIN: VENTURA BASIN  
TRAP TYPE: STRUCT/STRAT - FACIES CHANGE ON FLTD HOMOCL  
LITHOLOGY: SAND  
DEGREE OF: CONSOLIDATION; UNC  
HETEROGENEITY; HIGH  
FAULTING; NONE  
FRACTURE; BARRIER TO FLOW:  
DIP, DEG.: 35.0  
CLAY CONTENT, %:  
INTERBEDDED STREAKS: YES  

RESERVOIR CHARACTERISTICS

DEPTH, FT: 750  
GROSS PAY, FT: 350  
POROSITY, %: 38.0  
PERMEABILITY, MD:  
BHT, DEF P: 83 *  
GAS CAP:  
GAS CAP/OIL ZONE RATIO:  
INITIAL: OIL SAT., %; 70.0 *  
WTR SAT., %; 30.0  
GAS SAT., %;  
FVF, BBL/STB; 1.050 *  
WOR, BBL/BBL;  
GOR, SCF/BBL;  
BHP, PSI;  
NET PAY, FT: 40  
RANGE: TO  
SAT. PRESSURE, PSI:  
GAS CAP, ACRES:  
WETTING PHASE:  
CURRENT: OIL SAT., %; 58.0 *  
WTR SAT., %; 42.0  
GAS SAT., %;  
FVF, BBL/STB; 1.010 *  
WOR, BBL/BBL;  
GOR, SCF/BBL;  
BHP, PSI;
CASE 027

FLUID CHARACTERISTICS

OIL GRAVITY, API: 17.0
RANGE: 11.0 TO 30.0

VISCOSITY @ BHT, CP: 
@ F, CP:

SAYBOLT VISC (100°F), SEC:

SULFUR CONTENT, %:
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %:
ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM; 8550
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 14,900,000 BBL/AC-FT: 1965
ORIGINAL GAS IN PLACE, MCF: 
CUM PROD : OIL, BBL; 2,110,000 *
(GDEC 31, 1977) GAS, MCF; 350,000
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 20,000 *
GAS, MCF;
WATER, BBL; 11,000
OIL REMAINING IN PLACE, STB: 12,800,000 BBL/AC-FT: 1688
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATER DISPOSAL (1972- )

AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL; 657,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(GTHRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S): SUN OIL CO

26
## SECONDARY AND TERTIARY RECOVERIES (CONT.)

### T.1 CYCLIC STEAM  
(1965- )

<table>
<thead>
<tr>
<th>Area, Acres:</th>
<th>Fluid Injected:</th>
<th>No. Prod Wells:</th>
<th>No. Inj Wells:</th>
<th>Volume Injected:</th>
<th>Cumulative Prod:</th>
<th>Recovery Factor, %:</th>
<th>Degree of Success:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S</td>
<td></td>
<td>2</td>
<td>BBL;</td>
<td>BBL;</td>
<td></td>
<td>NE</td>
</tr>
</tbody>
</table>

**Remarks:**
Tertiary efforts unsuccessful

**Sources:** 5, 12, 14, 37, 38, 58, 113, 129, 132; 122

### T.2 IN-SITU COMBUSTION  
(1957-1960)

<table>
<thead>
<tr>
<th>Area, Acres:</th>
<th>Fluid Injected:</th>
<th>No. Prod Wells:</th>
<th>No. Inj Wells:</th>
<th>Volume Injected:</th>
<th>Cumulative Prod:</th>
<th>Recovery Factor, %:</th>
<th>Degree of Success:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td></td>
<td>1</td>
<td>BBL;</td>
<td>BBL;</td>
<td></td>
<td>NE</td>
</tr>
</tbody>
</table>

**Remarks:**
Tertiary efforts unsuccessful

**Sources:** 5, 12, 14, 37, 38, 58, 113, 129, 132; 122
CASE 030

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: LOS ANGELES
DISTRICT: COASTAL REGION, SANTA CLARA VALLEY DISTR
FIELD NAME: PLACERITA
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: ALL AREAS
NO. OF ZONES: 3
AREA, ACRES: 700
TOTAL WELLS: SHUT-IN WELLS: 199

DISCOVERY YEAR: 1920
SPACING, ACRES: PRODUCING WELLS: 205
INJECTION WELLS: 15

GEOLOGICAL INFORMATION

FORMATION: SAUGUS-PICO
GEOLOGICAL AGE: PLIOCENE
BASIN: LOS ANGELES BASIN
TRAP TYPE: STRUCTURAL - FAULTED HOMOCLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING; NONE
FRACTURE;
DIP, DEG.: 18.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1527
GROSS PAY, FT: 450
POROSITY, %: 33.0
PERMEABILITY, MD: 2500
BHT, DEP F: 99 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 60.0 *
WTR SAT., %; 40.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 300
RANGE: TO
WTR SAT., %; 50.0
GAS SAT., %;
FVF, BBL/STB; 1.010 *
WOR, BBL/BBL;
GOR, SCF/BBL; 16
BHP, PSI;
CURRENT: OIL SAT., %; 50.0 *
WTR SAT., %; 50.0
GAS SAT., %;
FVF, BBL/STB; 1.010 *
WOR, BBL/BBL;
GOR, SCF/BBL; 16
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 15.9  RANGE: 9.0 TO 23.0
VISCOSITY @ BHT, CP: 320.0;  @ F, CP:
SAYBOLT VISC (100°F), SEC:
SULFUR CONTENT, %: .30  CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: .3  ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;  2600
WATER HARDNESS: CA, PPM;  MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 307,200,000  BBL/AC-FT: 1463
ORIGINAL GAS IN PLACE, MCF:
CUM PROD  OIL, BBL; 42,016,974
(DEC 31, 1977)  GAS, MCF; 6,795,000
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 339,630
GAS, MCF; 5,000
WATER, BBL; 7,938,000
OIL REMAINING IN PLACE, STB: 265,200,000  BBL/AC-FT: 1263
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: GRAVITY DRAINAGE
RECOVERY FACTOR, %:  BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1954- )

AREA, ACRES: FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS: 28
VOLUME INJECTED: (EQUIV) WATER, BBL; 56,291,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977)  GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:  BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): CROWN CENTRAL PET. CORP.
### T.1 CYCLIC STEAM  
**(1964-1971)**

<table>
<thead>
<tr>
<th>AREA, ACRES:</th>
<th>FLUID INJECTED:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NO. PROD WELLS:</th>
<th>NO. INJ WELLS:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VOLUME INJECTED:</th>
<th>(EQUIV)WATER, BBL;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3,184,619</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CUMULATIVE PROD:</th>
<th>OIL, BBL;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(THRU 1977)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DEGREE OF SUCCESS:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OPERATOR(S):</th>
</tr>
</thead>
<tbody>
<tr>
<td>CROWN CENTRAL PET. CORP.</td>
</tr>
</tbody>
</table>

### T.2 IN-SITU COMBUSTION  
**(1964- )**

<table>
<thead>
<tr>
<th>AREA, ACRES:</th>
<th>FLUID INJECTED:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NO. PROD WELLS:</th>
<th>NO. INJ WELLS:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VOLUME INJECTED:</th>
<th>(EQUIV)WATER, BBL;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CUMULATIVE PROD:</th>
<th>OIL, BBL;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(THRU 1973)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DEGREE OF SUCCESS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>POOR</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OPERATOR(S):</th>
</tr>
</thead>
<tbody>
<tr>
<td>CROWN CENTRAL PET. CORP.</td>
</tr>
</tbody>
</table>

**SOURCES:** 5, 12, 14, 37, 38, 58, 113, 129, 132; 44
STATE: CALIFORNIA
COUNTY: VENTURA
DISTRICT: COASTAL REGION, SANTA CLARA VALLEY DISTR
FIELD NAME: TAPO CANYON SOUTH
NO. OF RESERVOIRS: 3

RESERVOIR INFORMATION

RESERVOIR: 4TH SESPE
NO. OF ZONES: 1
AREA, ACRES: 70 *
TOTAL WELLS: 
SHUT-IN WELLS: 
DISCOVERY YEAR: 1954
SPACING, ACRES: 12
PRODUCING WELLS: 6
INJECTION WELLS: 

GEOLOGICAL INFORMATION

FORMATION: SESPE
GEOLOGICAL AGE: OLIGOCENE
BASIN: VENTURA BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING; HIGH
FRACTURE;
DIP, DEG.: 14.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2376
GROSS PAY, FT:
POROSITY, %: 25.0
PERMEABILITY, MD: 400
BHT, DEF P: 117 *
GAS CAP: 
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 45.0 *
WTR SAT., %; 55.0
GAS SAT., %;
FVF, BBL/STB: 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 180
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 42.0 *
WTR SAT., %; 58.0
GAS SAT., %;
FVF, BBL/STB; 1.040 *
WOR, BBL/BBL;
GOR, SCF/BBL; 146
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 19.1
RANGE: 17.0 TO 21.0
VISCOSITY @ BHT, CP: 17.0 TO 21.0
SAYBOLT VISC (100F), SEC: CARBON/HYDROGEN RATIO:
SULFUR CONTENT, %: ACID NUMBER:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM: 18000
WATER HARDNESS: CA,PPM: MG,PPM:

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 10,500,000 BBL/AC-FT: 831
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977): OIL, BBL; 487,460
GAS, MCF; 203,000
WATER, BBL; 281,000
1977 ANNUAL PROD: OIL, BBL; 19,483
GAS, MCF; 1,000
WATER, BBL; 79,000
OIL REMAINING IN PLACE, STB: 10,000,000 BBL/AC-FT: 793
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 CYCLIC STEAM (1964-1965)

AREA, ACRES: FLUID INJECTED: S
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL; 11,063
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(GTHRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): UNION OIL CO

SOURCES: 5,12,14,37,38,58,113,129,132; 89
STATE: CALIFORNIA
COUNTY: LOS ANGELES
DISTRICT: COASTAL REGION, SANTA CLARA VALLEY DISTR
FIELD NAME: WAYSIDE CANYON
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: PLIOCENE
NO. OF ZONES: 2
AREA, ACRES: 100
TOTAL WELLS:
SHUT-IN WELLS: 5
DISCOVERY YEAR: 1962
SPACING, ACRES:
PRODUCING WELLS: 8
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: PICO
GEOLOGICAL AGE: PLIOCENE
BASIN: LOS ANGELES BASIN
TRAP TYPE: STRUCT/STRAT - SAND PINCHOUT ON HOMOCLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
  DIP, DEG.: 7.0
  HETEROGENEITY;
  CLAY CONTENT, %:
  FAULTING; NONE
  INTERBEDDED STREAKS:
  FRACTURE;
  BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1476
GROSS PAY, FT: 200
POROSITY, %: 35.0
PERMEABILITY, MD: 2500
BHT, DEF F: 98 *
GAS CAP: YES
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 70.0 *
  WTR SAT., %; 30.0
  GAS SAT., %;
  FVF, BBL/STB; 1.050 *
  WOR, BBL/BBL;
  GOR, SCF/BBL;
  BHP, PSI;

GAS CAP/OIL ZONE RATIO:
CURRENT: OIL SAT., %; 59.0 *
  WTR SAT., %; 41.0
  GAS SAT., %;
  FVF, BBL/STB; 1.010 *
  WOR, BBL/BBL;
  GOR, SCF/BBL;
  BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 21.3
VISCOSITY @ BHT, CP: 21.3
SAYBOLT VISC (100F), SEC: 21.3
SULFUR CONTENT, %: 21.3
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 13000
WATER HARDNESS: CA, PPM;
CARBON, PPM;
SULFUR, PPM:

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 18,100,000
ORIGINAL GAS IN PLACE, MCF: 2,337,140
CUM PROD:
(DEC 31, 1977) OIL, BBL; 45,000
GAS, MCF; 2,688,000
WATER, BBL; 2,337,140
1977 ANNUAL PROD:
OIL, BBL; 39,826
GAS, MCF; 132,000
WATER, BBL; 132,000
OIL REMAINING IN PLACE, STB: 15,800,000
(DEC 31,)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 PRESSURE MAINTENANCE (1966-1966)

AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
FLUID INJECTED: G
32,000
CUMULATIVE PROD:
OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S): TEXACO

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 120
STATE: CALIFORNIA
COUNTY: ORANGE
DISTRICT: LOS ANGELES REGION
FIELD NAME: HUNTINGTON BEACH
NO. OF RESERVOIRS: 16

RESERVOIR INFORMATION

RESERVOIR: SOUTH AREA ONSHORE TAR ZONE
NO. OF ZONES: 2
AREA, ACRES: 370
DISCOVERY YEAR: 1926
SPACING, ACRES:
TOTAL WELLS:
PRODUCING WELLS: 146
SHUT-IN WELLS: 115
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: PICO-PUENTE
GEOLOGICAL AGE: PLIOCENE
BASIN: LOS ANGELES BASIN
TRAP TYPE: -
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC
HETEROGENEITY;
FAULTING; HIGH
FRACTURE; HIGH
DIP, DEG.: 
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2175
GROSS PAY, FT: 
POROSITY, %: 38.0
PERMEABILITY, MD: 2300
BHT, DEF F: 110
GAS CAP: NO
GAS CAP/OIL ZONE RATIO: 
INITIAL: OIL SAT., %: 65.0
WTR SAT., %: 35.0
GAS SAT., %:
FVF, BBL/STB: 1.050 *
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:
NET PAY, FT: 150
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 44.0 *
WTR SAT., %: 56.0
GAS SAT., %:
FVF, BBL/STB: 1.000 *
WOR, BBL/BBL:
GOR, SCF/BBL: 474 
BHP, PSI: 900
FLUID CHARACTERISTICS

OIL GRAVITY, API: 15.0  RANGE: 11.0 TO 19.0
VISCOSITY @ BHT, CP: 740.0;  @ F, CP: 
SAYBOLT VISC (100°F), SEC: 
SULFUR CONTENT, %: .22  CARBON/HYDROGEN RATIO: 
CARBON RESIDUE, %: .7  ACID NUMBER: 
OIL TYPE: 
WATER SALINITY, PPM; 14400
WATER HARDNESS: CA, PPM; 200  MG, PPM; 234

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 101,300,000  BBL/AC-FT: 1825
ORIGINAL GAS IN PLACE, MCF: 
CUM PROD: OIL, BBL; 29,068,048
(DEC 31, 1977) GAS, MCF; WATER, BBL; 1977 ANNUAL PROD: OIL, BBL; 412,652
GAS, MCF; 247,000 WATER, BBL; 7,144,000
OIL REMAINING IN PLACE, STB: 72,200,000  BBL/AC-FT: 1301
(DEC 31, ) RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: GRAVITY
RECOVERY FACTOR, %: BBL/AC-FT: 
ANNUAL DECLINE RATE, %: 

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD  (1968-1969)

AREA, ACRES:  FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL; 9,544,000 GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977) GAS, MCF; WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT: 
DEGREE OF SUCCESS: 
OPERATOR(S):
CASE 068

SECONDARY AND TERTIARY RECOVERIES (CONT.)

S.2 WATERFLOOD (1971-1972)

AREA, ACRES: FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS: 7
VOLUME INJECTED: (EQUIV) WATER, BBL; 9,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): CHEVRON

T.1 CYCLIC STEAM (1964- )

AREA, ACRES: FLUID INJECTED: S
NO. PROD WELLS: NO. INJ WELLS: 3
VOLUME INJECTED: (EQUIV) WATER, BBL; 7,191,088
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): CHEVRON

T.2 STEAM DRIVE (1965- )

AREA, ACRES: FLUID INJECTED: S
NO. PROD WELLS: NO. INJ WELLS: 7
VOLUME INJECTED: (EQUIV) WATER, BBL; 7,184,181
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): CHEVRON

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 18, 29, 60, 62, 153, 156

37
**CASE 069**

**RESERVOIR AND PRODUCTION DATA ELEMENTS**

**STATE:** CALIFORNIA  
**COUNTY:** LOS ANGELES  
**DISTRICT:** LOS ANGELES REGION  
**FIELD NAME:** INGLEWOOD  
**NO. OF RESERVOIRS:** 8

### RESERVOIR INFORMATION

**RESERVOIR:** VICKERS  
**NO. OF ZONES:**  
**AREA, ACRES:** 1070  
**TOTAL WELLS:**  
**SHUT-IN WELLS:** 241  
**DISCOVERY YEAR:** 1924  
**SPACING, ACRES:**  
**PRODUCING WELLS:** 240  
**INJECTION WELLS:** 41

### GEOLOGICAL INFORMATION

**FORMATION:** PICO-PUENTE  
**GEOLOGICAL AGE:** PLIOCENE  
**BASIN:** LOS ANGELES BASIN  
**TRAP TYPE:** STRUCTURAL – FAULTED ANTICLINE  
**LITHOLOGY:** SAND  
**DEGREE OF:** CONSOLIDATION; HETEROGENEITY; FAULTING; FRACTURE; DIP, DEG.: 20.0  
**CLAY CONTENT, %:**  
**INTERBEDDED STREAKS:** YES  
**BARRIER TO FLOW:**

### RESERVOIR CHARACTERISTICS

**DEPTH, FT:** 1800  
**GROSS PAY, FT:** 750  
**POROSITY, %:** 44.0  
**PERMEABILITY, MD:** 600  
**BHT, DEF F:** 118  
**GAS CAP:** NO  
**GAS CAP/OIL ZONE RATIO:**  
**INITIAL:** OIL SAT., %; 75.0  
**WTR SAT., %; 25.0**  
**GAS SAT., %;  
**FVF, BBL/STB; 1.050**  
**WOR, BBL/BBL;  
**GOR, SCF/BBL;  
**BHP, PSI;**  
**NET PAY, FT:** 312  
**RANGE:** TO  
**RANGE:** TO  
**SAT. PRESSURE, PSI:**  
**GAS CAP, ACRES:**  
**WETTING PHASE:**  
**CURRENT:** OIL SAT., %; 53.0*  
**WTR SAT., %; 47.0**  
**GAS SAT., %;  
**FVF, BBL/STB; 1.000**  
**WOR, BBL/BBL;  
**GOR, SCF/BBL; 202**  
**BHP, PSI;**

### FLUID CHARACTERISTICS

**OIL GRAVITY, API:** 19.2  
**RANGE:** 13.0 TO 29.0  
**RANGE:**  
**VISCOITY @ BHT, CP:** 200.0; @ F, CP:  
**SAYBOLT VISC (100F), SEC:** 680  
**SULFUR CONTENT, %:** 2.50  
**CARBON/HYDROGEN RATIO:**  
**CARBON RESIDUE, %:** 6.9  
**ACID NUMBER:**  
**OIL TYPE:**  
**WATER SALINITY, PPM:** 29000  
**WATER HARDNESS: CA, PPM:** MG, PPM;
RESERVES AND PRODUCTION DATA

ORIGINAl OIL IN PLACE, STB: 814,000,000  BBL/AC-FT: 2438
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL: 211,717,414  GAS, MCF: 105,519,000
GAS, MCF: 193,000  WATER, BBL: 39,131
WATER, BBL:
1977 ANNUAL PROD: OIL, BBL: 211,717,414  GAS, MCF: 105,519,000
GAS, MCF: 193,000  WATER, BBL: 39,131
WATER, BBL:

OIL REMAINING IN PLACE, STB: 602,300,000  BBL/AC-FT: 1804
(DEC 31, 1977)
RESERVES (DEC 31, 1977)

PRIMARY PRODUCTION:
MECHANISM: GRAVITY DRAINAGE
RECOVERY FACTOR, %:  BBL/AC-FT: 8
ANNUAL DECLINE RATE, %: 6.0

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD  (1954- )
AREA, ACRES:  FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS: 84
VOLUME INJECTED: (EQUIV) WATER, BBL: 469,239,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL:
(GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:  BBL/AC-FT: 8
DEGREE OF SUCCESS:
OPERATOR(S): CHEVRON, GETTY OIL

T.1 CYCLIC STEAM  (1964- )
AREA, ACRES:  FLUID INJECTED: S
NO. PROD WELLS: NO. INJ WELLS: 105,504
VOLUME INJECTED: (EQUIV) WATER, BBL: 105,504
GAS, MCF;
CUMULATIVE PROD: OIL, BBL:
(GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:  BBL/AC-FT: 8
DEGREE OF SUCCESS:
OPERATOR(S):

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 17, 44, 50
RESERVOIR AND PRODUCTION DATA ELEMENTS

CASE 070

STATE: CALIFORNIA
COUNTY: ORANGE
DISTRICT: LOS ANGELES REGION
FIELD NAME: KRAEMER
NO. OF RESERVOIRS:

RESERVOIR INFORMATION

RESERVOIR: KRAEMER
NO. OF ZONES: 1
AREA, ACRES: 70
TOTAL WELLS: 24
SHUT-IN WELLS: 6
DISCOVERY YEAR: 1918
SPACING, ACRES: 70
PRODUCING WELLS: 19
INJECTION WELLS: 9

GEOLOGICAL INFORMATION

FORMATION: PUENTE
GEOLOGICAL AGE: MIocene
BASIN: LOS ANGELES BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; MOD DIP, DEG.: 22.0
HETEROGENEITY;
FAULTING; MOD INTERBEDDED STREAKS: YES
FRACTURE;
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2400
GROSS PAY, FT: 425
POROSITY, %: 20.0 *
PERMEABILITY, MD:
BHT, DEF P: 118 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 75.0 *
WTR SAT., %: 25.0
GAS SAT., %:
PVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 300
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 62.0 *
WTR SAT., %: 38.0
GAS SAT., %:
PVF, BBL/STB; 1.010 *
WOR, BBL/BBL;
GOR, SCF/BBL; 251
BHP, PSI;

FLUID CHARACTERISTICS

OIL GRAVITY, API: 19.6
VISCOITY @ BHT, CP: ; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM; 7200
WATER HARDNESS: CA,PPM; MG,PPM;
RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 23,300,000  BBL/AC-FT: 1108
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 3,354,521
(DEC 31, 1977)  GAS, MCF; 1,059,000
WATER, BBL; 13,126,000
1977 ANNUAL PROD: OIL, BBL; 46,260
GAS, MCF; 12,000
WATER, BBL; 1,366,000
OIL REMAINING IN PLACE, STB: 19,900,000  BBL/AC-FT: 949
(DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 PRESSURE MAINTENANCE  (1954-1957)

AREA, ACRES:  FLUID INJECTED: G
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV)WATER, BBL; 26,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977)  GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:  BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S):

S.2 WATERFLOOD  (1968-)

AREA, ACRES:  FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS: 12
VOLUME INJECTED: (EQUIV)WATER, BBL; 14,573,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977)  GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:  BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): UNION OIL

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 98
STATE: CALIFORNIA
COUNTY: ORANGE
DISTRICT: LOS ANGELES REGION
FIELD NAME: NEWPORT WEST
NO. OF RESERVOIRS: 6

RESERVOIR INFORMATION

RESERVOIR: MAIN AREA
NO. OF ZONES: 4
AREA, ACRES: 625
TOTAL WELLS: 66
SHUT-IN WELLS: 66
DISCOVERY YEAR: 1943
SPACING, ACRES: 3
PRODUCING WELLS: 230
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: PUENTE
GEOLOGICAL AGE: MIOCENE
BASIN: LOS ANGELES BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DIP, DEG.: 12.0
HETEROGENEITY;
FAULTING; HIGH
FRACTURE; HIGH
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1630
GROSS PAY, FT:
POROSITY, %: 36.0
PERMEABILITY, MD: 1000
BHT, DEF F: 100
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 69.0
WTR SAT., %; 31.0
GAS SAT., %;
FVF, BBL/STB; 1.020
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 275
RANGE: TO
RANGE: 500 TO 1000
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %;
WTR SAT., %;
GAS SAT., %;
FVF, BBL/STB;
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 15.5
VISCOSITY @ BHT, CP: 750.0; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 10000
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB:
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 28,796,159
(GDEC 31, 1977) GAS, MCF; 3,046,000
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 1,129,759
GAS, MCF; 2,000
WATER, BBL; 5,873,000
OIL REMAINING IN PLACE, STB:
(BDEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: GRAVITY DRAINAGE
RECOVERY FACTOR, %: 12.0
ANNUAL DECLINE RATE, %: BBL/AC-FT: 1889

REMARKS: ACREAGE REPRESENTS WHOLE FIELD

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 18, 54, 103
STATE: CALIFORNIA
COUNTY: LOS ANGELES
DISTRICT: LOS ANGELES REGION
FIELD NAME: WHITTIER
NO. OF RESERVOIRS: 8

RESERVOIR INFORMATION

RESERVOIR: RIDEOUT HEIGHTS (NEW PLIO, OLD NO. OF ZONES: DISCOVERY YEAR: 1901
AREA, ACRES: 100 SPACING, ACRES:
TOTAL WELLS: PRODUCING WELLS: 23
SHUT-IN WELLS: 4 INJECTION WELLS:

GEOLOGICAL INFORMATION

FAULTING; HIGH INTERBEDDED STREAKS:
FRACTURE; HIGH BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2174 NET PAY, FT: 150
GROSS PAY, FT:
POROSITY, %: 28.0 * RANGE: TO
PERMEABILITY, MD:
BHT, DEF F: 120 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 75.0 * WTR SAT., %; 25.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
CURRENT: OIL SAT., %; 72.0 *
WTR SAT., %; 28.0
GAS SAT., %;
FVF, BBL/STB; 1.040 *
WOR, BBL/BBL;
GOR, SCF/BBL; 159
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 20.3

RANGE: 14.0 TO 25.0

VISCOSITY @ BHT, CP: ;

@ F, CP:

SAYBOLT VISC (100 F), SEC: 124

SULFUR CONTENT, %: .53

CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %: 3.5

ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM;

WATER HARDNESS: CA, PPM;

MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 23,300,000 BBL/AC-FT: 1552

ORIGINAL GAS IN PLACE, MCF:

CUM PROD: OIL, BBL; 645,573

(GDEC 31, 1977) GAS, MCF; 298,000

WATER, BBL; 250,000

1977 ANNUAL PROD: OIL, BBL; 426,743

GAS, MCF; 228,000

WATER, BBL; 208,000

OIL REMAINING IN PLACE, STB: 22,600,000 BBL/AC-FT: 1509

(DEC 31, )

REERVES (DEC 31, )

PRIMARY PRODUCTION:

MECHANISM: SOLUTION GAS

RECOVERY FACTOR, %: BBL/AC-FT:

ANNUAL DECLINE RATE, %:

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 102
STATE: CALIFORNIA
COUNTY: LOS ANGELES
DISTRICT: LOS ANGELES REGION
FIELD NAME: WILMINGTON
NO. OF RESERVOIRS: 70

RESERVOIR INFORMATION

RESERVOIR: EAST AREA FAULT BLOCK V TAR
NO. OF ZONES: 2
AREA, ACRES: 213
SPACING, ACRES: 30
TOTAL WELLS:
PRODUCING WELLS: 6
SHUT-IN WELLS: 1
INJECTION WELLS: 1
DISCOVERY YEAR: 1967

GEOLOGICAL INFORMATION

FORMATION: REPETTO
GEOLOGICAL AGE: PLIOCENE
BASIN: LOS ANGELES BASIN
TRAP TYPE: ANTICLINE - FAULTED ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC
HETEROGENEITY; MOD
FAULTING; MOD
FRACTURE; MINOR
DIP, DEG.: 5.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2200
GROSS PAY, FT: 200
POROSITY, %: 37.0
PERMEABILITY, MD: 1500
BHT, DEF F: 110
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 79.0
WTR SAT., %; 19.0
GAS SAT., %; 2.0
FVF, BBL/STB; 1.060
WOR, BBL/BBL; 5
GOR, SCF/BBL; 270
BHP, PSI; 670
NET PAY, FT: 90
RANGE: TO
RANGE: 100 TO 5000
SAT. PRESSURE, PSI: 960
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 77.0 *
WTR SAT., %; 23.0
GAS SAT., %:
FVF, BBL/STB; 1.050
WOR, BBL/BBL; 6
GOR, SCF/BBL; 930
BHP, PSI; 820
FLUID CHARACTERISTICS

OIL GRAVITY, API: 12.8  RANGE: 12.0 TO 14.0
VISCOSITY @ BHT, CP: 200.0; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: 1.70 CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 13.0 ACID NUMBER:
OIL TYPE: ASPHALTIC
WATER SALINITY, PPM; 18000
WATER HARDNESS: CA, PPM; 500 MG, PPM; 400

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 14,600,000 BBL/AC-FT: 2100
ORIGINAL GAS IN PLACE, MCF: 1,229,000
CUM PROD: OIL, BBL; 245,332
(GDEC 31, 1977) GAS, MCF; 159,151
WATER, BBL; 507,738
1977 ANNUAL PROD: OIL, BBL; 26,291
GAS, MCF; 12,483
WATER, BBL; 77,494
OIL REMAINING IN PLACE, STB: 14,355,000 BBL/AC-FT: 2068
(DDEC 31, ) RESERVES (DEC 31, ) 610,000

PRIMARY PRODUCTION:
MECHANISM:
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1967-)

AREA, ACRES: 213 FLUID INJECTED: W
NO. PROD WELLS: 7 NO. INJ WELLS: 1
VOLUME INJECTED: (EQUIV) WATER, BBL; 6,283,597
GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 374,802
(GTHRU 1979) GAS, MCF; 216,155
WATER, BBL; 941,392
RECOVERY FACTOR, %: 2.6 BBL/AC-FT: 54
DEGREE OF SUCCESS: ME
OPERATOR(S): THUMS LONG BEACH CO

REMARKS: THIS POOL RENAMED IN 1971 DUE TO RECLASSIFICATION
SECONDARY PRODUCTION/INJECTION DATA AS OF 6/79.

SOURCES: 5, 12, 14, 37, 38, 58, 113, 124, 129, 132, 145, 300
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: LOS ANGELES
DISTRICT: LOS ANGELES REGION
FIELD NAME: WILMINGTON
NO. OF RESERVOIRS: 70

RESERVOIR INFORMATION

RESERVOIR: HARBOR AREA FAULT BLOCK IV TAR
NO. OF ZONES: 5
AREA, ACRES: 630 *
SPACING, ACRES: 18
TOTAL WELLS: 35
PRODUCING WELLS: 35
SHUT- IN WELLS: 8
INJECTION WELLS: 7

GEOLOGICAL INFORMATION

FORMATION: REPETTO
GEOLOGICAL AGE: PLIOCENE
BASIN: LOS ANGELES BASIN
TRAP TYPE: STRUCTURAL - ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC
HETEROGENEITY; MOD
FAULTING; MOD
FRACTURE; MINOR
DIP, DEG.: 8.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2150
GROSS PAY, FT: 160
POROSITY, %: 33.0
PERMEABILITY, MD: 500
BHT, DEF F: 126
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 81.0
WTR SAT., %; 19.0
GAS SAT., %;
FVF, BBL/STB: 1.053
WOR, BBL/BBL;
GOR, SCF/BBL: 130
BHP, PSI; 968
NET PAY, FT: 123
RANGE: TO
SAT. PRESSURE, PSI: 968
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 69.0 *
WTR SAT., %; 31.0
GAS SAT., %;
FVF, BBL/STB; 1.010 *
WOR, BBL/BBL;
GOR, SCF/BBL; 68
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 15.8 RANGE: 14.0 TO 18.0
VISCOSITY @ BHT, CP: 350.0; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: 1.70 CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 13.4 ACID NUMBER:
OIL TYPE: ASPHALTIC
WATER SALINITY, PPM; 23000
WATER HARDNESS: CA,PPM; 300 MG,PPM; 300

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE,STB: 152,600,000 BBL/AC-FT: 1969
ORIGINAL GAS IN PLACE,MCF:
CUM PROD (DEC 31, 1977): OIL,BBL; 16,079,315
GAS,MCF; 6,322,000
WATER,BBL;
1977 ANNUAL PROD: OIL,BBL; 302,073
GAS,MCF; 45,000
WATER,BBL; 5,533,000
OIL REMAINING IN PLACE,STB: 136,500,000 BBL/AC-FT: 1762
(DEC 31, )
RESERVES(DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %: 10.0 BBL/AC-FT: 196
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1958- )

AREA, ACRES: FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS: 7
VOLUME INJECTED: (EQUIV)WATER, BBL; 115,140,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): LBOD CO, MOBIL OIL

SOURCES: 5,12,14,37,38,58,113,129,132; 72,124,145,290
CASE 102

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: LOS ANGELES
DISTRICT: LOS ANGELES REGION
FIELD NAME: WILMINGTON
NO. OF RESERVOIRS: 70

RESERVOIR INFORMATION

RESERVOIR: HARBOR AREA FAULT BLOCK V TAR
NO. OF ZONES: 7
AREA, ACRES: 859
TOTAL WELLS: 18
SHUT-IN WELLS: 33
PRODUCING WELLS: 47
INJECTION WELLS: 17

GEOLOGICAL INFORMATION

FORMATION: REPETTO
GEOLOGICAL AGE: PLIOCENE
BASIN: LOS ANGELES BASIN
TRAP TYPE: STRUCTURAL - ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC HETEROGENEITY; MOD
DIP, DEG.: 8.0
FAULTING; MOD INTERBEDDED STREAKS: YES
FRACTURE; MINOR BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2200
GROSS PAY, FT: 160
POROSITY, %: 33.0
PERMEABILITY, MD: 500
BHT, DEF F: 126
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 81.0
WTR SAT., %: 19.0
GAS SAT., %:
FVF, BBL/STB: 1.053
WOR, BBL/BBL:
GOR, SCF/BBL: 130
BHP, PSI: 968
NET PAY, FT: 123
RANGE: TO
RANGE: 250 TO 2500
SAT. PRESSURE, PSI: 968
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 65.0*
WTR SAT., %: 35.0
GAS SAT., %:
FVF, BBL/STB: 1.038
WOR, BBL/BBL: 15
GOR, SCF/BBL: 232
BHP, PSI: 900

FLUID CHARACTERISTICS

OIL GRAVITY, API: 13.0
VISCOSITY @ BHT, CP: 450.0;
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: 1.70
CARBON RESIDUE, %: 13.4
OIL TYPE: ASPHALTIC
WATER SALINITY, PPM: 23000
WATER HARDNESS: CA, PPM: 300

CARBON/HYDROGEN RATIO:
ACID NUMBER:

CARBON RESIDUE, %:
ACID NUMBER:
CASE 102

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 208,384,000 BBL/AC-FT: 1969
ORIGINAL GAS IN PLACE, MCF: 27,090,000
GAS, MCF: 20,841,045
WATER, BBL: 154,375,380
1977 ANNUAL PROD: OIL, BBL: 1,040,049
GAS, MCF: 165,198
WATER, BBL: 12,808,630
OIL REMAINING IN PLACE, STB: 169,240,000 BBL/AC-FT: 1510 (DEC 31, )
RESERVES (DEC 31, ) 6,748,000

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS RECOVERY FACTOR, %: 10.0 BBL/AC-FT: 196
ANNUAL DECLINE RATE, %: 9.0

SECONDARY AND TERTIARY RECOVERIES:

S.1 PERIPHERAL WF (1960- )
AREA, ACRES: 859
NO. PROD WELLS: 47
VOLUME INJECTED: (EQUIV) WATER, BBL: 248,360,000
GAS, MCF:
CUMULATIVE PROD: OIL, BBL: 19,234,000
(THRU 1979) GAS, MCF: 10,098,000
WATER, BBL: 81,552,000
RECOVERY FACTOR, %: 9.2 BBL/AC-FT: 182
DEGREE OF SUCCESS: GOOD
OPERATOR(S): LBOD CO, POWERINE OIL

T.1 POLYMER FLOOD ( - )
AREA, ACRES: FLUID INJECTED: P/W
NO. PROD WELLS: NO. INJ WELLS: 16
VOLUME INJECTED: (EQUIV) WATER, BBL:
GAS, MCF:
CUMULATIVE PROD: OIL, BBL: (THRU ) GAS, MCF:
WATER, BBL:
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: PILOT
OPERATOR(S): LBOD CO, POWERINE OIL

REMARKS: SECONDARY PRODUCTION/INJECTION DATA AS OF 3/79
TERTIARY PILOT PROJECT

SOURCES: 5,12,14,37,38,58,113,129,132; 72,124,145,290

51
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: LOS ANGELES
DISTRICT: LOS ANGELES REGION
FIELD NAME: WILMINGTON
NO. OF RESERVOIRS: 70

RESERVOIR INFORMATION

RESERVOIR: TERMINAL AREA FAULT BLOCK II-A TAR
NO. OF ZONES: 5
AREA, ACRES: 180
DISCOVERY YEAR: 1937
SPACING, ACRES: 7
TOTAL WELLS: 
PRODUCING WELLS: 26
SHUT-IN WELLS: 21
INJECTION WELLS: 11

GEOLOGICAL INFORMATION

FORMATION: REPETTO
GEOLOGICAL AGE: PLIOCENE
BASIN: LOS ANGELES BASIN
TRAP TYPE: STRUCTURAL - ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC
HETEROGENEITY; MOD
FAULTING; MOD
FRACTURE; MINOR
DIP, DEG.: 8.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2000
GROSS PAY, FT: 350
POROSITY, %: 34.0
PERMEABILITY, MD: 1600
BHT, DEF F: 118
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 82.0
WTR SAT., %; 18.0
GAS SAT., %;
FVF, BBL/STB; 1.053 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 118
GAS CAP, ACRES:
RANGE: TO
RANGE: 250 TO
SAT. PRESSURE, PSI: 1000
WETTING PHASE:
CURRENT: OIL SAT., %; 43.0 *
WTR SAT., %; 57.0
GAS SAT., %;
FVF, BBL/STB; 1.030
WOR, BBL/BBL;
GOR, SCF/BBL; 70
BHP, PSI;
CASE 110

FLUID CHARACTERISTICS

OIL GRAVITY, API: 14.2
RANGE: 13.0 TO **.*

VISCOSITY @ BHT, CP: @ F, CP:

SAYBOLT VISC (100F), SEC:

SULFUR CONTENT, %: 1.60
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %:
ACID NUMBER:

OIL TYPE: ASPHALTIC
WATER SALINITY, PPM: 23000
WATER HARDNESS: CA, PPM: 300 MG, PPM: 300

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 43,600,000 BBL/AC-FT: 2054
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977): OIL, BBL: 20,099,916
GAS, MCF: 7,948,000
WATER, BBL: 135,743,000
1977 ANNUAL PROD:
OIL, BBL: 312,809
GAS, MCF: 25,000
WATER, BBL: 9,559,000
OIL REMAINING IN PLACE, STB: 23,500,000 BBL/AC-FT: 1108
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.L WATERFLOOD (1954- )

AREA, ACRES: FLUID INJECTED: W
NO. PROD WELLS: 26 NO. INJ WELLS: 15
VOLUME INJECTED: (EQUIV) WATER, BBL: 131,486,000
GAS, MCF:
CUMULATIVE PROD:
OIL, BBL: GAS, MCF:
(THRU ) WATER, BBL:
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: GOOD
OPERATOR(S): CHAMPLIN PETROLEUM CO

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 72, 110, 124, 145, 290
STATE: CALIFORNIA  
COUNTY: LOS ANGELES  
DISTRICT: LOS ANGELES REGION  
FIELD NAME: WILMINGTON  
NO. OF RESERVOIRS: 70

RESERVOIR INFORMATION

RESERVOIR: TERMINAL AREA FAULT BLOCK III TAR  
NO. OF ZONES: 5  
DISCOVERY YEAR: 1937  
AREA, ACRES: 224 *  
SPACING, ACRES: 7 *  
TOTAL WELLS:  
PRODUCING WELLS: 32  
INJECTION WELLS: 15  
SHUT-IN WELLS: 33

GEOLOGICAL INFORMATION

FORMATION: REPETTO  
GEOLOGICAL AGE: PLIOCENE  
BASIN: LOS ANGELES BASIN  
TRAP TYPE: STRUCTURAL - ANTICLINE  
LITHOLOGY: SAND  
DEGREE OF: CONSOLIDATION; UNC  
DIP, DEG.: 5.0  
HETEROGENEITY; MOD  
CLAY CONTENT, %:  
FAULTING; MOD  
INTERBEDDED STREAKS: YES  
FRACTURE; MINOR  
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2000  
GROSS PAY, FT: 350  
POROSITY, %: 35.0  
PERMEABILITY, MD: 1600  
BHT, DEF F: 118  
GAS CAP: NO  
GAS CAP/OIL ZONE RATIO:  
INITIAL: OIL SAT., %; 82.0  
WTR SAT., %; 18.0  
GAS SAT., %;  
FVF, BBL/STB; 1.053 *  
WOR, BBL/BBL;  
GOR, SCF/BBL;  
BHP, PSI; 700  
NET PAY, FT: 90 *  
RANGE: TO  
RANGE: 250 TO 2500  
 SAT. PRESSURE, PSI: 1000  
GAS CAP, ACRES:  
WETTING PHASE:  
CURRENT: OIL SAT., %; 47.0 *  
WTR SAT., %; 53.0  
GAS SAT., %;  
FVF, BBL/STB; 1.030 *  
WOR, BBL/BBL;  
GOR, SCF/BBL; 90  
BHP, PSI;
OIL GRAVITY, API: 15.2
VISCOSITY @ BHT, CP: 200.0; @ F, CP:
SAYBOLT VISC (100°F), SEC:
SULFUR CONTENT, %: 1.60
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
ACID NUMBER:
OIL TYPE: ASPHALTIC
WATER SALINITY, PPM: 23000
WATER HARDNESS: CA, PPM; 300
MG, PPM; 300

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 42,600,000
ORIGINAL GAS IN PLACE, MCF:
CUM PROD:
(DEC 31, 1977) GAS, MCF; 7,175,000
WATER, BBL; 139,986,000
1977 ANNUAL PROD: OIL, BBL; 284,840
GAS, MCF; 32,000
WATER, BBL; 8,636,000
OIL REMAINING IN PLACE, STB: 25,100,000
BBL/AC-FT: 1247

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1954-)

AREA, ACRES: 32
NO. PROD WELLS: 32
NO. INJ WELLS: 18
VOLUME INJECTED: (EQUIV) WATER, BBL; 237,136,000
GAS, MCF;
CUMULATIVE PROD:
(THRU)
OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
BBL/AC-FT:
DEGREE OF SUCCESS: GOOD
OPERATOR(S): LBDOP, CHAMPLIN PETR. CO

SOURCES: 5, 12, 14, 37, 38, 44, 58, 72, 110, 113, 124, 129, 132, 145, 290

55
STATE: CALIFORNIA  
COUNTY: ORANGE  
DISTRICT: LOS ANGELES REGION  
FIELD NAME: YORBA LINDA  
NO. OF RESERVOIRS: 4

<table>
<thead>
<tr>
<th>RESERVOIR INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESERVOIR: MAIN (SMITH)</td>
</tr>
<tr>
<td>NO. OF ZONES:</td>
</tr>
<tr>
<td>AREA, ACRES:</td>
</tr>
<tr>
<td>200 *</td>
</tr>
<tr>
<td>TOTAL WELLS:</td>
</tr>
<tr>
<td>SHUT-IN WELLS:</td>
</tr>
<tr>
<td>28</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GEOLOGICAL INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>FORMATION: REPETTO</td>
</tr>
<tr>
<td>GEOLOGICAL AGE: PLIOCENE</td>
</tr>
<tr>
<td>BASIN: LOS ANGELES BASIN</td>
</tr>
<tr>
<td>TRAP TYPE: STRUCTURAL - SAND LENSES ON HOMOCLINE</td>
</tr>
<tr>
<td>LITHOLOGY: SAND</td>
</tr>
<tr>
<td>DEGREE OF: CONSOLIDATION;</td>
</tr>
<tr>
<td>HETEROGENEITY;</td>
</tr>
<tr>
<td>FAULTING; MINOR</td>
</tr>
<tr>
<td>FRACTURE;</td>
</tr>
<tr>
<td>DIP, DEG.:</td>
</tr>
<tr>
<td>CLAY CONTENT, %:</td>
</tr>
<tr>
<td>INTERBEDDED STREAKS: YES</td>
</tr>
<tr>
<td>BARRIER TO FLOW:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RESERVOIR CHARACTERISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEPTH, FT: 2132</td>
</tr>
<tr>
<td>GROSS PAY, FT: 85</td>
</tr>
<tr>
<td>POROSITY, %: 30.0</td>
</tr>
<tr>
<td>PERMEABILITY, MD: 1000</td>
</tr>
<tr>
<td>BHT, DEF F: 100</td>
</tr>
<tr>
<td>GAS CAP:</td>
</tr>
<tr>
<td>GAS CAP/OILEZONERATIO:</td>
</tr>
<tr>
<td>INITIAL: OIL SAT., %: 74.0</td>
</tr>
<tr>
<td>WTR SAT., %: 26.0</td>
</tr>
<tr>
<td>GAS SAT., %:</td>
</tr>
<tr>
<td>FVF, BBL/STB: 1.050</td>
</tr>
<tr>
<td>WOR, BBL/BBL:</td>
</tr>
<tr>
<td>GOR, SCF/BBL:</td>
</tr>
<tr>
<td>BHP, PSI:</td>
</tr>
<tr>
<td>NET PAY, FT: 70</td>
</tr>
<tr>
<td>RANGE: TO</td>
</tr>
<tr>
<td>SAT. PRESSURE, PSI:</td>
</tr>
<tr>
<td>GAS CAP, ACRES:</td>
</tr>
<tr>
<td>WETTING PHASE:</td>
</tr>
<tr>
<td>CURRENT: OIL SAT., %: 44.0 *</td>
</tr>
<tr>
<td>WTR SAT., %: 56.0</td>
</tr>
<tr>
<td>GAS SAT., %:</td>
</tr>
<tr>
<td>FVF, BBL/STB: 1.000 *</td>
</tr>
<tr>
<td>WOR, BBL/BBL:</td>
</tr>
<tr>
<td>GOR, SCF/BBL: 200</td>
</tr>
<tr>
<td>BHP, PSI:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FLUID CHARACTERISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>OIL GRAVITY, API: 15.6</td>
</tr>
<tr>
<td>RANGE: 13.0 TO 17.0</td>
</tr>
<tr>
<td>VISCOSITY @ BHT, CP: 1500.0;</td>
</tr>
<tr>
<td>@ 300F, CP: 7.0</td>
</tr>
<tr>
<td>SAYBOLT VISC (100F), SEC:</td>
</tr>
<tr>
<td>SULFUR CONTENT, %:</td>
</tr>
<tr>
<td>CARBON/HYDROGEN RATIO:</td>
</tr>
<tr>
<td>CARBON RESIDUE, %:</td>
</tr>
<tr>
<td>ACID NUMBER:</td>
</tr>
<tr>
<td>OIL TYPE:</td>
</tr>
<tr>
<td>WATER SALINITY, PPM:</td>
</tr>
<tr>
<td>WATER HARDNESS: CA, PPM:</td>
</tr>
<tr>
<td>MG, PPM:</td>
</tr>
</tbody>
</table>
RESERVES AND PRODUCTION DATA

CASE 120

ORIGINAL OIL IN PLACE, STB: 23,000,000  BBL/AC-FT: 1640
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 8,703,746
(DEC 31, 1977) GAS, MCF; 786,000
WATER, BBL; 45,812,000
1977 ANNUAL PROD: OIL, BBL; 136,878
GAS, MCF; 11,000
WATER, BBL; 2,377,000
OIL REMAINING IN PLACE, STB: 14,300,000  BBL/AC-FT: 1019
(DEC 31,  )
RESERVES (DEC 31,  )

PRIMARY PRODUCTION:
MECHANISM: GRAVITY DRAINAGE
RECOVERY FACTOR, %: 5.0  BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 CYCLIC STEAM  (1963-  )

AREA, ACRES: FLUID INJECTED: 5
NO. PROD WELLS: NO. INJ WELLS: 3
VOLUME INJECTED: (EQUIV) WATER, BBL; 2,361,889
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1976) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S): SHELL OIL CO

T.2 STEAM DRIVE  (  -  )

AREA, ACRES: FLUID INJECTED: 5
NO. PROD WELLS: NO. INJ WELLS: 3
VOLUME INJECTED: (EQUIV) WATER, BBL; 3,363,169
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1976) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S): SHELL OIL CO

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 110
CASE 121

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: ORANGE
DISTRICT: LOS ANGELES REGION
FIELD NAME: YORBA LINDA
NO. OF RESERVOIRS: 4

RESERVOIR INFORMATION

RESERVOIR: SHALLOW
NO. OF ZONES: 2
AREA, ACRES: 620
TOTAL WELLS: (TOTAL WELLS)
PRODUCING WELLS: 397
INJECTION WELLS:
SHUT-IN WELLS: 70
DISCOVERY YEAR: 1954
SPACING, ACRES:

GEOLOGICAL INFORMATION

FORMATION: LA HABRA
GEOLOGICAL AGE: PLEISTOCENE
BASIN: LOS ANGELES BASIN
TRAP TYPE: STRUCTURAL - SAND LENSES ON HOMOCLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNCONSOLIDATED
HETEROGENEITY;
FAULTING; MINOR
FRACUCRE:
DIP, DEG.: 10.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 650
GROSS PAY, FT:
POROSITY, %: 30.0
PERMEABILITY, MD: 600
BHT, DEF F: 85
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 65.0
WTR SAT., %; 35.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 400
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 54.0 *
WTR SAT., %; 46.0
GAS SAT., %;
FVF, BBL/STB; 1.010 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

FLUID CHARACTERISTICS

OIL GRAVITY, API: 12.7
VISCOITY @ BHT, CP: 6400.0;
SAYBOLT VISC (100F), SEC: 6000
SULFUR CONTENT, %: 1.86
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 6.4
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;
RESERVES AND PRODUCTION DATA

CASE 121

ORIGINAL OIL IN PLACE, STB: 357,300,000 BBL/AC-FT: 1441
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 46,360,125
   (DEC 31, 1977) GAS, MCF; 172,000
   WATER, BBL; 173,927,000
1977 ANNUAL PROD: OIL, BBL; 2,931,394
   GAS, MCF; 18,590
OIL REMAINING IN PLACE, STB: 311,000,000 BBL/AC-FT: 1254
   (DEC 31,  )
RESERVES (DEC 31,  )

PRIMARY PRODUCTION:
MECHANISM: GRAVITY DRAINAGE
RECOVERY FACTOR, %: 5.0
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 CYCLIC STEAM (1960- )
AREA, ACRES: 428
NO. PROD WELLS: 255
VOLUME INJECTED: (EQUIV) WATER, BBL: 53,503,200
   GAS, MCF;
CUMULATIVE PROD: OIL, BBL; (THRU 1976) GAS, MCF;
   WATER, BBL;
RECOVERY FACTOR, %: 35.0
DEGREE OF SUCCESS:
OPERATOR(S): SHELL OIL CO

T.2 STEAM DRIVE (1971- )
AREA, ACRES: 428
NO. PROD WELLS: 255
VOLUME INJECTED: (EQUIV) WATER, BBL: 10,780,394
   GAS, MCF;
CUMULATIVE PROD: OIL, BBL; (THRU 1976) GAS, MCF;
   WATER, BBL;
RECOVERY FACTOR, %: 50.0
DEGREE OF SUCCESS:
OPERATOR(S): SHELL OIL CO

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 18, 45, 63, 110, 143
CASE 122
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: ORANGE
DISTRICT: LOS ANGELES REGION
FIELD NAME: YORBA LINDA
NO. OF RESERVOIRS: 4

RESERVOIR INFORMATION

RESERVOIR: SHELL
NO. OF ZONES: 4*  
AREA, ACRES: 90  
TOTAL WELLS: 90*  
SHUT-IN WELLS: 12  
DISCOVERY YEAR: 1937  
SPACING, ACRES: 3  
PRODUCING WELLS: 15  
INJECTION WELLS: 15

GEOLOGICAL INFORMATION

FORMATION: REPETTO
GEOLOGICAL AGE: PLIOCENE
BASIN: LOS ANGELES BASIN
TRAP TYPE: STRUCTURAL - SAND LENSES ON HOMOCLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.:  
HETEROGENEITY; CLAY CONTENT, %:  
FAULTING; NONE INTERBEDDED STREAKS: YES
FRACTURE; BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1733
GROSS PAY, FT:  
POROSITY, %: 44.0  
PERMEABILITY, MD:  
BHT, DEF F: 109*  
GAS CAP: NO  
GAS CAP/OIL ZONE RATIO:  
INITIAL: OIL SAT., %: 65.0 *  
WTR SAT., %: 35.0  
GAS SAT., %:  
FVF, BBL/STB: 1.050*  
WOR, BBL/BBL:  
GOR, SCF/BBL:  
BHP, PSI:  
NET PAY, FT: 125  
RANGE: TO  
RANGE: TO
SAT. PRESSURE, PSI:  
GAS CAP, ACRES:  
WETTING PHASE:  
CURRENT: OIL SAT., %: 50.0 *  
WTR SAT., %: 50.0  
GAS SAT., %:  
FVF, BBL/STB: 1.010*  
WOR, BBL/BBL:  
GOR, SCF/BBL:  
BHP, PSI:

FLUID CHARACTERISTICS

OIL GRAVITY, API: 17.3
VISCOITY @ BHT, CP:  
SAYBOLT VISC (100F), SEC:  
SULFUR CONTENT, %:  
CARBON RESIDUE, %:  
CARBON/HYDROGEN RATIO:  
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM:
WATER HARDNESS: CA, PPM:  
MG, PPM:

RANGE: 13.0 TO 20.0
@ F, CP:

CARBON/HYDROGEN RATIO:
ACID NUMBER:

WATER SALINITY, PPM:
WATER HARDNESS: CA, PPM:
MG, PPM:

60
RESERVES AND PRODUCTION DATA

CASE 122

ORIGINAL OIL IN PLACE, STB: 23,800,000  BBL/AC-FT: 2113
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 4,639,623
(GDEC 31, 1977) GAS, MCF; 883,000
WATER, BBL; 13,859,000
1977 ANNUAL PROD: OIL, BBL; 73,524
GAS; MCF;
WATER, BBL; 1,200,000
OIL REMAINING IN PLACE, STB: 19,100,000  BBL/AC-FT: 1701
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %: 
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 CYCLIC STEAM (1965- )

AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
CUMULATIVE PROD: OIL, BBL;
(THRU 1976) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR (S): SHELL OIL CO

T.2 STEAM DRIVE (1964- )

AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
CUMULATIVE PROD: OIL, BBL;
(THRU 1976) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR (S): SHELL OIL CO

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 45, 110
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: LOS ANGELES
DISTRICT: LOS ANGELES REGION, OTHER FIELDS
FIELD NAME: LOS ANGELES CITY
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: MIOCENE ZONES 1-2-3
NO. OF ZONES: 3
AREA, ACRES: 105
TOTAL WELLS: 44
SHUT-IN WELLS: 36
DISCOVERY YEAR: 1890
PRODUCING WELLS: 44
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: PUENTE
GEOLOGICAL AGE: MIOCENE
BASIN: LOS ANGELES BASIN
TRAP TYPE: STRUCTURAL - FAULTED HOMOCLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION
HETEROGEOLOGY:
FAULTING:
FRActURE:
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 894
GROSS PAY, FT: 205
POROSITY, %: 34.0
PERMEABILITY, MD:
BHT, DEF F: 88 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 71.0 *
WTR SAT., %; 29.0
GAS SAT., %;
PVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 185
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %;
WTR SAT., %;
GAS SAT., %;
PVF, BBL/STB;
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
CASE 123

FLUID CHARACTERISTICS

OIL GRAVITY, API: 14.0
RANGE: 12.0 TO 16.0

VISCOSITY @ BHT, CP:

SAYBOLT VISC (100F); SEC:

SULFUR CONTENT, %:

CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %:

ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM;

WATER HARDNESS: CA, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE,STB: BBL/AC-FT: 1784
ORIGINAL GAS IN PLACE, MCF:
CUM PROD : OIL, BBL; 21,780,477
(DEC 31, 1977) GAS, MCF; 17,000,000
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 35,844
GAS, MCF;
WATER, BBL; 224,000
OIL REMAINING IN PLACE, STB: BBL/AC-FT:
(DEC 31, )
RESERVES (DEC 31, 1977) 360,000

PRIMARY PRODUCTION:
MECHANISM: GRAVITY DRAINAGE
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

REMARKS: ABANDONMENTS HAVE CUT PROD-AREA FROM 780 ACRES.

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 69
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: RIVERSIDE
DISTRICT: LOS ANGELES REGION, OTHER FIELDS
FIELD NAME: PRADO-CORONA
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: GOEDHART AREA - HUNTER
NO. OF ZONES: 2
AREA, ACRES: 130
TOTAL WELLS: 
PRODUCING WELLS: 7
SHUT-IN WELLS: 2
INJECTION WELLS: 

DISCOVERY YEAR: 1968
SPACING, ACRES:

GEOLOGICAL INFORMATION

FORMATION: PUENTE
GEOLOGICAL AGE: MIOCENE
BASIN: SALTON BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING; HIGH
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2350
GROSS PAY, FT: 
POROSITY, %: 36.0
PERMEABILITY, MD: 174
BHT, DEF F: 124 *
GAS CAP: YES
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 70.0 *
WTR SAT., %: 30.0
GAS SAT., %:
FVF, BBL/STB: 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

NET PAY, FT: 100
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 69.0 *
WTR SAT., %: 31.0
GAS SAT., %:
FVF, BBL/STB: 1.040 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 16.0
VISCOSITY @ BHT, CP: RANGE: 16.0 TO 17.0
SAYBOLT VISC (100°F), SEC: @ F, CP:
SULFUR CONTENT, %: CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 24,200,000
ORIGINAL GAS IN PLACE, MCF: 
CUM PROD (DEC 31, 1977): OIL, BBL; 244,000 *
GAS, MCF; 218,000
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 18,600 *
GAS, MCF; 30,000
WATER, BBL;
OIL REMAINING IN PLACE, STB: 24,000,000
(WATER, BBL; 1843
(DEC 31, 1977))
RESERVES (DEC 31, 1977)

PRIMARY PRODUCTION:
MECHANISM:
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 80
STATE: CALIFORNIA
COUNTY: RIVERSIDE
DISTRICT: LOS ANGELES REGION, OTHER FIELDS
FIELD NAME: PRADO-CORONA
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: SARDCO AREA - HUNTER
NO. OF ZONES: 2
AREA, ACRES: 85
TOTAL WELLS: 9
PRODUCING WELLS: 9
SHUT-IN WELLS: 3
INJECTION WELLS:

DISCOVERY YEAR: 1966
SPACING, ACRES:

GEOLOGICAL INFORMATION

FORMATION: PUENTE
GEOLOGICAL AGE: MIOCENE
BASIN: SALTON BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DIP, DEG.: 15.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING; HIGH
FRACTURE;

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2350
GROSS PAY, FT:
POROSITY, %: 36.0
PERMEABILITY, MD: 174
BHT, DEF F: 124 *
NET PAY, FT: 150
RANGE:
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 70.0 *
WTR SAT., %; 30.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
CURRENT: OIL SAT., %; 68.0 *
WTR SAT., %; 32.0
GAS SAT., %;
FVF, BBL/STB; 1.040 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
RANGE: 31 TO 435
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
FLUID CHARACTERISTICS

OIL GRAVITY, API: 16.0
VISCOSITY @ BHT, CP: RANGE: 16.0 TO 17.0
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
CARBON/HYDROGEN RATIO:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 23,700,000 BBL/AC-FT: 1862
ORIGINAL GAS IN PLACE, MCF: CUM PROD:
(DEC 31, 1977) OIL, BBL: 466,000 *
GAS, MCF:
WATER, BBL:
1977 ANNUAL PROD: OIL, BBL: 43,400 *
GAS, MCF:
WATER, BBL:
OIL REMAINING IN PLACE, STB: 23,300,000 BBL/AC-FT: 1825
(DEC 31, ) RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM:
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 80
## Reservoir and Production Data Elements

**State:** California  
**County:** Kern  
**District:** San Joaquin Valley Region  
**Field Name:** Ant Hill  
**No. of Reservoirs:** 2

### Reservoir Information

**Reservoir:** Olicese  
**No. of Zones:**  
**Area, Acres:**  
**Total Wells:**  
**Shut-In Wells:** 6

### Geological Information

**Formation:** Olicese Sand  
**Geological Age:** Miocene  
**Basin:** San Joaquin Basin  
**Trap Type:** Structural - Faulted Anticline  
**Lithology:** Sand  
**Degree of Consolidation:** MOD  
**Dip, Deg.:** 4.0  
**Heterogeneity:** Minor  
**Clay Content, %:**  
**Faulting:** MOD  
**Interbedded Streaks:** No  
**Fracture:**  
**Barrier to Flow:** No

### Reservoir Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth, Ft.</td>
<td>2286</td>
</tr>
<tr>
<td>Gross Pay, Ft.</td>
<td>700</td>
</tr>
<tr>
<td>Porosity, %</td>
<td>34.0</td>
</tr>
<tr>
<td>Permeability, MD</td>
<td>122 *</td>
</tr>
<tr>
<td>BHT, Def F.</td>
<td>122</td>
</tr>
<tr>
<td>Gas Cap.</td>
<td>No</td>
</tr>
<tr>
<td>Gas Cap/Oil Zone Ratio:</td>
<td></td>
</tr>
<tr>
<td>Initial: Oil Sat., %</td>
<td>67.0</td>
</tr>
<tr>
<td>WTR Sat., %</td>
<td>33.0</td>
</tr>
<tr>
<td>Gas Sat., %</td>
<td></td>
</tr>
<tr>
<td>FVF, BBL/STB</td>
<td>1.050</td>
</tr>
<tr>
<td>WOR, BBL/BBL</td>
<td></td>
</tr>
<tr>
<td>GOR, SCF/BBL</td>
<td></td>
</tr>
<tr>
<td>BHP, PSI</td>
<td></td>
</tr>
<tr>
<td>Net Pay, Ft.</td>
<td>100</td>
</tr>
<tr>
<td>Current: Oil Sat., %</td>
<td>57.0</td>
</tr>
<tr>
<td>WTR Sat., %</td>
<td>43.0</td>
</tr>
<tr>
<td>Gas Sat., %</td>
<td></td>
</tr>
<tr>
<td>FVF, BBL/STB</td>
<td>1.010</td>
</tr>
<tr>
<td>WOR, BBL/BBL</td>
<td></td>
</tr>
<tr>
<td>GOR, SCF/BBL</td>
<td></td>
</tr>
<tr>
<td>BHP, PSI</td>
<td></td>
</tr>
<tr>
<td>Range: To</td>
<td></td>
</tr>
<tr>
<td>Range: To</td>
<td></td>
</tr>
<tr>
<td>Sat. Pressure, PSI:</td>
<td></td>
</tr>
<tr>
<td>Gas Cap, Acres:</td>
<td></td>
</tr>
<tr>
<td>Wetting Phase:</td>
<td></td>
</tr>
<tr>
<td>Current: Oil Sat., %</td>
<td>57.0</td>
</tr>
<tr>
<td>WTR Sat., %</td>
<td>43.0</td>
</tr>
<tr>
<td>Gas Sat., %</td>
<td></td>
</tr>
<tr>
<td>FVF, BBL/STB</td>
<td>1.010</td>
</tr>
<tr>
<td>WOR, BBL/BBL</td>
<td></td>
</tr>
<tr>
<td>GOR, SCF/BBL</td>
<td></td>
</tr>
<tr>
<td>BHP, PSI</td>
<td></td>
</tr>
</tbody>
</table>

68
## FLUID CHARACTERISTICS

**OIL GRAVITY, API:** 13.5  
**RANGE:** 12.0 TO 14.0  
**VISCOSITY @ BHT, CP:**  
**SAYBOLT VISC (100F), SEC:**  
**SULFUR CONTENT, %:** .65  
**CARBON HYDROGEN RATIO:**  
**CARBON RESIDUE, %:** .1  
**ACID NUMBER:**  
**OIL TYPE:**  
**WATER SALINITY, PPM:** 1500  
**WATER HARDNESS, CA, PPM:**  
**MG, PPM:**

## RESERVES AND PRODUCTION DATA

**ORIGINAL OIL IN PLACE, STB:** 48,000,000  
**BBL/AC-FT:** 1683  
**ORIGINAL GAS IN PLACE, MCF:**  
**CUM PROD, OIL, BBL:** 5,851,479  
**GAS, MCF:**  
**WATER, BBL:**  
**1977 ANNUAL PROD, OIL, BBL:** 117,040  
**GAS, MCF:**  
**WATER, BBL:** 3,105,000  
**OIL REMAINING IN PLACE, STB:** 42,100,000  
**BBL/AC-FT:** 1478  
**RESERVES (DEC 31, 1977):** 690,000

**PRIMARY PRODUCTION:**  
**MECHANISM:**  
**RECOVERY FACTOR, %:**  
**ANNUAL DECLINE RATE, %:**

**SECONDARY AND TERTIARY RECOVERIES:**

**S.1 WATERFLOOD (1959- )**

**AREA, ACRES:**  
**NO. PROD WELLS:**  
**NO. INJ WELLS:** 3  
**VOLUME INJECTED: (EQUIV) WATER, BBL:** 45,456,000  
**GAS, MCF:**  
**CUMULATIVE PROD, OIL, BBL:**  
**THRU 1977 GAS, MCF:**  
**WATER, BBL:**  
**RECOVERY FACTOR, %:**  
**BBL/AC-FT:**

**DEGREE OF SUCCESS:**  
**OPERATOR(S):** SAMSON RESOURCES

**SOURCES:** 5,12,14,37,38,58,113,129,132; 42
STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: ANTELOPE HILLS
NO. OF RESERVOIRS: 7

RESERVOIR INFORMATION

RESERVOIR: WILLIAMS AREA EAST BLOCK AGUA
NO. OF ZONES: DISCOVERY YEAR: 1943
AREA, ACRES: 145 SPACING, ACRES:
TOTAL WELLS: PRODUCING WELLS: 12
SHUT-IN WELLS: 4 INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: TEMBLOR
GEOLOGICAL AGE: MIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING; HIGH
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS: NO
BARRIER TO FLOW: NO

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2300
GROSS PAY, FT:
POROSITY, %: 33.0 *
PERMEABILITY, MD:
BHT, DEF F: 123 *
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 66.0 *
WTR SAT., %: 34.0
GAS SAT., %:
FVF, BBL/STB: 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 120
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 54.0 *
WTR SAT., %: 46.0
GAS SAT., %:
FVF, BBL/STB: 1.010 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
## FLUID CHARACTERISTICS

**OIL GRAVITY, API:** 18.9  
**RANGE:** 17.0 TO 24.0  
**VISCOSITY @ BHT, CP:**  
**SAYBOLT VISC (100F), SEC:**  
**SULFUR CONTENT, %:**  
**CARBON RESIDUE, %:**  
**OIL TYPE:**  
**WATER SALINITY, PPM:** 2600  
**WATER HARDNESS:** CA,PPM; MG,PPM;  
**CARBON/HYDROGEN RATIO:**  
**ACID NUMBER:**

## RESERVES AND PRODUCTION DATA

**ORIGINAL OIL IN PLACE, STB:** 28,000,000  
**BBL/AC-FT:** 1609  
**ORIGINAL GAS IN PLACE, MCF:**  
**CUM PROD (DEC 31, 1977):**  
**OIL, BBL:** 4,146,161  
**GAS, MCF:**  
**WATER, BBL:**  
**1977 ANNUAL PROD:**  
**OIL, BBL:** 40,453  
**GAS, MCF:** 11,000  
**WATER, BBL:** 650,000  
**OIL REMAINING IN PLACE, STB:** 23,900,000  
**BBL/AC-FT:** 1371  
**RESERVES (DEC 31, 1977):**  

**PRIMARY PRODUCTION:**  
**MECHANISM:**  
**RECOVERY FACTOR, %:**  
**ANNUAL DECLINE RATE, %:**

**SOURCES:** 5, 12, 14, 37, 38, 58, 113, 129, 132; 115
STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: ANTELOPE HILLS
NO. OF RESERVOIRS: 7

RESERVOIR INFORMATION

RESERVOIR: WILLIAMS AREA EAST BLOCK BUTTON BED
NO. OF ZONES: DISCOVERY YEAR: 1942
AREA, ACRES: SPACING, ACRES: 
TOTAL WELLS: PRODUCING WELLS: 24
SHUT-IN WELLS: INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: TEMBLOR (BUTTON BED SANDS)
GEOLOGICAL AGE: MIOCENE
 BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETERORENEITY;
FAULTING; HIGH
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDEN STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2335
GROSS PAY, FT: NET PAY, FT: 85
POROSITY, %: 33.0 *
PERMEABILITY, MD: RANGE: TO
BHT, DEP F: 124 * RANGE: TO
GAS CAP: YES SAT. PRESSURE, PSI: 
GAS CAP/OIL ZONE RATIO: GAS CAP, ACRES: 
INITIAL: OIL SAT., %; 66.0 *
WTR SAT., %; 34.0 WETTING PHASE: 
GAS SAT., %; CURRENT: OIL SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL; GAS SAT., %;
GOR, SCF/BBL;
BHP, PSI; BHP, PSI;

153
FLUID CHARACTERISTICS

OIL GRAVITY, API: 20.0  
RANGE: 18.0 TO 21.0
VISCOSITY @ BHT, CP:  
@ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM: 4200
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB:  
ORIGINAL GAS IN PLACE, MCF:  
CUM PROD (DEC 31, 1977): OIL, BBL: 2,316,581
GAS, MCF:  
WATER, BBL: 48,270,000
1977 ANNUAL PROD: OIL, BBL: 62,736
GAS, MCF: 18,000
WATER, BBL: 408,000
OIL REMAINING IN PLACE, STB:  
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: GC & WD
RECOVERY FACTOR, %:  
ANNUAL DECLINE RATE, %:  

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 115
STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: ANTELOPE HILLS
NO. OF RESERVOIRS: 7

RESERVOIR INFORMATION

RESERVOIR: WILLIAMS AREA W.B. BUTTON BED-AGUA
NO. OF ZONES: 2
AREA, ACRES: 265
TOTAL WELLS: 20
SHUT-IN WELLS: 12

DISCOVERY YEAR: 1942
SPACING, ACRES:
PRODUCING WELLS: 20
INJECTION WELLS:

GEOMORPHOLOGICAL INFORMATION

FORMATION: TEMBLOR
GEOLOGICAL AGE: MIocene
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETERGENEITY;
FAULTING; HIGH
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2298
GROSS PAY, FT: 250
POROSITY, %: 33.0 *
PERMEABILITY, MD:
BHT, DEF P: 123 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 66.0 *
WTR SAT., %; 34.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

NET PAY, FT: 150
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 56.0 *
WTR SAT., %; 44.0
GAS SAT., %;
FVF, BBL/STB; 1.010 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 16.5           RANGE: 15.0 TO 18.0
VISCOSITY @ BHT, CP:              ;     @ F, CP:
SAYBOLT VISc (100F), SEC:
SULFUR CONTENT, %:               CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:               ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 3400         MG, PPM;
WATER HARDNESS: CA, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 64,000,000 BBL/AC-FT: 1609
ORIGINAL GAS IN PLACE, MCF:     
CUM PROD : OIL, BBL; 7,146,744
(GDEC 31, 1977) GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 51,961
GAS, MCF; 1,000
WATER, BBL; 474,000
OIL REMAINING IN PLACE, STB: 56,800,000 BBL/AC-FT: 1429
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM:
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 115
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: ANTELOPE HILLS, NORTH
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: MIOCENE
NO. OF ZONES: 2
DISCOVERY YEAR: 1950
AREA, ACRES: 280
SPACING, ACRES: 
TOTAL WELLS: 
PRODUCING WELLS: 15
SHUT-IN WELLS: 10
INJECTION WELLS: 

GEOLOGICAL INFORMATION

FORMATION: TEMBLOR (BUTTON BED & AGUA SANDS)
GEOLOGICAL AGE: MIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRATIGRAPHIC - UNCONFORMITY ON HOMOCLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING; NONE
FRACTURE;
DIP, DEG.: 31.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1311
GROSS PAY, FT: 140
POROSITY, %: 33.0 *
PERMEABILITY, MD:
BHT, DEF F: 98 *
GAS CAP: YES
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 66.0 *
WTR SAT., %; 34.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 75 *
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 58.0 *
WTR SAT., %; 42.0
GAS SAT., %;
FVF, BBL/STB; 1.020 *
WOR, BBL/BBL;
GOR, SCF/BBL; 380
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 15.9  RANGE: 15.0 TO 16.0
VISCOSITY @ BHT, CP:  @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:  CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:  ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;  18000
WATER HARDNESS: CA,PPM;  MG,PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE,STB:  33,800,000  BBL/AC-FT: 1609
ORIGINAL GAS IN PLACE,MCF:
CUM PROD  : OIL,BBL;  3,325,453
            (DEC 31, 1977) GAS,MCF;  718,000
            WATER,BBL;  28,227,000
1977 ANNUAL PROD: OIL,BBL;  26,538
            GAS,MCF;  8,000
            WATER,BBL;  567,000
OIL REMAINING IN PLACE,STB:  30,500,000  BBL/AC-FT: 1451
(DEC 31,  )
RESERVES (DEC 31, 1977)  280,000

PRIMARY PRODUCTION:
   MECHANISM: GAS CAP GAS WATER DR
   RECOVERY FACTOR, %:  BBL/AC-FT:
   ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.I CYCLIC STEAM (1970-1971)

AREA, ACRES:  FLUID INJECTED: S
NO. PROD WELLS:  NO. INJ WELLS:
VOLUME INJECTED: (EQUIV)WATER, BBL;  33,681
            GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
            (THRU 1971) GAS, MCF;
            WATER, BBL;
RECOVERY FACTOR, %:  BBL/AC-FT:
DEGREE OF SUCCESS: NE
OPERATOR(S):

SOURCES: 5,12,14,37,38,58,113,129,132; 115

77
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: BELRIDGE, NORTH
NO. OF RESERVOIRS: 6

RESERVOIR INFORMATION

RESERVOIR: SHALLOW
NO. OF ZONES: 2
AREA, ACRES:
TOTAL WELLS:
SHUT-IN WELLS: 49
DISCOVERY YEAR: 1912
SPACING, ACRES:
PRODUCING WELLS: 100
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: TULARE-ETCHEGOIN
GEOLOGICAL AGE: PLEISTOCENE-PLIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCTURAL - ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC HETERogeneity; HIGH CLAY CONTENT, %: 5.0
FAULTING; MINOR INTERBEDDED streaks: YES
FRACTURE; MINOR BARRIER TO FLOW: NO

RESERVOIR CHARACTERISTICS

DEPTH, FT: 600
GROSS PAY, FT: 125
POROSITY, %: 35.0 *
PERMEABILITY, MD: 2000
BHT, DEF F: 85
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 60.0
WTR SAT., %: 40.0
GAS SAT., %:
FVF, BBL/STB: 1.030
WOR, BBL/BBL: 43
GOR, SCF/BBL:
BHP, PSI: 385

NET PAY, FT: 60
RANGE: TO
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %;
WTR SAT., %;
GAS SAT., %;
FVF, BBL/STB;
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI: 200
FLUID CHARACTERISTICS

OIL GRAVITY, API: 12.0 RANGE: 12.0 TO 15.0
VISCOSITY @ BHT, CP: @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
OIL TYPE: ASPHALTIC
WATER SALINITY, PPM: 12000
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: BBL/AC-FT: 1581
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977): OIL, BBL; 7,761,175
GAS, MCF; 11,287,000
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 284,544
GAS, MCF; 9,000
WATER, BBL; 1,409,000
OIL REMAINING IN PLACE, STB:
(DEC 31, )
RESERVES (DEC 31, )
PRIMAR PRODUCTION:
MECHANISM: GRAVITY DRAINAGE
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 289
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: BELRIDGE, SOUTH
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: TULARE - ETCHEGOIN - DIATOMITE
NO. OF ZONES: 2
AREA, ACRES: 8610
DISCOVERY YEAR: 1911
TOTAL WELLS: 3283
SHUT-IN WELLS: 968

GEOLOGICAL INFORMATION

FORMATION: TULARE-ETCHEGOIN-MONTEREY
GEOLOGICAL AGE: PLIOCENE-MIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCT/STRAT - ANTICLINE/PERM CHANGE
LITHOLOGY: SAND
DIP, DEG.: 8.0
CLAY CONTENT, %:
HETEROGENEITY; HIGH
FAULTING; MINOR
INTERBEDDED STREAKS: YES
FRACTURE; MINOR
BARRIER TO FLOW: NO

RESERVOIR CHARACTERISTICS

DEPTH, FT: 700
GROSS PAY, FT: 450
POROSITY, %: 35.0
PERMEABILITY, MD: 3000
BHT, DEF F: 95
GAS SAT:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 76.0
WTR SAT., %; 24.0
GAS SAT., %;
FVF, BBL/STB; 1.030
WOR, BBL/BBL; 1
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 100
RANGE: 34.0 TO 37.0
RANGE: 1800 TO 13000
SAT. PRESSURE, PSI: 200
GAS CAP, ACRES: 0
WETTING PHASE:
CURRENT: OIL SAT., %; 66.0 *
WTR SAT., %; 34.0
GAS SAT., %;
FVF, BBL/STB; 1.030
WOR, BBL/BBL; 4
GOR, SCF/BBL; 15
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 17.8  RANGE: 12.0 TO 31.0
VISCOSITY @ BHT, CP: 1600.0; @ 130F, CP: 340.0
SAYBOLT VISC (100F), SEC: 2440
SULFUR CONTENT, %: .23  CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 5.9  ACID NUMBER:
OIL TYPE: ASPHALTIC
WATER SALINITY, PPM: 12000
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 1,700,000,000 BBL/AC-FT: 1974
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 228,012,550
(DEC 31, 1977) GAS, MCF; 20,429,000
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 12,856,906
GAS, MCF; 148,000
WATER, BBL; 101,927,000
OIL REMAINING IN PLACE, STB: 1,472,000,000 BBL/AC-FT: 1710
(DEC 31, 1977) RESERVES (DEC 31, 1977) 184,000,000

PRIMARY PRODUCTION:
MECHANISM: SG, WD & GD
RECOVERY FACTOR, %: 9.1
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 CYCLIC STEAM (1964- 

AREA, ACRES:
NO. PROD WELLS: FLUID INJECTED: S
NO. INJ WELLS: 210
VOLUME INJECTED: (EQUIV) WATER, BBL; 34,019,089
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1976) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S):
<table>
<thead>
<tr>
<th>Case</th>
<th>Secondary and Tertiary Recoveries (Cont.)</th>
</tr>
</thead>
</table>

**T.1 Steam Drive (1963-)**

- **Area, Acres:** 204
- **No. Prod Wells:**
- **Volume Injected:** (Equiv) Water, bbl; 145,655,092
  - Gas, MCF;
- **Cumulative Prod:** Oil, bbl;
  - Gas, MCF;
  - Water, bbl;
- **Recovery Factor, %:**
- **Degree of Success:**
- **Operator(S):**

**T.2 In-Situ Combustion (1964-)**

- **Area, Acres:** 164
- **No. Prod Wells:**
- **Volume Injected:** (Equiv) Water, bbl; 21,400,000
  - Gas, MCF;
- **Cumulative Prod:** Oil, bbl;
  - Gas, MCF;
  - Water, bbl;
- **Recovery Factor, %:** 13.2
- **Degree of Success:**
- **Operator(S):**

**Sources:** 5, 12, 14, 17, 18, 37-8, 43, 58, 82-4, 113, 129, 132-3, 289
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: FRESNO
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: COALINGA GR - COALINGA
NO. OF RESERVOIRS: 3

RESERVOIR INFORMATION

RESERVOIR: WEST SIDE AREA TEMBLOR
NO. OF ZONES: DISCOVERY YEAR: 1900
AREA, ACRES: 6400 * SPACING, ACRES:
TOTAL WELLS: PRODUCING WELLS: 1245
SHUT-IN WELLS: INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: MIOCENE
GEOLOGICAL AGE: MIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCT/STRAT - THINNING ON ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; MOD DIP, DEG.:
HETEROGENEITY; HIGH CLAY CONTENT, %:
FAULTING:
FRActURE;
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1852
GROSS PAY, FT: 300
POROSITY, %: 32.2
PERMEABILITY, MD: 259
BHT, DEF F: 100
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 65.0
WTR SAT., %; 35.0
GAS SAT., %;
FVF, BBL/STB; 1.040
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 50
RANGE: 20.0 TO 46.0
RANGE: TO 4500
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 32.0 *
WTR SAT., %; 68.0
GAS SAT., %;
FVF, BBL/STB; 1.000 *
WOR, BBL/BBL;
GOR, SCF/BBL; 91
BHP, PSI;

FLUID CHARACTERISTICS

OIL GRAVITY, API: 15.3
RANGE: 12.0 TO 22.0
VISCOsITY @ BHT, CP: ¶ F, CP:
SAYBOLT VISc (100F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 1935
WATER HARDNESS: CA, PPM; MG, PPM;
RESERVES AND PRODUCTION DATA

CASE 134

ORIGINAL OIL IN PLACE, STB: 499,600,000
ORIGINAL GAS IN PLACE, MCF: 144,880,000
CUM PROD: OIL, BBL; 246,993,108
(DEC 31, 1977) GAS, MCF; 144,880,000
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 2,974,647
GAS, MCF;
WATER, BBL; 25,889,000
OIL REMAINING IN PLACE, STB: 252,600,000
(DEC 31, )
RESERVES (DEC 31, )

PRIMAR Y PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 PERIPHERAL WF (1962-1971)
AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL; 11,651,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S):

T.1 CYCLIC STEAM (1961- )
AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL; 3,119,346
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S):

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 17, 18, 104
STATE: CALIFORNIA  
COUNTY: KERN  
DISTRICT: SAN JOAQUIN VALLEY REGION  
FIELD NAME: CYMRIC  
NO. OF RESERVOIRS: 24

RESERVOIR INFORMATION

RESERVOIR: MCKITTRICK FRONT AREA REEF RIDGE  
NO. OF ZONES:  
AREA, ACRES: 160  
TOTAL WELLS:  
SHUT-IN WELLS: 19

GEOLOGICAL INFORMATION

FORMATION: MONTEREY  
GEOLOGICAL AGE: MIOCENE  
BASIN: SAN JOAQUIN BASIN  
TRAP TYPE: STRUCT/STRAT - UNCONFORMITY ON ANTICLINE  
LITHOLOGY: SAND  
DEGREE OF: CONSOLIDATION;  
HETEROGENEITY;  
FAULTING; NONE  
FRACTURE;  
DIP, DEG.: 12.5  
CLAY CONTENT, %:  
INTERBEDDED STREAKS:  
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2300  
GROSS PAY, FT: 150  
POROSITY, %: 31.0  
PERMEABILITY, MD: 1000  
BHT, DEF F: 120 *  
GAS CAP:  
GAS CAP/OIL ZONE RATIO:  
INITIAL: OIL SAT., %; 67.0 *  
WTR SAT., %; 33.0  
GAS SAT., %;  
FVF, BBL/STB; 1.050 *  
WOR, BBL/BBL;  
GOR, SCF/BBL;  
BHP, PSI;  
NET PAY, FT: 125  
RANGE: TO  
SIT. PRESSURE, PSI:  
GAS CAP, ACRES:  
WETTING PHASE:  
CURRENT: OIL SAT., %; 49.0 *  
WTR SAT., %; 51.0  
GAS SAT., %;  
FVF, BBL/STB; 1.000 *  
WOR, BBL/BBL;  
GOR, SCF/BBL; 618  
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 17.5
VISCOSITY @ BHT, CP: ; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM: 18000
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 30,700,000  BBL/AC-FT: 1535
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL: 6,919,224
(GER 31, 1977) GAS, MCF: 2,349,000
WATER, BBL: 47,363,000
1977 ANNUAL PROD: OIL, BBL: 17,111
GAS, MCF:
WATER, BBL: 331,000
OIL REMAINING IN PLACE, STB: 23,800,000  BBL/AC-FT: 1189
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SOURCES: 5,12,14,37,38,58,113,129,132; 35,128,148
CASE 136
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: CYMRIC
NO. OF RESERVOIRS: 24

RESERVOIR INFORMATION

RESERVOIR: MCKITTRICK FRONT AREA TULARE
NO. OF ZONES: DISCOVERY YEAR: 1909
AREA, ACRES: 1380 SPACING, ACRES:
TOTAL WELLS: PRODUCING WELLS: 240
SHUT-IN WELLS: 176 INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: TULARE
GEOLOGICAL AGE: PLEISTOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1000
GROSS PAY, FT:
POROSITY, %: 37.0
PERMEABILITY, MD: 200
BHT, DEP F: 100
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 66.0
WTR SAT., %: 34.0
GAS SAT., %:
FVF, BBL/STB: 1.050
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:
NET PAY, FT: 275
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 57.0 *
WTR SAT., %: 43.0
GAS SAT., %:
FVF, BBL/STB: 1.000
WOR, BBL/BBL:
GOR, SCF/BBL: 5
BHP, PSI:
FLUID CHARACTERISTICS

OIL GRAVITY, API: 12.5
RANGE: 11.0 TO 15.0

VISCOITY @ BHT, CP: 3000.0; @ F, CP:

SAYBOLT VISC (100F), SEC: 6000

SULFUR CONTENT, %: 1.16
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %: 6.8
ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM: 1700
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 311,000,000  BBL/AC-FT: 1804
ORIGINAL GAS IN PLACE, MCF:

- CUM PROD: OIL, BBL; 28,967,720
- (DEC 31, 1977) GAS, MCF; 2,342,000
- WATER, BBL; 201,806,000

1977 ANNUAL PROD: OIL, BBL; 896,056
- GAS, MCF; 12,000
- WATER, BBL; 9,829,000

OIL REMAINING IN PLACE, STB: 282,000,000  BBL/AC-FT: 1636
(DEC 31, 1977)

RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATER DISPOSAL (1967-1967)

- AREA, ACRES:
- NO. PROD WELLS:
- VOLUME INJECTED: (EQUIV) WATER, BBL; 171,000
- GAS, MCF;
- CUMULATIVE PROD: OIL, BBL;
- (THRU ) GAS, MCF;
- WATER, BBL;
- RECOVERY FACTOR, %:
- DEGREE OF SUCCESS:
- OPERATOR(S):

FLUID INJECTED: W
SECONDARY AND TERTIARY RECOVERIES (CONT.)

CASE 136

T.1 CYCLIC STEAM (1961- )

AREA, ACRES: 18
NO. PROD WELLS: 21
VOLUME INJECTED: (EQUIV) WATER, BBL; 15,812,535 GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1978) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 70.0 BBL/AC-FT:
DEGREE OF SUCCESS: GOOD
OPERATOR(S): CHEVRON USA

T.2 STEAM DRIVE (1975- )

AREA, ACRES: 18
NO. PROD WELLS: 21
VOLUME INJECTED: (EQUIV) WATER, BBL;
CUMULATIVE PROD: OIL, BBL;
(THRU 1978) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 70.0 BBL/AC-FT:
DEGREE OF SUCCESS: GOOD
OPERATOR(S): CHEVRON USA

SOURCES: 5,12,14,37,38,58,113,129,132; 17,35,76,128,148
CASE 137

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: CYMRIC
NO. OF RESERVOIRS: 24

RESERVOIR INFORMATION

RESERVOIR: SALT CREEK MAIN AREA CARNEROS UNIT
NO. OF ZONES: DISCOVERY YEAR: 1946
AREA, ACRES: 310 SPACING, ACRES:
TOTAL Wells: PRODUCING WELLS: 41
SHUT-IN WELLS: 20 INJECTION WELLS: 4

GEological INFORMATION

FORMATION: TEMBLOR
GEOLOGICAL AGE: MIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.: 18.0
HETEROGENEITY;
FAULTING; HIGH
CLAY CONTENT, %: INTERBEDDED STREAKS: NO
FRACtURE; BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2400
GROSS PAY, FT: NET PAY, FT: 150
POROSITY, %: 34.0 RANGE: TO
PERMEABILITY, MD: 1250 RANGE: TO
BHT, DEG F: 122 *
GAS CAP: YES SAT. PRESSURE, PSI:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 58.0 GAS CAP, ACRES:
WTR SAT., %; 42.0 WETTING PHASE:
GAS SAT., %; GAS CAP/OIL ZONE RATIO:
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL; CURRENT: OIL SAT., %; 36.0 *
GOR, SCF/BBL; WTR SAT., %; 64.0
BHP, PSI; GAS SAT., %;

FLUID CHARACTERISTICS

OIL GRAVITY, API: 19.5 WOR, BBL/BBL; 2178
VISCOsITY @ BHT, CP: BHP, PSI;
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM: 12000
WATER HARDNESS: CA,PPM; MG,PPM;
<table>
<thead>
<tr>
<th>RESERVES AND PRODUCTION DATA</th>
</tr>
</thead>
</table>

**ORIGINAL OIL IN PLACE, STB:** 67,800,000  
**ORIGINAL GAS IN PLACE, MCF:**  

**CUM PROD (DEC 31, 1977):**  
- **OIL, BBL:** 23,945,389  
  - **GAS, MCF:** 542,000  
  - **WATER, BBL:** 7,336,000  

**1977 ANNUAL PROD:**  
- **OIL, BBL:** 241,826  
  - **GAS, MCF:** 77,000  
  - **WATER, BBL:** 214,000  

**OIL REMAINING IN PLACE, STB:** 43,800,000  
**RESERVES (DEC 31, 1977):**  
**BBL/AC-FT:** 1457  

**PRIMAR PRODUCTION:**  
- MECHANISM: SOLUTION GAS  
- RECOVERY FACTOR, %:  
- ANNUAL DECLINE RATE, %:  

**SECONDARY AND TERTIARY RECOVERIES:**  

**S.1 PRESSURE MAINTENANCE (1948- )**  
- **AREA, ACRES:**  
- **NO. PROD WELLS:**  
- **VOLUME INJECTED:**  
  - **(EQUIV) WATER, BBL:** 25,874,000  
- **CUMULATIVE PROD:**  
  - **OIL, BBL:**  
  - **GAS, MCF:**  
  - **WATER, BBL:**  
- **RECOVERY FACTOR, %:**  
- **DEGREE OF SUCCESS:**  
- **OPERATOR(S): TESORO PETROLEUM CORP.**  

**T.1 MISICBLE DISPLNFT. ( )**  
- **AREA, ACRES:**  
- **NO. PROD WELLS:**  
- **VOLUME INJECTED:**  
  - **(EQUIV) WATER, BBL:**  
- **CUMULATIVE PROD:**  
  - **OIL, BBL:**  
  - **GAS, MCF:**  
  - **WATER, BBL:**  
- **RECOVERY FACTOR, %:**  
- **DEGREE OF SUCCESS:**  
- **OPERATOR(S): TESORO PETROLEUM CORP.**  

**SOURCES:** 5, 12, 14, 37, 38, 58, 113, 129, 132; 17, 35, 128
**STATE:** California  
**COUNTY:** Kern  
**DISTRICT:** San Joaquin Valley Region  
**FIELD NAME:** Cymric  
**NO. OF RESERVOIRS:** 24

### RESERVOIR INFORMATION

**RESERVOIR:** Sheep Springs Area 54-21 Etchegoin  
**NO. OF ZONES:**  
**DISCOVERY YEAR:** 1929  
**AREA, ACRES:** 170 *  
**SPACING, ACRES:**  
**TOTAL WELLS:**  
**PRODUCING WELLS:** 80  
**SHUT-IN WELLS:** 15  
**INJECTION WELLS:**

### GEOLOGICAL INFORMATION

**FORMATION:** Etchegoin  
**GEOLOGICAL AGE:** Pliocene  
**BASIN:** San Joaquin Basin  
**TRAP TYPE:** Struct/Strat - Facies Change on Faulted Anti  
**LITHOLOGY:** Sand  
**DEGREE OF:** Consolidation;  
**DIP, DEG.:**  
**HETERGENEITY:** Clay Content, %;  
**FAULTING; HIGH** Interbedded Streaks;  
**FRACTURE:** Barrier to Flow;

### RESERVOIR CHARACTERISTICS

**DEPTH, FT:** 2450  
**GROSS PAY, FT:**  
**POROSITY, %:** 35.0  
**PERMEABILITY, MD:** 2300  
**BHT, DEF F:** 123 *  
**GAS CAP:**  
**GAS CAP/OIL ZONE RATIO:**

**INITIAL:** Oil Sat., %; 66.0 *  
**WTR SAT., %:** 34.0  
**GAS SAT., %:**  
**FVF, BBL/STB:** 1.050 *  
**GOR, SCF/BBL:**  
**BHP, PSI:**  
**NET PAY, FT:** 75  
**RANGE:** To  
**RANGE:** To  
**SAT. PRESSURE, PSI:**  
**GAS CAP, ACRES:**  
**WETTING PHASE:**

**CURRENT:** Oil Sat., %; 54.0 *  
**WTR SAT., %:** 46.0  
**GAS SAT., %:**  
**FVF, BBL/STB:** 1.010 *  
**GOR, SCF/BBL:**  
**BHP, PSI:**

### FLUID CHARACTERISTICS

**OIL GRAVITY, API:** 17.0  
**RANGE:** 14.0 TO 18.0  
**VISCOSITY @ BHT, CP:**  
**@ F, CP:**  
**SAYBOLT VISC (100F), SEC:**  
**SULFUR CONTENT, %:**  
**CARBON/HYDROGEN RATIO:**  
**CARBON RESIDUE, %:**  
**ACID NUMBER:**

**OIL TYPE:**

**WATER SALINITY, PPM:** 19000  
**WATER HARDNESS:** Ca, PPM; Mg, PPM;
### RESERVES AND PRODUCTION DATA

**CASE 138**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Quantity</th>
<th>BBL/AC-FT:</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORIGINAL OIL IN PLACE, STB</td>
<td>21,800,000</td>
<td>1707</td>
</tr>
<tr>
<td>ORIGINAL GAS IN PLACE, MCF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CUM PROD OIL, BBL; (DEC 31, 1977)</td>
<td>3,318,925</td>
<td></td>
</tr>
<tr>
<td>CUM PROD GAS, MCF;</td>
<td>1,728,000</td>
<td></td>
</tr>
<tr>
<td>CUM PROD WATER, BBL;</td>
<td>4,643,000</td>
<td></td>
</tr>
<tr>
<td>1977 ANNUAL PROD OIL, BBL</td>
<td>85,214</td>
<td></td>
</tr>
<tr>
<td>1977 ANNUAL PROD GAS, MCF</td>
<td>65,000</td>
<td></td>
</tr>
<tr>
<td>1977 ANNUAL PROD WATER, BBL</td>
<td>300,000</td>
<td></td>
</tr>
<tr>
<td>OIL REMAINING IN PLACE, STB (DEC 31, )</td>
<td>18,400,000</td>
<td>1446</td>
</tr>
</tbody>
</table>

**PRIMARY PRODUCTION:**
- MECHANISM: SOLUTION GAS
- ANNUAL DECLINE RATE, %: 
- RECOVERY FACTOR, %: 

**SECONDARY AND TERTIARY RECOVERIES:**

#### S.1 GAS INJECTION (1958-1960)
- AREA, ACRES: 
- NO. PROD WELLS: 
- NO. INJ WELLS: 
- VOLUME INJECTED: (EQUIV) WATER, BBL: 
- FLUID INJECTED: G
- GAS, MCF: 44,000
- CUMULATIVE PROD: OIL, BBL: 
- GAS, MCF: 
- WATER, BBL: 
- RECOVERY FACTOR, %: 
- DEGREE OF SUCCESS: 
- OPERATOR(S): 

#### T.1 CYCLIC STEAM (1965-)
- AREA, ACRES: 
- NO. PROD WELLS: 
- NO. INJ WELLS: 23
- VOLUME INJECTED: (EQUIV) WATER, BBL: 130,988
- FLUID INJECTED: S
- GAS, MCF: 
- CUMULATIVE PROD: OIL, BBL: 
- GAS, MCF: 
- WATER, BBL: 
- RECOVERY FACTOR, %: 
- DEGREE OF SUCCESS: 
- OPERATOR(S): 

**REMARKS:** AREAL EXTENT CONFINED TO 3 SEPARATED AREAS

**SOURCES:** 5, 12, 14, 37, 38, 58, 113, 129, 132; 18, 35, 128
STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: CYMRIC
NO. OF RESERVOIRS: 24

RESEVOIR INFORMATION

RESEVOIR: WELPORT AREA TULARE
DISCOVERY YEAR: 1916
NO. OF ZONES: DISPOSING WELLS: 24
AREA, ACRES: 1670
SPACING, ACRES:
TOTAL WELLS: 305
PRODUCING WELLS: INJECTION WELLS:
SHUT-IN WELLS: 174

GEOLOGICAL INFORMATION

FORMATION: TULARE
GEOLOGICAL AGE: PLEISTOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING; MOD
FRACUTR;  
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW:

RESEVOIR CHARACTERISTICS

DEPTH, FT: 1000
GROSS PAY, FT: 350
POROSITY, %: 37.0
PERMEABILITY, MD: 200
BHT, DEF F: 100
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 66.0
WTR SAT., %; 34.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI:
NET PAY, FT: 125
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 60.0 *
WTR SAT., %; 40.0
GAS SAT., %;
FVF, BBL/STB; 1.050
WOR, BBL/BBL;
GOR, SCF/BBL; 10
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 12.5
VISCOSITY @ BHT, CP: 3000.0
SAYBOLT VISC (100°F), SEC:
SULFUR CONTENT, %: 1.16
CARBON RESIDUE, %: 6.8
OIL TYPE:
WATER SALINITY, PPM: 6000
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 376,600,000
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 34,886,165
(GDEC 31, 1977) GAS, MCF; 1,458,000
WATER, BBL; 296,279,000
1977 ANNUAL PROD: OIL, BBL; 1,868,741
(GDEC 31, 1977) GAS, MCF; 63,000
WATER, BBL; 11,075,000
OIL REMAINING IN PLACE, STB: 341,800,000
(GDEC 31, 1977) BBL/AC-FT: 1637
RESERVES (DEC 31):

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 CYCLIC STEAM (1964-)

AREA, ACRES: FLUID INJECTED: S
NO. PROD WELLS: NO. INJ WELLS: 139
VOLUME INJECTED: (EQUIV)WATER, BBL; 12,847,520
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S):

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 18, 35, 76, 128
CASE 142

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: EDISON
NO. OF RESERVOIRS: 14

RESERVOIR INFORMATION

RESERVOIR: MAIN AREA UPPER
NO. OF ZONES: 2
AREA, ACRES: 1500 *
TOTAL WELLS: PRODUCING WELLS: 157
SHUT-IN WELLS: 21

GEOLOGICAL INFORMATION

FORMATION: KERN RIVER
GEOLOGICAL AGE: PLIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRATIGRAPHIC - REGIONAL FACIES CHANGE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING; MINOR
FRACUTURE;

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1100
GROSS PAY, FT: 450
POROSITY, %: 27.0
PERMEABILITY, MD: 1500
BHT, DEF F: 95
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 67.0
WTR SAT., %; 33.0
GAS SAT., %;
FVF, BBL/STB; 1.050
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

FLUID CHARACTERISTICS

OIL GRAVITY, API: 19.0
VISCOSITY @ BHT, CP: 310.0;
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: .68
CARBON RESIDUE, %: .1
OIL TYPE:
WATER SALINITY, PPM; 70
WATER HARDNESS: CA, PPM;

GAS CAP, ACRES:
WETTIN PHASE:
CURRENT: OIL SAT., %; 54.0 *
WTR SAT., %; 46.0
GAS SAT., %;
FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL; 1970
BHP, PSI; 150

RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
WETTING PHASE:
CURRENT: OIL SAT., %; 54.0 *
WTR SAT., %; 46.0
GAS SAT., %;
FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL; 1970
BHP, PSI; 150

RANGE: 15.0 TO 28.0
@ F, CP:
CARBON/HYDROGEN RATIO:
ACID NUMBER:
RESERVES AND PRODUCTION DATA

CASE 142

ORIGINAL OIL IN PLACE, STB: 160,400,000 BBL/AC-FT: 1337
ORIGINAL GAS IN PLACE, MCF:

CUM PROD: OIL, BBL: 23,733,446
(DEC 31, 1977) GAS, MCF: 3,343,000
WATER, BBL:

1977 ANNUAL PROD: OIL, BBL: 430,229
GAS, MCF: 25,000
WATER, BBL: 1,632,000

OIL REMAINING IN PLACE, STB: 136,700,000 BBL/AC-FT: 1139
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %: 10.1

SECONDARY AND TERTIARY RECOVERIES:

S.1 PERIPHERAL WF (1964-1968)

AREA, ACRES: FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV)WATER, BBL: 982,378
GAS, MCF:
CUMULATIVE PROD: OIL, BBL:
(THRU 1977) GAS, MCF:
WATER, BBL:
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S):

T.1 CYCLIC STEAM (1964- )

AREA, ACRES: FLUID INJECTED: S
NO. PROD WELLS: NO. INJ WELLS: 86
VOLUME INJECTED: (EQUIV)WATER, BBL: 1,594,316
GAS, MCF:
CUMULATIVE PROD: OIL, BBL:
(THRU 1973) GAS, MCF:
WATER, BBL:
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S):

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 291

97
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: FRESNO & KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: KERN BLUFF
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: MIOCENE
NO. OF ZONES: DISCOVERY YEAR: 1944
AREA, ACRES: 610
SPACING, ACRES:
TOTAL WELLS: PRODUCING WELLS: 133
SHUT-IN WELLS: 28
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: TRANSITION-SANTA MARGARITA
GEOLOGICAL AGE: MIOCENE
basin: SAN JOAQUIN BASIN
TRAP TYPE: STRUCTURAL - FAULT HOMOCLINE
LITHOLOGY: SAND
DIP, DEG.: 5.0
DEGREE OF: CONSOLIDATION;
HETEROGENEITY; HIGH
FAULTING; HIGH
FRACTURE;
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1082
GROSS PAY, FT:
POROSITY, %: 29.0 *
PERMEABILITY, MD:
BHT, DEG F: 97 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 70.0 *
WTR SAT., %: 30.0
GAS SAT., %:
FVF, BBL/STB: 1.050 *
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:
NET PAY, FT: 85
RANGE: TO
RANGE:
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 59.0 *
WTR SAT., %: 41.0
GAS SAT., %:
FVF, BBL/STB: 1.010 *
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:
FLUID CHARACTERISTICS

CASE 148

OIL GRAVITY, API: 15.0
VISCOSITY @ BHT, CP: @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM: 90
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 77,800,000 BBL/AC-FT: 1500
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977) OIL, BBL: 10,079,159
GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL: 192,942
GAS, MCF;
WATER, BBL: 5,025,000
OIL REMAINING IN PLACE, STB: 67,700,000 BBL/AC-FT: 1305
(DEC 31, )
RESERVES (DEC 31, ) 700,000

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 65

99
CASE 149

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: FRESNO & KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: KERN FRONT
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: MAIN
NO. OF ZONES: 2
AREA, ACRES: 5540
TOTAL WELLS: PRODUCING WELLS: 1087
SHUT-IN WELLS: 309
INJECTION WELLS:

DISCOVERY YEAR: 1914
SPACING, ACRES:

GEOLOGICAL INFORMATION

FORMATION: ETCHEGOIN-CHANAC
GEOLOGICAL AGE: PLIOCENE-MIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCT/STRAT - FAULTED HOMOCLINE/PERM VAR
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.: 5.0
HETEROGENEITY; HIGH
FAULTING; MOD
FRACTURE;
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2265
GROSS PAY, FT: 800
POROSITY, %: 34.0
PERMEABILITY, MD: 1260
BHT, DEF F: 118
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 68.0
WTR SAT., %; 32.0
GAS SAT., %;
FVF, BBL/STB; 1.050
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 84
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 53.0 *
WTR SAT., %; 47.0
GAS SAT., %;
FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL; 68
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 14.2  
RANGE: 12.0 TO 17.0
VISCOSITY @ BHT, CP: 400.0;  
@ F, CP:
SAYBOLT VISC (100F), SEC: 5100
SULFUR CONTENT, %: .85
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 5.8
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 90
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 794,900,000  BBL/AC-FT: 1708
ORIGINAL GAS IN PLACE, MCF:
CUM PROD  (DEC 31, 1977) : OIL, BBL; 146,448,860
                                         GAS, MCF; 16,564,000
                                         WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 3,685,181
                                GAS, MCF; 575,000
                                WATER, BBL; 37,847,000
OIL REMAINING IN PLACE, STB: 648,500,000  BBL/AC-FT: 1394
(DEC 31, )
RESERVES (DEC 31, 1977) 52,000,000

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %:  
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 CYCLIC STEAM (1964- )
AREA, ACRES:  
NO. PROD WELLS:  
NO. INJ WELLS:  
VOLUME INJECTED: (EQUIV) WATER, BBL; GAS, MCF;
CUMULATIVE PROD: OIL, BBL; (THRU ) GAS, MCF;
                                WATER, BBL;
RECOVERY FACTOR, %:  
DEGREE OF SUCCESS:
OPERATOR(S):

SOURCES: 5,12,14,37,38,58,113,129,132; 17,76,125
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: FRESNO & KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: KERN RIVER
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: PLIOCENE - KERN RIVER
NO. OF ZONES: 3
DISCOVERY YEAR: 1899
AREA, ACRES: 9435
SPACING, ACRES:
TOTAL WELLS: PRODUCING WELLS: 5144
SHUT-IN WELLS: 886
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: KERN RIVER
GEOLOGICAL AGE: PLIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCT/STRAT - HOMOCLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC HETEROGENEITY; CLAY CONTENT, %;
FAULTING; MINOR INTERBEDDED STREAKS: YES
FRACTURE; BARRIER TO FLOW: YES

DEPTH, FT: 1008
NET PAY, FT: 220
GROSS PAY, FT: 800
POROSITY, %: 35.0
RANGE: 31.0 TO 39.0
PERMEABILITY, MD: 4000
RANGE: 2000 TO 7600
BHT, DEF P: 90
SAT. PRESSURE, PSI:
GAS CAP:
GAS CAP/OIL ZONE RATIO:
WETTING PHASE:
INITIAL: OIL SAT., %; 66.0
CURRENT: OIL SAT., %; 52.0 *
WTR SAT., %; 34.0
WTR SAT., %; 48.0
GAS SAT., %;
GAS SAT., %;
FVF, BBL/STB; 1.025
FVF, BBL/STB; 1.000
WOR, BBL/BBL;
WOR, BBL/BBL;
GOR, SCF/BBL;
GOR, SCF/BBL;
BHP, PSI; 225
BHP, PSI; 50

FLUID CHARACTERISTICS

OIL GRAVITY, API: 13.8
RANGE: 11.0 TO 16.0
VISCOITY @ BHT, CP: 4000.0;
@ 250F, CP: 15.0
SAYBOLT VISC (100F), SEC: 7000
SULFUR CONTENT, %: 1.19
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 6.8
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 90
WATER HARDNESS: CA, PPM;
MG, PPM;

102
RESERVES AND PRODUCTION DATA

CASE 150

ORIGINAL OIL IN PLACE, STB: 3,629,100,000
ORIGINAL GAS IN PLACE, MCF: 1,207,040
CUM PROD
  (DEC 31, 1977)
    OIL, BBL: 726,605,000
    GAS, MCF: 2,605,000
    WATER, BBL: 33,216,756
1977 ANNUAL PROD:
  OIL, BBL: 33,216,756
  GAS, MCF: 33,216,756
  WATER, BBL: 182,446,000

OIL REMAINING IN PLACE, STB: 2,902,900,000
RESERVES (DEC 31, 1977): 640,000,000

PRIMURY PRODUCTION:
  MECHANISM: SOLUTION GAS
  RECOVERY FACTOR, %: 15.0
  ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 CYCLIC STEAM (1961-)

AREA, ACRES: 3938
NO. PROD WELLS: 1359
VOLUME INJECTED: (EQUIV) WATER, BBL: 551,886,232
CUMULATIVE PROD: OIL, BBL: (THRU 1976)
GAS, MCF: WATER, BBL:
RECOVERY FACTOR, %: 34.0
DEGREE OF SUCCESS: GOOD
OPERATOR(S): GETTY SHELL CHEVRON...

T.2 STEAM DRIVE (1962-)

AREA, ACRES: 3938
NO. PROD WELLS: 2697
VOLUME INJECTED: (EQUIV) WATER, BBL: 414,053,844
CUMULATIVE PROD: OIL, BBL: (THRU 1976)
GAS, MCF: WATER, BBL:
RECOVERY FACTOR, %: 15.0
DEGREE OF SUCCESS: 
OPERATOR(S): 

REMARKS: MORE THAN 10 STEAM DRIVE PROJECTS CURRENTLY ACTIVE

SOURCES: 5, 12, 16-8, 37, 39-41, 51, 56-8, 68, 77, 113-4, 129, 132, 135
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: LOST HILLS
NO. OF RESERVOIRS: 6

RESERVOIR INFORMATION

RESERVOIR: MAIN
NO. OF ZONES: 5
AREA, ACRES: 4000 *
TOTAL WELS: 282
SHUT-IN WELS: 282

DISCOVERY YEAR: 1910
SPACING, ACRES:
PRODUCING WELS: 1207
INJECTION WELS:

GEOLOGICAL INFORMATION

FORMATION: TULARE-ETCHEGOIN-MONTEREY-TEMBLOR
GEOLOGICAL AGE: MIocene-PLIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCTURAL – FACIES CHANGE ON ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING; HIGH
FRACTURE;
DIP, DEG.: 10.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1928
GROSS PAY, FT: 300
POROSITY, %: 34.0
PERMEABILITY, MD: 1250
BHT, DEG F: 114
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 66.0
WTR SAT., %; 34.0
GAS SAT., %;
FVF, BBL/STB; 1.050
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

NET PAY, FT: 63
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 49.0 *
WTR SAT., %; 51.0
GAS SAT., %;
FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL; 1226
BHP, PSI;

FLUID CHARACTERISTICS

OIL GRAVITY, API: 20.5
VISCOSITY @ BHT, CP: 60.0;
SAYBOLT VISC (100F), SEC: 52
SULFUR CONTENT, %: .33
CARBON RESIDUE, %: 1.8
CARBON/HYDROGEN RATIO:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM: 20000
WATER HARDNESS: CA, PPM;
MG, PPM;
RESERVES AND PRODUCTION DATA

CASE 152

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORIGINAL OIL IN PLACE, STB:</td>
<td>534,000,000</td>
<td>BBL/AC-FT</td>
</tr>
<tr>
<td>ORIGINAL GAS IN PLACE, MCF:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CUM PROD (DEC 31, 1977) OIL, BBL;</td>
<td>113,722,059</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25,540,000</td>
<td></td>
</tr>
<tr>
<td>WATER, BBL;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1977 ANNUAL PROD:</td>
<td>1,945,670</td>
<td></td>
</tr>
<tr>
<td>OIL, BBL;</td>
<td>2,055,000</td>
<td></td>
</tr>
<tr>
<td>GAS, MCF;</td>
<td>8,809,000</td>
<td></td>
</tr>
<tr>
<td>WATER, BBL;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OIL REMAINING IN PLACE, STB:</td>
<td>420,000,000</td>
<td>BBL/AC-FT</td>
</tr>
<tr>
<td>RESERVES (DEC 31, 1977)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PRIMARY PRODUCTION:
- MECHANISM: SOLUTION GAS
- RECOVERY FACTOR, %: BBL/AC-FT:
- ANNUAL DECLINE RATE, %: 3.9

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1946-1948)

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>AREA, ACRES:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO. PROD WELLS:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VOLUME INJECTED: (EQUIV) WATER, BBL;</td>
<td>74,000</td>
<td></td>
</tr>
<tr>
<td>GAS, MCF;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CUMULATIVE PROD: OIL, BBL; (THRU )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAS, MCF;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WATER, BBL;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RECOVERY FACTOR, %:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEGREE OF SUCCESS:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPERATOR(S):</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.2 GAS STORAGE (1961-1962)

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>AREA, ACRES:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO. PROD WELLS:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VOLUME INJECTED: (EQUIV) WATER, BBL;</td>
<td>262,000</td>
<td></td>
</tr>
<tr>
<td>GAS, MCF;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CUMULATIVE PROD: OIL, BBL; (THRU 1977)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAS, MCF;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WATER, BBL;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RECOVERY FACTOR, %:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEGREE OF SUCCESS:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPERATOR(S):</td>
<td>CHEVRON</td>
<td></td>
</tr>
</tbody>
</table>

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 17, 44, 76
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: MC KITTRICK
NO. OF RESERVOIRS: 8

RESERVOIR INFORMATION

RESERVOIR: MAIN AREA UPPER
NO. OF ZONES: 3
AREA, ACRES: 1430
TOTAL WELLS: 575
SHUT-IN WELLS: 378

DISCOVERY YEAR: 1887
SPACING, ACRES:
PRODUCING WELLS: 575
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: TULARE-MONTEREY
GEOLOGICAL AGE: PLEISTOCENE-MIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCT/STRAT - FAULTED HOMOCLINE
LITHOLOGY: SAND
DEGREE OF:
CONSOLIDATION;
HETEROGENEITY;
FAULTING; MINOR
FRACTURE;
DIP, DEG.: 21.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1191
GROSS PAY, FT: 1000
POROSITY, %: 36.0
PERMEABILITY, MD: 1000
BHT, DEF F: 99
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 70.0
WTR SAT., %; 30.0
GAS SAT., %;
FVF, BBL/STB; 1.050
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 265
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 52.0 *
WTR SAT., %; 48.0
GAS SAT., %;
FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL; 4
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 14.9  
RANGE: 11.0 TO 17.0

VISCOSITY @ BHT, CP: 800.0;  
@ F, CP:

SAYBOLT VISC (100F), SEC:

SULFUR CONTENT, %: .96  
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %: 2.0  
ACID NUMBER:

OIL TYPE:

WATER SALINTY, PPM; 6000  
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 705,600,000  
BBL/AC-FT: 1862

ORIGINAL GAS IN PLACE, MCF:

CUM PROD: OIL, BBL; 159,343,068  
DEC 31, 1977

GAS, MCF; 8,768,000

WATER, BBL;

1977 ANNUAL PROD: OIL, BBL; 2,871,362  
GAS, MCF; 66,000

WATER, BBL; 6,060,000

OIL REMAINING IN PLACE, STB: 546,200,000  
BBL/AC-FT: 1441

(DEC 31,  
RESERVES (DEC 31, )

PRIMARY PRODUCTION:

MECHANISM: SOLUTION GAS

RECOVERY FACTOR, %:  
BBL/AC-FT:

ANNUAL DECLINE RATE, %: 16.2

SECONDARY AND TERTIARY RECOVERIES:

T.1 CYCLIC STEAM (1962- )

AREA, ACRES:

NO. PROD WELLS:

VOLUME INJECTED: (EQUIV) WATER, BBL;

GAS, MCF;

CUMULATIVE PROD: OIL, BBL;

GAS, MCF;

WATER, BBL;

RECOVERY FACTOR, %:  
BBL/AC-FT:

DEGREE OF SUCCESS:

OPERATOR(S):

SOURCES: 5,12,14,37,38,58,113,129,132; 17,90
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: MIDWAY-SUNSET
NO. OF RESERVOIRS: 17

RESERVOIR INFORMATION

RESERVOIR: OLIG
NO. OF ZONES: 
AREA, ACRES: 320
TOTAL WELLS: 
SHUT-IN WELLS: 41

DISCOVERY YEAR: 1963
SPACING, ACRES: 
PRODUCING WELLS: 25
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: ETCHEGOIN-MONTEREY
GEOLOGICAL AGE: PLIOCENE-MIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SILTY SAND
DEGREE OF: CONSOLIDATION;
DIP, DEG.: 14.0
HETEROGENEITY;
CLAY CONTENT, %:
FAULTING; MINOR
INTERBEDDED STREAKS:
FRACTURE;
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1950
GROSS PAY, FT: 300
POROSITY, %: 33.0 *
PERMEABILITY, MD:
BHT, DEF F: 114 *
GAS CAP: YES
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 76.0 *
WTR SAT., %; 24.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; *

NET PAY, FT: 113
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 69.0 *
WTR SAT., %; 31.0
GAS SAT., %;
FVF, BBL/STB; 1.030 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 15.1
RANGE: 14.0 TO 16.0

VISCOITY @ BHT, CP;  @ F, CP:

SAYBOLT VISC (100F), SEC:

SULFUR CONTENT, %:
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %:
ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 67,000,000
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 5,191,375
(GDEC 31, 1977) GAS, MCF; 4,860,000
WATER, BBL; 36,382,000

1977 ANNUAL PROD: OIL, BBL; 139,561
GAS, MCF; 48,000
WATER, BBL; 1,896,000

OIL REMAINING IN PLACE, STB: 61,800,000
(DEC 31,)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

BBL/AC-FT: 1853

BBL/AC-FT: 1709

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 100
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: MIDWAY-SUNSET
NO. OF RESERVOIRS: 17

RESERVOIR INFORMATION

RESERVOIR: OTHERS
NO. OF ZONES: 
AREA, ACRES: 24370
TOTAL WELLS: 
SHUT-IN WELLS: 1983
DISCOVERY YEAR: 1901
SPACING, ACRES: 
PRODUCING WELLS: 6529
INJECTION WELLS: 1

GEOLOGICAL INFORMATION

FORMATION: PLIOCENE
GEOLOGICAL AGE: PLIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCT/STRAT - FACIES CHANGE ON ANTICLINE
LITHOLOGY: SAND
DIP, DEG.: 
CLAY CONTENT, %: 
INTERBEDDED STREAKS: 
BARRIER TO FLOW: 

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1687
GROSS PAY, FT: 350
POROSITY, %: 32.0
PERMEABILITY, MD: 1250
BHT, DEF F: 109
GAS CAP: 
NET PAY, FT: 125
GAS CAP/OIL ZONE RATIO: 
INITIAL: OIL SAT., %; 66.0
WTR SAT., %; 34.0
GAS SAT., %; 
FVF, BBL/STB; 1.050
WOR, BBL/BBL; 
GOR, SCF/BBL; 
BHP, PSI; 
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI: 
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 49.0 *
WTR SAT., %; 51.0
GAS SAT., %;
FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL; 121
BHP, PSI; 75
FLUID CHARACTERISTICS

OIL GRAVITY, API: 16.3  RANGE: 11.0 TO 29.0
VISCOSITY @ BHT, CP: 400.0;  @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM; 20000
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 5,400,000,000  BBL/AC-FT: 1560
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977): OIL, BBL; 1,161,954,320
GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 38,001,741
GAS, MCF; 2,071,000
WATER, BBL; 72,381,000
OIL REMAINING IN PLACE, STB: 4,200,000,000  BBL/AC-FT: 1213
(REC 31,  )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 GAS INJECTION (1944-1949)

AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S):  BBL/AC-FT:
### S.2 Peripheral WF (1954-1969)

<table>
<thead>
<tr>
<th>Area, Acres:</th>
<th>FLUID INJECTED: W</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Prod Wells:</td>
<td>No. INJ Wells:</td>
</tr>
<tr>
<td>Volume Injected: (EQUIV) WATER, BBL: 2,144,000</td>
<td></td>
</tr>
<tr>
<td>Gas, MCF:</td>
<td></td>
</tr>
<tr>
<td>Cumulative Prod: OIL, BBL; (THRU 1977): GAS, MCF; WATER, BBL;</td>
<td></td>
</tr>
<tr>
<td>Recovery Factor, %:</td>
<td></td>
</tr>
<tr>
<td>Degree of Success:</td>
<td></td>
</tr>
<tr>
<td>Operator(S):</td>
<td></td>
</tr>
</tbody>
</table>

### S.3 Peripheral WF (1957-1967)

<table>
<thead>
<tr>
<th>Area, Acres:</th>
<th>FLUID INJECTED: W</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Prod Wells:</td>
<td>No. INJ Wells:</td>
</tr>
<tr>
<td>Volume Injected: (EQUIV) WATER, BBL: 6,597,000</td>
<td></td>
</tr>
<tr>
<td>Gas, MCF:</td>
<td></td>
</tr>
<tr>
<td>Cumulative Prod: OIL, BBL; (THRU 1977): GAS, MCF; WATER, BBL;</td>
<td></td>
</tr>
<tr>
<td>Recovery Factor, %:</td>
<td></td>
</tr>
<tr>
<td>Degree of Success:</td>
<td></td>
</tr>
<tr>
<td>Operator(S):</td>
<td></td>
</tr>
</tbody>
</table>

### S.4 Pressure Maintenance (1973- )

<table>
<thead>
<tr>
<th>Area, Acres:</th>
<th>FLUID INJECTED: G</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Prod Wells:</td>
<td>No. INJ Wells: 3</td>
</tr>
<tr>
<td>Volume Injected: (EQUIV) WATER, BBL; 507,000</td>
<td></td>
</tr>
<tr>
<td>Gas, MCF:</td>
<td></td>
</tr>
<tr>
<td>Cumulative Prod: OIL, BBL; (THRU 1977): GAS, MCF; WATER, BBL;</td>
<td></td>
</tr>
<tr>
<td>Recovery Factor, %:</td>
<td></td>
</tr>
<tr>
<td>Degree of Success:</td>
<td></td>
</tr>
<tr>
<td>Operator(S):</td>
<td></td>
</tr>
</tbody>
</table>
SECONDARY AND TERTIARY RECOVERIES (CONT.)

T.1 CYCLIC STEAM (1963- )

AREA, ACRES: 202  FLUID INJECTED: S
NO. PROD WELLS:   NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
                  GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
      (THRU ) GAS, MCF;
                  WATER, BBL;
RECOVERY FACTOR, %:  DEGREE OF SUCCESS:
BBL/AC-FT:
OPERATOR(S):

T.2 IN-SITU COMBUSTION (1960- )

AREA, ACRES: FLUID INJECTED: A
NO. PROD WELLS:  NO. INJ WELLS: 5
VOLUME INJECTED: (EQUIV) WATER, BBL;
                  GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
      (THRU ) GAS, MCF;
                  WATER, BBL;
RECOVERY FACTOR, %: 24.0  BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): MOBIL (MOCO POOL)

REMARKS: INCLUDE MANY RESERVOIRS: 87% OF CUM FIELD PROD
SOURCES: 5,17-8,34,37-8,44,58,75,84,86,113,129,132,134,157
**CASE 171**

**RESERVOIR AND PRODUCTION DATA ELEMENTS**

**STATE:** CALIFORNIA  
**COUNTY:** KERN  
**DISTRICT:** SAN JOAQUIN VALLEY REGION  
**FIELD NAME:** MIDWAY-SUNSET  
**NO. OF RESERVOIRS:** 17

### RESERVOIR INFORMATION

**RESERVOIR:** SPELLACY 200 SAND  
**NO. OF ZONES:**  
**AREA, ACRES:** 250  
**TOTAL WELLS:**  
**SHUT-IN WELLS:**  
**DISCOVERY YEAR:** 1974  
**SPACING, ACRES:**  
**PRODUCING WELLS:**  
**INJECTION WELLS:**

### GEOLOGICAL INFORMATION

**FORMATION:** SPELLACY  
**GEOLOGICAL AGE:** MIOCENE  
** BASIN:** SAN JOAQUIN BASIN  
** TRAP TYPE:** STRUCTURAL - ANTICLINE  
**LITHOLOGY:** SAND  
**DEGREE OF:** CONSOLIDATION; HETEROGENEITY; FAULTING; FRACTURE  
**DIP, DEG.:** 12.0  
**CLAY CONTENT, %:**  
**INTERBEDDED STREAKS:**  
**BARRIER TO FLOW:** YES

### RESERVOIR CHARACTERISTICS

**DEPTH, FT:** 550  
**GROSS PAY, FT:** 200  
**POROSITY, %:** 30.0  
**PERMEABILITY, MD:** 2250  
**BHT, DEF F:** 90  
**GAS CAP:**  
**GAS CAP/OIL ZONE RATIO:**  
**INITIAL:** OIL SAT., %; 59.0  
**WTR SAT., %; 41.0  
**GAS SAT., %;**  
**FVF, BBL/STB; 1.000  
**WOR, BBL/BBL;**  
**GOR, SCF/BBL;**  
**BHP, PSI; 40  
**NET PAY, FT:** 150  
**RANGE:** TO
**RANGE: 1050 TO 3440  
**SAT. PRESSURE, PSI:**  
**GAS CAP, ACRES:**  
**WETTING PHASE:**  
**CURRENT:** OIL SAT., %; 59.0 *  
**WTR SAT., %; 41.0  
**GAS SAT., %;**  
**FVF, BBL/STB; 1.000  
**WOR, BBL/BBL;**  
**GOR, SCF/BBL;**  
**BHP, PSI; 40**

### FLUID CHARACTERISTICS

**OIL GRAVITY, API:** 11.2  
**VISCOSITY @ BHT, CP:** 6500.0;  
**SAYBOLT VISC (100°F), SEC:**  
**SULFUR CONTENT, %:**  
**CARBON RESIDUE, %:**  
**OIL TYPE:**  
**WATER SALINITY, PPM:**  
**WATER HARDNESS: CA, PPM:**
**RANGE:** TO
**RANGE: @ 212°F, CP:** 60.0  
**CARBON/HYDROGEN RATIO:**  
**ACID NUMBER:**  
**MG, PPM:**
RESERVES AND PRODUCTION DATA

CASE 171

ORIGINAL OIL IN PLACE, STB: 50,000,000 BBL/AC-FT: 1373

ORIGINAL GAS IN PLACE, MCF:

CUM PROD:
(OCT 31, 1977)
GAS, MCF:
WATER, BBL:

1977 ANNUAL PROD:
OIL, BBL:
GAS, MCF:
WATER, BBL:

OIL REMAINING IN PLACE, STB: 50,000,000 BBL/AC-FT: 1370

RESERVES (OCT 31, )

PRIMARY PRODUCTION:
MECHANISM:
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T. 1 CYCLIC STEAM (1973-1974)

AREA, ACRES: 170
NO. PROD WELLS: 24
NO. INJ WELLS: 4
VOLUME INJECTED: (EQUIV) WATER, BBL:
GAS, MCF:

CUMULATIVE PROD:
(OCT THRU 1974)
OIL, BBL:
GAS, MCF:
WATER, BBL:

RECOVERY FACTOR, %:
BBL/AC-FT:
DEGREE OF SUCCESS: FAIL
OPERATOR(S): CHANSLOR-WESTERN

T. 2 STEAM DRIVE (1975- )

AREA, ACRES: 9
NO. PROD WELLS: 16
NO. INJ WELLS: 4
VOLUME INJECTED: (EQUIV) WATER, BBL:
GAS, MCF:

CUMULATIVE PROD:
(OCT THRU 1978)
OIL, BBL:
GAS, MCF:
WATER, BBL:

RECOVERY FACTOR, %:
BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): CHANSLOR-WESTERN/DOE

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 16, 33

115
RESERVOIR AND PRODUCTION DATA ELEMENTS

CASE 172

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: MOUNT POSO
NO. OF RESERVOIRS: 9

RESERVOIR INFORMATION

RESERVOIR: DOMINION AREA-VEDDER
NO. OF ZONES: 1
AREA, ACRES: 665
TOTAL WELLS: PRODUCING WELLS: 79
SHUT-IN WELLS: 45
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: VEDDER
GEOLOGICAL AGE: MIocene
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRATIGRAPHIC - FACIES CHANGE ON FAULT
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.: 4.0
HETEROGENEITY;
FAULTING; MOD
FRACUTURE;
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1584
GROSS PAY, FT:
POROSITY, %: 33.0
PERMEABILITY, MD: 2000
BHT, DEP F: 107 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 52.0
WTR SAT., %; 48.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 40
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 41.0 *
WTR SAT., %; 59.0
GAS SAT., %;
FVF, BBL/STB; 1.010 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

CASE 172

OIL GRAVITY, API: 15.3  RANGE: 13.0 TO 16.0
VISCOSITY @ BHT, CP:  1900  @ F, CP:
SAYBOLT VISC (100F), SEC: 1900
SULFUR CONTENT, %: .68  CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:  5.9  ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM:  200  MG, PPM;
WATER HARDNESS: CA, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 33,700,000  BBL/AC-FT: 1268
ORIGINAL GAS IN PLACE, MCF:  
CUM PROD (DEC 31, 1977): OIL, BBL: 6,135,161  GAS, MCF:  
GAS, MCF:  
WATER, BBL:  
1977 ANNUAL PROD: OIL, BBL: 98,390  GAS, MCF:  
WATER, BBL: 6,296,000
OIL REMAINING IN PLACE, STB: 27,600,000  BBL/AC-FT: 1037
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 CYCLIC STEAM (1964- )

AREA, ACRES:  
NO. PROD WELLS:  
VOLUME INJECTED: (EQUIV) WATER, BBL: 177,242
FLUID INJECTED: S  GAS, MCF:  
NO. INJ WELLS:  
CUMULATIVE PROD: OIL, BBL:  
(GAS, MCF:  
(THRU 1973) WATER, BBL:  
RECOVERY FACTOR, %:  BBL/AC-FT:
DEGREE OF SUCCESS:  
OPERATOR(S):  

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 32
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: MOUNT POSO
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: MOUNT POSO AREA VEDDER
NO. OF ZONES: 3
AREA, ACRES: 2220
TOTAL WELLS: PRODUCING WELLS: 338
SHUT-IN WELLS: 153

DISCOVERY YEAR: 1926
SPACING, ACRES: 338
INJECTION WELLS: 2

GEOLOGICAL INFORMATION

FORMATION: VEDDER SAND
GEOLOGICAL AGE: MIocene
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCT/STRAT - FAULT HOMOCLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING; MINOR
FRACTURE;
DIP, DEG.: 27.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1806
GROSS PAY, FT: 350
POROSITY, %: 33.0
PERMEABILITY, MD: 10000
BHT, DEG F: 110
GAS CAP: YES
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 60.0
WTR SAT., %; 40.0
GAS SAT., %;
FVF, BBL/STB; 1.035
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 450

NET PAY, FT: 292
RANGE: 28.0 TO 34.0
RANGE: 1500 TO 20000
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 42.0 *
WTR SAT., %; 58.0
GAS SAT., %;
FVF, BBL/STB; 1.022
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 100
FLUID CHARACTERISTICS

OIL GRAVITY, API: 16.0
RANGE: 12.0 TO 17.0
VISCOSITY @ BHT, CP: 280.0; @ 250°F, CP: 5.0
SAYBOLT VISC (100°F), SEC: 1900
SULFUR CONTENT, %: .68
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM: 1400
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 547,000,000 BBL/AC-FT: 1484
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 161,460,360
(DEC 31, 1977) GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 4,018,869
GAS, MCF;
WATER, BBL; 88,075,000
OIL REMAINING IN PLACE, STB: 386,000,000 BBL/AC-FT: 1047
(DEC 31, 1977) RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %: 35.0 BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1952-1960)

AREA, ACRES: FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV)WATER, BBL; 372,000 GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S):
S.2 WATER DISPOSAL  
(1972- )

AREA, ACRES: FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS: 29
VOLUME INJECTED: (EQUIV) WATER, BBL: 29,926,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): SHELL OIL, TEXACO

T.1 CYCLIC STEAM  
(1963- )

AREA, ACRES: FLUID INJECTED: S
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL: 116,623
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1976) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): SHELL OIL CO

T.2 STEAM DRIVE  
( - )

AREA, ACRES: 2100 FLUID INJECTED: S
NO. PROD WELLS: NO. INJ WELLS: 49
VOLUME INJECTED: (EQUIV) WATER, BBL: 46,536,426
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1976) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): SHELL OIL CO

REMARKS: INCLUDE 3 ZONES OF DIFFERENT PAYS AND EXTENSIONS

SOURCES: 5,12,14,37-8,58,113,129,132; 16-18,32,76,123,142
CASE 177

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: POSO CREEK
NO. OF RESERVOIRS: 6

RESERVOIR INFORMATION

RESERVOIR: ENAS AREA
NO. OF ZONES: 165 *
AREA, ACRES: 165 *
TOTAL WELLS: 5
SHUT-IN WELLS: 5

DISCOVERY YEAR: 1929
SPACING, ACRES:

PRODUCING WELLS: 33
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: CHANAC
GEOLOGICAL AGE: MIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCT/STRAT - FACIES CHANGE ON FAULT
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
DIP, DEG.: 4.0
HETEROGENEITY; HIGH
FAULTING; MINOR
FRACTURE;
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2115
GROSS PAY, FT: 300
POROSITY, %: 30.0
PERMEABILITY, MD: 1700
BHT, DEP F: 117 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 70.0 *
WTR SAT., %; 30.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

NET PAY, FT: 150
RANGE: TO
RANGE: 125 TO 7600
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 68.0 *
WTR SAT., %; 32.0
GAS SAT., %;
FVF, BBL/STB; 1.040 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 12.0
RANGE: 12.0 TO 13.0
VISCOITY @ BHT, CP:  
@ °F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 700
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 38,400,000 BBL/AC-FT: 1552
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 1,044,378
(GDEC 31, 1977) GAS, MCF; 3,000
WATER, BBL; 8,818,000
1977 ANNUAL PROD: OIL, BBL; 63,606
GAS, MCF; 2,000
WATER, BBL; 459,000
OIL REMAINING IN PLACE, STB: 37,400,000 BBL/AC-FT: 1509
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: GRAVITY DRAINAGE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 151
STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: POSO CREEK
NO. OF RESERVOIRS: 6

RESERVOIR INFORMATION

RESERVOIR: MCVAN AREA
NO. OF ZONES: 1
AREA, ACRES: 280
TOTAL WELLS: 62
SHUT-IN WELLS: 22
DISCOVERY YEAR: 1932
SPACING, ACRES:
PRODUCING WELLS: 62
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: ETCHEGOIN VEDDER
GEOLOGICAL AGE: PLIOCENE-MIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCT/STRAT - FACIES CHANGE ON FAULT
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING; HIGH
FRACTURE;
DIP, DEG.: 4.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1215
GROSS PAY, FT:
POROSITY, %: 34.0
PERMEABILITY, MD: 1200
BHT, DEG F: 100 *
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 67.0 *
WTR SAT., %; 33.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 40
RANGE: TO
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 54.0 *
WTR SAT., %; 46.0
GAS SAT., %;
FVF, BBL/STB; 1.010 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

**OIL GRAVITY, API:** 12.5  
**RANGE:** 12.0 TO 13.0

**VISCOITY @ BHT, CP:**  
**SAYBOLT VISC (100°F), SEC:**  
**SULFUR CONTENT, %:**  
**CARBON RESIDUE, %:**  
**OIL TYPE:**  
**WATER SALINITY, PPM:** 90  
**WATER HARDNESS: CA, PPM:**  
**MG, PPM:**

RESERVES AND PRODUCTION DATA

**ORIGINAL OIL IN PLACE, STB:** 18,900,000  
**BBL/AC-FT:** 1683  
**ORIGINAL GAS IN PLACE, MCF:**  
**CUM PROD:** OIL, BBL: 3,020,251  
**GAS, MCF:**  
**WATER, BBL:**

1977 ANNUAL PROD:  
**OIL, BBL:** 183,846  
**GAS, MCF:**  
**WATER, BBL:** 1,699,000

**OIL REMAINING IN PLACE, STB:** 15,800,000  
**BBL/AC-FT:** 1413  
**RESERVES (DEC 31, )**

**PRIMARY PRODUCTION:**  
**MECHANISM:** WATER DRIVE  
**RECOVERY FACTOR, %:**

**ANNUAL DECLINE RATE, %:**

**SOURCES:** 5, 12, 14, 37, 38, 58, 113, 129, 132; 117, 152
CASE 179

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: POSO CREEK
NO. OF RESERVOIRS: 6

RESERVOIR INFORMATION

RESERVOIR: PREMIER AREA MAIN
NO. OF ZONES: 2
DISCOVERY YEAR: 1919
AREA, ACRES: 3285
SPACING, ACRES:
TOTAL WELLS:
PRODUCING WELLS: 494
SHUT-IN WELLS: 133
INJECTION WELLS: 1

GEOLOGICAL INFORMATION

FORMATION: ETCHEGOIN-CHANAC
GEOLOGICAL AGE: PLIOCENE-MIOCENE
basin: SAN JOAQUIN BASIN
trap TYPE: STRUCT/STRAT - FACIES CHANGE ON FAULT
lithology: SAND
DEGREE OF: CONSOLIDATION;
DIP, DEG.: 3.0
HETEROGENEITY;
CLAY CONTENT, %:
FAULTING;
INTERBEDDED STREAKS: YES
FRACTURE;
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2400
GROSS PAY, FT: 390
POROSITY, %: 30.0
PERMEABILITY, MD: 1700
BHT, DEF F: 122 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 68.0 *
WTR SAT., %: 32.0
GAS SAT., %:
PVF, BBL/STB: 1.050 *
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:

NET PAY, FT: 240
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
CURRENT: OIL SAT., %: 61.0 *
WTR SAT., %: 39.0
GAS SAT., %:
PVF, BBL/STB: 1.030 *
WOR, BBL/BBL:
GOR, SCF/BBL: 58
BHP, PSI:
WETTING PHASE:

FLUID CHARACTERISTICS

OIL GRAVITY, API: 13.5
RANGE: 11.0 TO 15.0
VISCOITY @ BHT, CP: @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM: 700
WATER HARDNESS: CA, PPM: MG, PPM:
CASE 179

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 695,200,000
ORIGINAL GAS IN PLACE, MCF: 
CUM PROD: OIL, BBL; 57,649,445
(GAS, MCF; 5,344,000)
WATER, BBL; 599,875,000
1977 ANNUAL PROD: OIL, BBL; 1,257,168
GAS, MCF; 405,000
WATER, BBL; 39,887,000
OIL REMAINING IN PLACE, STB: 637,600,000

PRIMARIES PRODUCTION:
MECHANISM: GRAVITY
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %: BBL/AC-FT:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATER INJECTION (1961-1964)

<table>
<thead>
<tr>
<th>AREA, ACRES:</th>
<th>FLUID INJECTED: W</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. PROD WELLS:</td>
<td>NO. INJ WELLS:</td>
</tr>
<tr>
<td>VOLUME INJECTED: (EQUIV)</td>
<td>WATER, BBL;</td>
</tr>
<tr>
<td>GAS, MCF;</td>
<td></td>
</tr>
<tr>
<td>CUMULATIVE PROD:</td>
<td>OIL, BBL;</td>
</tr>
<tr>
<td>(THRU 1977)</td>
<td>GAS, MCF;</td>
</tr>
<tr>
<td>WATER, BBL;</td>
<td></td>
</tr>
<tr>
<td>RECOVERY FACTOR, %:</td>
<td>BBL/AC-FT:</td>
</tr>
<tr>
<td>DEGREE OF SUCCESS:</td>
<td></td>
</tr>
<tr>
<td>OPERATOR(S):</td>
<td></td>
</tr>
</tbody>
</table>

S.2 WATER INJECTION (1972- )

<table>
<thead>
<tr>
<th>AREA, ACRES:</th>
<th>FLUID INJECTED: W</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. PROD WELLS:</td>
<td>NO. INJ WELLS:</td>
</tr>
<tr>
<td>VOLUME INJECTED: (EQUIV)</td>
<td>WATER, BBL;</td>
</tr>
<tr>
<td>GAS, MCF;</td>
<td></td>
</tr>
<tr>
<td>CUMULATIVE PROD:</td>
<td>OIL, BBL;</td>
</tr>
<tr>
<td>(THRU 1977)</td>
<td>GAS, MCF;</td>
</tr>
<tr>
<td>WATER, BBL;</td>
<td></td>
</tr>
<tr>
<td>RECOVERY FACTOR, %:</td>
<td>BBL/AC-FT:</td>
</tr>
<tr>
<td>DEGREE OF SUCCESS:</td>
<td></td>
</tr>
<tr>
<td>OPERATOR(S): CHEVRON</td>
<td></td>
</tr>
</tbody>
</table>

REMARKS: CHANAC: 2760 AC, 150' TH; ETCH: 525 AC, 90' TH.

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 151
STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: PYRAMID GR - BLACKWELLS CORNER
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: TEMBLOR AND AGUA
NO. OF ZONES: DISCOVERY YEAR: 1941
AREA, ACRES: 140 * SPACING, ACRES:
TOTAL WELLS: PRODUCING WELLS: 16
SHUT-IN WELLS: INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: TEMBLOR
GEOLOGICAL AGE: MIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCT/STRAT - ANTICLINE NOSE/PERM VAR
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING; MINOR
FRACURE;
DIP, DEG.: 34.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1211
GROSS PAY, FT:
POROSITY, %: 33.0 *
PERMEABILITY, MD:
BHT, DEF F: 100 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 66.0 *
WTR SAT., %; 34.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 86
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 62.0 *
WTR SAT., %; 38.0
GAS SAT., %;
FVF, BBL/STB; 1.040 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 12.0
VISCOITY @ BHT, CP: 12.0
SAYBOLT VISC (100F), SEC: TO 15.0
RANGE: 12.0 TO 15.0
SULFUR CONTENT, %: CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM: 13500
WATER HARDNESS: CA, PPM: MG, PPM:

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 19,400,000 BBL/AC-FT: 1609
ORIGINAL GAS IN PLACE, MCF: 879,255
CUM PROD (DEC 31, 1977) OIL, BBL: 91,000
GAS, MCF: 18,500,000 BBL/AC-FT: 1536
WATER, BBL: 1977 ANNUAL PROD: OIL, BBL: 9,860
GAS, MCF: WATER, BBL: 80,000
OIL REMAINING IN PLACE, STB: 18,500,000 BBL/AC-FT: 1536
(DEC 31, ) RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132, 105
CASE 183

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: ROUND MOUNTAIN
NO. OF RESERVOIRS: 6

RESERVOIR INFORMATION

RESERVOIR: COFFEE CANYON-VEDDER & PYRAMID HILL
NO. OF ZONES: 2
AREA, ACRES: 435
TOTAL WELLS: 15
PRODUCING WELLS: 6
SHUT-IN WELLS: 24
INJECTION WELLS: 20
DISCOVERY YEAR: 1928
SPACING, ACRES:

GEOLOGICAL INFORMATION

FORMATION: JEWETT - VEDDER
GEOLOGICAL AGE: MIocene
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCT/STRAT - FAULT UNCONFORMITY
LITHOLOGY: SAND
DEGREE OF CONSOLIDATION;
HETEROGENEITY;
FAULTING; HIGH
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
FACTOR TO FLOW: YES
DIP, DEG.: 4.0

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1500
GROSS PAY, FT: 205
POROSITY, %: 32.0
PERMEABILITY, MD:
BHT, DEF F: 105 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 60.0
WTR SAT., %; 40.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 180
RANGE: 30.0 TO 35.0
RANGE: 6 TO 35000
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 36.0 *
WTR SAT., %; 64.0
GAS SAT., %;
FVF, BBL/STB; 1.000 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 16.9
RANGE: 15.0 TO 19.0
VISCOITY @ BHT, CP;
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON HYDROGEN RATIO:
CARBON RESIDUE, %:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 1000
WATER HARDNESS: CA, PPM;
MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 53,200,000 BBL/AC-FT: 1419
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977) OIL, BBL; 19,259,249
GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 110,373
GAS, MCF;
WATER, BBL; 8,077,000
OIL REMAINING IN PLACE, STB: 33,900,000 BBL/AC-FT: 905
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1960-1965)

AREA, ACRES: 400
NO. PROD WELLS: 30'TH
VOLUME INJECTED: (EQUIV) WATER, BBL; 1,834,000
GAS, MCF;
CUMULATIVE PROD (THRU 1977) OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S):

REMARKS: VEDDER: 400 AC, 30'TH; PYR HILL: 170 AC, 150'TH.

SOURCES: 5,12,14,37,38,58,113,129,132; 127
STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: ROUND MOUNTAIN
NO. OF RESERVOIRS: 6

RESERVOIR INFORMATION

RESERVOIR: ROUND MOUNTAIN AREA VEDDER
NO. OF ZONES: DISCOVERY YEAR: 1927
AREA, ACRES: 990 SPACING, ACRES:
TOTAL WELLS: PRODUCING WELLS: 137
SHUT-IN WELLS: 16 INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: VEDDER
GEOLOGICAL AGE: MIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCT/STRAT - FACIES CHANGE ON FAULT
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC DIP, DEG.: 9.0
HETEROGENEITY; MINOR CLAY CONTENT, %:
FAULTING; MOD INTERBEDDED STREAKS: NO
FRACTURE; BARRIER TO FLOW: NO

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1946 NET PAY, FT: 80
GROSS PAY, FT: 160 RANGE: 30.4 TO 39.8
POROSITY, %: 35.0
PERMEABILITY, MD: 11600 RANGE: 1725 TO 35000
BHT, DEF F: 114 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 67.0 *
WTR SAT., %: 33.0
GAS SAT., %:
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL; GOR, SCF/BBL;
BHP, PSI;
CURRENT: OIL SAT., %: 40.0 *
WTR SAT., %: 60.0
GAS SAT., %:
FVF, BBL/STB; 1.000 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 16.4
RANGE: 13.0 TO 25.0

VISCOSITY @ BHT, CP:
SAYBOLT VISC (100°F), SEC:
SULFUR CONTENT, %: .71
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %: 6.6
ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM: 1500
WATER HARDNESS: CA, PPM:
MG, PPM:

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 137,200,000 BBL/AC-FT: 1733
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977) :
GAS, MCF:
WATER, BBL:

1977 ANNUAL PROD:
OIL, BBL:
GAS, MCF:
WATER, BBL:

OIL REMAINING IN PLACE, STB:
(DEC 31, )
RESERVES (DEC 31, )

PRIMAR Y PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 PERIPHERAL WF (1961-1963)

AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL:
GAS, MCF:
CUMULATIVE PROD (THRU 1977):
OIL, BBL:
GAS, MCF:
WATER, BBL:
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S):

FLUID INJECTED: W
NO. INJ WELLS:

VOLUME INJECTED: (EQUIV) WATER, BBL: 872,587
GAS, MCF:

CUMULATIVE PROD (THRU 1977):
OIL, BBL:
GAS, MCF:
WATER, BBL:

RECOVERY FACTOR, %:
BBL/AC-FT:

DEGREE OF SUCCESS:
OPERATOR(S):

SOURCES: 5,12,14,37,38,58,113,129,132; 127
CASE 185

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN-VALLEY REGION
FIELD NAME: ROUND MOUNTAIN
NO. OF RESERVOIRS: 6

RESERVOIR INFORMATION

RESERVOIR: ROUND MTN. - JEWETT & PYRAMID HILL
NO. OF ZONES: 6
AREA, ACRES: 620
DISCOVERY YEAR: 1928
TOTAL WELLS: 48
SPACING, ACRES:
SHUT-IN WELLS: 16
PRODUCING WELLS: 48
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: FREEMAN-JEWETT
GEOLOGICAL AGE: MIocene
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCT/STRAT - FACIES CHANGE ON FAULT
LITHOLOGY: SILTY SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY; MOD
FAULTING; MOD
FRAC TURE;
DIP, DEG.: 9.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1791
GROSS PAY, FT: 500
POROSITY, %: 35.0
PERMEABILITY, MD: 170
BHT, DEG F: 111 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 60.0 *
WTR SAT., %; 40.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 205 *
RANGE: 28.4 TO 41.6
RANGE: TO 925
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %;
WTR SAT., %;
GAS SAT., %;
FVF, BBL/STB;
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
RANGE: 28.4 TO 41.6
RANGE: 28.4 TO 41.6
E'VF, BBL/STB;
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
CASE 185

FLUID CHARACTERISTICS

OIL GRAVITY, API: 21.3
RANGE: 18.0 TO 23.0
VISCOSITY @ BHT, CP: 
@ F, CP:
SAYBOLT VISC (100°F), SEC:
SULFUR CONTENT, %: .43
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: .6
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 1000
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB:
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977) OIL, BBL; 8,856,322
GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 54,473
GAS, MCF;
WATER, BBL; 957,000
OIL REMAINING IN PLACE, STB:
RESERVES (DEC 31, )
PRIMAR Y PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 127

BBL/AC-FT: 1552
STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: WHEELER RIDGE
NO. OF RESERVOIRS: 16

RESERVOIR INFORMATION

RESERVOIR: CENTRAL AREA COAL OIL CANYON
NO. OF ZONES: 1
AREA, ACRES: 170
TOTAL WELLS: 19
PRODUCING WELLS: 19
SHUT-IN WELLS: 8
INJECTION WELLS: 6
DISCOVERY YEAR: 1948
SPACING, ACRES: 10

GEOLOGICAL INFORMATION

FORMATION: SANTA MARGARITA
GEOLOGICAL AGE: MIocene
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING; MINOR FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2350
GROSS PAY, FT: 170
POROSITY, %: 29.0 *
PERMEABILITY, MD:
BHT, DEP F: 121 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 68.0 *
WTR SAT., %; 32.0
GAS SAT., %;
FVF, BBL/STB: 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 100
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 58.0 *
WTR SAT., %; 42.0
GAS SAT., %;
FVF, BBL/STB; 1.010 *
WOR, BBL/BBL;
GOR, SCF/BBL; 280
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 22.3
RANGE: 18.0 TO 23.0
VISCOSITY @ BHT, CP: SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: ACID NUMBER:
OIL TYPE: WATER SALINITY, PPM; 6000
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 24,800,000 BBL/AC-FT: 1457
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL: 2,679,621
(GDEC 31, 1977) GAS, MCF: 1,024,000
WATER, BBL:
1977 ANNUAL PROD: OIL, BBL: 58,453
GAS, MCF: 9,000
WATER, BBL: 250,000
OIL REMAINING IN PLACE, STB: 22,100,000 BBL/AC-FT: 1299
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 PERIPHERAL WF (1962- )

AREA, ACRES: FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS: 9
VOLUME INJECTED: (EQUIV)WATER, BBL: 9,749,000
GAS, MCF:
CUMULATIVE PROD: OIL, BBL:
(THRU 1977) GAS, MCF:
WATER, BBL:
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): ARCO

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 61
CASE 193

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION, OTHER FIELDS
FIELD NAME: WHITE WOLF
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR:
NO. OF ZONES: 3
AREA, ACRES: 90
TOTAL WELLS:
SHUT-IN WELLS: 7

DISCOVERY YEAR: 1960

SPACING, ACRES:
PRODUCING WELLS: 8
INJECTION WELLS:

GEOPHYSICAL INFORMATION

FORMATION: KERN RIVER-CHANAC-REEF RIDGE
GEOLOGICAL AGE: PLIOCENE-MIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING; HIGH
FRACUTURE;

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2290
GROSS PAY, FT: 600
POROSITY, %: 22.0
PERMEABILITY, MD:
BHT, DEG F: 120 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 68.0 *
WTR SAT., %: 32.0
GAS SAT., %:
FVF, BBL/STB: 1.050 *
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:

NET PAY, FT: 400 *
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %:
WTR SAT., %:
GAS SAT., %:
FVF, BBL/STB:
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:

FLUID CHARACTERISTICS

OIL GRAVITY, API: 14.2
VISCOSITY @ BHT, CP: ; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;

CARBON/HYDROGEN RATIO:
ACID NUMBER:

137
### RESERVES AND PRODUCTION DATA

**CASE 193**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ORIGINAL OIL IN PLACE, STB:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>ORIGINAL GAS IN PLACE, MCF:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>CUM PROD (DEC 31, 1977):</strong></td>
<td></td>
</tr>
<tr>
<td>OIL, BBL;</td>
<td>887,694</td>
</tr>
<tr>
<td>GAS, MCF;</td>
<td></td>
</tr>
<tr>
<td>WATER, BBL;</td>
<td>227,000</td>
</tr>
<tr>
<td><strong>1977 ANNUAL PROD:</strong></td>
<td></td>
</tr>
<tr>
<td>OIL, BBL;</td>
<td>27,608</td>
</tr>
<tr>
<td>GAS, MCF;</td>
<td></td>
</tr>
<tr>
<td>WATER, BBL;</td>
<td>10,000</td>
</tr>
<tr>
<td><strong>OIL REMAINING IN PLACE, STB:</strong></td>
<td></td>
</tr>
<tr>
<td>(DEC 31, )</td>
<td>130,000</td>
</tr>
<tr>
<td><strong>RESERVES (DEC 31, )</strong></td>
<td></td>
</tr>
<tr>
<td><strong>PRIMAR PRODUCTION: MECHANISM: SOLUTION GAS</strong></td>
<td>BBL/AC-FT:</td>
</tr>
<tr>
<td><strong>RECOVERY FACTOR, %:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>ANNUAL DECLINE RATE, %:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>SECONDARY AND TERTIARY RECOVERIES:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>T.1 CYCLIC STEAM (1964- )</strong></td>
<td></td>
</tr>
<tr>
<td><strong>AREA, ACRES:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>NO. PROD WELLS:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>VOLUME INJECTED: (EQUIV) WATER, BBL:</strong></td>
<td>111,238</td>
</tr>
<tr>
<td><strong>GAS, MCF:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>CUMULATIVE PROD: OIL, BBL;</strong></td>
<td></td>
</tr>
<tr>
<td>(THRU 1973)</td>
<td></td>
</tr>
<tr>
<td><strong>GAS, MCF:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>WATER, BBL:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>RECOVERY FACTOR, %:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>DEGREE OF SUCCESS:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>OPERATOR(S): OCCIDENTAL PETROLEUM</strong></td>
<td></td>
</tr>
<tr>
<td><strong>T.2 IN-SITU COMBUSTION ( )</strong></td>
<td></td>
</tr>
<tr>
<td><strong>AREA, ACRES:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>NO. PROD WELLS:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>VOLUME INJECTED: (EQUIV) WATER, BBL:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>GAS, MCF:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>CUMULATIVE PROD: OIL, BBL;</strong></td>
<td></td>
</tr>
<tr>
<td>(THRU )</td>
<td></td>
</tr>
<tr>
<td><strong>GAS, MCF:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>WATER, BBL:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>RECOVERY FACTOR, %:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>DEGREE OF SUCCESS:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>OPERATOR(S): OCCIDENTAL PETROLEUM</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Sources:** 5, 12, 14, 37, 38, 58, 113, 129, 132
**RESERVOIR AND PRODUCTION DATA ELEMENTS**

STATE: KANSAS  
COUNTY: WOODSON  
DISTRICT: EASTERN STRIPPER  
FIELD NAME: BIG SANDY POOL  
NO. OF RESERVOIRS: 1

**RESERVOIR INFORMATION**

<table>
<thead>
<tr>
<th>Reservoir: BARTLESVILLE</th>
<th>Discovery Year: 1926</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Zones:</td>
<td></td>
</tr>
<tr>
<td>Area, Acres: 1240</td>
<td>Spacing, Acres: 20</td>
</tr>
<tr>
<td>Total Wells:</td>
<td>Producing Wells: 62</td>
</tr>
<tr>
<td>Shut-In Wells:</td>
<td>Injection Wells:</td>
</tr>
</tbody>
</table>

**GEOLOGICAL INFORMATION**

<table>
<thead>
<tr>
<th>Formation: BARTLESVILLE</th>
<th>Geological Age: M.PENN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geological Age: M.PENN</td>
<td></td>
</tr>
<tr>
<td>Basin: CHEROKEE BASIN</td>
<td></td>
</tr>
<tr>
<td>Trap Type:</td>
<td></td>
</tr>
<tr>
<td>Lithology: SAND</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Degree of: Consolidation; Heterogeneity; Faulting; Fracture;</th>
<th>Dip, Deg.:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clay Content, %:</td>
</tr>
<tr>
<td></td>
<td>Interbedded Streaks:</td>
</tr>
<tr>
<td></td>
<td>Barrier to Flow:</td>
</tr>
</tbody>
</table>

**RESERVOIR CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Depth, FT: 1250</th>
<th>Net Pay, FT: 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Pay, FT:</td>
<td>Range: to</td>
</tr>
<tr>
<td>Porosity, %: 23.0 *</td>
<td>Range: to</td>
</tr>
<tr>
<td>Permeability, MD:</td>
<td>Sat. Pressure, PSI:</td>
</tr>
<tr>
<td>BHT, DEF F: 81 *</td>
<td>Gas Cap, Acres:</td>
</tr>
<tr>
<td>Gas Cap:</td>
<td>Wetting Phase:</td>
</tr>
<tr>
<td>Gas Cap/Oil Zone Ratio:</td>
<td>Current: Oil Sat., %:</td>
</tr>
<tr>
<td>Initial: Oil Sat., %: 73.5 *</td>
<td>Water Sat., %:</td>
</tr>
<tr>
<td>WTR Sat., %: 26.5</td>
<td>Gas Sat., %:</td>
</tr>
<tr>
<td>Gas Sat., %:</td>
<td>FVF, BBL/STB:</td>
</tr>
<tr>
<td>FVF, BBL/STB: 1.050 *</td>
<td>WOR, BBL/BBL:</td>
</tr>
<tr>
<td>WOR, BBL/BBL:</td>
<td>GOR, SCF/BBL:</td>
</tr>
<tr>
<td>GOR, SCF/BBL:</td>
<td>BHP, PSI:</td>
</tr>
<tr>
<td>BHP, PSI:</td>
<td></td>
</tr>
</tbody>
</table>
FLUID CHARACTERISTICS

OIL GRAVITY, API: 21.0
RANGE: TO

VISCOITY @ BHT, CP: 380
0 F, CP:

SAYBOLT VISC (100F), SEC: 380

SULFUR CONTENT, %: .60
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %: 3.6
ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM;

WATER HARDINESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB:

ORIGINAL GAS IN PLACE, MCF:

CUM PROD: OIL, BBL; 1,271,604
(DEC 31, 1977) GAS, MCF;
WATER, BBL;

1977 ANNUAL PROD: OIL, BBL; 20,457
GAS, MCF;
WATER, BBL;

OIL REMAINING IN PLACE, STB:

(DEC 31, )

RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: GRAVITY DRAINAGE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1957-)

AREA, ACRES: 30
FLUID INJECTED: W

NO. PROD WELLS: 41
NO. INJ WELLS: 8
VOLUME INJECTED: (EQUIV) WATER, BBL; 1,857,897
GAS, MCF;

CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;

RECOVERY FACTOR, %:

DEGREE OF SUCCESS:
OPERATOR(S): MACK C. COLT, INC

BBL/AC-FT: 1249

BBL/AC-FT:

BBL/AC-FT:

SOURCES: 5, 12, 13, 14, 164, 165, 167, 171, 172
STATE: KANSAS
COUNTY: WOODSON
DISTRICT: EASTERN STRIPPER
FIELD NAME: OWL CREEK
NO. OF RESERVOIRS: 1

RESEVOIR INFORMATION

RESEVOIR: SQUIRREL
NO. OF ZONES: DISCOVERY YEAR: 1967
AREA, ACRES: 1740 SPACING, ACRES: 20
TOTAL WELLS: PRODUCING WELLS: 87
SHUT-IN WELLS: INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: SQUIRREL (CHEROKEE GROUP)
GEOLOGICAL AGE: M. PENN
BASIN: CHEROKEE BASIN
TRAP TYPE: -
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACRTUE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESEVOIR CHARACTERISTICS

DEPTH, FT: 900
GROSS PAY, FT: NET PAY, FT: 38
POROSITY, %: 23.0 *
PERMEABILITY, MD: RANGE: TO
BHT, DEF F: 78 *
GAS CAP:
GAS CAP/OIL ZONE RATIO: RANGE: TO
INITIAL: OIL SAT., %: 73.5 *
WTR SAT., %: 26.5
GAS SAT., %:
FVF, BBL/STB: 1.050 *
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:

FLUID CHARACTERISTICS

OIL GRAVITY, API: 24.0
VISCOSITY @ BHT, CP: RANGE: TO
SAYBOLT VISC (100°F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM:
WATER HARDNESS: CA, PPM; MG, PPM;
### RESERVES AND PRODUCTION DATA

**CASE 201**

**ORIGINAL OIL IN PLACE, STB:**

**ORIGINAL GAS IN PLACE, MCF:**

**CUM PROD:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Quantity (STB)</th>
<th>1977 Annual Prod (BBL)</th>
<th>BBL/AC-FT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil, BBL</td>
<td>889,654</td>
<td>75,760</td>
<td>1249</td>
</tr>
<tr>
<td>Gas, MCF</td>
<td>75,760</td>
<td>75,760</td>
<td></td>
</tr>
<tr>
<td>Water, BBL</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**GAS IN PLACE, MCF:**

**WATER IN PLACE, BBL:**

**OIL REMAINING IN PLACE, STB:**

**RESERVES (DEC 31, 1977):**

**PRIMARY PRODUCTION:**

- **MECHANISM:** SG & GRAV DRNGE
- **RECOVERY FACTOR, %:**
- **ANNUAL DECLINE RATE, %:**

**SECONDARY AND TERTIARY RECOVERIES:**

**S.1 WATERFLOOD (1975–):**

<table>
<thead>
<tr>
<th>Type</th>
<th>Quantity (STB)</th>
<th>BBL/AC-FT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil, BBL</td>
<td>22,583</td>
<td></td>
</tr>
<tr>
<td>Gas, MCF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water, BBL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FLUID INJECTED:**

**NO. PROD WELLS:** 23
**NO. INJ WELLS:** 6
**VOLUME INJECTED:** 143,349

**S.2 WATERFLOOD (–):**

<table>
<thead>
<tr>
<th>Type</th>
<th>Quantity (STB)</th>
<th>BBL/AC-FT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil, BBL</td>
<td>12,240</td>
<td></td>
</tr>
<tr>
<td>Gas, MCF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water, BBL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FLUID INJECTED:**

**NO. PROD WELLS:** 16
**NO. INJ WELLS:** 4
**VOLUME INJECTED:** 12,240

**SOURCES:** 5, 12, 13, 14, 164, 165, 167, 171, 172
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: LOUISIANA
COUNTY: BOSSIER & WEBSTER
DISTRICT: NORTH
FIELD NAME: BELLEWE
NO. OF RESERVOIRS: 6

RESERVOIR INFORMATION

RESERVOIR: NACATOCH
NO. OF ZONES: 1
DISCOVERY YEAR: 1921
AREA, ACRES: 900
SPACING, ACRES:
TOTAL WELLS:
PRODUCING WELLS: 646
SHUT-IN WELLS:
INJECTION WELLS: 95

GEOLOGICAL INFORMATION

FORMATION: NACATOCH
GEOLOGICAL AGE: GULF
BASIN: ARKLA BASIN
TRAP TYPE: STRUCTURAL - FAULTED DOME
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC DIP, DEG.:
HETEROGENEITY;
FAULTING;
FRAC TURE;
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 335
GROSS PAY, FT:
POROSITY, %: 36.0
PERMEABILITY, MD: 600
BHT, DEF F: 75
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 69.5
WTR SAT., %: 30.5
GAS SAT., %:
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI: 200
NET PAY, FT: 60
RANGE: 500 TO 1000
SAT. PRESSURE, PSI: 40
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 61.0 *
WTR SAT., %: 39.0
GAS SAT., %:
FVF, BBL/STB; 1.000
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI: 40

FLUID CHARACTERISTICS

OIL GRAVITY, API: 19.0
VIS COSITY @ BHT, CP: 580.0;
SAYBOLT VISC (100F), SEC: 900
SULFUR CONTENT, %: .80
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 5.3
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 8500
WATER HARDNESS: CA, PPM;
MG, PPM;
### RESERVES AND PRODUCTION DATA

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original Oil In Place, STB</td>
<td>99,800,000</td>
<td>BBL</td>
</tr>
<tr>
<td>Original Gas In Place, MCF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cum Prod: Oil, BBL</td>
<td>7,170,431</td>
<td>BBL/AC-FT: 1849</td>
</tr>
<tr>
<td>(Dec 31, 1977)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water, BBL</td>
<td>66,891,843</td>
<td></td>
</tr>
<tr>
<td>Annual Prod: Oil, BBL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas, MCF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water, BBL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil Remaining In Place, STB</td>
<td>92,700,000</td>
<td>BBL/AC-FT: 1716</td>
</tr>
<tr>
<td>(Dec 31, )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reserves (Dec 31, )</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PRIMARY PRODUCTION:**
- Mechanism: FE, SG, WD & GD
- Recovery Factor, %: 5.0
- Annual Decline Rate, %:

**SECONDARY AND TERTIARY RECOVERIES:**

T.1 IN-SITU COMBUSTION (1971-
- Area, Acres: 110
- No. Prod Wells: 72
- No. Inj Wells: 24
- Volume Injected: (equiv) Water, BBL: 9,113,441
  Gas, MCF: 16,243,453
- Cumulative Prod: Oil, BBL: 1,158,733
  Gas, MCF: 1,158,733
  Water, BBL:
- Recovery Factor, %: 37.0
- BBL/AC-FT: 680
- Degree of Success: GOOD
- Operator(s): CITIES SERVICE/DOE

T.2 IN-SITU COMBUSTION (1963-
- Area, Acres: 593
- No. Prod Wells: 335
- No. Inj Wells: 82
- Volume Injected: (equiv) Water, BBL: 46,357,119
  Gas, MCF: 95,935,977
- Cumulative Prod: Oil, BBL: 5,060,060
  Gas, MCF: 5,060,060
  Water, BBL:
- Recovery Factor, %: 40.0
- BBL/AC-FT: 740
- Degree of Success: GOOD
- Operator(s): GETTY; BAYOU STATE OIL

**REMARKS:** WELL FIGURES REFLECT ENTIRE FIELD

**SOURCES:** 5, 12, 14, 16, 18, 175-80, 182-3, 186-9
STATE: LOUISIANA  
COUNTY: CADD  
DISTRICT: NORTH  
FIELD NAME: CADD PINE ISLAND  
NO. OF RESERVOIRS: 11

RESERVOIR INFORMATION

RESERVOIR: NACATOCH  
NO. OF ZONES: 1  
AREA, ACRES: 100480  
TOTAL WELLS:  
SHUT-IN WELLS:  
DISCOVERY YEAR: 1906  
SPACING, ACRES: 10  
PRODUCING WELLS: 9183  
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: NACATOCH  
GEOLOGICAL AGE: GULF  
BASIN: ARKLA BASIN  
TRAP TYPE: STRUCTURAL - ANTICLINE FAULT CLOSURE  
LITHOLOGY: SAND  
DEGREE OF: CONSOLIDATION; UNC  
HETEROGENEITY;  
FAULTING;  
FRACTURE;  
DIP, DEG.:  
CLAY CONTENT, %:  
INTERBEDDED STREAKS:  
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1095  
GROSS PAY, FT: 14  
POROSITY, %: 35.5  
PERMEABILITY, MD: 550  
BHT, DEF F: 80  
NET PAY, FT: 14  
RANGE: 34.0 TO 37.0  
RANGE: TO 37  
SAT. PRESSURE, PSI:  
WETTING PHASE:  
GAS CAP, ACRES:  
CURRNT: OIL SAT., %:  
WTR SAT., %:  
GAS SAT., %:  
FVF, BBL/STB; 1.090  
WOR, BBL/BBL:  
GOR, SCF/BBL:  
BHP, PSI:
### FLUID CHARACTERISTICS

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil Gravity, API</td>
<td>20.0</td>
</tr>
<tr>
<td>Viscosity @ BHT, CP</td>
<td>280.0</td>
</tr>
<tr>
<td>@ 95F, CP</td>
<td>60.0</td>
</tr>
<tr>
<td>Saybolt Visc (100F), SEC</td>
<td>690</td>
</tr>
<tr>
<td>Sulfur Content, %</td>
<td>0.49</td>
</tr>
<tr>
<td>Carbon/Hydrogen Ratio</td>
<td></td>
</tr>
<tr>
<td>Carbon Residue, %</td>
<td>4.9</td>
</tr>
<tr>
<td>Acid Number</td>
<td></td>
</tr>
<tr>
<td>Oil Type</td>
<td></td>
</tr>
<tr>
<td>Water Salinity, PPM</td>
<td>60000</td>
</tr>
<tr>
<td>Water Hardness: Ca, PPM</td>
<td>361</td>
</tr>
<tr>
<td>Mg, PPM</td>
<td>196</td>
</tr>
</tbody>
</table>

### RESERVES AND PRODUCTION DATA

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original Oil In Place, STB</td>
<td></td>
</tr>
<tr>
<td>Original Gas In Place, MCF</td>
<td></td>
</tr>
<tr>
<td>Cum Prod (Dec 31, 1977)</td>
<td>319,599,168</td>
</tr>
<tr>
<td>(OIL, BBL)</td>
<td></td>
</tr>
<tr>
<td>(GAS, MCF)</td>
<td></td>
</tr>
<tr>
<td>(WATER, BBL)</td>
<td></td>
</tr>
<tr>
<td>1977 Annual Prod: OIL, BBL</td>
<td>3,081,879</td>
</tr>
<tr>
<td>GAS, MCF</td>
<td></td>
</tr>
<tr>
<td>WATER, BBL</td>
<td></td>
</tr>
<tr>
<td>Oil Remaining In Place, STB</td>
<td></td>
</tr>
<tr>
<td>(Dec 31, 1977)</td>
<td>20,400,000</td>
</tr>
</tbody>
</table>

**Primary Production:**
- Mechanism: Solution Gas
- Recovery Factor, %: BBL/AC-FT: 1819
- Annual Decline Rate, %: 4.9

**Secondary and Tertiary Recoveries:**

<table>
<thead>
<tr>
<th>Method</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.1 W &amp; Viscous F Inj</td>
<td>(1964-1965)</td>
</tr>
<tr>
<td>Area, Acres</td>
<td>2</td>
</tr>
<tr>
<td>No. Prod Wells</td>
<td></td>
</tr>
<tr>
<td>No. Inj Wells</td>
<td></td>
</tr>
<tr>
<td>Fluid Injected: W/P</td>
<td></td>
</tr>
<tr>
<td>Volume Injected: (equiv) Water, BBL</td>
<td>32,000</td>
</tr>
<tr>
<td>Gas, MCF</td>
<td></td>
</tr>
<tr>
<td>Cumulative Prod: OIL, BBL</td>
<td>112</td>
</tr>
<tr>
<td>(THRU)</td>
<td></td>
</tr>
<tr>
<td>Gas, MCF</td>
<td></td>
</tr>
<tr>
<td>WATER, BBL</td>
<td></td>
</tr>
<tr>
<td>Recovery Factor, %:</td>
<td></td>
</tr>
<tr>
<td>Degree of Success:</td>
<td></td>
</tr>
<tr>
<td>Operator(s):</td>
<td>Caddo Oil Co</td>
</tr>
</tbody>
</table>
SECONDARY AND TERTIARY RECOVERIES (CONT.)

T.1 STEAM DRIVE  (1975-  )

AREA, ACRES:  36  FLUID INJECTED: S
NO. PROD WELLS:  4  NO. INJ WELLS:  1
VOLUME INJECTED: (EQUIV)WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
  (THRU ) GAS, MCF;
  WATER, BBL;
RECOVERY FACTOR, %:  BBL/AC-FT:
DEGREE OF SUCCESS: ME
OPERATOR(S): TEXACO

T.2 IN-SITU COMBUSTION  (1973-  )

AREA, ACRES:  60  FLUID INJECTED: A
NO. PROD WELLS:  17  NO. INJ WELLS:  6
VOLUME INJECTED: (EQUIV)WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
  (THRU ) GAS, MCF;
  WATER, BBL;
RECOVERY FACTOR, %:  BBL/AC-FT:
DEGREE OF SUCCESS: DSC
OPERATOR(S): CONOCO

REMARKS: AREA, WELLS, PROD AND RES REFLECT ENTIRE FIELD
10 ADDITIONAL STEAM DRIVE AND ISC PROJ

SOURCES: 5,12,14,17,18,175,178,180,185-89
CASE 211

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: LOUISIANA
COUNTY: IBERVILLE
DISTRICT: SOUTHEAST
FIELD NAME: WHITE CASTLE
NO. OF RESERVOIRS: 6

RESERVOIR INFORMATION

RESERVOIR: WC V RD SU AND U RD SU
NO. OF ZONES: 2
AREA, ACRES: 57
TOTAL WELLS: 17
SHUT-IN WELLS: 5
DISCOVERY YEAR: 1974
SPACING, ACRES: 3
PRODUCING WELLS: 17
INJECTION WELLS: 7

GEOPHYSICAL INFORMATION

FORMATION: MIOCENE
GEOLOGICAL AGE: MIOCENE
BASIN: GULFCOAST BASIN
TRAP TYPE: STRUCTURAL - SALT DOME
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC
HETEROGENEITY; MOD
FAULTING; HIGH
FRACUTURE; MINOR
DIP, DEG.: 45.0
CLAY CONTENT, %: 20.0
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1200
GROSS PAY, FT: 220
POROSITY, %: 38.0
PERMEABILITY, MD: 3000
BHT, DEF F: 90
GAS CAP: YES
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 90.0
WTR SAT., %; 10.0
GAS SAT., %;
FVF, BBL/STB; 1.030
WOR, BBL/BBL;
GOR, SCF/BBL; 50
BHP, PSI; 525
NET PAY, FT: 175
RANGE: TO
RANGE: 1000 TO 5000
SAT. PRESSURE, PSI: 525
GAS CAP, ACRES: 5
WETTING PHASE:
CURRENT: OIL SAT., %; 85.0 *
WTR SAT., %; 15.0
GAS SAT., %;
FVF, BBL/STB; 1.030
WOR, BBL/BBL;
GOR, SCF/BBL; 300
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 16.2
RANGE: TO
VISCOSITY @ BHT, CP: 300.0;
@ 140F, CP: 27.5
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: .40
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
ACID NUMBER: 9.0
OIL TYPE:
WATER SALINITY, PPM: 50000
WATER HARDNESS: CA, PPM; 3000
MG, PPM: 1150

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 13,300,000
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL:
(DEC 31, 1977) 740,042
GAS, MCF:
273,003
WATER, BBL:
3,956,068
1977 ANNUAL PROD: OIL, BBL:
245,752
GAS, MCF:
145,401
WATER, BBL:
1,313,820
OIL REMAINING IN PLACE, STB:
(DEC 31, 1977) 12,600,000
RESERVES (DEC 31, 1979) 8,000,000

PRIMARY PRODUCTION:
MECHANISM:
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD

AREA, ACRES:
NO. PROD WELLS:
FLUID INJECTED: W
VOLUME INJECTED: (EQUIV) WATER, BBL:
GAS, MCF;
CUMULATIVE PROD: OIL, BBL:
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S):
SECONDARY AND TERTIARY RECOVERIES (CONT.)

T.1 STEAM DRIVE  (1974- )

AREA, ACRES:  57
NO. PROD WELLS:  14
NO. INJ WELLS:  6
FLUID INJECTED: S
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): SHELL

T.2 STEAM DRIVE  (1976- )

AREA, ACRES:  30
NO. PROD WELLS:  15
NO. INJ WELLS:  5
FLUID INJECTED: S
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: FAIR
OPERATOR(S): SHELL

REMARKS: AREA UNDER STEAM DRIVE PREVIOUSLY WATERFLOODED

SOURCES: 5,12,14,18,175,180,186-89,296
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: LOUISIANA
COUNTY: CALCASIEU
DISTRICT: SOUTHWEST
FIELD NAME: VINTON
NO. OF RESERVOIRS: 16

RESERVOIR INFORMATION

RESERVOIR: UPPER MIOCENE
NO. OF ZONES: DISCOVERY YEAR: 1910
AREA, ACRES: 7020
TOTAL WELLS: PRODUCING WELLS: 153
SHUT-IN WELLS: INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: MIOCENE
GEOLOGICAL AGE: MIOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCTURAL - SALT DOME CLOSURE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1880
GROSS PAY, FT: 250
POROSITY, %: 30.0
PERMEABILITY, MD: 1000
BHT, DEF P: 103 *
GAS CAP: YES
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 65.0
WTR SAT., %; 35.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL; 400
BHP, PSI;
NET PAY, FT: 48
RANGE: TO
RANGE: 115 TO 1100
SAT. PRESSURE, PSI:
GAS CAP, ACRES: 755
WETTING PHASE:
CURRENT: OIL SAT., %;
WTR SAT., %;
GAS SAT., %;
FVF, BBL/STB;
WOR, BBL/BBL;
GOR, SCF/BBL; 5
BHP, PSI;

151
FLUID CHARACTERISTICS

OIL GRAVITY, API: 23.0
VISCOSITY @ BHT, CP:
SAYBOLT VISC (100F), SEC: 230
SULFUR CONTENT, %: .31
CARBON RESIDUE, %: 2.6
CARBON/HYDROGEN RATIO:
ACID NUMBER:

OIL TYPE:
WATER SALINITY, PPM; 40000
WATER HARDNESS: CA, PPM; 3132
MG, PPM; 906

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 15,000,000
ORIGINAL GAS IN PLACE, MCF:
CUM PROD:
(DEC 31, 1975) OIL, BBL; 126,399,700
GAS, MCF; 245
WATER, BBL;
1975 ANNUAL PROD:
OIL, BBL; 2,731,500
GAS, MCF; 20
WATER, BBL;
OIL REMAINING IN PLACE, STB:
(DEC 31, 1977) 13,600,000

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

BBL/AC-FT: 1441

REMARKS: AREA, WELLS AND PROD REFLECT ENTIRE FIELD

SOURCES: 5, 12, 14, 175, 180, 186, 187, 188, 189; 190, 293
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: OKLAHOMA
COUNTY: CARTER
DISTRICT: SOUTH CENTRAL
FIELD NAME: SHO-VEL-TUM
NO. OF RESERVOIRS: 51

RESERVOIR INFORMATION

RESERVOIR: 4TH DEESE (DES MOINES OR PENN SD)
NO. OF ZONES: 1  DISCOVERY YEAR: 1925
AREA, ACRES: 705  SPACING, ACRES: 6
TOTAL WELLS:  PRODUCING WELLS: 103
SHUT-IN WELLS:  INJECTION WELLS: 8

GEOLOGICAL INFORMATION

FORMATION: DEESE
GEOLOGICAL AGE: UPPER PENN.
BASIN: OKLAHOMA FOLDED BELT
TRAP TYPE: STRUCT-STRAT -
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;  DIP, DEG.: 45.0
HETEROGENEITY;  CLAY CONTENT, %:
FAULTING;  INTERBEDDED STREAKS:
FRACTURE;  BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1400
GROSS PAY, FT:
POROSITY, %: 28.0
PERMEABILITY, MD: 500
BHT, DEF F: 80
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 78.0
WTR SAT., %: 22.0
GAS SAT., %:
FVF, BBL/STB: 1.050 *
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI: 75

NET PAY, FT: 50
RANGE: TO
RANGE: 200 TO 1700
SAT. PRESSURE, PSI: 75
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %:
WTR SAT., %:
GAS SAT., %:
FVF, BBL/STB:
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI;
FLUID CHARACTERISTICS

CASE 235

OIL GRAVITY, API: 15.0
RANGE: TO
VISCOSITY @ BHT, CP: 1000.0;
@ F, CP: SAYBOLT VISC (100F), SEC: 4000
SULFUR CONTENT, %: 2.00
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 10.0
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB:
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1976):
OIL, BBL:
GAS, MCF:
WATER, BBL:
1976 ANNUAL PROD:
OIL, BBL:
GAS, MCF:
WATER, BBL:
OIL REMAINING IN PLACE, STB:
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SG & GRAV DRNGE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.L WATERFLOOD (1964- )
AREA, ACRES: 450
FLUID INJECTED: W
NO. PROD WELLS: 90
NO. INJ WELLS: 12
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD:
OIL, BBL:
GAS, MCF:
WATER, BBL:
(THRU )
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S): 3 PROJTS; SHELL AND MOBIL

BBL/AC-FT: 1614
2,943,371
97,315
5,342,225

154
SECONDARY AND TERTIARY RECOVERIES (CONT.)

T.1 STEAM DRIVE (1964- )

AREA, ACRES: 60  FLUID INJECTED: S
NO. PROD WELLS: 20  NO. INJ WELLS: 4
VOLUME INJECTED: (EQUIV) WATER, BBL;
    GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
    (THRU ) GAS, MCF;
    WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): SHELL - HEFNER LEASE

T.2 IN-SITU COMBUSTION (1961- )

AREA, ACRES: 94  FLUID INJECTED: A
NO. PROD WELLS: 22  NO. INJ WELLS: 2
VOLUME INJECTED: (EQUIV) WATER, BBL;
    GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
    (THRU ) GAS, MCF;
    WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): MOBIL - COX PENN LEASE

REMARKS: FORMERLY CALLED TATUMS FLD (UNTIL 1955)

SOURCES: 5,14; 11,15,195,196,198
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: OKLAHOMA
COUNTY: CARTER
DISTRICT: SOUTH CENTRAL
FIELD NAME: SHO-VEL-TUM
NO. OF RESERVOIRS: 51

RESERVOIR INFORMATION

<table>
<thead>
<tr>
<th>RESERVOIR: PONTOTOC (OIL CITY UNIT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. OF ZONES: 1</td>
</tr>
<tr>
<td>AREA, ACRES: 370</td>
</tr>
<tr>
<td>TOTAL WELLS:</td>
</tr>
<tr>
<td>PRODUCING WELLS: 45</td>
</tr>
<tr>
<td>SHUT-IN WELLS:</td>
</tr>
<tr>
<td>DISCOVERY YEAR: 1904</td>
</tr>
<tr>
<td>SPACING, ACRES:</td>
</tr>
<tr>
<td>INJECTION WELLS: 10</td>
</tr>
</tbody>
</table>

GEOLOGICAL INFORMATION

| FORMATION: PONTOTOC |
| GEOLOGICAL AGE: DESMOINIAN |
| BASIN: OKLAHOMA FOLDED BELT |
| TRAP TYPE: STRUCTURAL |
| LITHOLOGY: SAND |
| DEGREE OF: CONSOLIDATION; |
| HETEROGENEITY; |
| FAULTING; |
| FRACTURE; |
| DIP, DEG.: |
| CLAY CONTENT, %: |
| INTERBEDDED STREAKS: |
| BARRIER TO FLOW: |

RESERVOIR CHARACTERISTICS

| DEPTH, FT: 1000 |
| GROSS PAY, FT: |
| POROSITY, %: 25.0 |
| PERMEABILITY, MD: 5000 |
| BHT, DEG F: 80 |
| GAS CAP: |
| GAS CAP/OIL ZONE RATIO: |
| INITIAL: OIL SAT., %: 75.0 * |
| WTR SAT., %: 25.0 |
| GAS SAT., %: |
| FVF, BBL/STB: 1.050 * |
| WOR, BBL/BBL: |
| GOR, SCF/BBL: |
| BHP, PSI: |
| NET PAY, FT: 33 |
| RANGE: TO |
| SAT. PRESSURE, PSI: |
| GAS CAP, ACRES: |
| WETTING PHASE: |
| INITIAL: OIL SAT., %: 75.0 * |
| WTR SAT., %: 25.0 |
| GAS SAT., %: |
| FVF, BBL/STB: 1.050 * |
| WOR, BBL/BBL: |
| GOR, SCF/BBL: |
| BHP, PSI: |

CURRENT: OIL SAT., %: 72.0 |
| WTR SAT., %: 28.0 |
| GAS SAT., %: |
| FVF, BBL/STB: 1.040 * |
| WOR, BBL/BBL: |
| GOR, SCF/BBL: |
| BHP, PSI: |
FLUID CHARACTERISTICS

OIL GRAVITY, API: 21.0

RANGE: TO

VISCOSITY @ BHT, CP: 150.0;

@ F, CP:

SAYBOLT VISC (100F), SEC: 530

SULFUR CONTENT, %: 1.50

CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %: 5.5

ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM;

WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 16,900,000 BBL/AC-FT: 1385

ORIGINAL GAS IN PLACE, MCF:

CUM PROD: OIL, BBL; 556,472

(GAS, MCF; WATER, BBL;

1976 ANNUAL PROD: OIL, BBL; 27,829

GAS, MCF; WATER, BBL;

OIL REMAINING IN PLACE, STB: 16,400,000 BBL/AC-FT: 1340

(DEC 31, 1976)

RESERVES (DEC 31, )

PRIMARY PRODUCTION:

MECHANISM: FLUID EXPANSION

RECOVERY FACTOR, %: BBL/AC-FT:

ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S. I WATERFLOOD (1962- )

AREA, ACRES: 300

FLUID INJECTED: W

NO. PROD WELLS: 45

NO. INJ WELLS: 10

VOLUME INJECTED: (EQUIV) WATER, BBL; 6,490,696

GAS, MCF;

CUMULATIVE PROD: OIL, BBL; 556,472

(GAS, MCF;

WATER, BBL;

RECOVERY FACTOR, %: BBL/AC-FT:

DEGREE OF SUCCESS:

OPERATOR(S): TWIN MTN. OIL CO

REMARKS: FORMERLY WHEELER FIELD (UNTIL 1975)

SOURCES: 5,14; 11,15,196,198
RESEVOIR AND PRODUCTION DATA ELEMENTS

STATE: OKLAHOMA
COUNTY: STEPHENS
DISTRICT: SOUTHWEST
FIELD NAME: LOCO
NO. OF RESERVOIRS: 3

RESEVOIR INFORMATION

RESEVOIR: LOCO SANDS
NO. OF ZONES: 4
AREA, ACRES: 4000 *
TOTAL WELLS: 
SHUT-IN WELLS: 
DISCOVERY YEAR: 1917
SPACING, ACRES: 
PRODUCING WELLS: 
INJECTION WELLS: 

GEOLOGICAL INFORMATION

FORMATION: LOCO AND HOXBAR
GEOLOGICAL AGE: PENNSYLVANIAN-PERMIAN
BASIN: OKLAHOMA FOLDED BELT
TRAP TYPE: STRUCTURAL
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC DIP, DEC.: HETEROGENEITY; MINOR CLAY CONTENT, %:
FAULTING; INTERBEDDED STREAKS:
FRACTURE; BARRIER TO FLOW:

RESEVOIR CHARACTERISTICS

DEPTH, FT: 350
GROSS PAY, FT: 
POROSITY, %: 27.0
PERMEABILITY, MD: 500
BHT, DEF F: 70
GAS CAP: NO
GAS CAP/OIL ZONE RATIO: 
INITIAL: OIL SAT., %: 74.0
WTR SAT., %: 26.0
GAS SAT., %:
FVF, BBL/STB: 1.050
WOR, BBL/BBL: 5
GOR, SCF/BBL:
BHP, PSI: 
NET PAY, FT: 18
RANGE: 10 TO 5000
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE: 
CURRENT: OIL SAT., %;
WTR SAT., %;
GAS SAT., %;
FVF, BBL/STB;
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 21.0
VISCOSITY @ BHT, CP: 798.0
@ F, CP: 
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: 
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 260
WATER HARDNESS: CA, PPM; 10 MG, PPM; 18

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 
ORIGINAL GAS IN PLACE, MCF: 
CUM PROD (DEC 31, ) OIL, BBL; 
GAS, MCF; 
WATER, BBL; 
ANNUAL PROD: OIL, BBL; 
GAS, MCF; 
WATER, BBL; 
OIL REMAINING IN PLACE, STB: 
(DEC 31, ) 
RESERVES (DEC 31, ) 
CUM PROD: OIL, BBL; 
GAS, MCF; 
WATER, BBL; 
CUM PROD: OIL, BBL; 
GAS, MCF; 
WATER, BBL; 
RECOVERY FACTOR, %: 15.0 BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1955- )
AREA, ACRES: 4000
NO. PROD WELLS: 
NO. INJ WELLS: 
VOLUME INJECTED: (EQUIV) WATER, BBL; 
GAS, MCF; 
CUMULATIVE PROD: OIL, BBL; 
GAS, MCF; 
WATER, BBL; 
RECOVERY FACTOR, %: 15.0 BBL/AC-FT:
DEGREE OF SUCCESS: 
OPERATOR(S): 

159
SECONDARY AND TERTIARY RECOVERIES (CONT.)

T.1 IN-SITU COMBUSTION (1975-1980)

AREA, ACRES: 24  FLUID INJECTED: A
NO. PROD WELLS: 25  NO. INJ WELLS: 5
VOLUME INJECTED: (EQUIV) WATER, BBL;
  GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
  (THRU ) GAS, MCF;
  WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: POOR
OPERATOR(S): CONOCO

T.2 STEAM DRIVE (1976-)

AREA, ACRES: 20  FLUID INJECTED: S
NO. PROD WELLS: 24  NO. INJ WELLS: 5
VOLUME INJECTED: (EQUIV) WATER, BBL;
  GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
  (THRU ) GAS, MCF;
  WATER, BBL;
RECOVERY FACTOR, %: 46.4  BBL/AC-FT:
DEGREE OF SUCCESS: GOOD
OPERATOR(S): CONOCO

REMARKS: ACREAGE REFLECTS SEVERAL POOLS; DATA FOR J SAND.
AT LEAST 22 WF PROJ., INCL 1 HOTWATER FLOOD.
SEVERAL THERMAL PROJ.; A SD CANDIDATE.

SOURCES: 5,14; 11,18,194,196,197,198
STATE: TEXAS
COUNTY: MEDINA
DISTRICT: 1
FIELD NAME: TAYLOR INA
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION
RESERVOIR: NAVARRO RESERVOIR
NO. OF ZONES: DISCOVERY YEAR: 1936
AREA, ACRES: 4700 SPACING, ACRES: 7
TOTAL WELLS: PRODUCING WELLS: 595
SHUT-IN WELLS: 43 INJECTION WELLS:

GEOLGICAL INFORMATION
FORMATION: NAVARRO-OLMOS
GEOLOGICAL AGE: GULF
BASIN: OUACHITA TECTONIC BELT PROVINCE
TRAP TYPE: STRUCT-STRAT - FAULTED MONOCLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC
HETEROGENEITY;
FAULTING; MOD
FRACUTRE;
DIP, DEG.: 3.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: NO
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS
DEPTH, FT: 900
GROSS PAY, FT:
POROSITY, %: 32.0
PERMEABILITY, MD: 85
BHT, DEF F: 80
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 55.0
WTR SAT., %: 45.0
GAS SAT., %:
FVF, BBL/STB: 1.040
WOR, BBL/BBL:
GOR, SCF/BBL: 100
BHP, PSI: 420
NET PAY, FT: 20
RANGE: 24.7 TO 48.0
RANGE: 20 TO 495
SAT. PRESSURE, PSI: 150
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 52.0 *
WTR SAT., %: 48.0
GAS SAT., %:
FVF, BBL/STB: 1.000
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI: 50

FLUID CHARACTERISTICS
OIL GRAVITY, API: 16.0
VISCOSITY @ BHT, CP: 390.0;
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA,PPM;
RANGE: TO
@g, F, CP:
CARBON/HYDROGEN RATIO:
ACID NUMBER:
MG,PPM;
RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 123,400,000 BBL/AC-FT: 1313
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 2,790,758
(GDEC 31, 1977) GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 158,213
GAS, MCF; 32,223
WATER, BBL;
OIL REMAINING IN PLACE, STB: 120,600,000 BBL/AC-FT: 1283
(GDEC 31, 1977)
RESERVOIRS (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: GD AND SG
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 ISC AND SD (1965-1968)
AREA, ACRES: 77 FLUID INJECTED: A/W
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL; 195,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(GTHRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: UD
OPERATOR(S): TENNECO/COASTAL STATES

T.2 ELECTROFLOOD, AC (1978- )
AREA, ACRES: 36 FLUID INJECTED:
NO. PROD WELLS: 36 NO. INJ WELLS: 3
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(GTHRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: VE
OPERATOR(S): PETRO OIL & GAS

REMARKS: ISC: ONE 2.5 AC 5-SPOT INV PATTERN; SD: 75 AC

SOURCES: 5,12,14,200,203-4,206,209,211-12,214,217,266-7

162
CASE 257

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: WASHINGTON
DISTRICT: 3
FIELD NAME: CLAY CREEK
NO. OF RESERVOIRS: 3

RESERVOIR INFORMATION

RESERVOIR: SPARTA-QUEEN CITY-WILCOX
NO. OF ZONES: 
AREA, ACRES: 586
TOTAL WELLS: 
SHUT-IN WELLS: 12
DISCOVERY YEAR: 1928
SPACING, ACRES: 7
PRODUCING WELLS: 64
INJECTION WELLS: 1

GEOLOGICAL INFORMATION

FORMATION: QUEEN
GEOLOGICAL AGE: EOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULTED SALT DOME
LITHOLOGY: SAND

DEGREE OF: CONSOLIDATION; UNC
HETEROGENEITY;
FAULTING;
FRACUTRE;

DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1125
GROSS PAY, FT: 
POROSITY, %: 22.0
PERMEABILITY, MD: 
BHT, DEF F: 90 *
GAS CAP: 
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 70.0
WTR SAT., %; 30.0
GAS SAT., %;
FVF, BBL/STB; 1.045
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 630

NET PAY, FT: 60
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI: 630
GAS CAP, ACRES: 
WETTING PHASE:
CURRENT: OIL SAT., %; 48.0 *
WTR SAT., %; 52.0
GAS SAT., %:
FVF, BBL/STB; 1.000 *
WOR, BBL/BBL; 3
GOR, SCF/BBL; 261
BHP, PSI; 100

163
FLUID CHARACTERISTICS

OIL GRAVITY, API: 25.0  RANGE: 23.0 TO 26.0
VISCOSITY @ BHT, CP: ; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: .35  CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:  ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 40,200,000  BBL/AC-FT: 1143
ORIGINAL GAS IN PLACE, MCF:
CUM PROD  : OIL, BBL; 11,253,966  GAS, MCF;
   (DEC 31, 1977)  WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 150,499  GAS, MCF;
   WATER, BBL;
OIL REMAINING IN PLACE, STB: 28,900,000  BBL/AC-FT: 823
   (DEC 31, 1977)  RESERVES (DEC 31,  )

PRIMARY PRODUCTION:
MECHANISM: GAS DRIVE
RECOVERY FACTOR, %:  BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD  (1967-1972)

AREA, ACRES: 150  FLUID INJECTED: SW
NO. PROD WELLS: 52  NO. INJ WELLS: 1
VOLUME INJECTED: (EQUIV) WATER, BBL; 2,020,000
   GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 1,247,000  GAS, MCF;
   (THRU 1977)  WATER, BBL;
RECOVERY FACTOR, %:  BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): SUN OIL CO.

REMARKS: GAS CAP PRESENT ORIGINALLY

SOURCES: 5, 12, 14, 200, 204, 209, 211, 266-7; 229
CASE 297
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: WYOMING
COUNTY: NATRONA
DISTRICT:
FIELD NAME: CASPER CREEK, SOUTH
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: TENSLEEP
NO. OF ZONES: DISCOVERY YEAR: 1919
AREA, ACRES: 240 SPACING, ACRES: 5
TOTAL WELLS: PRODUCING WELLS: 39
SHUT-IN WELLS:

GEOLOGICAL INFORMATION

FORMATION: TENSLEEP
GEOLOGICAL AGE: DESMOINES
BASIN: POWDER RIVER
TRAP TYPE: STRUCTURAL - ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; MOD DIP, DEG.:
HETEROGENEITY; MOD CLAY CONTENT, %:
FAULTING;
FRACTURE; MINOR INTERBEDDED STREAKS:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2400
GROSS PAY, FT: 155
POROSITY, %: 19.0
PERMEABILITY, MD: 200
BHT, DEF FG: 90
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 89.0
WTR SAT., %; 11.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 1000

NET PAY, FT: 150
RANGE: TO
RANGE: 100 TO 1500
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE: OIL
CURRENT: OIL SAT., %; 69.0 *
WTR SAT., %; 31.0
GAS SAT., %;
FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 750
FLUID CHARACTERISTICS

OIL GRAVITY, API: 15.0
RANGE: TO
VISCOSITY @ BHT, CP: 580.0; @ F, CP:
SAYBOLT VISC (100F), SEC: 3100
SULFUR CONTENT, %: 4.49
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 10.7
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM: 2600
WATER HARDNESS: CA, PPM: 300
MG, PPM: 100

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 45,000,000 BBL/AC-FT: 1249
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 8,567,604
(GO 31, 1977) GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 167,604
GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB: 36,400,000 BBL/AC-FT: 1011
(DEC 31, 1977) RESERVES (DEC 31, )
PRIMAIY PRODUCTION:
MECHANISI: WATER DRIVE
RECOVERY FACTOR, %: 11.0 BBL/AC-FT: 140
ANNUAL DECLINE RATE, %: 3.0

SECONDARY AND TERTIARY RECOVERIES:

T.I STEAM INJECTION (1975- )
AREA, ACRES: 240 FLUID INJECTED: S
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(GO ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: ME OPERATOR(S): UNION OIL

SOURCES: 12, 14, 286, 289; 301

166
STATE: WYOMING  
COUNTY: JOHNSON  
FIELD NAME: TISDALE, NORTH  
NO. OF RESERVOIRS: 3

<table>
<thead>
<tr>
<th>RESERVOIR INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESERVOIR: CURTIS</td>
</tr>
<tr>
<td>NO. OF ZONES: 2</td>
</tr>
<tr>
<td>AREA, ACRES: 360 *</td>
</tr>
<tr>
<td>DISCOVERY YEAR: 1952</td>
</tr>
<tr>
<td>NO. OF ZONES: 2</td>
</tr>
<tr>
<td>AREA, ACRES: 360 *</td>
</tr>
<tr>
<td>SPACING, ACRES: 10</td>
</tr>
<tr>
<td>TOTAL WELLS:</td>
</tr>
<tr>
<td>PRODUCING WELLS: 26</td>
</tr>
<tr>
<td>SHUT-IN WELLS:</td>
</tr>
<tr>
<td>INJECTION WELLS: 5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GEOLOGICAL INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>FORMATION: CURTIS</td>
</tr>
<tr>
<td>GEOLOGICAL AGE: UPPER JURASSIC</td>
</tr>
<tr>
<td>BASIN: POWDER RIVER</td>
</tr>
<tr>
<td>TRAP TYPE: STRUCT/STRAT - FAULT NOSE</td>
</tr>
<tr>
<td>LITHOLOGY: SAND</td>
</tr>
<tr>
<td>DEGREE OF: CONSOLIDATION;</td>
</tr>
<tr>
<td>DIP, DEG.: 3.0</td>
</tr>
<tr>
<td>HETEROGENEITY;</td>
</tr>
<tr>
<td>CLAY CONTENT, %:</td>
</tr>
<tr>
<td>FAULTING;</td>
</tr>
<tr>
<td>INTERBEDDED STreakS: YES</td>
</tr>
<tr>
<td>FRACTURE;</td>
</tr>
<tr>
<td>BARRIER TO FLOW:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RESERVOIR CHARACTERISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEPTH, FT: 900</td>
</tr>
<tr>
<td>GROSS PAY, FT: 126</td>
</tr>
<tr>
<td>POROSITY, %: 24.5</td>
</tr>
<tr>
<td>PERMEABILITY, MD: 1034</td>
</tr>
<tr>
<td>BHT, DEF F: 73</td>
</tr>
<tr>
<td>GAS CAP:</td>
</tr>
<tr>
<td>GAS CAP/OIL ZONE RATIO:</td>
</tr>
<tr>
<td>INITIAL: OIL SAT., %: 65.0</td>
</tr>
<tr>
<td>WTR SAT., %: 35.0</td>
</tr>
<tr>
<td>GAS SAT., %:</td>
</tr>
<tr>
<td>FVF, BBL/STB: 1.050 *</td>
</tr>
<tr>
<td>WOR, BBL/BBL;</td>
</tr>
<tr>
<td>GOR, SCF/BBL;</td>
</tr>
<tr>
<td>BHP, PSI: 290</td>
</tr>
<tr>
<td>NET PAY, FT: 54</td>
</tr>
<tr>
<td>RANGE: TO</td>
</tr>
<tr>
<td>RANGE: TO</td>
</tr>
<tr>
<td>SAT. PRESSURE, PSI:</td>
</tr>
<tr>
<td>GAS CAP, ACRES:</td>
</tr>
<tr>
<td>WETTING PHASE:</td>
</tr>
<tr>
<td>CURRENT: OIL SAT., %:</td>
</tr>
<tr>
<td>WTR SAT., %:</td>
</tr>
<tr>
<td>GAS SAT., %:</td>
</tr>
<tr>
<td>FVF, BBL/STB:</td>
</tr>
<tr>
<td>WOR, BBL/BBL;</td>
</tr>
<tr>
<td>GOR, SCF/BBL;</td>
</tr>
<tr>
<td>BHP, PSI:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FLUID CHARACTERISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>OIL GRAVITY, API: 21.0</td>
</tr>
<tr>
<td>RANGE: TO</td>
</tr>
<tr>
<td>VISCOSITY @ BHT, CP: 175.0; @ F, CP:</td>
</tr>
<tr>
<td>SAYBOLT VISC (100F), SEC:</td>
</tr>
<tr>
<td>SULFUR CONTENT, %: 2.82</td>
</tr>
<tr>
<td>CARBON/HYDROGEN RATIO:</td>
</tr>
<tr>
<td>CARBON RESIDUE, %:</td>
</tr>
<tr>
<td>ACID NUMBER:</td>
</tr>
<tr>
<td>OIL TYPE:</td>
</tr>
<tr>
<td>WATER SALINITY, PPM:</td>
</tr>
<tr>
<td>WATER HARDNESS: CA, PPM;</td>
</tr>
<tr>
<td>MG, PPM;</td>
</tr>
</tbody>
</table>
RESERVES AND PRODUCTION DATA

CASE 326

ORIGINAL OIL IN PLACE, STB: 22,900,000
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL: 2,741,684
(DEC 31, 1977) GAS, MCF: 44,724
WATER, BBL:

RESERVES AND PRODUCTION DATA

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1962- )

AREA, ACRES: FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL:
GAS, MCF: CUMULATIVE PROD: OIL, BBL:
(THRU ) GAS, MCF:
WATER, BBL:
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): HIGHLAND EXP., INC

T.1 IN-SITU COMBUSTION (1959-1963)

AREA, ACRES: 12 FLUID INJECTED: A
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL:
GAS, MCF: CUMULATIVE PROD: OIL, BBL:
(THRU ) GAS, MCF:
WATER, BBL:
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: VE
OPERATOR(S): CONOCO

REMARKS: PROD & RES INCLUDE 2 OTHER POOLS

SOURCES: 12, 14, 286, 289; 276
### Reservoir and Production Data Elements

**State:** Wyoming  
**County:** Fremont  
**District:**  
**Field Name:** Winkleman Dome  
**No. of Reservoirs:** 5

#### Reservoir Information

<table>
<thead>
<tr>
<th>Reservoir: Nugget</th>
<th>Discovery Year: 1944</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Zones:</td>
<td></td>
</tr>
<tr>
<td>Area, Acres:</td>
<td>207</td>
</tr>
<tr>
<td>Total Wells:</td>
<td></td>
</tr>
<tr>
<td>Shut-in Wells:</td>
<td></td>
</tr>
</tbody>
</table>

#### Geological Information

<table>
<thead>
<tr>
<th>Formation: Nugget</th>
<th>Geological AGE: Upper Triassic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geological Age:</td>
<td>Upper Triassic</td>
</tr>
<tr>
<td>Basin: Wind River</td>
<td></td>
</tr>
<tr>
<td>Trap Type:</td>
<td>Structural - Anticline</td>
</tr>
<tr>
<td>Lithology: Sand</td>
<td></td>
</tr>
<tr>
<td>Degree of:</td>
<td>Consolidation, Heterogeneity, Faulting, Fracture,</td>
</tr>
<tr>
<td></td>
<td>DIP, Deg.: Clay Content, %; Interbedded Streaks: Barrier to Flow:</td>
</tr>
</tbody>
</table>

#### Reservoir Characteristics

<table>
<thead>
<tr>
<th>Depth, FT:</th>
<th>1286</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Pay, FT:</td>
<td>180</td>
</tr>
<tr>
<td>Porosity, %</td>
<td>24.0</td>
</tr>
<tr>
<td>Permeability, MD:</td>
<td>431</td>
</tr>
<tr>
<td>BHT, DEF F:</td>
<td>81</td>
</tr>
<tr>
<td>Gas Cap:</td>
<td></td>
</tr>
<tr>
<td>Gas Cap/Oil Zone Ratio:</td>
<td></td>
</tr>
<tr>
<td>Initial: Oil Sat., %: 71.0</td>
<td></td>
</tr>
<tr>
<td>WTR Sat., %:</td>
<td>29.0</td>
</tr>
<tr>
<td>Gas Sat., %:</td>
<td></td>
</tr>
<tr>
<td>FVF, BBL/STB:</td>
<td>1.000</td>
</tr>
<tr>
<td>WOR, BBL/BBL:</td>
<td></td>
</tr>
<tr>
<td>GOR, SCF/BBL:</td>
<td>30</td>
</tr>
<tr>
<td>BHP, PSI:</td>
<td>210</td>
</tr>
<tr>
<td>Net Pay, FT:</td>
<td>57</td>
</tr>
<tr>
<td>Range:</td>
<td>To</td>
</tr>
<tr>
<td>Range:</td>
<td>To</td>
</tr>
<tr>
<td>Sat. Pressure, PSI:</td>
<td></td>
</tr>
<tr>
<td>Gas Cap, Acres:</td>
<td></td>
</tr>
<tr>
<td>Wetting Phase:</td>
<td></td>
</tr>
<tr>
<td>Current: Oil Sat., %: 55.0 *</td>
<td></td>
</tr>
<tr>
<td>WTR Sat., %:</td>
<td>45.0</td>
</tr>
<tr>
<td>Gas Sat., %:</td>
<td></td>
</tr>
<tr>
<td>FVF, BBL/STB:</td>
<td>1.000</td>
</tr>
<tr>
<td>WOR, BBL/BBL:</td>
<td></td>
</tr>
<tr>
<td>GOR, SCF/BBL:</td>
<td></td>
</tr>
<tr>
<td>BHP, PSI:</td>
<td></td>
</tr>
</tbody>
</table>
FLUID CHARACTERISTICS

OIL GRAavity, API: 14.0
VISCOSITY @ BHT, CP: 1000.0; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;
MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 13,200,000
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 2,653,427
(GEC 31, 1977) GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 239,417
GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB: 10,307,156
(DEC 31, 1977) RESERVES (DEC 31,
)
PRIMARY PRODUCTION:
MECHANISM: FE & WD
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:
BBL/AC-FT:

SECONDARY AND TERTIARY RECOVERIES:

T.1 STEAM INJECTION (1967- )
AREA, ACRES: 100
NO. PROD WELLS:
FLUID INJECTED: S
NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(GEO ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS: VE
OPERATOR(S): AMOCO
BBL/AC-FT:

SOURCES: 12, 14, 286, 289; 268, 273, 278, 279, 287
3. DATA LISTING: CANDIDATE RESERVOIRS CONTAINING 10 MILLION BARRELS OF 8° TO 25° API GRAVITY OIL-IN-PLACE RECOVERABLE BY IN SITU COMBUSTION TECHNOLOGY

The data for reservoirs recoverable by in situ combustion are presented in this section.

All of the pages for a particular reservoir are denoted by the same case number.

Source numbers correspond to the references listed in Section 2 of the Appendix.
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: ARKANSAS
COUNTY: NEVADA
DISTRICT:
FIELD NAME: IRMA
NO. OF RESERVOIRS: 7

RESERVOIR INFORMATION

RESERVOIR: OLD NACATOCH
NO. OF ZONES: DISCOVERY YEAR: 1921
AREA, ACRES: 2300 SPACING, ACRES: 20
TOTAL WELLS: PRODUCING WELLS: 97
SHUT-IN WELLS: INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: NACATOCH GEOLOGICAL AGE: GULF
BASIN: ARKLA BASIN TRAP TYPE: STRUCTURAL - FAULTED MONOCLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.:
HETEROGENEITY; CLAY CONTENT, %:
FAULTING; INTERBEDDED STREAKS:
FRACTURE; BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1150 NET PAY, FT: 13
GROSS PAY, FT: 27 RANGE: TO
POROSITY, %: 40.0 RANGE: 300 TO 2500
PERMEABILITY, MD: 1500 SAT. PRESSURE, PSI:
BHT, DEF F: 88 * GAS CAP, ACRES:
GAS CAP/OIL ZONE RATIO: WETTING PHASE:
INITIAL: OIL SAT., %; 67.0 CURRENT: OIL SAT., %; 55.0 *
WTR SAT., %; 33.0 WTR SAT., %; 45.0
GAS SAT., %; GAS SAT., %;
FVF, BBL/STB; 1.000 FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

FLUID CHARACTERISTICS

OIL GRAVITY, API: 14.0 RANGE: TO
VISCOITY @ BHT, CP: %
SAYBOLT VISC (100F), SEC: 6000 CARBON/HYDROGEN RATIO: 7.44
SULFUR CONTENT, %: 2.82 ACID NUMBER:
CARBON RESIDUE, %: 9.4
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;
MG, PPM;
CASE 004

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 62,200,000  BBL/AC-FT: 2079
ORIGINAL GAS IN PLACE, MCF:

CUM PROD:
(DEC 31, 1977)

1977 ANNUAL PROD:

OIL REMAINING IN PLACE, STB: 51,500,000  BBL/AC-FT: 1723

PRIMAR PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %: 20.0
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 IN-SITU COMBUSTION  (1964-1966)

AREA, ACRES: 4
NO. PROD WELLS: 4
FLUID INJECTED: A
NO. INJ WELLS: 1
VOLUME INJECTED: (EQUIV) WATER, BBL:
GAS, MCF: 1,300,000
CUMULATIVE PROD:
(THRU )
OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): MOBIL OIL

T.2 STEAM DRIVE  (1967-1968)

AREA, ACRES:
NO. PROD WELLS:
FLUID INJECTED: S
NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL:
GAS, MCF:
CUMULATIVE PROD:
(THRU )
OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 38.0  BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S):

SOURCES: 5,12,13,14,21,24; 18,23

173
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: ARKANSAS
COUNTY: UNION & BRADLEY
DISTRICT:
FIELD NAME: LICK CREEK
NO. OF RESERVOIRS: 4

RESERVOIR INFORMATION

RESERVOIR: MEAKIN
NO. OF ZONES: DISCOVERY YEAR: 1957
AREA, ACRES: 1120 SPACING, ACRES: 20
TOTAL WELLS: PRODUCING WELLS: 58
SHUT-IN WELLS: INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: MEAKIN GEOLOGICAL AGE: GULF
GEOLOGICAL AGE: GULF BASIN: ARKLA BASIN
TRAP TYPE: STRUCTURAL - ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.: CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2545 NET PAY, FT: 12
GROSS PAY, FT: 12 RANGE: TO
POROSITY, %: 29.3 RANGE: TO
PERMEABILITY, MD: 1192 SAT. PRESSURE, PSI:
BHT, DEFT F: 118 GAS CAP, ACRES:
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 68.0 WETTING PHASE:
WTR SAT., %: 32.0 CURRENT: OIL SAT., %: 48.0 *
GAS SAT., %: WTR SAT., %: 52.0
FVF, BBL/STB: 1.100 GAS SAT., %:
WOR, BBL/BBL; FVF, BBL/STB: 1.020 *
GOR, SCF/BBL; BHP, PSI:
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 18.0  RANGE:  TO  
VISCOSITY @ BHT, CP:  188.0; @  F, CP:  
SAYBOLT VISC (100°F), SEC: 2580  
SULFUR CONTENT, %: 2.92  CARBON/HYDROGEN RATIO: 7.42  
CARBON RESIDUE, %: 5.6  ACID NUMBER:  
OIL TYPE:  
WATER SALINITY, PPM;  
WATER HARDNESS: CA, PPM;  
MG, PPM;  

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 18,900,000  BBL/AC-FT: 1405  
ORIGINAL GAS IN PLACE, MCF:  
CUM PROD (DEC 31, 1977):  
OIL, BBL; 4,625,276  
GAS, MCF;  
WATER, BBL;  
1977 ANNUAL PROD:  
OIL, BBL; 99,300  
GAS, MCF;  
WATER, BBL;  
OIL REMAINING IN PLACE, STB: 14,300,000  BBL/AC-FT: 1061  
(DEC 31, 1977)  
RESERVES (DEC 31, )  

PRIMARY PRODUCTION:  
MECHANISM: SOLUTION GAS  
RECOVERY FACTOR, %:  
ANNUAL DECLINE RATE, %:  

SECONDARY AND TERTIARY RECOVERIES:  

T.1 CARBON DIOXIDE FLOOD (1976- )  
AREA, ACRES:  1120  
FLUID INJECTED: CO2  
NO. PROD WELLS: 32  
NO. INJ WELLS: 14  
VOLUME INJECTED: (EQUIV) WATER, BBL;  
GAS, MCF;  
CUMULATIVE PROD:  
OIL, BBL;  
GAS, MCF;  
WATER, BBL;  
THRU )  
RECOVERY FACTOR, %:  
BBL/AC-FT:  
DEGREE OF SUCCESS: GOOD  
OPERATOR(S): PHILLIPS PETROLEUM  

SOURCES: 5, 12, 13, 14, 21, 24; 18, 25
CASE 006

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: ARKANSAS
COUNTY: OUACHITA & UNION
DISTRICT:
FIELD NAME: SMACKOVER (OLD)
NO. OF RESERVOIRS: 8

RESERVOIR INFORMATION

RESERVOIR: BLOSSOM
NO. OF ZONES: DISCOVERY YEAR: 1925
AREA, ACRES: 43970 *
TOTAL WELLS: SPACING, ACRES:
SHUT-IN WELLS: PRODUCING WELLS: 2986

INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: BLOSSOM GEOLOGICAL AGE: UPPER CRETACEOUS
GEOLOGICAL AGE: UPPER CRETACEOUS BASIN: ARKLA BASIN
TRAP TYPE: STRUCTURAL - ANTICLINE FAULT
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; MOD DIP, DEG.:
HETEROGENEITY; MOD CLAY CONTENT, %: 20.0
FAULTING; NONE INTERBEDDED STREAKS: YES
FRACTURE; MINOR BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2530 NET PAY, FT: 40
GROSS PAY, FT: RANGE: TO
POROSITY, %: 27.0 RANGE: TO
PERMEABILITY, MD:
BHT, DEF F: 121 SAT. PRESSURE, PSI:
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 75.0 CURRENT: OIL SAT., %;
WTR SAT., %; 25.0 WTR SAT., %;
GAS SAT., %; GAS SAT., %;
FVF, BBL/STB; 1.060 FVF, BBL/STB;
WOR, BBL/BBL; WOR, BBL/BBL;
GOR, SCF/BBL; GOR, SCF/BBL;
BHP, PSI; BHP, PSI;

176
FLUID CHARACTERISTICS

OIL GRAVITY, API: 24.5 RANGE: TO
VISCOSITY @ BHT, CP: 12.6; @ 130F, CP: 12.1
SAYBOLT VISC (100F), SEC: 300
SULFUR CONTENT, %: 2.11 CARBON HYDROGEN RATIO:
CARBON RESIDUE, %: 6.4 ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: BBL/AC-FT: 1482
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 513,494,904
(GAR 31, 1977) GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 3,724,313
(GAR 31, DEC 31) GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB:
(DEC 31, 1977) RESERVES (DEC 31, 1977)
BBL/AC-FT: 16,506,000

PRIMARY PRODUCTION:
MECHANISM:
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD

AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(GAR ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S):

REMARKS: AREA, PRODUCTION, WELLS, RESERVES INCLUDE NACATOCH, MEAKIN, GRAVES, BLOSSOM, AND TOKIO FORMATIONS.

SOURCES: 5, 12, 13, 14, 21, 24; 11, 293
RESERVOIR AND PRODUCTION DATA ELEMENTS

CASE 007

STATE: ARKANSAS
COUNTY: OUACHITA & UNION
DISTRICT:
FIELD NAME: SMACKOVER (OLD)
NO. OF RESERVOIRS: 8

RESERVOIR INFORMATION

RESERVOIR: GRAVES
NO. OF ZONES: 4
AREA, ACRES: 43970 *
TOTAL WELLS:
SHUT-IN WELLS:
DISCOVERY YEAR: 1925
SPACING, ACRES:
PRODUCING WELLS: 2986
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: GRAVES
GEOLOGICAL AGE: GULF
BASIN: ARKLA BASIN
TRAP TYPE: STRUCTURAL - ANTICLINE FAULT
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; MOD
HETEROGENEITY; MOD
FAULTING; NONE
FRACUTRE; MINOR
DIP, DEG.: 
CLAY CONTENT, %: 20.0
INTERBEDDED STREAKS: YES
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2380
GROSS PAY, FT:
POROSITY, %: 31.0
PERMEABILITY, MD:
BHT, DEF F: 118
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 75.0
WTR SAT., %; 25.0
GAS SAT., %;
FVF, BBL/STB: 1.060
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 15
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %;
WTR SAT., %;
GAS SAT., %;
FVF, BBL/STB;
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 21.1    RANGE: TO
VISCOSITY @ BHT, CP:  23.6;  @ 130°F, CP:  21.5
SAYBOLT VISC (100°F), SEC: 280
SULFUR CONTENT, %: 2.25    CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 6.2    ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;
MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB:  BBL/AC-FT: 1701
ORIGINAL GAS IN PLACE, MCF:
           GAS, MCF:
           WATER, BBL:
1977 ANNUAL PROD: OIL, BBL: 3,724,313
           GAS, MCF:
           WATER, BBL:
OIL REMAINING IN PLACE, STB:  BBL/AC-FT: 16,506,000
(DEC 31, )
RESERVES (DEC 31, 1977)

PRIMARY PRODUCTION:
MECHANISM:
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD  (- - )
AREA, ACRES:  FLUID INJECTED: W
NO. PROD WELLS:  NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
             GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
             GAS, MCF;
             WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S):

REMARKS: AREA, PRODUCTION, WELLS, RESERVES INCLUDE
NACATOCH, MEAKIN, GRAVES, BLOSSOM, AND
TOKIO FORMATIONS.

SOURCES: 5, 12, 13, 14, 21, 24; 11, 293
### RESERVOIR AND PRODUCTION DATA ELEMENTS

**STATE:** ARKANSAS  
**COUNTY:** OUACHITA & UNION  
**DISTRICT:**  
**FIELD NAME:** SMACKOVER (OLD)  
**NO. OF RESERVOIRS:** 8

#### RESERVOIR INFORMATION

**RESERVOIR:** NACATOCH  
**NO. OF ZONES:** 3  
**AREA, ACRES:** 43970  
**TOTAL WELLS:**  
**PRODUCING WELLS:** 2986  
**SHUT-IN WELLS:**  
**SPACING, ACRES:**  
**DISCOVERY YEAR:** 1922  
**PRODUCING WELLS:**  
**INJECTION WELLS:**

#### GEOLOGICAL INFORMATION

**FORMATION:** NACATOCH  
**GEOLOGICAL AGE:** GULF  
**BASIN:** ARKLA BASIN  
**TRAP TYPE:** STRUCTURAL - ANTICLINE FAULT  
**LITHOLOGY:** SAND  
**DEGREE OF:** CONSOLIDATION; MOD  
**HETEROSTERITY:** MOD  
**FAULTING:** NONE  
**FRACTURE:** MINOR  
**INTERBEDDED STREAKS:** YES  
**CLAY CONTENT:** %: 40.0  
**BARRIER TO FLOW:** YES

#### RESERVOIR CHARACTERISTICS

**DEPTH, FT:** 2000  
**GROSS PAY, FT:**  
**POROSITY, %:** 36.0  
**PERMEABILITY, MD:** 2000  
**BHT, DEF F:** 110  
**GAS CAP:**  
**GAS CAP/OIL ZONE RATIO:**  
**INITIAL:** OIL SAT., %; 70.0  
**WTR SAT., %; 30.0  
**GAS SAT., %:**  
**FVF, BBL/STB:** 1.060  
**WOR, BBL/BBL:**  
**GOR, SCF/BBL:** 150  
**BHP, PSI:**  
**NET PAY, FT:** 50  
**RANGE:** TO  
**RANGE:** 1000 TO 3000  
**SAT. PRESSURE, PSI:**  
**GAS CAP, ACRES:**  
**WETTING PHASE:**  
**CURRENT:** OIL SAT., %; 65.0  
**WTR SAT., %; 35.0  
**GAS SAT., %:**  
**FVF, BBL/STB:** 1.000  
**WOR, BBL/BBL:** 20  
**GOR, SCF/BBL:**  
**BHP, PSI:**

#### FLUID CHARACTERISTICS

**OIL GRAVITY, API:** 18.0  
**RANGE:** TO  
**VISCOITY @ BHT, CP:** 75.0  
**@ 70F, CP:** 180.0  
**SAYBOLT VISC (100F), SEC:** 340  
**SULFUR CONTENT:** %; 2.33  
**CARBON RESIDUE:** %; 8.1  
**CARBON/HYDROGEN RATIO:**  
**ACID NUMBER:**  
**OIL TYPE:**  
**WATER SALINITY, PPM:** 72600  
**WATER HARDNESS:** Ca, PPM; 10800  
**MG, PPM:**  

180
RESERVES AND PRODUCTION DATA

CASE 009

ORIGINAL OIL IN PLACE, STB: BBL/AC-FT: 1844
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 513,494,904
(GDEC 31, 1977) GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 3,724,313
GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB:
(DEC 31, ) BBL/AC-FT: 16,506,000
RESERVES (DEC 31, 1977)

PRIMARY PRODUCTION:
MECHANISM: GD & SG
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %: 6.0

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1954- )
AREA, ACRES: 40 FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(GTHRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): PHILLIPS

S.2 WATERFLOOD (1962- )
AREA, ACRES: 320 FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(GTHRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): TINSLEY UNIT
SECONDARY AND TERTIARY RECOVERIES (CONT.)

S.3 WATERFLOOD (1972- )

AREA, ACRES: 160
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S): GULF

T.1 STEAM DRIVE (1969- )

AREA, ACRES: 1145
NO. PROD WELLS: 130
NO. INJ WELLS: 14
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 30.0
DEGREE OF SUCCESS: FAIR
OPERATOR(S): PHILLPS; GULF

T.2 IN-SITU COMBUSTION (1970- )

AREA, ACRES: 160
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S): GULF

REMARKS: AREA, WELLS, PRODUCTION, RESERVES INCLUDE NACATOCHE, MEAKIN, GRAVES, BLOSSOM, AND TOKIO FORMATIONS

SOURCES: 5,12,13,14,21,24; 11,17,18,22,27,293
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: ARKANSAS
COUNTY: OUACHITA & UNION
DISTRICT:
FIELD NAME: SMACKOVER (OLD)
NO. OF RESERVOIRS: 8

RESERVOIR INFORMATION

RESERVOIR: TOKIO
NO. OF ZONES:
AREA, ACRES: 43970 *
TOTAL WELLS:
SHUT-IN WELLS:
DISCOVERY YEAR: 1954
SPACING, ACRES:
PRODUCING WELLS:
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: TOKIO
GEOLOGICAL AGE: GULF
BASIN: ARKLA BASIN
TRAP TYPE: STRUCTURAL - ANTICLINE FAULT
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; MOD
HETEROGENEITY; MOD
FAULTING; NONE
FRACTURE; MINOR
DIP, DEG.:
CLAY CONTENT, %: 20.0
INTERBEDDED STREAKS: YES
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2640
GROSS PAY, FT:
POROSITY, %: 24.0
PERMEABILITY, MD:
BHT, DEF F: 123
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 75.0
WTR SAT., %: 25.0
GAS SAT., %:
FVF, BBL/STB: 1.060
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:
NET PAY, FT: 15
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %:
WTR SAT., %:
GAS SAT., %:
FVF, BBL/STB:
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:
FLUID CHARACTERISTICS

OIL GRAVITY, API: 19.0 RANGE: TO
VISCOSITY @ BHT, CP: ; @ F, CP:
SAYBOLT VISC (100F), SEC: 300
SULFUR CONTENT, %: 2.22 CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 6.6 ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: BBL/AC-FT: 1317
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977): OIL, BBL; GAS, MCF; WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; GAS, MCF; WATER, BBL;
OIL REMAINING IN PLACE, STB: BBL/AC-FT: 16,506,000
(DEC 31, ) RESERVES (DEC 31, 1977)

PRIMARY PRODUCTION:
MECHANISM:
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

REMARKS: AREA, WELLS, PRODUCTION, AND RESERVES INCLUDE
NACATOCHE, MEAKIN, GRAVES, BLOSSOM, AND
TOKIO FORMATIONS.

SOURCES: 5, 12, 13, 14, 21, 24; 11, 293
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: ARKANSAS
COUNTY: NEVADA
DISTRICT:
FIELD NAME: TROY
NO. OF RESERVOIRS: 4

RESERVOIR INFORMATION

RESERVOIR: OLD NACATOCH
NO. OF ZONES: DISCOVERY YEAR: 1936
AREA, ACRES: 997 SPACING, ACRES: 10
TOTAL WELLS: PRODUCING WELLS: 50
SHUT-IN WELLS: INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: NACATOCH TOKIO
GEOLOGICAL AGE: GULF
BASIN: ARKLA BASIN
TRAP TYPE: STRUCTURAL - FAULT CLOSURE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.:
HETEROGENEITY; CLAY CONTENT, %:
FAULTING; INTERBEDDED streaks:
FRACTURE; BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1220 NET PAY, FT: 18
GROSS PAY, FT: RANGE: TO
POROSITY, %: 40.0 RANGE: TO
PERMEABILITY, MD: 3500 SAT. PRESSURE, PSI:
BHT, DEF F: 89 GAS CAP, ACRES:
GAS CAP/OIL ZONE RATIO: WETTING PHASE:
INITIAL: OIL SAT., %: 67.0 CURRENT: OIL SAT., %:
WTR SAT., %: 33.0 WTR SAT., %:
GAS SAT., %: GAS SAT., %:
FVF, BBL/STB: 1.100 FVF, BBL/STB:
WOR, BBL/BBL: WOR, BBL/BBL:
GOR, SCF/BBL: GOR, SCF/BBL:
BHP, PSI: BHP, PSI:

FLUID CHARACTERISTICS

OIL GRAVITY, API: 18.0 RANGE: TO
VISCOSITY @ BHT, CP: 7000.0; @ F, CP:
SAYBOLT VISC (100F), SEC: 6000 CARBON/HYDROGEN RATIO: 7.26
SULFUR CONTENT, %: 2.51 ACID NUMBER:
CARBON RESIDUE, %: 11.6
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM; MG, PPM;
RESERVES AND PRODUCTION DATA

CASE 011

ORIGINAL OIL IN PLACE, STB: 33,900,000 BBL/AC-FT: 1890
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 8,755,726
(GAS, MCF; WATeR, BBL;)
1977 ANNUAL PROD: OIL, BBL; 40,362
(GAS, MCF; WATeR, BBL;)
OIL REMAINING IN PLACE, STB: BBL/AC-FT:
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %: 11.0
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1968- )
AREA, ACRES: 997
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV)WATER, BBL; GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 25.0
DEGREE OF SUCCESS:
OPERATOR(S):

T.1 STEAM INJECTION (1966- )
AREA, ACRES: 17
NO. PROD WELLS: 4
VOLUME INJECTED: (EQUIV)WATER, BBL; 1,177,400 GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 1,177,400
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): MOBIL OIL CORP

REMARKS: PROD FIGURES ARE TTLS FOR NAKATOCH & TOKIO

SOURCES: 5, 12, 13, 14, 21, 24; 22, 23, 26

186
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: MONTEREY
DISTRICT: COASTAL REGION, SALINAS VALLEY DISTRICT
FIELD NAME: SAN ARDO
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: AURIGNAC
NO. OF ZONES: DISCOVERY YEAR: 1948
AREA, ACRES: 3500 * SPACING, ACRES: 10
TOTAL WELLS: PRODUCING WELLS: 390
SHUT-IN WELLS: 115 INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: MONTEREY GEOLOGICAL AGE: MIocene
GEOLOGICAL AGE: MIocene
BASIN: COASTAL BASIN
TRAP TYPE: STRUC/STRAT - FACIES CHANGE ON ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.: 1.0
HETEROGENEITY; CLAY CONTENT, %:
FAULTING; NONE INTERBEDDED STREAKS: YES
FRACTURE;
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2350 NET PAY, FT: 100
GROSS PAY, FT: 120 RANGE: TO
POROSITY, %: 34.0 RANGE: TO
PERMEABILITY, MD: 2200 SAT. PRESSURE, PSI:
BHT, DEF F: 119
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 73.0 CURRENT: OIL SAT., %; 57.0 *
WTR SAT., %; 27.0 WTR SAT., %; 43.0
GAS SAT., %;
FVF, BBL/STB; 1.050 GAS SAT., %;
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

187
FLUID CHARACTERISTICS

OIL GRAVITY, API: 11.5
RANGE: 11.0 TO 14.0

VISCOSITY @ BHT, CP: 300.0
@ °F, CP:

SAYBOLT VISC (100°F), SEC:

SULFUR CONTENT, %: * **
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %:
ACID NUMBER:

OIL TYPE:
WATER SALINITY, PPM: 1700
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 641,800,000 BBL/AC-FT: 1834
ORIGINAL GAS IN PLACE, MCF:

CUM PROD:
(DEC 31, 1977)
OIL, BBL: 113,796,475
GAS, MCF:
WATER, BBL:

1977 ANNUAL PROD:
OIL, BBL: 10,707,485
GAS, MCF:
WATER, BBL: 64,696,000

OIL REMAINING IN PLACE, STB: 528,000,000 BBL/AC-FT: 1509
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 IN-SITU COMBUSTION (1959- )

AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL:
GAS, MCF;
CUMULATIVE PROD:
(THRU ) OIL, BBL:
GAS, MCF:
WATER, BBL:
RECOVERY FACTOR, %:
DEGREE OF SUCCESS: NE
OPERATOR(S): MOBIL OIL

BBL/AC-FT:

REMARKS: EOR OPERATIONS INCLUDED WITH LOMBARDI FORMATION

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 17, 18, 49, 77
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: MONTEREY
DISTRICT: COASTAL REGION, SALINAS VALLEY DISTRICT
FIELD NAME: SAN ARDO
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: LOMBARDI
NO. OF ZONES: 2
AREA, ACRES: 4200 *
TOTAL WELLS: 100
SHUT-IN WELLS: 301
DISCOVERY YEAR: 1947
SPACING, ACRES: 5
PRODUCING WELLS: 0
INJECTION WELLS: 4

GEOLOGICAL INFORMATION

FORMATION: MONTEREY
GEOLOGICAL AGE: MIocene
BASIN: COASTAL BASIN
TRAP TYPE: STRUCT/STRAT - FACIES CHANGE ON ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING; NONE
FRACvURE;
DIP, DEG.: 1.0
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2122
GROSS PAY, FT: 200
POROSITY, %: 34.0
PERMEABILITY, MD: 5000
BHT, DEF F: 117
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 73.0
WTR SAT., %: 27.0
GAS SAT., %:
FVF, BBL/STB: 1.050
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:
NET PAY, FT: 115
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 54.0 *
WTR SAT., %: 46.0
GAS SAT., %:
FVF, BBL/STB: 1.000
WOR, BBL/BBL:
GOR, SCF/BBL: 118
BHP, PSI:

FLUID CHARACTERISTICS

OIL GRAVITY, API: 11.1
VISCOSITY @ BHT, CP: 3000.0; @ 125F, CP: 3100.0
SAYBOLT VISC (100F), SEC: 6000
SULFUR CONTENT, %: 2.25
CARBON RESIDUE, %: 3.4
CARBON/HYDROGEN RATIO:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM: 6000
WATER HARDNESS: CA, PPM:
MG, PPM;
RESERVES AND PRODUCTION DATA

CASE 015

ORIGINAL OIL IN PLACE, STB: 885,700,000  BBL/AC-FT: 1834
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 200,483,244
(DEC 31, 1977) GAS, MCF; WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 2,421,762
GAS, MCF; WATER, BBL; 44,745,000
OIL REMAINING IN PLACE, STB: 685,300,000  BBL/AC-FT: 1419
(DEC 31, 1977)
RESERVES (DEC 31, 1977)

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
ANNUAL DECLINE RATE, %: 13.0

SECONDARY AND TERTIARY RECOVERIES:

S.1 GAS SWEEP (1955-1955)
AREA, ACRES: FLUID INJECTED: G
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL; 416,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL; (THRU 1977)
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S): MOBIL OIL

S.2 WATERFLOOD (1956-)
AREA, ACRES: FLUID INJECTED: W
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL; 418,089,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL; (THRU 1977)
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S): MOBIL OIL

190
SECONDARY AND TERTIARY RECOVERIES (CONT.)

S.3 CYCLIC STEAM (1964- )

AREA, ACRES: 3121
NO. PROD WELLS: 1234
VOLUME INJECTED: (EQUIV) WATER, GAS, MCF;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1973) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): MOBIL OIL

T.1 IN-SITU COMBUSTION (1963- )

AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, GAS, MCF;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1973) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): MOBIL OIL

T.2 STEAM DRIVE (1968- )

AREA, ACRES: 14
NO. PROD WELLS: 97
VOLUME INJECTED: (EQUIV) WATER, GAS, MCF;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1973) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): MOBIL OIL

REMARKS: THERMAL PROJECTS INCLUDE AURIGNAC FORMATION

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 17, 18, 49
CASE 027

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: VENTURA
DISTRICT: COASTAL REGION, SANTA CLARA VALLEY DISTR
FIELD NAME: OJAI GR - SISAR AREA
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: (UNNAMED)
NO. OF ZONES:
AREA, ACRES: 190
TOTAL WELLS:
SHUT-IN WELLS: 18
DISCOVERY YEAR: 1900
SPACING, ACRES:
PRODUCING WELLS: 25
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: SAUGUS-MONTEREY
GEOLOGICAL AGE: PLIOCENE-MIOCENE
BASIN: VENTURA BASIN
TRAP TYPE: STRUCT/STRAT - FACIES CHANGE ON FLTD HOMocl
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC
DIP, DEG.: 35.0
HETEROGENEITY; HIGH
CLAY CONTENT, %:
FAULTING; NONE
INTERBEDDED STREAKS: YES
FRACUTURE; BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 750
GROSS PAY, FT: 350
POROSITY, %: 38.0
PERMEABILITY, MD:
BHT, DEF F: 83 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 70.0 *
WTR SAT., %; 30.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 40
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 58.0 *
WTR SAT., %; 42.0
GAS SAT., %;
FVF, BBL/STB; 1.010 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 17.0
RANGE: 11.0 TO 30.0

VISCOITY @ BHT, CP: @ F, CP:

SAYBOLT VISC (100F), SEC:

SULFUR CONTENT, %:
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %:
ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM: 8550
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 14,900,000  BBL/AC-FT: 1965
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977) OIL, BBL; 2,110,000 *
(GAS, MCF; 350,000
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 20,000 *
(GAS, MCF;
WATER, BBL; 11,000
OIL REMAINING IN PLACE, STB: 12,800,000 BBL/AC-FT: 1688
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATER DISPOSAL (1972- )
AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL: 657,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S): SUN OIL CO

BBL/AC-FT:
## T.1 CYCLIC STEAM (1965-

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AREA, ACRES:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>NO. PROD WELLS:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>NO. INJ WELLS:</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>VOLUME INJECTED:</strong></td>
<td>(EQUIV)WATER, BBL;</td>
</tr>
<tr>
<td></td>
<td>GAS, MCF;</td>
</tr>
<tr>
<td><strong>CUMULATIVE PROD:</strong></td>
<td>OIL, BBL;</td>
</tr>
<tr>
<td></td>
<td>(THRU ) GAS, MCF;</td>
</tr>
<tr>
<td></td>
<td>WATER, BBL;</td>
</tr>
<tr>
<td><strong>RECOVERY FACTOR, %:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>DEGREE OF SUCCESS:</strong></td>
<td>NE</td>
</tr>
<tr>
<td><strong>OPERATOR(S):</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Volume Injected
- **(EQUIV)WATER, BBL:** 19,512
- **GAS, MCF:**
- **WATER, BBL:**

### Cumulative Production
- **OIL, BBL:**
- **GAS, MCF:**
- **WATER, BBL:**

### Remarks
- TERTIARY EFFORTS UNSUCCESSFUL

### Sources
- 5, 12, 14, 37, 38, 58, 113, 129, 132; 122
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: LOS ANGELES
DISTRICT: COASTAL REGION, SANTA CLARA VALLEY DISTRICT
FIELD NAME: PLACERITA
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: ALL AREAS
NO. OF ZONES: 3
AREA, ACRES: 700
TOTAL WELLS: PRODUCING WELLS: 205
SHUT-IN WELLS: 199 INJECTION WELLS: 15

DISCOVERY YEAR: 1920
SPACING, ACRES: PRODUCING WELLS: 205
INJECTION WELLS: 15

GEOLOGICAL INFORMATION

FORMATION: SAUGUS-PICO
GEological Age: PLIOCENE
BASIN: LOS ANGELES BASIN
TRAP TYPE: STRUCTURAL - FAULTED HOMOCILINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.: 18.0
HETEROGENEITY; CLAY CONTENT, %:
FAULTING; NONE INTERBEDDED STREAKS: YES
FRACTURE; BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1527
GROSS PAY, FT: 450
POROSITY, %: 33.0
PERMEABILITY, MD: 2500
BHT, DEF F: 99 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 60.0 *
WTR SAT., %; 40.0 GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

NET PAY, FT: 300
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 50.0 *
WTR SAT., %; 50.0 GAS SAT., %;
FVF, BBL/STB; 1.010 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 15.9
RANGE: 9.0 TO 23.0

VISCOSITY @ BHT, CP: 320.0; @ F, CP:

SAYBOLT VISC (100°F), SEC:

SULFUR CONTENT, %: .30
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: .3
ACID NUMBER:

OIL TYPE:
WATER SALINITY, PPM: 2600
WATER HARDNESS: MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 307,200,000
ORIGINAL GAS IN PLACE, MCF:

CUM PROD:
OIL, BBL: 42,016,974
GAS, MCF: 6,795,000
WATER, BBL:

1977 ANNUAL PROD:
OIL, BBL: 339,630
GAS, MCF: 5,000
WATER, BBL: 7,938,000

OIL REMAINING IN PLACE, STB: 265,200,000
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: GRAVITY DRAINAGE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1954– )

AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL:
CUMULATIVE PROD:
OIL, BBL:
GAS, MCF:
WATER, BBL:
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S):

FLUID INJECTED: W
NO. INJ WELLS: 28
GAS, MCF;
(THRU 1977) GAS, MCF;
WATER, BBL;

CROWN CENTRAL PET. CORP.
### T.1 CYCLIC STEAM (1964-1971)

<table>
<thead>
<tr>
<th>Area, Acres:</th>
<th>Fluid Injected: S</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Prod Wells:</td>
<td>No. Inj Wells:</td>
</tr>
<tr>
<td>Volume Injected: (equiv) Water, BBL; 3,184,619</td>
<td></td>
</tr>
<tr>
<td>Cumulative Prod: Oil, BBL; (thru 1977) Gas, MCF; Water, BBL;</td>
<td></td>
</tr>
<tr>
<td>Recovery Factor, %:</td>
<td>BBL/AC-FT:</td>
</tr>
<tr>
<td>Degree of Success:</td>
<td></td>
</tr>
</tbody>
</table>

### T.2 IN-SITU COMBUSTION (1964-1973)

<table>
<thead>
<tr>
<th>Area, Acres:</th>
<th>Fluid Injected: A</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Prod Wells:</td>
<td>No. Inj Wells:</td>
</tr>
<tr>
<td>Volume Injected: (equiv) Water, BBL; Gas, MCF;</td>
<td></td>
</tr>
<tr>
<td>Cumulative Prod: Oil, BBL; (thru 1973) Gas, MCF; Water, BBL;</td>
<td></td>
</tr>
<tr>
<td>Recovery Factor, %:</td>
<td>BBL/AC-FT:</td>
</tr>
<tr>
<td>Degree of Success: Poor</td>
<td></td>
</tr>
</tbody>
</table>

Sources: 5, 12, 14, 37, 38, 58, 113, 129, 132; 44
STATE: CALIFORNIA
COUNTY: SANTA BARBARA
DISTRICT: COASTAL REGION, SANTA MARIA DISTRICT
FIELD NAME: CAT CANYON WEST
NO. OF RESERVOIRS: 4

RESERVOIR INFORMATION

RESERVOIR: PLIOCENE (NEW AREA-CENTRAL)
NO. OF ZONES: DISCOVERY YEAR: 1956
AREA, ACRES: 590 SPACING, ACRES:
TOTAL WELLS: PRODUCING WELLS: 50
SHUT-IN WELLS: 29 INJECTION WELLS: 6

GEOLOGICAL INFORMATION

FORMATION: SISQUOC
GEOLOGICAL AGE: PLIOCENE
BASIN: SANTA MARIA BASIN
TRAP TYPE: STRUCTURAL - SAND PINCHOUT ON HOMOCLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2749
NET PAY, FT: 45
GROSS PAY, FT:
POROSITY, %: 30.0
PERMEABILITY, MD: 1200
BHT, DEF F: 125
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 70.0 *
WTR SAT., %: 30.0
GAS SAT., %:
FVF, BBL/STB: 1.050 *
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 55.0 *
WTR SAT., %: 45.0
GAS SAT., %:
FVF, BBL/STB; 1.010 *
WOR, BBL/BBL:
GOR, SCF/BBL; 162
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 12.3  RANGE: 8.0 TO 14.0
VISCOSITY @ BHT, CP:  @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:  CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:  ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;  8000
WATER HARDNESS: CA, PPM;  MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 41,200,000  BBL/AC-FT: 1552
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL;  7,522,605
(DEC 31, 1977) GAS, MCF;  1,624,000
WATER, BBL;  12,027,000
1977 ANNUAL PROD: OIL, BBL;  290,177
GAS, MCF;  45,000
WATER, BBL;  1,393,000
OIL REMAINING IN PLACE, STB: 33,700,000  BBL/AC-FT: 1268
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %:  
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1964-
)

AREA, ACRES:  FLUID INJECTED: W
NO. PROD WELLS:  NO. INJ WELLS: 11
VOLUME INJECTED: (EQUIV)WATER, BBL; 18,000,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:  BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): GETTY OIL, UNION OIL
SECONDARY AND TERTIARY RECOVERIES (CONT.)

T.1 CYCLIC STEAM  (1963-)

AREA, ACRES: FLUID INJECTED: S
NO. PROD WELLS: NO. INJ WELLS: 15
VOLUME INJECTED: (EQUIV)WATER, BBL; 1,180,231
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1973) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): GETTY OIL, UNION OIL

T.2 IN-SITU COMBUSTION  (1965-)

AREA, ACRES: FLUID INJECTED: A
NO. PROD WELLS: NO. INJ WELLS: 1
VOLUME INJECTED: (EQUIV)WATER, BBL; 41,322
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1973) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): GETTY OIL, UNION OIL

SOURCES: 5,12,14,37,38,58,113,129,132; 16,87,88,91,94
CASE 041

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: SANTA BARBARA
DISTRICT: COASTAL REGION, SANTA MARIA DISTRICT
FIELD NAME: CAT CANYON WEST
NO. OF RESERVOIRS: 4

RESERVOIR INFORMATION

RESERVOIR: PLIOCENE (OLD AREA)
NO. OF ZONES: 1
AREA, ACRES: 2930
TOTAL WELLS:
SHUT-IN WELLS: 36
PRODUCING WELLS: 52
INJECTION WELLS: 44

DISCOVERY YEAR: 1908
SPACING, ACRES:

GEORGICAL INFORMATION

FORMATION: SISQUOC
GEOLOGICAL AGE: PLIOCENE
BASIN: SANTA MARIA BASIN
TRAP TYPE: STRUCTURAL - ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING; MOD
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 3043
GROSS PAY, FT:
POROSITY, %: 30.0
PERMEABILITY, MD: 1200
BHT, DEF P: 130
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 70.0
WTR SAT., %: 30.0
GAS SAT., %: 
FVF, BBL/STB: 1.050
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:
NET PAY, FT: 54
RANGE: 21.0 TO 31.0
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 55.0 *
WTR SAT., %: 45.0
GAS SAT., %:
FVF, BBL/STB: 1.000
WOR, BBL/BBL:
GOR, SCF/BBL: 504
BHP, PSI;

201
FLUID CHARACTERISTICS

OIL GRAVITY, API: 15.2  
RANGE: 14.0 TO 20.0 
VISCOSITY @ BHT, CP: 175.0; @ F, CP: 
SAYBOLT VISC (100F), SEC: 
SULFUR CONTENT, %: .83  
CARBON/HYDROGEN RATIO: 
CARBON RESIDUE, %: .8 
ACID NUMBER: 
OIL TYPE: 
WATER SALINITY, PPM: 23000 
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 245,500,000  
BBL/AC-FT: 1552 
ORIGINAL GAS IN PLACE, MCF: 
CUM PROD (DEC 31, 1977): OIL, BBL; 44,354,689  
GAS, MCF; 19,994,000 
WATER, BBL; 
1977 ANNUAL PROD: OIL, BBL; 484,380  
GAS, MCF; 2,000  
WATER, BBL; 10,346,000 
OIL REMAINING IN PLACE, STB: 201,100,000  
BBL/AC-FT: 1271 
(DEC 31, ) 
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS 
RECOVERY FACTOR, %:  
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1954- )
AREA, ACRES: 
NO. PROD WELLS: 54  
VOLUME INJECTED: (EQUIV)WATER, BBL; 168,768,000  
GAS, MCF; 
CUMULATIVE PROD: OIL, BBL;  
(THRU 1977) GAS, MCF;  
WATER, BBL; 
RECOVERY FACTOR, %:  
DEGREE OF SUCCESS: 
OPERATOR(S): UNION OIL CO
CASE 041

SECONDARY AND TERTIARY RECOVERIES (CONT.)

T.1 CYCLIC STEAM 
(1964-
)

AREA, ACRES: FLUID INJECTED: S NO. PROD WELLS: 20 NO. INJ WELLS: 20 VOLUME INJECTED: (EQUIV)WATER, BBL; 247,872,000 GAS, MCF; CUMULATIVE PROD: OIL, BBL; GAS, MCF; WATER, BBL; (THRU 1973) RECOVERY FACTOR, %: BBL/AC-FT: DEGREE OF SUCCESS: OPERATOR(S): UNION OIL CO

T.2 STEAM DRIVE 
(1971-
)

AREA, ACRES: FLUID INJECTED: S NO. PROD WELLS: NO. INJ WELLS: VOLUME INJECTED: (EQUIV)WATER, BBL; GAS, MCF; CUMULATIVE PROD: OIL, BBL; GAS, MCF; WATER, BBL; (THRU ) RECOVERY FACTOR, %: BBL/AC-FT: DEGREE OF SUCCESS: OPERATOR(S): UNION OIL CO

SOURCES: 5,12,14,37,38,58,113,129,132; 16,17,44,87,88,91,94
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: SANTA BARBARA
DISTRICT: COASTAL REGION, SANTA MARIA DISTRICT
FIELD NAME: SANTA MARIA VALLEY
NO. OF RESERVOIRS: 11

RESERVOIR INFORMATION

RESERVOIR: MAIN AREA
NO. OF ZONES: 6
AREA, ACRES: 4020
TOTAL WELLS: 
SHUT-IN WELLS: 241

DISCOVERY YEAR: 1934
SPACING, ACRES:
PRODUCING WELLS: 127
INJECTION WELLS: 37

GEOLOGICAL INFORMATION

FORMATION: MONTEREY SHALE
GEOLOGICAL AGE: MIocene
BASIN: SANTA MARIA BASIN
TRAP TYPE: STRUCT/STRAT - FACIES CHANGE ON ANTICLINE
LITHOLOGY: SILTY/SHALY SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.: 
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4711
GROSS PAY, FT: 1030
POROSITY, %: 26.0
PERMEABILITY, MD: 300
BHT, DEF F: 169
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 64.0
WTR SAT., %: 36.0
GAS SAT., %:
FVF, BBL/STB: 1.050
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:

NET PAY, FT: 
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %:
WTR SAT., %:
GAS SAT., %:
FVF, BBL/STB: 1.000
WOR, BBL/BBL:
GOR, SCF/BBL: 2365
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 14.5
VISCOSITY @ BHT, CP: 85.0; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: 5.00
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM; 21000
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB:
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977)
148,529,026
216,445,000
1977 ANNUAL PROD: OIL, BBL; 788,852
GAS, MCF; 1,963,000
WATER, BBL; 7,597,000
OIL REMAINING IN PLACE, STB:
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLine RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1951- )

AREA, ACRES: FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS: 51
VOLUME INJECTED: (EQUIV) WATER, BBL; 96,023,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): UNION OIL

205
SECONDARY AND TERTIARY RECOVERIES (CONT.)

T.1 IN-SITU COMBUSTION (1964-1966)

<table>
<thead>
<tr>
<th>AREA, ACRES:</th>
<th>FLUID INJECTED: A</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. PROD WELLS:</td>
<td>1</td>
</tr>
<tr>
<td>NO. INJ WELLS:</td>
<td>1</td>
</tr>
<tr>
<td>VOLUME INJECTED: (EQUIV)</td>
<td>WATER, BBL;</td>
</tr>
<tr>
<td>GAS, MCF;</td>
<td></td>
</tr>
<tr>
<td>CUMULATIVE PROD: OIL, BBL;</td>
<td></td>
</tr>
<tr>
<td>(THRU 1973)</td>
<td>GAS, MCF;</td>
</tr>
<tr>
<td>WATER, BBL;</td>
<td></td>
</tr>
<tr>
<td>RECOVERY FACTOR, %:</td>
<td></td>
</tr>
<tr>
<td>BBL/AC-FT:</td>
<td></td>
</tr>
<tr>
<td>DEGREE OF SUCCESS:</td>
<td></td>
</tr>
<tr>
<td>OPERATOR(S): UNION OIL</td>
<td></td>
</tr>
</tbody>
</table>

T.2 STEAM INJECTION (1965-1970)

<table>
<thead>
<tr>
<th>AREA, ACRES:</th>
<th>FLUID INJECTED: S</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. PROD WELLS:</td>
<td>488,732 BBL;</td>
</tr>
<tr>
<td>NO. INJ WELLS:</td>
<td>1</td>
</tr>
<tr>
<td>VOLUME INJECTED: (EQUIV)</td>
<td>WATER, BBL;</td>
</tr>
<tr>
<td>GAS, MCF;</td>
<td></td>
</tr>
<tr>
<td>CUMULATIVE PROD: OIL, BBL;</td>
<td></td>
</tr>
<tr>
<td>(THRU 1973)</td>
<td>GAS, MCF;</td>
</tr>
<tr>
<td>WATER, BBL;</td>
<td></td>
</tr>
<tr>
<td>RECOVERY FACTOR, %:</td>
<td></td>
</tr>
<tr>
<td>BBL/AC-FT:</td>
<td></td>
</tr>
<tr>
<td>DEGREE OF SUCCESS:</td>
<td></td>
</tr>
<tr>
<td>OPERATOR(S): UNION OIL</td>
<td></td>
</tr>
</tbody>
</table>

SOURCES: 5,12,14,37,38,58,113,129,132; 17,288
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: LOS ANGELES & ORANGE
DISTRICT: LOS ANGELES REGION
FIELD NAME: BREA-OLINDA
NO. OF RESERVOIRS: 4

RESERVOIR INFORMATION

RESERVOIR: TONNER AREA
NO. OF ZONES: 2
AREA, ACRES: 590 *
DISCOVERY YEAR: 1907
TOTAL WELLS: 108
SPACING, ACRES: *
PRODUCING WELLS: 108
SHUT-IN WELLS: 24
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: REPETTO-PUENTE
GEOLOGICAL AGE: PLIOCENE-MIOCENE
BASIN: LOS ANGELES BASIN
TRAP TYPE: STRUCTURAL - FAULTED HOMOCLINE
LITHOLOGY: SAND
DISSOLUTION:
DIP, DEG.: 45.0
HETEROGENEITY:
CLAY CONTENT, %:
FAULTING; MOD
INTERBEDDED STREAKS: YES
FRACTURE;
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4112
GROSS PAY, FT: NET PAY, FT: 200
POROSITY, %: 29.0
RANGE: TO
PERMEABILITY, MD: 500
RANGE: TO
BHT, DEF F: 135
SAT. PRESSURE, PSI:
GAS CAP:
GAS CAP/OIL ZONE RATIO:
WETTING PHASE:
INITIAL: OIL SAT., %: 71.0
CURRENT: OIL SAT., %: 49.0 *
WTR SAT., %: 29.0
WTR SAT., %: 51.0
GAS SAT., %:
GAS SAT., %:
FVF, BBL/STB: 1.000 *
FVF, BBL/STB: 1.000 *
WOR, BBL/BBL:
WOR, BBL/BBL:
GOR, SCF/BBL:
GOR, SCF/BBL:
BHP, PSI:
BHP, PSI:

FLUID CHARACTERISTICS

OIL GRAVITY, API: 25.2
RANGE: 18.0 TO 28.0
VISCOITY @ BHT, CP: 20.0;
@ F, CP:
SAYBOLT VISC (100F), SEC: 135
SULFUR CONTENT, %: .75
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 6.0
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 15000
WATER HARDNESS: CA,PPM; MG,PPM;
RESERVES AND PRODUCTION DATA

CASE 056

ORIGINAI OIL IN PLACE, STB: 188,500,000 BBL/AC-FT: 1597
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 57,528,999
(DEC 31, 1977) GAS, MCF; 57,708,000
WATER, BBL; 21,320,000
1977 ANNUAL PROD: OIL, BBL; 682,948
GAS, MCF; 1,175,000
WATER, BBL; 743,000
OIL REMAINING IN PLACE, STB: 131,000,000 BBL/AC-FT: 1110
(DEC 31,

1977 ANNUAL PROD: OIL, BBL; 682,948
GAS, MCF; 1,175,000
WATER, BBL; 743,000
OIL REMAINING IN PLACE, STB: 131,000,000 BBL/AC-FT: 1110
(DEC 31,

PRIMARY PRODUCTION:
MECHANISM: SG & GD
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1965-1972)

AREA, ACRES: FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS: 3
VOLUME INJECTED: (EQUIV) WATER, BBL; 2,096,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
BBL/AC-FT: POOR
DEGREE OF SUCCESS: POOR
OPERATOR(S): UNION OIL CO

T.1 IN SITU COMBUSTION (1972-)

AREA, ACRES: FLUID INJECTED: A
NO. PROD WELLS: NO. INJ WELLS: 2
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): UNION OIL CO

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 16, 18, 81, 140, 146
CASE 131

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: BELRIDGE, NORTH
NO. OF RESERVOIRS: 6

RESERVOIR INFORMATION

RESERVOIR: SHALLOW
NO. OF ZONES: 2
AREA, ACRES: 
TOTAL WELLS: 100
SHUT-IN WELLS: 49
DISCOVERY YEAR: 1912
PRODUCING WELLS: 100
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: TULARE-ETCHEGOIN
GEOLOGICAL AGE: PLEISTOCENE-PLIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCTURAL - ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC DIP, DEG.: 5.0
HETEROGENEITY; HIGH CLAY CONTENT, %: 5.0
FAULTING; MINOR INTERBEDDED STREAKS: YES
FRACTURE; MINOR BARRIER TO FLOW: NO

RESERVOIR CHARACTERISTICS

DEPTH, FT: 600
GROSS PAY, FT: 125
POROSITY, %: 35.0 *
PERMEABILITY, MD: 2000
BHT, DEF F: 85
GAS CAP: 
GAS CAP/OIL ZONE RATIO: 
INITIAL: OIL SAT., %: 60.0
WTR SAT., %: 40.0
GAS SAT., %: 
FVF, BBL/STB: 1.030
WOR, BBL/BBL: 43
GOR, SCF/BBL: 
BHP, PSI: 385
NET PAY, FT: 60
RANGE: TO
RANGE: 1000 TO 18000
SAT. PRESSURE, PSI: 200
GAS CAP, ACRES: 
WETTING PHASE:
CURRENT: OIL SAT., %:
WTR SAT., %:
GAS SAT., %:
FVF, BBL/STB:
WOR, BBL/BBL: 4
GOR, SCF/BBL: 
BHP, PSI: 200

209
FLUID CHARACTERISTICS

OIL GRAVITY, API: 12.0
RANGE: 12.0 TO 15.0
VISCOITY @ BHT, CP: [Blank]
@ F, CP: [Blank]
SAYBOLT VISC (100F), SEC: [Blank]
SULFUR CONTENT, %: [Blank]
CARBON/HYDROGEN RATIO: [Blank]
CARBON RESIDUE, %: [Blank]
ACID NUMBER: [Blank]
OIL TYPE: ASPHALTIC
WATER SALINITY, PPM; 12000
WATER HARDNESS: CA, PPM; [Blank]
MG, PPM; [Blank]

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB:
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 7,761,175
(GDEC 31, 1977) GAS, MCF; 11,287,000
WATER, BBL; 1,409,000
1977 ANNUAL PROD: OIL, BBL; 284,544
GAS, MCF; 9,000
WATER, BBL; 1,409,000
OIL REMAINING IN PLACE, STB:
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: GRAVITY DRAINAGE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 289
STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: BELRIDGE, SOUTH
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION
RESERVOIR: TULARE - ETCHEGOIN - DIATOMITE
NO. OF ZONES: 2
AREA, ACRES: 8610
TOTAL WELLS: PRODUCING WELLS: 3283
SPACING, ACRES: 5
SHUT-IN WELLS: 968
DISCOVERY YEAR: 1911
PRODUCING WELLS: 3
INJECTION WELLS:

GEOLOGICAL INFORMATION
FORMATION: TULARE-ETCHEGOIN-MONTEREY
GEOLOGICAL AGE: PLIOCENE-MIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCT/STRAT - ANTICLINE/PERM CHANGE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC
HETEROGENEITY; HIGH
FAULTING; MINOR
FRACTURE; MINOR
DIP, DEG.: 8.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: NO

RESERVOIR CHARACTERISTICS
DEPTH, FT: 700
GROSS PAY, FT: 450
POROSITY, %: 35.0
PERMEABILITY, MD: 3000
BHT, DEF P: 95
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 76.0
WTR SAT., %: 24.0
GAS SAT., %:
PVF, BBL/STB: 1.030
WOR, BBL/BBL: 1
GOR, SCF/BBL:
BHP, PSI: 420
NET PAY, FT: 100
RANGE: 34.0 TO 37.0
RANGE: 1800 TO 13000
SAT. PRESSURE, PSI: 200
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 66.0 *
WTR SAT., %: 34.0
GAS SAT., %:
PVF, BBL/STB: 1.030
WOR, BBL/BBL: 4
GOR, SCF/BBL: 15
BHP, PSI:
FLUID CHARACTERISTICS

CASE 132

OIL GRAVITY, API: 17.8
VISCOSITY @ BHT, CP: 1600.0; @ 130°F, CP: 340.0
SAYBOLT VISC (100°F), SEC: 2440
SULFUR CONTENT, %: .23
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 5.9
ACID NUMBER:
OIL TYPE: ASPHALTIC
WATER SALINITY, PPM: 12000
WATER HARDNESS: CA, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 1,700,000,000
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 228,012,550
(GEQ 31, 1977) GAS, MCF; 20,429,000
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 12,856,906
GAS, MCF; 148,000
WATER, BBL; 101,927,000
OIL REMAINING IN PLACE, STB: 1,472,000,000
(DEC 31, 1977)
RESERVES (DEC 31, 1977) 184,000,000

PRIMARY PRODUCTION:
MECHANISM: SG, WD & GD
RECOVERY FACTOR, %: 9.1
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 CYCLIC STEAM (1964- )
AREA, ACRES:
NO. PROD WELLS:
NO. INJ WELLS: 210
VOLUME INJECTED: (EQUIV)WATER, BBL; 34,019,089
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1976) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S):

212
SECONDARY AND TERTIARY RECOVERIES (CONT.)

T.1 STEAM DRIVE (1963- )

- AREA, ACRES: 204
- NO. PROD WELLS: 365
- VOLUME INJECTED: (EQUIV) WATER, BEL; 145,655,092
- GAS, MCF;
- CUMULATIVE PROD: OIL, BBL;
  (THRU 1976) GAS, MCF;
  WATER, BBL;
- RECOVERY FACTOR, %:
- DEGREE OF SUCCESS:
- OPERATOR(S): 

T.2 IN-SITU COMBUSTION (1964- )

- AREA, ACRES: 164
- NO. PROD WELLS: 5
- VOLUME INJECTED: (EQUIV) WATER, BEL; 21,400,000
- GAS, MCF; 3,800,000
- CUMULATIVE PROD: OIL, BBL;
  (THRU 1978) GAS, MCF;
  WATER, BBL;
- RECOVERY FACTOR, %: 13.2
- DEGREE OF SUCCESS:
- OPERATOR(S): 

SOURCES: 5, 12, 14, 17, 18, 37-8, 43, 58, 82-4, 113, 129, 132-3, 289
CASE 133

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: FRESNO
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: COALINGA GR - COALINGA
NO. OF RESERVOIRS: 3

RESERVOIR INFORMATION

RESERVOIR: EAST SIDE TEMBLOR
NO. OF ZONES: 10
AREA, ACRES: 10560 *
TOTAL WELLS:
SHUT-IN WELLS: 856

DISCOVERY YEAR: 1887
SPACING, ACRES:
PRODUCING WELLS: 889
INJECTION WELLS: 7

GEOLOGICAL INFORMATION

FORMATION: TEMBLOR
GEOLOGICAL AGE: MIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCT/STRAT - THINNING ON ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC
HETEROGENEITY; HIGH
FAULTING; NONE
FRACUTURE;

DIP, DEG.: 14.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 3182
GROSS PAY, FT: 300
POROSITY, %: 26.9
PERMEABILITY, MD: 683
BHT, DEF F: 100
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 65.0
WTR SAT., %: 35.0
GAS SAT., %:
FVF, BBL/STB: 1.050
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI;

NET PAY, FT: 50
RANGE: 20.0 TO 46.0
RANGE: TO 45000
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 25.0 *
WTR SAT., %: 75.0
GAS SAT., %:
FVF, BBL/STB: 1.000 *
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 22.8  RANGE: 16.0 TO 30.0
VISCOSITY @ BHT, CP: 50.0;  @  F, CP:
SAYBOLT VISC (100°F), SEC:
SULFUR CONTENT, %: .71  CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 3.1  ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 5000
WATER HARDNESS: Ca, PPM; Mg, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 682,100,000  BBL/AC-FT: 1292
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977) OIL, BBL: 403,373,408
GAS, MCF: 80,997,000
WATER, BBL:
1977 ANNUAL PROD: OIL, BBL: 2,775,954
GAS, MCF:
WATER, BBL: 12,490,000
OIL REMAINING IN PLACE, STB: 278,701,000  BBL/AC-FT: 528
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %:  BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 PILOT REPRESSURE (1930-1948)

AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL:
GAS, MCF; 127,000,000
CUMULATIVE PROD (THRU 1977) OIL, BBL:
GAS, MCF:
WATER, BBL:
RECOVERY FACTOR, %:  BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): MOBIL OIL
SECONDARY AND TERTIARY RECOVERIES (CONT.)

S.2 WATERFLOOD (1953-1958)

AREA, ACRES:  
FLUID INJECTED: WATER
NO. PROD WELLS:  
NO. INJ WELLS:
VOLUME INJECTED: (EQUIV)WATER, GAS, MCF; BBL; 1,093,000
CUMULATIVE PROD: OIL, GAS, MCF; WATER, BBL;
(THRU 1977)
RECOVERY FACTOR, %:  
DEGREE OF SUCCESS:
OPERATOR(S):

S.3 WATERFLOOD (1953-1957)

AREA, ACRES:  
FLUID INJECTED: WATER
NO. PROD WELLS:  
NO. INJ WELLS:
VOLUME INJECTED: (EQUIV)WATER, GAS, MCF; BBL; 3,263,000
CUMULATIVE PROD: OIL, GAS, MCF; WATER, BBL;
(THRU 1977)
RECOVERY FACTOR, %:  
DEGREE OF SUCCESS:
OPERATOR(S):

S.4 WATERFLOOD (1961-

AREA, ACRES:  
FLUID INJECTED: WATER
NO. PROD WELLS:  
NO. INJ WELLS:
VOLUME INJECTED: (EQUIV)WATER, GAS, MCF; BBL; 93,230,000
CUMULATIVE PROD: OIL, GAS, MCF; WATER, BBL;
(THRU 1977)
RECOVERY FACTOR, %:  
DEGREE OF SUCCESS:
OPERATOR(S):
SECONDARY AND TERTIARY RECOVERIES (CONT.)

CASE 133

T.1 STEAM DRIVE  (1963-1966)

AREA, ACRES: 530  FLUID INJECTED: S
NO. PROD WELLS: 93  NO. INJ WELLS: 60
VOLUME INJECTED: (EQUIV) WATER, BBL; 26,351,875
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(GTHRU 1976) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): MOBIL OIL

T.2 POLYMER FLOOD  (1976-)

AREA, ACRES: 130  FLUID INJECTED: P/W
NO. PROD WELLS: 9  NO. INJ WELLS: 4
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(GTHRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 32.6 BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): MOBIL OIL

REMARKS: TERTIARY STEAM INJ CONVERTED TO WF

SOURCES: 5,12,14,37,38,58,113,129,132; 17,18,30,44,104,139

217
RESERVOIR AND PRODUCTION DATA ELEMENTS

CASE 134

STATE: CALIFORNIA
COUNTY: FRESNO
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: COALINGA GR - COALINGA
NO. OF RESERVOIRS: 3

RESERVOIR INFORMATION

RESERVOIR: WEST SIDE AREA TEMBLOR
NO. OF ZONES: DISCOVERY YEAR: 1900
AREA, ACRES: 6400 * SPACING, ACRES:
TOTAL WELLS: PRODUCING WELLS: 1245
SHUT-IN WELLS: 586 INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: MIocene
GEOLOGICAL AGE: MIocene
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCT/STRAT - THINNING ON ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; MOD DIP, DEG.:
HETEROGENEITY; HIGH CLAY CONTENT, %:
FAULTING;
FRACTURE;

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1852 NET PAY, FT: 50
GROSS PAY, FT: 300 RANGE: 20.0 TO 46.0
POROSITY, %: 32.2 RANGE: TO 4500
PERMEABILITY, MD: 259 SAT. PRESSURE, PSI:
BHT, DEF F: 100 GAS CAP, ACRES:
GAS CAP/OIL ZONE RATIO: WETTING PHASE:
INITIAL: OIL SAT., %; 65.0 CURRENT: OIL SAT., %; 32.0 *
WTR SAT., %; 35.0 WTR SAT., %; 68.0
GAS SAT., %;
FVF, BBL/STB; 1.040 GAS SAT., %;
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

FLUID CHARACTERISTICS

OIL GRAVITY, API: 15.3 CARBON/HYDROGEN RATIO:
VISCOSITY @ BHT, CP: RANGE: 12.0 TO 22.0
SAYBOLT VISC (100F), SEC: @ F, CP:
SULFUR CONTENT, %: CARBON NUMBER:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM; 1935
WATER HARDNESS: CA,PPM; MG,PPM;

218
RESERVES AND PRODUCTION DATA

CASE 134

ORIGINAL OIL IN PLACE, STB: 499,600,000
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 246,993,108
(GDEC 31, 1977) GAS, MCF; 144,880,000
WATER, BBL; 1977 ANNUAL PROD: OIL, BBL; 2,974,647
GAS, MCF; WATER, BBL; 25,889,000
OIL REMAINING IN PLACE, STB: 252,600,000
(DEC 31, ) RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 PERIPHERAL WF (1962-1971)
AREA, ACRES: NO. PROD WELLS:
NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL; 11,651,000 GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(GTHRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S):

T.1 CYCLIC STEAM (1961- )
AREA, ACRES: NO. PROD WELLS:
NO. INJ WELLS: 69
VOLUME INJECTED: (EQUIV) WATER, BBL; 3,119,346 GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(GTHRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S):

SOURCES: 5,12,14,37,38,58,113,129,132; 17,18,104
**RESERVOIR AND PRODUCTION DATA ELEMENTS**

STATE: CALIFORNIA  
COUNTY: KERN  
DISTRICT: SAN JOAQUIN VALLEY REGION  
FIELD NAME: ELK HILLS  
NO. OF RESERVOIRS: 15

**RESERVOIR INFORMATION**

<table>
<thead>
<tr>
<th>RESERVOIR: MAIN AREA UPPER</th>
<th>DISCOVERY YEAR: 1919</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. OF ZONES: 5</td>
<td>PRODUCING WELLS: 502</td>
</tr>
<tr>
<td>AREA, ACRES: 16000</td>
<td>INJECTION WELLS: 3</td>
</tr>
<tr>
<td>TOTAL WELLS:</td>
<td>SHUT-IN WELLS: 534</td>
</tr>
</tbody>
</table>

**GEOLOGICAL INFORMATION**

<table>
<thead>
<tr>
<th>FORMATION: SAN JOAQUIN ETCHEGOIN</th>
<th>DIP, DEG.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOLOGICAL AGE: PLEISTOCENE-PLIOCENE</td>
<td>CLAY CONTENT, %:</td>
</tr>
<tr>
<td>BASIN: SAN JOAQUIN BASIN</td>
<td>INTERBEDDED STREAKS:</td>
</tr>
<tr>
<td>TRAP TYPE: STRUCT/STRAT - FACIES CHANGE ON ANTICLINE</td>
<td>BARRIER TO FLOW:</td>
</tr>
<tr>
<td>LITHOLOGY: SAND</td>
<td></td>
</tr>
<tr>
<td>DEGREE OF: CONSOLIDATION;</td>
<td></td>
</tr>
<tr>
<td>HETEROGENEITY;</td>
<td></td>
</tr>
<tr>
<td>FAULTING;</td>
<td></td>
</tr>
<tr>
<td>FRACTURE;</td>
<td></td>
</tr>
</tbody>
</table>

**RESERVOIR CHARACTERISTICS**

<table>
<thead>
<tr>
<th>DEPTH, FT: 2967</th>
<th>NET PAY, FT: 57</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROSS PAY, FT:</td>
<td>RANGE: TO</td>
</tr>
<tr>
<td>POROSITY, %: 32.0</td>
<td>RANGE: TO</td>
</tr>
<tr>
<td>PERMEABILITY, MD: 1250</td>
<td>SAT. PRESSURE, PSI:</td>
</tr>
<tr>
<td>BHT, DEF F: 134</td>
<td>GAS CAP, ACRES:</td>
</tr>
<tr>
<td>GAS CAP/OIL ZONE RATIO:</td>
<td>WETTING PHASE:</td>
</tr>
<tr>
<td>INITIAL: OIL SAT., %: 70.0</td>
<td>CURRENT: OIL SAT., %: 53.0 *</td>
</tr>
<tr>
<td>WTR SAT., %: 30.0</td>
<td>WTR SAT., %: 47.0</td>
</tr>
<tr>
<td>GAS SAT., %:</td>
<td>GAS SAT., %:</td>
</tr>
<tr>
<td>FVF, BBL/STB: 1.050</td>
<td>FVF, BBL/STB: 1.000</td>
</tr>
<tr>
<td>WOR, BBL/BBL:</td>
<td>WOR, BBL/BBL:</td>
</tr>
<tr>
<td>GOR, SCF/BBL:</td>
<td>GOR, SCF/BBL: 62</td>
</tr>
<tr>
<td>BHP, PSI:</td>
<td>BHP, PSI:</td>
</tr>
</tbody>
</table>

**FLUID CHARACTERISTICS**

<table>
<thead>
<tr>
<th>OIL GRAVITY, API: 21.4</th>
<th>RANGE: 11.0 TO 44.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>VISCOSITY @ BHT, CP:</td>
<td>@ F, CP:</td>
</tr>
<tr>
<td>SAYBOLT VISC (100F), SEC: 135</td>
<td></td>
</tr>
<tr>
<td>SULFUR CONTENT, %: .68</td>
<td>CARBON/HYDROGEN RATIO:</td>
</tr>
<tr>
<td>CARBON RESIDUE, %: 2.1</td>
<td>ACID NUMBER:</td>
</tr>
<tr>
<td>OIL TYPE:</td>
<td></td>
</tr>
<tr>
<td>WATER SALINITY, PPM: 32000</td>
<td></td>
</tr>
<tr>
<td>WATER HARDNESS: CA,PPM:</td>
<td>MG,PPM:</td>
</tr>
</tbody>
</table>
CASE 145

RESERVES AND PRODUCTION DATA

**ORIGINAL OIL IN PLACE, STB:** 1,509,400,000
**ORIGINAL GAS IN PLACE, MCF:**

**CUM PROD:**
- **OIL, BBL:** 302,049,076
- **GAS, MCF:** 1,836,000
- **WATER, BBL:** 7,926,000

**1977 ANNUAL PROD:**
- **OIL, BBL:** 15,963,425
- **GAS, MCF:** 148,784
- **WATER, BBL:** 7,926,000

**OIL REMAINING IN PLACE, STB:** 1,207,300,000
**BBL/AC-FT:** 1324

**PRIMEIRTH PRODUCTION:**
- **MECHANISM:** GRAVITY
- **RECOVERY FACTOR, %:**
- **ANNUAL DECLINE RATE, %:**

**SECONDARY AND TERTIARY RECOVERIES:**

**S.1 PRESSURE MAINTENANCE (1945- )**

<table>
<thead>
<tr>
<th>AREA, ACRES:</th>
<th>FLUID INJECTED: G</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. PROD WELLS:</td>
<td>5</td>
</tr>
<tr>
<td>VOLUME INJECTED: (EQUIV) WATER, BBL:</td>
<td></td>
</tr>
<tr>
<td>CUMULATIVE PROD: OIL, BBL; (THRU 1977)</td>
<td></td>
</tr>
<tr>
<td>GAS, MCF:</td>
<td></td>
</tr>
<tr>
<td>WATER, BBL:</td>
<td></td>
</tr>
<tr>
<td>RECOVERY FACTOR, %:</td>
<td></td>
</tr>
<tr>
<td>DEGREE OF SUCCESS:</td>
<td></td>
</tr>
<tr>
<td>OPERATOR(S):</td>
<td></td>
</tr>
</tbody>
</table>

**S.2 WATERFLOOD (1957- )**

<table>
<thead>
<tr>
<th>AREA, ACRES:</th>
<th>FLUID INJECTED: W</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. PROD WELLS:</td>
<td>5</td>
</tr>
<tr>
<td>VOLUME INJECTED: (EQUIV) WATER, BBL: 37,276,000</td>
<td></td>
</tr>
<tr>
<td>CUMULATIVE PROD: OIL, BBL; (THRU 1977)</td>
<td></td>
</tr>
<tr>
<td>GAS, MCF:</td>
<td></td>
</tr>
<tr>
<td>WATER, BBL:</td>
<td></td>
</tr>
<tr>
<td>RECOVERY FACTOR, %:</td>
<td></td>
</tr>
<tr>
<td>DEGREE OF SUCCESS:</td>
<td></td>
</tr>
<tr>
<td>OPERATOR(S): WILLIAMS BRO ENGR</td>
<td></td>
</tr>
</tbody>
</table>

**SOURCES:** 5, 12, 14, 37, 38, 58, 113, 129, 132; 17, 115
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: FRESNO
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: FRESNO GR-RAISIN CITY
NO. OF RESERVOIRS: 3

RESERVOIR INFORMATION

RESERVOIR: TAR MIOCENE
NO. OF ZONES: 19
DISCOVERY YEAR: 1946
AREA, ACRES: 1125
SPACING, ACRES:
TOTAL WELLS:
PRODUCING WELLS: 17
SHUT-IN WELLS: 28
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: MIOCENE
GEOLOGICAL AGE: MIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCT/STRAT - SAND LENSES ON ANTICLINE
LITHOLOGY: SAND
DIP, DEG.: 1.0
DEGREE OF: CONSOLIDATION;
HETEROGENEITY; HIGH
FAULTING; MINOR
FARECEIT;
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4796
GROSS PAY, FT: 150
POROSITY, %: 32.0 *
PERMEABILITY, MD:
BHT, DEF F: 168 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 68.0 *
WTR SAT., %; 32.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

NET PAY, FT: 20 *
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 46.0 *
WTR SAT., %; 54.0
GAS SAT., %;
FVF, BBL/STB; 1.000 *
WOR, BBL/BBL;
GOR, SCF/BBL; 219
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 17.2
RANGE: 16.0 TO 21.0

VISCOSITY @ BHT, CP: 15
@ F, CP: 21

SAYBOLT VISC (100F), SEC: 145

SULFUR CONTENT, %: .45
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %: 5.5
ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM; 2850
WATER HARDNESS: Ca,PPM; Mg,PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE,STB: 36,200,000
ORIGINAL GAS IN PLACE,MCF:

CUM PROD: OIL,BBL; 10,364,218
GAS,MCF; 3,190,000
WATER,BBL; 184,596,000

1977 ANNUAL PROD: OIL,BBL; 148,478
GAS,MCF; 23,000
WATER,BBL; 7,080,000

OIL REMAINING IN PLACE,STB: 25,800,000
(DEC 31, 1978)
BBL/AC-FT: 1608

RESERVES (DEC 31, 1977)

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SOURCES: 5,12,14,37,38,58,113,129,132; 95,144
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: MC KITTRICK
NO. OF RESERVOIRS: 8

RESERVOIR INFORMATION

RESERVOIR: NORTHEAST AREA UPPER
NO. OF ZONES: 2 DISCOVERY YEAR: 1944
AREA, ACRES: SPACING, ACRES:
TOTAL WELLS: PRODUCING WELLS: 242
SHUT-IN WELLS: 111 INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: TULARE-MONTEREY
GEOLOGICAL AGE: MIocene-PLEISTOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.:
HETEROGENEITY; CLAY CONTENT, %:
FAULTING; MOD INTERBEDDED STREAKS: YES
FRACTURE; BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 650 NET PAY, FT:
GROSS PAY, FT: 900 RANGE: TO
POROSITY, %: 35.0 RANGE: TO
PERMEABILITY, MD: 3000 SAT. PRESSURE, PSI:
BHT, DEF F: 89 * GAS CAP, ACRES:
GAS CAP: YES WETTING PHASE:
GAS CAP/OIL ZONE RATIO: CURRENT: OIL SAT., %: 63.0 *
INITIAL: OIL SAT., %: 66.0 *
WTR SAT., %: 34.0 WTR SAT., %: 37.0
GAS SAT., %: GAS SAT., %:
FVF, BBL/STB: 1.050 * FVF, BBL/STB: 1.040 *
WOR, BBL/BBL; GOR, SCF/BBL;
GOR, SCF/BBL; 1088
BHP, PSI; BHP, PSI;
CASE 155

FLUID CHARACTERISTICS

OIL GRAVITY, API: 14.3
VISCOSITY @ BHT, CP: \( @ \) F, CP:
SAYBOLT VISC (100°F), SEC:
SULFUR CONTENT, %: .88
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 4200
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 300,000,000
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 11,043,738
(GDEC 31, 1977) GAS, MCF; 2,451,000
WATER, BBL; 33,337,000
1977 ANNUAL PROD: OIL, BBL; 1,220,623
GAS, MCF; 52,000
WATER, BBL; 5,835,000
OIL REMAINING IN PLACE, STB: 289,000,000
(DERC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 IN-SITU COMBUSTION (1966-1970)

AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(GTHRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S):

FLUID INJECTED: A NO. INJ WELLS:

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 76

BBL/AC-FT: 1707

BBL/AC-FT: 1644
STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: MIDWAY-SUNSET
NO. OF RESERVOIRS: 17

RESERVOIR INFORMATION

RESERVOIR: OTHERS
NO. OF ZONES: DISCOVERY YEAR: 1901
AREA, ACRES: 24370 SPACING, ACRES:
TOTAL WELLS: PRODUCING WELLS: 6529
SHUT-IN WELLS: 1983 INJECTION WELLS: 1

GEOLOGICAL INFORMATION

FORMATION: PLIOCENE
GEOLOGICAL AGE: PLIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCT/STRAT - FACIES CHANGE ON ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC DIP, DEG.: CLAY CONTENT, %:
HETEROGENEITY; INTERBEDDED STREAKS:
FAULTING; BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1687
GROSS PAY, FT: 350
POROSITY, %: 32.0
PERMEABILITY, MD: 1250
BHT, DEF F: 109
GAS CAP:
GAS CAP/OIL ZONE RATIO: NET PAY, FT: 125
INITIAL: OIL SAT., %; 66.0 RANGE: TO
WTR SAT., %; 34.0 RANGE: TO
GAS SAT., %:
FVF, BBL/STB; 1.050 SAT. PRESSURE, PSI:
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:

CURRENT: OIL SAT., %; 49.0 *
WTR SAT., %; 51.0
GAS SAT., %:
FVF, BBL/STB; 1.000
WOR, BBL/BBL:
GOR, SCF/BBL; 121
BHP, PSI; 75
CASE 166

FLUID CHARACTERISTICS

OIL GRAVITY, API: 16.3
RANGE: 11.0 TO 29.0

VISCOITY @ BHT, CP: 400.0; @ F, CP:

SAYBOLT VISC (100F), SEC:

SULFUR CONTENT, %: CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM; 20000
WATER HARDNESS: CA,PPM; MG,PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 5,400,000,000 BBL/AC-FT: 1560

ORIGINAL GAS IN PLACE, MCF:

CUM PROD (DEC 31, 1977)
OIL, BBL: 1,161,954,320
GAS, MCF:
WATER, BBL:

1977 ANNUAL PROD:
OIL, BBL: 38,001,741
GAS, MCF: 2,071,000
WATER, BBL: 72,381,000

OIL REMAINING IN PLACE, STB: 4,200,000,000 BBL/AC-FT: 1213

RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 GAS INJECTION (1944-1949)

AREA, ACRES:
NO. PROD WELLS:
FLUID INJECTED: G
NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL:
GAS, MCF:
CUMULATIVE PROD: OIL, BBL:
(GAS, MCF:
(WATER, BBL:
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S):
### S.2 Peripheral WF (1954-1969)

<table>
<thead>
<tr>
<th>Area, Acres:</th>
<th>FLUID INJECTED: W</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Prod Wells:</td>
<td>No. INJ WELLS:</td>
</tr>
<tr>
<td>Volume Injected: (EQUIV) Water, BBL; 2,144,000</td>
<td></td>
</tr>
<tr>
<td>Gas, MCF;</td>
<td></td>
</tr>
<tr>
<td>Cumulative Prod: OIL, BBL; (THRU 1977)</td>
<td></td>
</tr>
<tr>
<td>Gas, MCF;</td>
<td></td>
</tr>
<tr>
<td>Water, BBL;</td>
<td></td>
</tr>
<tr>
<td>Recovery Factor, %:</td>
<td>BBL/AC-FT:</td>
</tr>
<tr>
<td>Degree of Success:</td>
<td></td>
</tr>
<tr>
<td>Operator(S):</td>
<td></td>
</tr>
</tbody>
</table>

### S.3 Peripheral WF (1957-1967)

<table>
<thead>
<tr>
<th>Area, Acres:</th>
<th>FLUID INJECTED: W</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Prod Wells:</td>
<td>No. INJ WELLS:</td>
</tr>
<tr>
<td>Volume Injected: (EQUIV) Water, BBL; 6,597,000</td>
<td></td>
</tr>
<tr>
<td>Gas, MCF;</td>
<td></td>
</tr>
<tr>
<td>Cumulative Prod: OIL, BBL; (THRU 1977)</td>
<td></td>
</tr>
<tr>
<td>Gas, MCF;</td>
<td></td>
</tr>
<tr>
<td>Water, BBL;</td>
<td></td>
</tr>
<tr>
<td>Recovery Factor, %:</td>
<td>BBL/AC-FT:</td>
</tr>
<tr>
<td>Degree of Success:</td>
<td></td>
</tr>
<tr>
<td>Operator(S):</td>
<td></td>
</tr>
</tbody>
</table>

### S.4 Pressure Maintenance (1973-)

<table>
<thead>
<tr>
<th>Area, Acres:</th>
<th>FLUID INJECTED: G</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Prod Wells:</td>
<td>No. INJ WELLS:</td>
</tr>
<tr>
<td>Volume Injected: (EQUIV) Water, BBL; 507,000</td>
<td></td>
</tr>
<tr>
<td>Gas, MCF;</td>
<td></td>
</tr>
<tr>
<td>Cumulative Prod: OIL, BBL; (THRU 1977)</td>
<td></td>
</tr>
<tr>
<td>Gas, MCF;</td>
<td></td>
</tr>
<tr>
<td>Water, BBL;</td>
<td></td>
</tr>
<tr>
<td>Recovery Factor, %:</td>
<td>BBL/AC-FT:</td>
</tr>
<tr>
<td>Degree of Success:</td>
<td></td>
</tr>
<tr>
<td>Operator(S):</td>
<td></td>
</tr>
</tbody>
</table>
SECONDARY AND TERTIARY RECOVERIES (CONT.)

T.1 CYCLIC STEAM (1963- )

AREA, ACRES: 202
NO. PROD WELLS: 
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 
DEGREE OF SUCCESS: 
OPERATOR(S): 

T.2 IN-SITU COMBUSTION (1960- )

AREA, ACRES: 
NO. PROD WELLS: 5
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 24.0
DEGREE OF SUCCESS: 
OPERATOR(S): MOBIL (MOCO POOL)

REMARKS: INCLUDES MANY RESERVOIRS: 87% OF CUMULATIVE FIELD PRODUCTION.

SOURCES: 5,17-8,34,37-8,44,58,75,84,86,113,129,132,134,157
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: MOUNT POSO
NO. OF RESERVOIRS: 9

RESERVOIR INFORMATION

RESERVOIR: DOMINION AREA-VEDDER
NO. OF ZONES: 1
DESCRIPTION: DISCOVERY YEAR: 1926
AREA, ACRES: 665
SPACING, ACRES: TOTAL WELLS:
SHUT-IN WELLS: 45
PRODUCING WELLS: 79
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: VEDDER
GEOLOGICAL AGE: MIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRATIGRAPHIC - FACIES CHANGE ON FAULT
LITHOLOGY: SAND
DIP, DEG.: 4.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
FAULTING; MOD
BARRIER TO FLOW:
HETEROGENEITY;

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1584
GROSS PAY, FT: 375
POROSITY, %: 33.0
RANGE: TO
PERMEABILITY, MD: 2000
GAS SAT.:
RANGE: TO
BHT, DEF F: 107 *
SAT. PRESSURE, PSI:
GAS CAP:
WETTING PHASE:
GAS CAP/OIL ZONE RATIO:
WETTING PHASE:
INITIAL: OIL SAT., %; 52.0
CURRENT: OIL SAT., %; 41.0 *
WTR SAT., %; 48.0
WTR SAT., %; 59.0
GAS SAT., %;
GAS SAT., %;
FVF, BBL/STB; 1.050 *
FVF, BBL/STB; 1.010 *
WOR, BBL/BBL;
WOR, BBL/BBL;
GOR, SCF/BBL;
GOR, SCF/BBL;
BHP, PSI;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 15.3  
RANGE: 13.0 TO 16.0
VISCOSITY @ BHT, CP:  
@ F, CP:
SAYBOLT VISC (100°F), SEC: 1900
SULFUR CONTENT, %: .68  
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 5.9  
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 200
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 33,700,000  
BBL/AC-FT: 1268
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977) GAS, MCF:
WATER, BBL:
1977 ANNUAL PROD: OIL, BBL; 98,390  
GAS, MCF:
WATER, BBL:
OIL REMAINING IN PLACE, STB: 27,600,000  
BBL/AC-FT: 1037
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE  
RECOVERY FACTOR, %:  
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 CYCLIC STEAM (1964- )
AREA, ACRES:  
NO. PROD WELLS:  
FLUID INJECTED:
NO. INJ WELLS:  
VOLUME INJECTED: (EQUIV) WATER, BBL; 177,242  
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;  
(THRU 1973) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:  
BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S):

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 32
**STATE:** CALIFORNIA  
**COUNTY:** KERN  
**DISTRICT:** SAN JOAQUIN VALLEY REGION  
**FIELD NAME:** MOUNT POSO  
**NO. OF RESERVOIRS:** 9

**RESERVOIR INFORMATION**

<table>
<thead>
<tr>
<th>RESERVOIR: DORSEY AREA-VEDDER</th>
<th>DISCOVERY YEAR: 1928</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. OF ZONES: 1</td>
<td>SPACING, ACRES:</td>
</tr>
<tr>
<td>AREA, ACRES: 375</td>
<td>PRODUCING WELLS: 50</td>
</tr>
<tr>
<td>TOTAL WELLS:</td>
<td>INJECTION WELLS:</td>
</tr>
<tr>
<td>SHUT-IN WELLS: 10</td>
<td></td>
</tr>
</tbody>
</table>

**GEOLOGICAL INFORMATION**

<table>
<thead>
<tr>
<th>FORMATION: MIOCENE</th>
<th>DIP, DEG.: 24.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOLOGICAL AGE: MIOCENE</td>
<td>CLAY CONTENT, %:</td>
</tr>
<tr>
<td>BASIN: SAN JOAQUIN BASIN</td>
<td>FAULTING; MINOR</td>
</tr>
<tr>
<td>TRAP TYPE: STRUCT/STRAT - FAULT HOMOCLINE</td>
<td>INTERBEDDED STREAKS:</td>
</tr>
<tr>
<td>LITHOLOGY: SAND</td>
<td>BARRIER TO FLOW:</td>
</tr>
<tr>
<td>DEGREE OF: CONSOLIDATION;</td>
<td></td>
</tr>
<tr>
<td>HETEROGENEITY;</td>
<td></td>
</tr>
<tr>
<td>FAULTING; MINOR</td>
<td></td>
</tr>
<tr>
<td>FRACTURE;</td>
<td></td>
</tr>
</tbody>
</table>

**RESERVOIR CHARACTERISTICS**

<table>
<thead>
<tr>
<th>DEPTH, FT: 1542</th>
<th>NET PAY, FT: 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROSS PAY, FT:</td>
<td>RANGE: TO</td>
</tr>
<tr>
<td>POROSITY, %: 34.0 *</td>
<td>RANGE: TO</td>
</tr>
<tr>
<td>PERMEABILITY, MD:</td>
<td>SAT. PRESSURE, PSI:</td>
</tr>
<tr>
<td>BHT, DEF F: 106 *</td>
<td>GAS CAP, ACRES:</td>
</tr>
<tr>
<td>GAS CAP:</td>
<td>WETTING PHASE:</td>
</tr>
<tr>
<td>GAS CAP/OIL ZONE RATIO:</td>
<td>CURRENT: OIL SAT., %: 49.0 *</td>
</tr>
<tr>
<td>INITIAL: OIL SAT., %: 67.0 *</td>
<td>WTR SAT., %: 51.0</td>
</tr>
<tr>
<td></td>
<td>GAS SAT., %:</td>
</tr>
<tr>
<td></td>
<td>FVF, BBL/STB: 1.000 *</td>
</tr>
<tr>
<td></td>
<td>WOR, BBL/BBL:</td>
</tr>
<tr>
<td></td>
<td>GOR, SCF/BBL:</td>
</tr>
<tr>
<td></td>
<td>BHP, PSI:</td>
</tr>
</tbody>
</table>
FLUID CHARACTERISTICS

OIL GRAVITY, API: 15.5
RANGE: 15.0 TO 16.0
VISCOSITY @ BHT, CP:
@ F, CP:
SAYBOLT VISC (100F), SEC: 1900
SULFUR CONTENT, %: .68
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 5.9
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 90
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE,STB: 19,200,000 BBL/AC-FT: 1708
ORIGINAL GAS IN PLACE,MCF:
CUM PROD (DEC 31, 1977): OIL,BBL; 4,819,332
GAS,MCF;
WATER,BBL;
1977 ANNUAL PROD: OIL,BBL; 84,908
GAS,MCF;
WATER,BBL; 2,621,000
OIL REMAINING IN PLACE,STB: 14,400,000 BBL/AC-FT: 1279
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SOURCES: 5,12,14,37,38,58,113,129,132; 32
**RESERVOIR AND PRODUCTION DATA ELEMENTS**

**CASE 178**

**STATE:** CALIFORNIA  
**COUNTY:** KERN  
**DISTRICT:** SAN JOAQUIN VALLEY REGION  
**FIELD NAME:** POSO CREEK  
**NO. OF RESERVOIRS:** 6

**RESERVOIR INFORMATION**

**RESERVOIR:** MCVAN AREA  
**NO. OF ZONES:** 1  
**AREA, ACRES:** 280  
**TOTAL WELLS:**  
**SHUT-IN WELLS:** 22  
**DISCOVERY YEAR:** 1932  
**SPACING, ACRES:**  
**PRODUCING WELLS:** 62  
**INJECTION WELLS:**

**GEOLOGICAL INFORMATION**

**FORMATION:** ETCHEGOIN VEDDER  
**GEOLOGICAL AGE:** PLIOCENE-MIOCENE  
**BASIN:** SAN JOAQUIN BASIN  
**TRAP TYPE:** STRUCT/STRAT - FACIES CHANGE ON FAULT  
**LITHOLOGY:** SAND  
**DIP, DEG.:** 4.0  
**CLAY CONTENT, %:**  
**INTERBEDDED STREAKS:** YES  
**BARRIER TO FLOW:**

**RESERVOIR CHARACTERISTICS**

**DEPTH, FT:** 1215  
**GROSS PAY, FT:**  
**POROSITY, %:** 34.0  
**PERMEABILITY, MD:** 1200  
**BHT, DEF F:** 100 *  
**GAS CAP:** NO  
**GAS CAP/OIL ZONE RATIO:**  
**INITIAL:** OIL SAT., %; 67.0 *  
**WTR SAT., %; 33.0  
**GAS SAT., %;  
**FVF, BBL/STB; 1.050 *  
**WOR, BBL/BBL;  
**GOR, SCF/BBL;  
**BHP, PSI;**

**NET PAY, FT:** 40  
**RANGE:** TO  
**RANGE:** 150 TO 7700  
**SAT. PRESSURE, PSI:**  
**GAS CAP, ACRES:**  
**WETTING PHASE:**

**CURRENT:** OIL SAT., %; 54.0 *  
**WTR SAT., %; 46.0  
**GAS SAT., %;  
**FVF, BBL/STB; 1.010 *  
**WOR, BBL/BBL;  
**GOR, SCF/BBL;  
**BHP, PSI;**
FLUID CHARACTERISTICS

- **OIL GRAVITY, API:** 12.5
- **RANGE:** 12.0 TO 13.0
- **VISCOSITY @ BHT, CP:**
- **SAYBOLT VISC (100°F), SEC:**
- **SULFUR CONTENT, %:**
- **CARBON/HYDROGEN RATIO:**
- **CARBON RESIDUE, %:**
- **ACID NUMBER:**
- **OIL TYPE:**
- **WATER SALINITY, PPM:** 90
- **WATER HARDNESS: CA, PPM:**
- **MG, PPM:**

RESERVES AND PRODUCTION DATA

- **ORIGINAL OIL IN PLACE, STB:** 18,900,000
- **BBL/AC-FT:** 1683
- **ORIGINAL GAS IN PLACE, MCF:**
- **CUM PROD:**
  - **OIL, BBL:** 3,020,251
  - **GAS, MCF:**
  - **WATER, BBL:**
  - **(DEC 31, 1977):**
  - **1977 ANNUAL PROD:**
    - **OIL, BBL:** 183,846
    - **GAS, MCF:**
    - **WATER, BBL:** 1,699,000
- **OIL REMAINING IN PLACE, STB:** 15,800,000
- **BBL/AC-FT:** 1413
- **(DEC 31, )
- **RESERVES (DEC 31, )**

PRIMARY PRODUCTION:

- **MECHANISM:** WATER DRIVE
- **RECOVERY FACTOR, %:**
- **ANNUAL DECLINE RATE, %:**

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 117, 152
CASE 189
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION
FIELD NAME: TEJON GR - TEJON GRAPEVINE
NO. OF RESERVOIRS: 13

RESERVOIR INFORMATION

RESERVOIR: WESTERN AREA S
NO. OF ZONES: DISCOVERY YEAR: 1945
AREA, ACRES: 540 SPACING, ACRES: 6
TOTAL WELLS: PRODUCING WELLS: 54
SHUT-IN WELLS: 30 INJECTION WELLS: 7

GEOLOGICAL INFORMATION

FORMATION: TRANSITION-SANTA MARGARITA
GEOLOGICAL AGE: MIocene
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCTURAL - ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.: 1.0
HETEROGENEITY; CLAY CONTENT, %:
FAULTING; NONE INTERBEDDED STREAKS: YES
FRACTURE; MINOR BARRIER TO FLOW: NO

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2649
GROSS PAY, FT: NET PAY, FT: 55
POROSITY, %: 29.0 RANGE: TO
PERMEABILITY, MD: 2000 RANGE: TO
BHT, DEF F: 127 * SAT. PRESSURE, PSI:
GAS CAP: GAS CAP, ACRES:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 61.0 WETTING PHASE:
WTR SAT., %; 39.0 CURRENT: OIL SAT., %; 42.0 *
GAS SAT., %; FVF, BBL/STB; 1.050 *
FVF, BBL/STB; 1.000 *
WOR, BBL/BBL; GOR, SCF/BBL; 192
GOR, SCF/BBL; BHP, PSI;
BHP, PSI;

FLUID CHARACTERISTICS

OIL GRAVITY, API: 15.8 RANGE: 14.0 TO 18.0
VISCOITY @ BHT, CP; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 1100
WATER HARDNESS: CA, PPM; MG, PPM;
CASE 189

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 38,800,000
ORIGINAL GAS IN PLACE, MCF: 1307

CUM PROD:
   OIL, BBL: 10,772,460
   GAS, MCF: 258,000
   WATER, BBL: 73,778
(DEC 31, 1977)

1977 ANNUAL PROD:
   OIL, BBL: 73,778
   GAS, MCF: 8,000
   WATER, BBL: 1,429,000

OIL REMAINING IN PLACE, STB: 28,000,000
(DEC 31, )

PRIMARIES PRODUCTION:
   MECHANISM: GC & WD
   RECOVERY FACTOR, %: BBL/AC-FT:
   ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1960-)

   AREA, ACRES: FLUID INJECTED: W
   NO. PROD WELLS: NO. INJ WELLS: 9
   VOLUME INJECTED: (EQUIV) WATER, BBL: 39,669,000
   GAS, MCF:
   CUMULATIVE PROD: OIL, BBL:
   (THRU 1977) GAS, MCF:
   WATER, BBL:
   RECOVERY FACTOR, %: BBL/AC-FT:
   DEGREE OF SUCCESS:
   OPERATOR(S): CHANSLOR; D&P; GULF

T.1 CYCLIC STEAM (1964-1967)

   AREA, ACRES: FLUID INJECTED: S
   NO. PROD WELLS: NO. INJ WELLS: 167,189
   VOLUME INJECTED: (EQUIV) WATER, BBL: 167,189
   GAS, MCF:
   CUMULATIVE PROD: OIL, BBL:
   (THRU 1977) GAS, MCF:
   WATER, BBL:
   RECOVERY FACTOR, %: BBL/AC-FT:
   DEGREE OF SUCCESS:
   OPERATOR(S):

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 107
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION, OTHER FIELDS
FIELD NAME: JASMIN
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: CANTLEBERRY VEDDER (2 AREAS)
NO. OF ZONES: 2
AREA, ACRES: 410
TOTAL WELLS: 48
SHUT-IN WELLS: 10

DISCOVERY YEAR: 1946
SPACING, ACRES: 7
PRODUCING WELLS: 48
INJECTION WELLS: 

GEOLOGICAL INFORMATION

FORMATION: VEDDER
GEOLOGICAL AGE: MIocene
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRATIGRAPHIC - LATERAL CHANGE IN POROSITY
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.: 4.0
HETEROGENEITY; CLAY CONTENT, %: 
FAULTING; MOD INTERBEDDED STREAKS: 
FRACTURE; BARRIER TO FLOW: 

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2937
GROSS PAY, FT: 
POROSITY, %: 34.0 *
PERMEABILITY, MD: 
BHT, DEF P: 132 *
GAS CAP: 
NET PAY, FT: 30
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI: 
GAS CAP, ACRES: 
WETTING PHASE: 
CURRENT: OIL SAT., %: 59.0 *
WTR SAT., %: 41.0 
GAS SAT., %: 
FVF, BBL/STB: 1.020 *
WOR, BBL/BBL: 
GOR, SCF/BBL: 
BHP, PSI: 

238
FLUID CHARACTERISTICS

OIL GRAVITY, API: 12.9  RANGE: 12.0 TO 16.0
VISCOSITY @ BHT, CP: @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM: 170
WATER HARDNESS: CA, PPM: MG, PPM:

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 20,700,000 BBL/AC-FT: 1683
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL: 2,045,260
(DEC 31, 1977) GAS, MCF: 1,000
WATER, BBL: 1,000
1977 ANNUAL PROD: OIL, BBL: 126,335
GAS, MCF: 1,000
WATER, BBL: 2,342,000
OIL REMAINING IN PLACE, STB: 18,700,000 BBL/AC-FT: 1517
(DEC 31, ) RESERVES (DEC 31, 1977) 1,000,000

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132; 92
CASE 193

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: CALIFORNIA
COUNTY: KERN
DISTRICT: SAN JOAQUIN VALLEY REGION, OTHER FIELDS
FIELD NAME: WHITE WOLF
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR:
NO. OF ZONES: 3
AREA, ACRES: 90
TOTAL WELLS: 15
SHUT-IN WELLS: 7
DISCOVERY YEAR: 1960
SPACING, ACRES: 10
PRODUCING WELLS: 8
INJECTION WELLS: 7

GEOLOGICAL INFORMATION

FORMATION: KERN RIVER-CHANAC-REEF RIDGE
GEOLOGICAL AGE: PLIOCENE-MIOCENE
BASIN: SAN JOAQUIN BASIN
TRAP TYPE: STRUCTURAL - FAULTEDanticline
LITHOLOGY: SAND

DEGREE OF: CONSOLIDATION; DIP, DEG.: HETEROGENEITY; CLAY CONTENT, %;
FAULTING; HIGH INTERBEDDED STREAKS: YES
FRACtURE; BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2290
GROSS PAY, FT: 600
POROSITY, %: 22.0
PERMEABILITY, MD:
BHT, DEF F: 120 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 68.0 *
WTR SAT., %; 32.0
GAS SAT., %;
FVF, BBL/STB: 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 400 *
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %;
WTR SAT., %;
GAS SAT., %;
FVF, BBL/STB;
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
RANGE: 12.0 TO 17.0 @ F, CP:
CARBON/HYDROGEN RATIO:
ACID NUMBER:

FLUID CHARACTERISTICS

OIL GRAVITY, API: 14.2
VISCOsITY @ BHT, CP: ; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: Ca, PPM; Mg, PPM;
RESERVES AND PRODUCTION DATA

CASE 193

ORIGINAL OIL IN PLACE, STB: 887,694
ORIGINAL GAS IN PLACE, MCF: 227,000
CUM PROD (DEC 31, 1977) OIL, BBL; 887,694
GAS, MCF;
WATER, BBL; 227,000
1977 ANNUAL PROD: OIL, BBL; 887,694
GAS, MCF;
WATER, BBL; 227,000
OIL REMAINING IN PLACE, STB: BBL/AC-FT: 130,000
RESERVES (DEC 31, )

PRIMAR PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %: 
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 CYCLIC STEAM (1964- )

AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL; 111,238
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 
DEGREE OF SUCCESS: TERM
OPERATOR(S): OCCIDENTAL PETROLEUM

T.2 IN-SITU COMBUSTION ( - )

AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 
DEGREE OF SUCCESS:
OPERATOR(S): OCCIDENTAL PETROLEUM

SOURCES: 5, 12, 14, 37, 38, 58, 113, 129, 132

241
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: ILLINOIS
COUNTY: EDGAR
DISTRICT:
FIELD NAME: DUDLEY
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: LOWER DUDLEY
NO. OF ZONES: 1
DISCOVERY YEAR: 1949
AREA, ACRES: 800
SPACING, ACRES:
TOTAL WELLS: 95
PRODUCING WELLS: 80
SHUT-IN WELLS: 1
INJECTION WELLS: 14

GEOLOGICAL INFORMATION

FORMATION: LOWER DUDLEY
GEOLOGICAL AGE: DESMOINES
BASIN: ILLINOIS BASIN
TRAP TYPE: STRATIGRAPHIC - MONOCLINE LENSE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACURE;

RESERVOIR CHARACTERISTICS

DEPTH, FT: 410
GROSS PAY, FT: 50
POROSITY, %: 20.0
PERMEABILITY, MD: 100
BPT, DEF F: 75 *

GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 80.0 *
WTR SAT., %; 20.0
GAS SAT., %;
PVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

NET PAY, FT: 20
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 70.0 *
WTR SAT., %; 30.0
GAS SAT., %;
PVF, BBL/STB; 1.020 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 24.0
RANGE: 24.0 TO 29.0
VISCOSITY @ BHT, CP: 75.0; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 18,900,000 BBL/AC-FT: 1182
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 1,800,000 *
(DEC 31, 1977) GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 54,000 *
GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB: 17,100,000 BBL/AC-FT: 1070
(DEC 31, 1977) RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM:
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1966- )

AREA, ACRES: 480 FLUID INJECTED: W
NO. PROD WELLS: 50 NO. INJ WELLS: 12
VOLUME INJECTED: (EQUIV) WATER, BBL; 4,071,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 867,000
(GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S):

SOURCES: 5, 12, 14, 161, 162
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: KANSAS
COUNTY: WOODSON
DISTRICT: EASTERN STRIPPER
FIELD NAME: BIG SANDY POOL
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: BARTLESVILLE
NO. OF ZONES: DISCOVERY YEAR: 1926
AREA, ACRES: 1240 SPACING, ACRES: 20
TOTAL WELLS: PRODUCING WELLS: 62
SHUT-IN WELLS: INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: BARTLESVILLE
GEOLOGICAL AGE: M. PENN
BASIN: CHEROKEE BASIN
TRAP TYPE: LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1250
GROSS PAY, FT: 
POROSITY, %: 23.0 *
PERMEABILITY, MD: 
BHT, DEG F: 81 *
GAS CAP: 
NET PAY, FT: 50
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 73.5 *
WTR SAT., %; 26.5
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %;
WTR SAT., %;
GAS SAT., %;
FVF, BBL/STB;
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
OIL GRAVITY, API: 21.0  RANGE: TO 
VISCOITY @ BHT, CP: @ F, CP:
SAYBOLT VISC (100F), SEC: 380 
SULFUR CONTENT, %: .60  CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 3.6  ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE,STB: 
ORIGINAL GAS IN PLACE,MCF: 
CUM PROD : OIL,BBL; 1,271,604 
(DEC 31, 1977) GAS,MCF; 
WATER,BBL; 
1977 ANNUAL PROD: OIL,BBL; 20,457 
GAS,MCF; 
WATER,BBL; 
OIL REMAINING IN PLACE,STB: 
(DEC 31, ) 
RESERVES(DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: GRAVITY DRAINAGE
RECOVERY FACTOR, %: 
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1957- )

AREA, ACRES: 30  FLUID INJECTED: W 
NO. PROD WELLS: 41  NO. INJ WELLS: 8 
VOLUME INJECTED: (EQUIV)WATER, BBL; 1,857,897 
GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 
(THRU ) GAS, MCF; 
WATER, BBL; 
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: 
OPERATOR(S): MACK C. COLT, INC 

SOURCES: 5,12,13,14,164,165,167,171,172

245
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: KANSAS
COUNTY: ALLEN
DISTRICT: EASTERN STRIPPER
FIELD NAME: IOU
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: BARTLESVILLE
NO. OF ZONES: DISCOVERY YEAR:
AREA, ACRES: 1910 PRODUCING ACRES: 10
TOTAL WELLS: PRODUCING WELLS: 191
SHUT-IN WELLS: INJECTION WELLS: 34

GEOLOGICAL INFORMATION

FORMATION: BARTLESVILLE GEOLOGICAL AGE: DES MOINES
GEOLAGE: CHEROKEE BASIN TRAP TYPE:
LITHOLOGY: SAND DEGREE OF:
CONSOLIDATION:
HETEROGENEITY:
FAULTING:
FRACUTURE:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 860 NET PAY, FT: 30
GROSS PAY, FT: RANGE: TO
POROSITY, %: 25.0 RANGE: TO
PERMEABILITY, MD:
BHT, DEF F: 74 SAT. PRESSURE, PSI:
GAS CAP: YES GAS CAP, ACRES:
GAS CAP/OIL ZONE RATIO: WETTING PHASE:
INITIAL: OIL SAT., %: 68.0 CURRENT: OIL SAT., %: 65.0 *
WTR SAT., %: 27.0 WTR SAT., %: 35.0
GAS SAT., %: 5.0 GAS SAT., %:
FVF, BBL/STB: 1.050 * FVF, BBL/STB: 1.040 *
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:

FLUID CHARACTERISTICS

OIL GRAVITY, API: 20.0 RANGE: TO
VISCOITY @ BHT, CP: 700.0; @ F, CP:
SAYBOLT VISC (100F), SEC: 1150 CARBON/HYDROGEN RATIO:
SULFUR CONTENT, %: .65 ACID NUMBER:
CARBON RESIDUE, %: .7
OIL TYPE:
WATER SALINITY, PPM:
WATER HARDNESS: CA, PPM; MG, PPM;
## CASE 199

### RESERVES AND PRODUCTION DATA

**ORIGINAL OIL IN PLACE, STB:** ~00,000,000  
**ORIGINAL GAS IN PLACE, MCF:**  
**CUM PROD:**  
- OIL, BBL: 3,844,858  
- GAS, MCF:  
- WATER, BBL:  
**1977 ANNUAL PROD:**  
- OIL, BBL: 64,083  
- GAS, MCF:  
- WATER, BBL:  

**OIL REMAINING IN PLACE, STB:** 96,000,000  
**RESERVES (DEC 31, **  

**PRIMARY PRODUCTION:**  
- MECHANISM: SOLUTION GAS  
- ANNUAL DECLINE RATE, %:  
- RECOVERY FACTOR, %:  
- BBL/AC-FT:  

**SECONDARY AND TERTIARY RECOVERIES:**

### S.1 WATERFLOOD  (1968- )

**AREA, ACRES:** 410  
**NO. PROD WELLS:** 37  
**NO. INJ WELLS:** 15  
**VOLUME INJECTED:** (EQUIV) WATER, BBL: 2,480,042  
**CUMULATIVE PROD:**  
- OIL, BBL:  
- GAS, MCF:  
- WATER, BBL:  
**RECOVERY FACTOR, %:**  
**DEGREE OF SUCCESS:**  
**OPERATOR(S):** TECH-AMERICAN RES. CORP  

### T.1 IN-SITU COMBUSTION  (1963- )

**AREA, ACRES:** 10  
**NO. PROD WELLS:** 9  
**NO. INJ WELLS:** 5  
**VOLUME INJECTED:** (EQUIV) WATER, BBL: 1,145,000  
**CUMULATIVE PROD:**  
- OIL, BBL:  
- GAS, MCF:  
- WATER, BBL:  
**RECOVERY FACTOR, %:**  
**DEGREE OF SUCCESS:**  
**OPERATOR(S):** LAYTON OIL CO.  

**REMARKS:** AREA, WELL & PROD FIGURES INCLUDE SQUIRREL POOL  
**SOURCES:** 5, 12, 13, 14, 18, 163, 164, 165, 166, 167, 170, 171, 172, 173
STATE: KANSAS
COUNTY: ALLEN
DISTRICT: EASTERN STRIPPER
FIELD NAME: MORAN
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: BARTLESVILLE
NO. OF ZONES: 
AREA, ACRES: 4520
TOTAL WELLS:
SHUT-IN WELLS: 
DISCOVERY YEAR: 1904
SPACING, ACRES: 20
PRODUCING WELLS: 226
INJECTION WELLS: 168

GEOLOGICAL INFORMATION

FORMATION: BARTLESVILLE
GEOLOGICAL AGE: DES MOINES
BASIN: CHEROKEE BASIN
TRAP TYPE: 
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.: 
CLAY CONTENT, %: 
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 820
GROSS PAY, FT: 
POROSITY, %: 21.0
PERMEABILITY, MD: 88
BHT, DEF F: 77
GAS CAP: 
GAS CAP/OIL ZONE RATIO: 
INITIAL: OIL SAT., %; 79.0
WTR SAT., %; 21.0
GAS SAT., %;
FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 50
NET PAY, FT: 17
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI: 
GAS CAP, ACRES: 
WETTING PHASE: 
CURRENT: OIL SAT., %; 76.0 *
WTR SAT., %; 24.0
GAS SAT., %;
FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 20.0
VISCOSITY @ BHT, CP: 750.0; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 98,900,000 BBL
ORIGINAL GAS IN PLACE, MCF: 3,222,990
CUM PROD: OIL, BBL; 124,925
(DEC 31, 1977) GAS, MCF; WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 124,925
GAS, MCF; WATER, BBL;
OIL REMAINING IN PLACE, STB: 95,700,000 BBL
(DEC 31,  )
RESERVES (DEC 31,  )

PRIMARY PRODUCTION:
MECHANISM: SG & GRAV DRNGE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1953- )

AREA, ACRES: FLUID INJECTED: W
NO. PROD WELLS: 6 NO. INJ WELLS: 6
VOLUME INJECTED: (EQUIV) WATER, BBL; 1,467,677
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): MACK C. COLT, INC
SECONDARY AND TERTIARY RECOVERIES (CONT.)

CASE 200

S.2 WATERFLOOD

(1976- )

AREA, ACRES: 1100
NO. PROD WELLS: 31
VOLUME INJECTED: (EQUIV) WATER, BBL;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): ENSMINGER OIL CO.

T.1 IN-SITU COMBUSTION

(1965- )

AREA, ACRES: 20
NO. PROD WELLS: 20
VOLUME INJECTED: (EQUIV) WATER, BBL;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 70.0 BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): ENSMINGER OIL CO.

REMARKS: RESERVOIR IS ANISOTROPIC, WITH HIGHLY DIRECTIONAL PERMEABILITY

SOURCES: 5,12,13,14,164,165,167,168,169,171,172
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: KANSAS
COUNTY: WOODSON
DISTRICT: EASTERN STRIPPER
FIELD NAME: OWL CREEK
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: SQUIRREL
NO. OF ZONES: DISCOVERY YEAR: 1967
AREA, ACRES: 1740 SPACING, ACRES: 20
TOTAL WELLS: PRODUCING WELLS: 87
SHUT-IN WELLS: INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: SQUIRREL (CHEROKEE GROUP)
GEOLOGICAL AGE: M. PENN
BASIN: CHEROKEE BASIN
TRAP TYPE: -
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.:
HETEROGENEITY; CLAY CONTENT, %:
FAULTING; INTERBEDDED STREAKS:
FRAC TURE; BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 900 NET PAY, FT: 38
GROSS PAY, FT: RANGE: TO
POROSITY, %: 23.0 * RANGE: TO
PERMEABILITY, MD:
BHT, DEF F: 78 * SAT. PRESSURE, PSI:
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 73.5 * CURRENT: OIL SAT., %;
WTR SAT., %; 26.5 WTR SAT., %;
GAS SAT., %; GAS SAT., %;
FVF, BBL/STB; 1.050 * PVF, BBL/STB;
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

FLUID CHARACTERISTICS

OIL GRAVITY, API: 24.0 RANGE: TO
VISOSITY @ BHT, CP: @ F, CP:
SAYBOLT VISC (100F), SEC: CARBON/HYDROGEN RATIO:
SULFUR CONTENT, %: ACID NUMBER:
CARBON RESIDUE, %: OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM; MG, PPM;
RESERVES AND PRODUCTION DATA

CASE 201

ORIGINAL OIL IN PLACE, STB: 889,654
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 889,654
(GDEC 31, 1977) GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 75,760
GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB: BBL/AC-FT:
(DEC 31,  )
RESERVES (DEC 31,  )

PRIMARY PRODUCTION:
MECHANISM: SG & GRAV DRNGE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1975- )

AREA, ACRES: 190
NO. PROD WELLS: 23
VOLUME INJECTED: (EQUIV) WATER, BBL; 143,349
GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 22,583
(GTHRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): TEC DRILLING CO

S.2 WATERFLOOD ( )

AREA, ACRES: 240
NO. PROD WELLS: 16
VOLUME INJECTED: (EQUIV) WATER, BBL; 12,240
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(GTHRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): N&B ENTERPRISES

SOURCES: 5, 12, 13, 14, 164, 165, 167, 171, 172
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: LOUISIANA
COUNTY: BOSSIER & WEBSTER
DISTRICT: NORTH
FIELD NAME: BELLEVUE
NO. OF RESERVOIRS: 6

RESERVOIR INFORMATION

RESERVOIR: NACATOCB
NO. OF ZONES: 1
AREA, ACRES: 900
DISCOVERY YEAR: 1921
SPACING, ACRES:
TOTAL WELLS:
PRODUCING WELLS: 646
SHUT- IN WELLS:
INJECTION WELLS: 95

GEOLOGICAL INFORMATION

FORMATION: NACATOCH
GEOLOGICAL AGE: GULF
BASIN: ARKLA BASIN
TRAP TYPE: STRUCTURAL - FAULTED DOME
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC
HETEROGENEITY;
FAULTING;
FRACTURE;
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 335
GROSS PAY, FT: NET PAY, FT: 60
POROSITY, %: 36.0
PERMEABILITY, MD: 600
BHT, DEF F: 75
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 69.5
WTR SAT., %; 30.5
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 200
RANGE: TO
RANGE: 500 TO 1000
SAT. PRESSURE, PSI: 40
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 61.0 *
WTR SAT., %; 39.0
GAS SAT., %;
FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 40

FLUID CHARACTERISTICS

OIL GRAVITY, API: 19.0
RANGE: TO
VISCOITY @ BHT, CP: 580.0;
@ F, CP:
SAYBOLT VISC (100F), SEC: 900
SULFUR CONTENT, %: .80
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 5.3
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 8500
WATER HARDNESS: CA, PPM; MG, PPM;
RESERVES AND PRODUCTION DATA

CASE 203

ORIGINAL OIL IN PLACE, STB: 99,800,000 BBL/AC-FT: 1849
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 7,170,431
(DEC 31, 1977) GAS, MCF;
WATER, BBL; 66,891,843
ANNUAL PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB: 92,700,000 BBL/AC-FT: 1716
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: FE, SG, WD & GD
RECOVERY FACTOR, %: 5.0 BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 IN-SITU COMBUSTION (1971- )

AREA, ACRES: 110 FLUID INJECTED: A/W
NO. PROD WELLS: 72 NO. INJ WELLS: 24
VOLUME INJECTED: (EQUIV) WATER, BBL; 9,113,441
GAS, MCF; 16,243,453
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 37.0 BBL/AC-FT: 680
DEGREE OF SUCCESS: GOOD
OPERATOR(S): CITIES SERVICE/DOE

T.2 IN-SITU COMBUSTION (1963- )

AREA, ACRES: 593 FLUID INJECTED: A/W
NO. PROD WELLS: 335 NO. INJ WELLS: 82
VOLUME INJECTED: (EQUIV) WATER, BBL; 46,357,119
GAS, MCF; 95,935,977
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 40.0 BBL/AC-FT: 740
DEGREE OF SUCCESS: GOOD
OPERATOR(S): GETTY; BAYOU STATE OIL

REMARKS: WELL FIGURES REFLECT ENTIRE FIELD

SOURCES: 5, 12, 14, 16, 18, 175-80, 182-3, 186-9
STATE: LOUISIANA
COUNTY: CADDOD DISTRICT: NORTH
FIELD NAME: CADDOD PINE ISLAND
NO. OF RESERVOIRS: 11

RESERVOIR INFORMATION

RESERVOIR: NACATOCH
NO. OF ZONES: 1
AREA, ACRES: 100480
TOTAL WELLS:
SHUT-IN WELLS:
DISCOVERY YEAR: 1906
SPACING, ACRES: 10
PRODUCING WELLS: 9183
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: NACATOCH
GEOLOGICAL AGE: GULF
BASIN: ARKLA BASIN
TRAP TYPE: STRUCTURAL - ANTIKLIN FAULT CLOSURE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC HETEROGENEITY;
FAULTING;
FRACURA;
DIP, DEG.: CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1095
GROSS PAY, FT: 14
POROSITY, %: 35.5
PERMEABILITY, MD: 550
BHT, DEF F: 80
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 72.0
WTR SAT., %: 28.0
GAS SAT., %:
FVF, BBL/STB: 1.090
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:
NET PAY, FT: 14
RANGE: 34.0 TO 37.0
RANGE: TO 37
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %:
WTR SAT., %:
GAS SAT., %:
FVF, BBL/STB:
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:
FLUID CHARACTERISTICS

OIL GRAVITY, API: 20.0
VISCOSITY @ BHT, CP: 280.0; @ 95F, CP: 60.0
SAYBOLT VISC (100F), SEC: 690
SULFUR CONTENT, %: .49
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 4.9
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM: 60000
WATER HARDNESS: CA, PPM: 361 MG, PPM: 196

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB:
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977) :
OIL, BBL: 319,599,168
GAS, MCF: 
WATER, BBL: 
1977 ANNUAL PROD:
OIL, BBL: 3,081,879
GAS, MCF: 
WATER, BBL: 
OIL REMAINING IN PLACE (DEC 31, ): 
RESERVES (DEC 31, 1977) :
20,400,000

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %: 4.9
BBL/AC-FT: 1819

SECONDARY AND TERTIARY RECOVERIES:
S.1 W & VISCOUS F INJ (1964-1965)
AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED:
(EQUIV) WATER, BBL:
GAS, MCF:
CUMULATIVE PROD:
OIL, BBL:
GAS, MCF:
WATER, BBL:
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S): CADD0 OIL CO
SECONDARY AND TERTIARY RECOVERIES (CONT.)

T.1 STEAM DRIVE (1975-)

AREA, ACRES: 36
NO. PROD WELLS: 4
VOLUME INJECTED: (EQUIV) WATER, BBL;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 
DEGREE OF SUCCESS: ME
OPERATOR(S): TEXACO

FLUID INJECTED: S
NO. INJ WELLS: 1

T.2 IN-SITU COMBUSTION (1973-)

AREA, ACRES: 60
NO. PROD WELLS: 17
VOLUME INJECTED: (EQUIV) WATER, BBL;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS: DSC
OPERATOR(S): CONOCO

FLUID INJECTED: A
NO. INJ WELLS: 6

REMARKS: AREA, WELLS, PROD AND RES REFLECT ENTIRE FIELD
10 ADDITIONAL STEAM DRIVE AND ISC PROJ

SOURCES: 5, 12, 14, 17, 18, 175, 178, 180, 185-89
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: LOUISIANA
COUNTY: LA SALLE
DISTRICT: NORTH
FIELD NAME: NEBO-HEMPHILL
NO. OF RESERVOIRS: 4

RESERVOIR INFORMATION

RESERVOIR: COCKFIELD
NO. OF ZONES: 
AREA, ACRES: 8120
TOTAL WELLS: 
SHUT-IN WELLS: 143

DISCOVERY YEAR: 1940
SPACING, ACRES: 29
PRODUCING WELLS: 134

INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: COCKFIELD
GEOLOGICAL AGE: EOCENE
BASIN: ARKLA BASIN
TRAP TYPE: STRUCTURAL - ANTICLINE FAULT
LITHOLOGY: SAND
DIP, DEG.:
HETEROGENEITY;
FAULTING;
FRACTURE;
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1420
GROSS PAY, FT: 15
POROSITY, %: 15.0
PERMEABILITY, MD:
BHT, DEF F: 95 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 75.0 *
WTR SAT., %: 25.0
GAS SAT., %:
GAS SAT.:
PVF, BBL/STB: 1.050 *
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:

NET PAY, FT: 15
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %:
WTR SAT., %:
GAS SAT.:
PVF, BBL/STB:
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:
FLUID CHARACTERISTICS

OIL GRAVITY, API: 19.0
RANGE: TO

VISCOSITY @ BHT, CP: @ F, CP:

SAYBOLT VISC (100F), SEC:

SULFUR CONTENT, %:
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %:
ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM:

WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: BBL/AC-FT: 831
ORIGINAL GAS IN PLACE, MCF:

CUM PROD: OIL, BBL; 68,620,494
(DEC 31, 1975) GAS, MCF;
WATER, BBL;

1975 ANNUAL PROD: OIL, BBL; 1,351,222
GAS, MCF;
WATER, BBL;

OIL REMAINING IN PLACE, STB: BBL/AC-FT:
(DEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM:
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

REMARKS: PROD & AREA REFLECT ENTIRE FIELD

SOURCES: 5, 12, 14, 175, 180, 186, 187, 188, 189
STATE: LOUISIANA
COUNTY: CALCASIEU
DISTRICT: SOUTHWEST
FIELD NAME: VINTON
NO. OF RESERVOIRS: 16

RESERVOIR INFORMATION

RESERVOIR: UPPER MIOCENE
NO. OF ZONES: DISCOVERY YEAR: 1910
AREA, ACRES: 7020 SPACING, ACRES: 20
TOTAL WELLS: PRODUCING WELLS: 153
SHUT-IN WELLS: INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: MIOCENE
GEOLOGICAL AGE: MIOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCTURAL - SALT DOME CLOSURE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1880
GROSS PAY, FT: 250
POROSITY, %: 30.0
PERMEABILITY, MD: 1000
BHT, DEF F: 103 *
GAS CAP: YES
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 65.0
WTR SAT., %: 35.0
GAS SAT., %:
FVF, BBL/STB: 1.050 *
WOR, BBL/BBL:
GOR, SCF/BBL: 400
BHP, PSI:

NET PAY, FT: 48
RANGE: TO
RANGE: 115 TO 1100
SAT. PRESSURE, PSI:
GAS CAP, ACRES: 755
WETTING PHASE:
CURRENT: OIL SAT., %;
WTR SAT., %;
GAS SAT., %;
FVF, BBL/STB;
WOR, BBL/BBL; 5
GOR, SCF/BBL; 2000
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 23.0
RANGE: TO
VISCOITY @ BHT, CP: ; @ F, CP:
SAYBOLT VISC (100F), SEC: 230
SULFUR CONTENT, %: .31
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 2.6
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 40000
WATER HARDNESS: CA, PPM; 3132 MG, PPM; 906

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 15,000,000 BBL/AC-FT: 1441
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 126,399,700 GAS, MCF; 245
WATER, BBL;
1975 ANNUAL PROD: OIL, BBL; 2,731,500 GAS, MCF; 20 WATER, BBL;
WATER, BBL;
OIL REMAINING IN PLACE, STB: BBL/AC-FT:
(DEC 31, 1977) RESERVES (DEC 31, 1977) 13,600,000

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

REMARKS: AREA, WELLS AND PROD REFLECT ENTIRE FIELD

SOURCES: 5, 12, 14, 175, 180, 186, 187, 188, 189; 190, 293
RESERVOIR AND PRODUCTION DATA ELEMENTS

CASE 214

STATE: MISSISSIPPI
COUNTY: LAMAR-MARION
DISTRICT:
FIELD NAME: BAXTERVILLE
NO. OF RESERVOIRS: 7

RESERVOIR INFORMATION

RESERVOIR: L. TUSCALOOSA MASSIVE
NO. OF ZONES: DISCOVERY YEAR: 1944
AREA, ACRES: 3080 SPACING, ACRES: 39
TOTAL WELLS: 78 PRODUCING WELLS: 78
SHUT-IN WELLS: INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: L. TUSCALOOSA MASSIVE
GEOLOGICAL AGE: UPPER CRETACEOUS
BASIN: MID-GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULTED DOME
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.:
HETEROGENEITY;
FAULTING;
FRACTURE;
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 8800
GROSS PAY, FT:
POROSITY, %: 24.3
PERMEABILITY, MD: 1474
BHT, DEF F: 229
NET PAY, FT: 57
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 87.4
WTR SAT., %; 12.6
GAS SAT., %;
FVF, BBL/STB; 1.100
WOR, BBL/BBL;
GOR, SCF/BBL; 238
BHP, PSI; 4022
CURRENT: OIL SAT., %; 50.0 *
WTR SAT., %; 50.0
GAS SAT., %;
FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
CASE 214

FLUID CHARACTERISTICS

OIL GRAVITY, API: 17.0
RANGE: 15.0 TO 18.0

VISCOSITY @ BHT, CP: 25.0; @ F, CP: 

SAYBOLT VISC (100°F), SEC: 1500

SULFUR CONTENT, %: 2.71
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %: 10.3
ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM: 200,000

WATER HARDNESS: CA, PPM: 18,500
MG, PPM: 2,000

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 2,630,000,000
BBL/AC-FT: 1,498

ORIGINAL GAS IN PLACE, MCF:

CUM PROD
DEC 31, 1977:

OIL, BBL: 98,909,376
GAS, MCF: 26,092,999
WATER, BBL: 245,608,420

1977 ANNUAL PROD:
OIL, BBL: 2,882,064
GAS, MCF: 941,271
WATER, BBL: 27,528,353

OIL REMAINING IN PLACE, STB: 164,100,000
BBL/AC-FT: 934

(DEC 31, 1977)

RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM:
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

BBL/AC-FT:

REMARKS: DIVIDED IN 1971 INTO: L TUSC & L TUSC MSSV
APPRX CUM PROD BY WEIGHING TOTAL AS PROD SINCE 71

SOURCES: 5, 14, 17, 191; 11, 15, 17
RESERVOIR AND PRODUCTION DATA ELEMENTS

CASE 215

STATE: MISSISSIPPI
COUNTY: LAMAR & MARION
DISTRICT:
FIELD NAME: BAXTERVILLE
NO. OF RESERVOIRS: 7

RESERVOIR INFORMATION

RESERVOIR: LOWER TUSCALOOSA
NO. OF ZONES:
AREA, ACRES: 4280
TOTAL WELLS: 122
SHUT-IN WELLS: 13
DISCOVERY YEAR: 1944
SPACING, ACRES: 35
PRODUCING WELLS: 109
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: LOWER TUSCALOOSA
GEOLOGICAL AGE: UPPER CRETACEOUS
BASIN: MID-GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULTED DOME
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 8675
GROSS PAY, FT:
POROSITY, %: 22.9
PERMEABILITY, MD: 680
BHT, DEF F: 229
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 81.7
WTR SAT., %; 18.3
GAS SAT., %;
FVF, BBL/STB; 1.100 *
WOR, BBL/BBL;
GOR, SCF/BBL; 238
BHP, PSI; 4022
NET PAY, FT: 57
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI: 1110
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 56.0 *
WTR SAT., %; 44.0
GAS SAT., %;
FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 16.0        RANGE: 14.0 TO 20.0
VISCOITY @ BHT, CP: 25.0;     @ F, CP:
SAYBOLT VISC (100F), SEC: 2400
SULFUR CONTENT, %: 2.80
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 9.0
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM: 200000
WATER HARDNESS: CA, PPM: 18500  MG, PPM: 2000

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 321,900,000  BBL/AC-FT: 1320
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 79,000,000 *
(DEC 31, 1977) GAS, MCF; 24,000,000
WATER, BBL; 183,000,000
1977 ANNUAL PROD: OIL, BBL; 2,383,792
GAS, MCF; 945,232
WATER, BBL; 15,591,085
OIL REMAINING IN PLACE, STB: 242,900,000  BBL/AC-FT: 996
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM:
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

REMARKS: DIVIDED IN 1971 INTO LOWER TUSCALOOSA AND
LOWER TUSCALOOSA MASSIVE

SOURCES: 5,14,17,191; 11,15,17
STATE: MISSISSIPPI
COUNTY: LAMAR & MARION
DISTRICT:
FIELD NAME: BAXTERVILLE-SOUTHEAST FAULT
NO. OF RESERVOIRS: 4

RESERVOIR INFORMATION

RESERVOIR: LOWER TUSCALOOSA
NO. OF ZONES: DISCOVERY YEAR: 1973
AREA, ACRES: 440 SPACING, ACRES: 110
TOTAL WELLS: 4 PRODUCING WELLS: 3
SHUT-IN WELLS: 1 INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: LOWER TUSCALOOSA
GEOLOGICAL AGE: UPPER CRETACEOUS
BASIN: MID-GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULTED DOME
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 8544
GROSS PAY, FT:
POROSITY, %: 22.9
PERMEABILITY, MD: 680
BHT, DEF F: 229
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 81.7
WTR SAT., %: 18.3
GAS SAT., %:
FVF, BBL/STB: 1.100 *
WOR, BBL/BBL:
GOR, SCF/BBL: 238
BHP, PSI: 4022

NET PAY, FT: 37
RANGE: TO
RANGE: TO 680
SAT. PRESSURE, PSI: 1110
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 81.0 *
WTR SAT., %: 19.0
GAS SAT., %:
FVF, BBL/STB: 1.100 *
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:
FLUID CHARACTERISTICS

CASE 216

OIL GRAVITY, API: 16.0  RANGE: 15.0 TO 19.0
VISCOSITY @ BHT, CP: 7 F, CP:
SAYBOLT VISC (100F), SEC: 2400
SULFUR CONTENT, %: 2.80 CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 8.7 ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA,PPM; MG,PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE,STB: 21,500,000 BBL/AC-FT: 1320
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977) OIL,BBL; 102,578
GAS, MCF; 29,008
WATER, BBL; 35,384
1977 ANNUAL PROD: OIL, BBL; 47,934
GAS, MCF; 96
WATER, BBL; 19,565
OIL REMAINING IN PLACE, STB: 21,400,000 BBL/AC-FT: 1313
(DEC 31, 1977)
RESERVES (DEC 31,)

PRIMARY PRODUCTION:
MECHANISM:
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SOURCES: 5,14,17,191
CASE 217

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: MISSISSIPPI
COUNTY: WAYNE
DISTRICT:
FIELD NAME: EUCUTTA, EAST
NO. OF RESERVOIRS: 7

RESERVOIR INFORMATION

RESERVOIR: EUTAW
NO. OF ZONES:
AREA, ACRES: 2360
TOTAL WELLS: 62
SHUT-IN WELLS: 4
DISCOVERY YEAR: 1943
SPACING, ACRES: 25
PRODUCING WELLS: 58
INJECTION WELLS: 32

GEOLOGICAL INFORMATION

FORMATION: EUTAW
GEOLLOGICAL AGE: UPPER CRETACEOUS
BASIN: MID-GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DEGREE OF:
CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4884
GROSS PAY, FT:
POROSITY, %: 27.0
PERMEABILITY, MD: 210
BHT, DEF F: 152
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 53.8
WTR SAT., %; 46.2
GAS SAT., %;
FVF, BBL/STB; 1.050
WOR, BBL/BBL;
GOR, SCF/BBL; 50
BHP, PSI; 2068
NET PAY, FT: 59
RANGE: TO
RANGE: 1 TO 5000
SAT. PRESSURE, PSI: 276
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 40.0 *
WTR SAT., %; 60.0
GAS SAT., %;
FVF, BBL/STB; 1.050
WOR, BBL/BBL;
GOR, SCF/BBL; 50
BHP, PSI; 1200
FLUID CHARACTERISTICS

OIL GRAVITY, API: 23.0
RANGE: 21.0 TO 24.0
VISCOSITY @ BHT, CP: 18.0; @ F, CP:
SAYBOLT VISC (100°F), SEC: 360
SULFUR CONTENT, %: 3.89
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 9.7
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 140000
WATER HARDNESS: CA, PPM; 7300 MG, PPM; 1500

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 149,400,000 BBL/AC-FT: 1073
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977) OIL, BBL: 39,732,185
GAS, MCF: 2,029,210
WATER, BBL: 86,930,297
1977 ANNUAL PROD: OIL, BBL: 906,287
GAS, MCF: 39,909
WATER, BBL: 8,694,747
OIL REMAINING IN PLACE, STB: 109,700,000 BBL/AC-FT: 788
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: LIMITED WATER DRIVE
RECOVERY FACTOR, %: 19.9
BBL/AC-FT: 213
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1966- )

AREA, ACRES: 2360
NO. PROD WELLS: 51
FLUID INJECTED: W
NO. INJ WELLS: 32
VOLUME INJECTED: (EQUIV) WATER, BBL: 68,793,742
GAS, MCF:
CUMULATIVE PROD: OIL, BBL: 26,058,950
(THRU ) GAS, MCF: 1,302,948
WATER, BBL: 38,452,772
RECOVERY FACTOR, %: 7.5
BBL/AC-FT: 81
DEGREE OF SUCCESS:
OPERATOR(S): AMERADA HESS CORP.

SOURCES: 5, 14, 17, 191
STATE: MISSISSIPPI
COUNTY: JASPER
FIELD NAME: HEIDELBERG, EAST
NO. OF RESERVOIRS: 4

RESERVOIR INFORMATION

RESERVOIR: CHRISTMAS
NO. OF ZONES: 4
AREA, ACRES: 1360
TOTAL WELLS: 34
SHUT-IN WELLS: 

DISCOVERY YEAR: 1971
SPACING, ACRES: 40
PRODUCING WELLS: 34
INJECTION WELLS: 

GEOLOGICAL INFORMATION

FORMATION: CHRISTMAS
GEOLOGICAL AGE: UPPER CRETACEOUS
BASIN: MID-GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULTED DOME
LITHOLOGY: SAND

DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;

DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4827
GROSS PAY, FT: 
POROSITY, %: 30.0
PERMEABILITY, MD: 1600
BHT, DEF F: 152
GAS CAP: 
GAS CAP/OIL ZONE RATIO: 
INITIAL: OIL SAT., %: 60.0
WTR SAT., %: 40.0
GAS SAT., %: 
FVF, BBL/STB: 1.050 *
WOR, BBL/BBL: 
GOR, SCF/BBL: 75
BHP, PSI: 2101

NET PAY, FT: 25
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI: 891
GAS CAP, ACRES: 
WETTING PHASE: 
CURRENT: OIL SAT., %: 45.0 *
WTR SAT., %: 55.0
GAS SAT., %: 
FVF, BBL/STB: 1.000 *
WOR, BBL/BBL: 
GOR, SCF/BBL: 
BHP, PSI: 

270
FLUID CHARACTERISTICS

OIL GRAVITY, API: 25.0  RANGE: 21.0 TO 30.0

VISCOSITY @ BHT, CP:  @ F, CP:

SAYBOLT VISC (100°F), SEC: 250

SULFUR CONTENT, %: 3.70  CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %: 10.5  ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM;

WATER HARDNESS: CA, PPM;

MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 45,200,000  BBL/AC-FT: 1330

ORIGINAL GAS IN PLACE, MCF:  

CUM PROD : OIL, BBL; 9,895,789  GAS, MCF; 1,142,985

(WDEC 31, 1977)  WATER, BBL; 25,457,379

1977 ANNUAL PROD: OIL, BBL; 1,471,702  GAS, MCF; 176,649

WATER, BBL; 6,035,021

OIL REMAINING IN PLACE, STB: 35,300,000  BBL/AC-FT: 1039

(DEC 31, 1977)

RESERVES (DEC 31,  )

PRIMARY PRODUCTION:

MECHANISM:

RECOVERY FACTOR, %:   

ANNUAL DECLINE RATE, %:  

BBL/AC-FT:

SOURCES: 5, 14, 17, 191; 11
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: MISSISSIPPI
COUNTY: JASPER
DISTRICT: 
FIELD NAME: HEIDELBERG, EAST
NO. OF RESERVOIRS: 4

RESERVOIR INFORMATION

RESERVOIR: EUTAW
NO. OF ZONES: 
AREA, ACRES: 8360
TOTAL WELLS: 115
SHUT-IN WELLS: 2

DISCOVERY YEAR: 1944
SPACING, ACRES: 72
PRODUCING WELLS: 107
INJECTION WELLS: 6

GEOLOGICAL INFORMATION

FORMATION: EUTAW
GEOLOGICAL AGE: UPPER CRETACEOUS
BASIN: MID-GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULTED DOME
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4687
GROSS PAY, FT: 
POROSITY, %: 27.0
PERMEABILITY, MD: 300
BHT, DEF F: 152
GAS CAP: 
GAS CAP/OIL ZONE RATIO: 
INITIAL: OIL SAT., %; 79.0
WTR SAT., %; 21.0
GAS SAT., %;
FVF, BBL/STB; 1.045
WOR, BBL/BBL;
GOR, SCF/BBL; 75
BHP, PSI; 2101
NET PAY, FT: 42
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI: 
GAS CAP, ACRES: 
WETTING PHASE: 
CURRENT: OIL SAT., %; 67.0 *
WTR SAT., %; 33.0
GAS SAT., %;
FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL; 192
BHP, PSI; 544
FLUID CHARACTERISTICS

OIL GRAVITY, API: 24.5  
VISCOSITY @ BHT, CP: 10.0  
SAYBOLT VISC (100°F), SEC: 250  
SULFUR CONTENT, %: 3.70  
CARBON/HYDROGEN RATIO:  
CARBON RESIDUE, %: 10.5  
ACID NUMBER:  
OIL TYPE:  
WATER SALINITY, PPM:  
WATER HARDNESS: CA, PPM:  
MG, PPM:

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 556,000,000  
ORIGINAL GAS IN PLACE, MCF:  
CUM PROD: OIL, BBL; 66,398,343  
(GDEC 31, 1977) GAS, MCF; 7,970,350  
WATER, BBL; 95,849,387  
1977 ANNUAL PROD: OIL, BBL; 1,325,498  
GAS, MCF; 294,825  
WATER, BBL; 2,719,393  
OIL REMAINING IN PLACE, STB: 489,600,000  
(BDEC 31, 1977) BBL/AC-FT: 1584  
RESERVES (DEC 31, )  

PRIMARY PRODUCTION:  
MECHANISM: SG & WD  
RECOVERY FACTOR, %:  
ANNUAL DECLINE RATE, %:  

SOURCES: 5, 11, 14, 17, 191
STATE: MISSISSIPPI
COUNTY: JASPER
DISTRICT: 
FIELD NAME: HEIDELBERG, EAST
NO. OF RESERVOIRS:  4

RESERVOIR INFORMATION

RESERVOIR: UPPER TUSCALOOSA
NO. OF ZONES: DISCOVERY YEAR: 1944
AREA, ACRES: 520 SPACING, ACRES: 40
TOTAL WELLS: 13 PRODUCING WELLS: 13
SHUT-IN WELLS: INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: UPPER TUSCALOOSA
GEOLOGICAL AGE: UPPER CRETACEOUS
BASIN: MID-GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULTED DOME
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.: 
HETEROGENEITY; CLAY CONTENT, %:
FAULTING; INTERBEDDED STREAKS:
FRACTURE; BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4932
GROSS PAY, FT: 
POROSITY, %: 28.8
PERMEABILITY, MD:
BHT, DEF F: 152
GAS CAP: 
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 70.0
WTR SAT., %; 30.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL; 77
BHP, PSI; 2196

NET PAY, FT: 55
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI: 891
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 50.0 *
WTR SAT., %; 50.0
GAS SAT., %;
FVF, BBL/STB; 1.000 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
### FLUID CHARACTERISTICS

- **OIL GRAVITY, API:** 24.5
- **RANGE:** 22.0 TO 30.0
- **VISCOSITY @ BHT, CP:**
- **RANGE:**
- **SAybolt Visc (100F), SEC:** 250
- **SULFUR CONTENT, %:** 3.70
- **CARBON RESIDUE, %:** 10.5
- **OIL TYPE:**
- **WATER SALINITY, PPM:**
- **WATER HARDNESS:** CA, PPM; MG, PPM;

### RESERVES AND PRODUCTION DATA

- **ORIGINAL OIL IN PLACE, STB:** 42,600,000
  - BBL/AC-FT: 1490
- **ORIGINAL GAS IN PLACE, MCF:**
- **CUM PROD (DEC 31, 1977):**
  - OIL, BBL: 10,863,512
  - GAS, MCF: 827,765
  - WATER, BBL: 61,323,182
- **1977 ANNUAL PROD:**
  - OIL, BBL: 240,817
  - GAS, MCF: 23,989
  - WATER, BBL: 3,871,733
- **OIL REMAINING IN PLACE, STB:** 31,700,000
  - BBL/AC-FT: 1110
- **RESERVES (DEC 31, 1977):**

### PRIMARY PRODUCTION:

- **MECHANISM:**
- **RECOVERY FACTOR, %:**
- **ANNUAL DECLINE RATE, %:**

### SOURCES:

5, 14, 17, 191; 11
STATE: MISSISSIPPI  
COUNTY: JASPER  
FIELD NAME: HEIDELBERG, WEST  
NO. OF RESERVOIRS: 10

RESERVOIR INFORMATION

RESERVOIR: CHRISTMAS  
NO. OF ZONES:  
AREA, ACRES: 560  
TOTAL WELLS: 13  
SHUT-IN WELLS:  
DISCOVERY YEAR: 1971  
SPACING, ACRES: 43  
PRODUCING WELLS: 13  
INJECTION WELLS: 

GEOLOGICAL INFORMATION

FORMATION: CHRISTMAS  
GEOLOGICAL AGE: UPPER CRETACEOUS  
BASIN: MID-GULF COAST BASIN  
TRAP TYPE:  
LITHOLOGY: SAND  
DEGREE OF CONSOLIDATION;  
HETEROGENEITY;  
FAULTING;  
FRACTURE;  
DIP, DEG.:  
CLAY CONTENT, %:  
INTERBEDDED STREAKS:  
BARRIER TO FLOW: 

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4974  
GROSS PAY, FT:  
POROSITY, %: 29.4  
PERMEABILITY, MD: 1100  
BHT, DEF P: 150  
GAS CAP:  
NET PAY, FT: 46  
GAS CAP/OIL ZONE RATIO:  
INITIAL: OIL SAT., %: 79.0  
WTR SAT., %: 21.0  
GAS SAT., %:  
FVF, BBL/STB: 1.050 *  
WOR, BBL/BBL:  
GOR, SCF/BBL: 72  
BHP, PSI: 2100  
CURRENT: OIL SAT., %: 73.0 *  
WTR SAT., %: 27.0  
GAS SAT., %:  
FVF, BBL/STB: 1.030 *  
WOR, BBL/BBL:  
GOR, SCF/BBL:  
BHP, PSI:
FLUID CHARACTERISTICS

OIL GRAVITY, API: 24.3
VISCOSITY @ BHT, CP: 3.6
SAYBOLT VISC (100°F), SEC: 270
SULFUR CONTENT, %: 4.10
CARBON RESIDUE, %: 11.4
CARBON/HYDROGEN RATIO:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM:
WATER HARDNESS: Ca, PPM; Mg, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 44,200,000
ORIGINAL GAS IN PLACE, MCF: 3,141,171
CUM PROD (DEC 31, 1977): OIL, BBL; 2,567,678
GAS, MCF; 541,289
WATER, BBL; 10,929,963
1977 ANNUAL PROD: OIL, BBL; 319,455
GAS, MCF; 70,072
WATER, BBL; 2,531,990
OIL REMAINING IN PLACE, STB: 41,600,000
(DEC 31, 1977)
RESERVES (DEC 31, 1977)

PRIMARY PRODUCTION:
MECHANISM:
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SOURCES: 5, 14, 17, 191; 11
RESERVOIR AND PRODUCTION DATA ELEMENTS

CASE 223

STATE: MISSISSIPPI
COUNTY: JASPER
FIELD NAME: HEIDELBERG, WEST
NO. OF RESERVOIRS: 10

RESERVOIR INFORMATION

RESERVOIR: COTTON VALLEY
NO. OF ZONES: DISCOVERY YEAR: 1959
AREA, ACRES: 554 SPACING, ACRES: 50
TOTAL WELLS: 11 PRODUCING WELLS: 8
SHUT-IN WELLS: 1 INJECTION WELLS: 2

GEOLOGICAL INFORMATION

FORMATION: COTTON VALLEY
GEOLOGICAL AGE: U. JURASSIC
BASIN: MID-GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULTED DOME
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 11750
GROSS PAY, FT:
POROSITY, %: 16.4
PERMEABILITY, MD: 39
BHT, DEG F: 221
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 85.0
WTR SAT., %; 15.0
GAS SAT., %;
FVF, BBL/STB: 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL: 108
BHP, PSI: 5000
NET PAY, FT: 30
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI: 930
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 70.0 *
WTR SAT., %; 30.0
GAS SAT., %;
FVF, BBL/STB: 1.010 *
WOR, BBL/BBL;
GOR, SCF/BBL: 100
BHP, PSI: 2634
FLUID CHARACTERISTICS

OIL GRAVITY, API: 23.0  RANGE: 18.0 TO 30.0
VISCOSITY @ BHT, CP: @ F, CP:
SAYBOLT VISC (100°F), SEC: 350
SULFUR CONTENT, %: 4.10  CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 11.4  ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 17,100,000  BBL/AC-FT: 1030
ORIGINAL GAS IN PLACE, MCF:
CUM PROD : OIL, BBL; 2,423,684
(DEC 31, 1977) GAS, MCF; 358,276
WATER, BBL; 72,698
1977 ANNUAL PROD: OIL, BBL; 108,105
GAS, MCF; 808
WATER, BBL;
OIL REMAINING IN PLACE, STB: 14,700,000  BBL/AC-FT: 884
(DEC 31, 1977)
RESERVES (DEC 31

PRIMARY PRODUCTION:
MECHANISM: FLUID EXPANSION
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 AIR INJECTION (1971- )

AREA, ACRES:
NO. PROD WELLS: 7  FLUID INJECTED: A/FG
NO. INJ WELLS: 2
VOLUME INJECTED: (EQUIV) WATER, BBL:
GAS, MCF; 2,134,855
CUMULATIVE PROD: OIL, BBL; 1,557,299
(GRU 1977) GAS, MCF; 228,801
WATER, BBL; 57,456
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: ACT.
OPERATOR(S): GULF OIL

REMARKS: SECONDARY AIR INJECTION INTO COTTON VALLEY #5 ONLY

SOURCES: 5, 14, 17, 191; 11, 16, 18
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: MISSISSIPPI
COUNTY: JASPER
DISTRICT: FIELD NAME: HEIDELBERG, WEST
NO. OF RESERVOIRS: 10

RESERVOIR INFORMATION

RESERVOIR: EUTAW
NO. OF ZONES: DISCOVERY YEAR: 1944
AREA, ACRES: 1920 SPACING, ACRES: 38
TOTAL WELLS: 50 PRODUCING WELLS: 49
SHUT-IN WELLS: 1 INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: EUTAW
GEOLOGICAL AGE: UPPER CRETACEOUS
BASIN: MID-GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULTED DOME
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.:
HETEROGENEITY; CLAY CONTENT, %:
FAULTING; INTERBEDDED STREAKS:
FRACTURE; BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 5000
GROSS PAY, FT: NET PAY, FT: 31
POROSITY, %: 28.7 RANGE: TO 1021
PERMEABILITY, MD: 300 RANGE: TO
BHT, DEF F: 150 SAT. PRESSURE, PSI: 446
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 66.4 CURRENT: OIL SAT., %; 38.0 *
WTR SAT., %; 33.6 WTR SAT., %; 62.0
GAS SAT., %; GAS SAT., %;
FVF, BBL/STB; 1.127 FVF, BBL/STB; 1.030 *
WOR, BBL/BBL;
GOR, SCF/BBL; 72 GOR, SCF/BBL; 207
BHP, PSI; 2034 BHP, PSI; 520
FLUID CHARACTERISTICS

OIL GRAVITY, API: 22.0  
VISCOSITY @ BHT, CP: 28.0; @ F, CP: 
SAYBOLT VISC (100F), SEC: 500  
SULFUR CONTENT, %: 4.00  
CARBON RESIDUE, %: 12.0  
CARBON/HYDROGEN RATIO:  
ACID NUMBER:  
OIL TYPE: 
WATER SALINITY, PPM;  
WATER HARDNESS: CA, PPM;  
MG, PPM;  

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 75,500,000  
ORIGINAL GAS IN PLACE, MCF: 
CUM PROD : OIL, BBL; 27,908,000 
(GDEC 31, 1977) GAS, MCF; 5,214,244 
WATER, BBL; 64,870,104  
1977 ANNUAL PROD: OIL, BBL; 508,442 
GAS, MCF; 187,545  
WATER, BBL; 2,045,164  
OIL REMAINING IN PLACE, STB: 47,600,000  
(DEC 31, 1977)  
RESERVES (DEC 31, )  

PRIMARY PRODUCTION:  
MECHANISM: SOLUTION GAS  
RECOVERY FACTOR, %:  
ANNUAL DECLINE RATE, %:  

SOURCES: 5, 11, 14, 17, 191
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: MISSISSIPPI
COUNTY: CLARKE
FIELD NAME: JUNCTION CITY
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: EUTAW
NO. OF ZONES: 38
AREA, ACRES: 1320
TOTAL WELLS: 38
SHUT-IN WELLS: 1
DISCOVERY YEAR: 1958
SPACING, ACRES: 34
PRODUCING WELLS: 37
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: EUTAW
GEOLOGICAL AGE: UPPER CRETACEOUS
BASIN: MID-GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULT CLOSURE
LITHOLOGY: SAND
DIP, DEG.: 128
CLAY CONTENT, %: 5%
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 3710
GROSS PAY, FT: 3710
POROSITY, %: 29.9
PERMEABILITY, MD: 3710
BHT, DEF F: 120
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 50.0
WTR SAT., %: 35.0
GAS SAT., %:
FVF, BBL/STB: 1.050 *
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI: 1620
NET PAY, FT: 25
RANGE, TO:
RANGE: TO 1090
GAS SAT., %: 35.0
WTR SAT., %: 59.0 *
GAS SAT.:
FVF, BBL/STB: 1.050 *
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:

282
FLUID CHARACTERISTICS

OIL GRAVITY, API: 18.2

RANGE: 16.0 TO 20.0

VISCOITY @ BHT, CP:

; @ F, CP:

SAYBOLT VISC (100°F), SEC:

SULFUR CONTENT, %:

CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %:

ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM;

WATER HARDNESS: CA, PPM;

MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 47,400,000

ORIGINAL GAS IN PLACE, MCF: 

CUM PROD: OIL, BBL; 3,714,581

(GDEC 31, 1977) GAS, MCF; 191,490

WATER, BBL; 13,710,884

1977 ANNUAL PROD: OIL, BBL; 186,120

GAS, MCF; 13710884

WATER, BBL; 1,196,197

OIL REMAINING IN PLACE, STB: 43,700,000

(DEC 31, 1977)

RESERVES (DEC 31, )

PRIMARY PRODUCTION:

MECHANISM:

RECOVERY FACTOR, %:

ANNUAL DECLINE RATE, %:

BBL/AC-FT:

SOURCES: 5, 14, 17, 191
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: MISSISSIPPI
COUNTY: CLARKE
FIELD NAME: LANGSDALE
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: EUTAW
REZOS: 1320
TOTAL WELLS: 19
SPACING, ACRES: 57
NO. OF ZONES: DISCOVERY YEAR: 1945
PRODUCING WELLS: 18
SHUT-IN WELLS: 1
INJECTION WELLS: 4

GEOLOGICAL INFORMATION

FORMATION: EUTAW
GEOLOGICAL AGE: UPPER CRETACEOUS
BASIN: MID-GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULT CLOSURE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.: 30.0
HETEROGENEITY; CLAY CONTENT, %:
FAULTING; INTERBEDDED STREAKS:
FRACTURE; BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 3700
GROSS PAY, FT: 22
POROSITY, %: 30.0
PERMEABILITY, MD: 20
BHT, DEF F: 120

GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 60.0
WTR SAT., %; 40.0
GAS SAT., %;
FVF, BBL/STB; 1.050
WOR, BBL/BBL;
GOR, SCF/BBL; 25
BHP, PSI; 1600

NET PAY, FT: 22
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 50.0 *
WTR SAT., %; 50.0
GAS SAT., %;
FVF, BBL/STB; 1.010 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 19.0   RANGE: 19.0 TO 20.0
VISCOSITY @ BHT, CP:   @ F, CP:
SAYBOLT VISC (100F), SEC:  850
SULFUR CONTENT, %:  4.13
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:  11.7
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM:
WATER HARDNESS: CA, PPM;  MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB:  38,600,000  BBL/AC-FT: 1330
ORIGINAL GAS IN PLACE, MCF:
CUM PROD  (DEC 31, 1977):  OIL, BBL;  4,991,871  GAS, MCF;  127,123
WATER, BBL;  28,350,671
1977 ANNUAL PROD:  OIL, BBL;  60,139  GAS, MCF;
WATER, BBL;  1,270,159
OIL REMAINING IN PLACE, STB:  33,600,000  BBL/AC-FT: 1158  (DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SG & WD
RECOVERY FACTOR, %:  BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD  (1967- )

AREA, ACRES: 1320  FLUID INJECTED: SW/P
NO. PROD WELLS: 16  NO. INJ WELLS: 4
VOLUME INJECTED: (EQUIV) WATER, BBL; 4,747,460  GAS, MCF;
CUMULATIVE PROD:  OIL, BBL;  3,971,466  GAS, MCF;
(WTHRU 1977)  WATER, BBL;  13,007,503
RECOVERY FACTOR, %:  BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): ARDEN A. ANDERSON

REMARKS: FAILURE TO FLOOD CAUSED SECONDARY PROD DROP

SOURCES: 5, 14, 17, 191

285
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: MISSISSIPPI
COUNTY: JONES
DISTRICT:
FIELD NAME: LOVETT
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: EUTAW
NO. OF ZONES:  
AREA, ACRES: 680
TOTAL WELLS: 19
SHUT-IN WELLS: 5
DISCOVERY YEAR: 1950
PRODUCING WELLS: 14
INJECTION WELLS:

SPACING, ACRES: 35

GEOLOGICAL INFORMATION

FORMATION: EUTAW
GEOLOGICAL AGE: UPPER CRETACEOUS
BASIN: MID-GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULTED DOME
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 7850
GROSS PAY, FT:  
POROSITY, %: 30.0
PERMEABILITY, MD: 300
BHT, DEG F: 170
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 65.0
WTR SAT., %: 35.0
GAS SAT., %:
FVF, BBL/STB: 1.050
WOR, BBL/BBL:
GOR, SCF/BBL: 200
BHP, PSI: 2975
NET PAY, FT: 25
RANGE: TO
RANGE: 200 TO 400
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 49.0 *
WTR SAT., %: 51.0
GAS SAT., %:
FVF, BBL/STB: 1.000 *
WOR, BBL/BBL:
GOR, SCF/BBL: 200
BHP, PSI:
FLUID CHARACTERISTICS

OIL GRAVITY, API: 9.5 RANGE: 9.0 TO 13.0
VISCOSITY @ BHT, CP:;
SAYBOLT VISC (100°F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;
CARBON/HYDROGEN RATIO:
ACID NUMBER:

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 24,500,000 BBL/AC-FT: 1441
ORIGINAL GAS IN PLACE, MCF: 39,309
CUM PROD (DEC 31, 1977):
OIL, BBL; 5,106,013
GAS, MCF; 22,279,096
WATER, BBL; 2,736,574
1977 ANNUAL PROD:
OIL, BBL; 273,981
GAS, MCF; 39,309
WATER, BBL; 2,736,574
OIL REMAINING IN PLACE, STB: 19,400,000 BBL/AC-FT: 1140
(DEC 31, 1977)
RESERVES (DEC 31, 1977)

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SOURCES: 5, 14, 17, 191
CASE 228
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: MISSISSIPPI
COUNTY: JONES
DISTRICT:
FIELD NAME: SANDERSVILLE
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: EUTAW
NO. OF ZONES: 
AREA, ACRES: 900
TOTAL WELLS: 14
SHUT-IN WELLS: 

GEOLOGICAL INFORMATION

FORMATION: EUTAW
GEOLOGICAL AGE: UPPER CRETACEOUS
BASIN: MID-GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULT CLOSURE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 5276
GROSS PAY, FT: 
POROSITY, %: 25.0
PERMEABILITY, MD: 
BBT, DEF F: 160
GAS CAP: 
GAS CAP/OIL ZONE RATIO: 
INITIAL: OIL SAT., %; 60.0
WTR SAT., %; 40.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 2250
NET PAY, FT: 30
RANGE: TO
RANGE: 120 TO 2000
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 49.0 *
WTR SAT., %; 51.0
GAS SAT., %;
FVF, BBL/STB; 1.010 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 12.0
VISCOSITY @ BHT, CP;
SAYBOLT VISC (100ºF), SEC;
SULFUR CONTENT, %:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: Ca, PPM;
CARBON/HYDROGEN RATIO:
ACID NUMBER:
RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 29,900,000
ORIGINAL GAS IN PLACE, MCF: 4,391,159
CUM PROD (DEC 31, 1977):
OIL, BBL: 28,674
GAS, MCF: 2,021,924
WATER, BBL: 27,083
1977 ANNUAL PROD:
OIL, BBL: 75,083
GAS, MCF: 2,897,968
WATER, BBL: 20,061
ORIGINAL GAS IN PLACE, MCF: 4,391,159
WATER, BBL: 27,021,824
1977 ANNUAL PROD:
OIL, BBL: 75,083
GAS, MCF: 2,897,968
WATER, BBL: 20,061
RESERVES (DEC 31, 1977): 25,500,000
BBL/AC-FT: 1108
BBL/AC-FT: 946
PRIMARY PRODUCTION:
MECHANISM:
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SOURCES: 5, 14, 17, 191
STATE: MISSISSIPPI
COUNTY: JONES & COVINGTON
DISTRICT:
FIELD NAME: SUMMERLAND
NO. OF RESERVOIRS: 10

RESERVOIR INFORMATION

RESERVOIR: U WASHITA - FREDERICKSBURG
NO. OF ZONES: 10
DISCOVERY YEAR: 1961
AREA, ACRES: 600
SPACING, ACRES: 66
TOTAL WELLS: 9
PRODUCING WELLS: 7
SHUT-IN WELLS: 2
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: U WASHITA - FREDERICKSBURG
GEOLOGICAL AGE: COMANCHE
BASIN: MID-GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRActURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 9400
NET PAY, FT: 33
POROSITY, %: 20.0
RANGE:
PERMEABILITY, MD: 265
RANGE: 10 TO 1720
BHT, DEF F: 200
SAT. PRESSURE, PSI:
GAS CAP:
GAS CAP, ACRES:
GAS CAP/OIL ZONE RATIO:
WETTING PHASE:
INITIAL: OIL SAT., %; 79.3
CURRENT: OIL SAT., %; 60.0 *
WTR SAT., %; 20.7
WTR SAT., %; 40.0
GAS SAT., %;
GAS SAT., %;
FVF, BBL/STB; 1.050 *
FVF, BBL/STB; 1.000 *
WOR, BBL/BBL;
WOR, BBL/BBL;
GOR, SCF/BBL; 105
GOR, SCF/BBL; 175
BHP, PSI; 4225
BHP, PSI; 3684
FLUID CHARACTERISTICS

OIL GRAavity, API: 25.0 RANGE: 23.0 TO 31.0
VISCOSITY @ BHT, CP: @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM:
WATER HARDNESS: CA, PPM; MG, PPM:

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 22,900,000 BBL/AC-FT: 1172
ORIGINAL GAS IN PLACE, MCF:
CUM PROD : OIL, BBL; 4,650,889
(DEC 31, 1977) GAS, MCF; 684,167
WATER, BBL; 5,412,213
1977 ANNUAL PROD: OIL, BBL; 91,077
GAS, MCF; 9,107
WATER, BBL; 374,813
OIL REMAINING IN PLACE, STB: 18,200,000 BBL/AC-FT: 933
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: FLUID EXPANSION
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 PRESSURE MAINTENANCE (1969-1971)

AREA, ACRES: FLUID INJECTED SW
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL; 1,869,411
GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 2,021,130
(GTHRU 1976) GAS, MCF; 200,091
WATER, BBL; 3,697,004
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: ABND
OPERATOR(S): TRIAD OIL & GAS CO

SOURCES: 5,14,17,191
CASE 230

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: MISSISSIPPI
COUNTY: WAYNE
DISTRICT:
FIELD NAME: YELLOW CREEK, EAST
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: EUTAW
NO. OF ZONES: 1
AREA, ACRES: 1040
TOTAL WELLS: 30
SHUT-IN WELLS:

DISCOVERY YEAR: 1948
SPACING, ACRES: 34
PRODUCING WELLS: 26
INJECTION WELLS: 4

GEOLOGICAL INFORMATION

FORMATION: EUTAW
GEOLOGICAL AGE: UPPER CRETACEOUS
BASIN: MID-GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINAL DOME
LITHOLOGY: SAND
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4800
GROSS PAY, FT: 
POROSITY, %: 27.5
PERMEABILITY, MD: 
BHT, DEF F: 160
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 50.0
WTR SAT., %; 50.0
GAS SAT., %;
FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL; 56
BHP, PSI; 1948
NET PAY, FT: 18
RANGE: TO
RANGE: 25 TO 500
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 32.0 *
WTR SAT., %; 68.0
GAS SAT., %;
FVF, BBL/STB; 1.000 *
WOR, BBL/BBL;
GOR, SCF/BBL; 65
BHP, PSI; 250
FLUID CHARACTERISTICS

OIL GRAVITY, API: 20.0
VISCOSITY @ BHT, CP: 90
SAYBOLT VISC (100°F), SEC: 960
SULFUR CONTENT, %: 3.85
CARBON RESIDUE, %: 10.3
CARBON/HYDROGEN RATIO:
ACID NUMBER:
WATER SALINITY, PPM:
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 20,000,000 BBL/AC-FT: 1067
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 7,404,869 (DEC 31, 1977)
GAS, MCF; 36,837,549
WATER, BBL; 248,444
1977 ANNUAL PROD: OIL, BBL; 115,368
GAS, MCF; 145
WATER, BBL; 1,856,230
OIL REMAINING IN PLACE, STB: 12,600,000 BBL/AC-FT: 671
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %: BBL/AC-FT: 250
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1972- )

AREA, ACRES: 440
NO. PROD WELLS: 12
FLUID INJECTED: SW
NO. INJ WELLS: 4
VOLUME INJECTED: (EQUIV) WATER, BBL; 5,151,636
GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 422,244 (THRU 1976)
GAS, MCF;
WATER, BBL; 2,997,873
RECOVERY FACTOR, %: 9.2 BBL/AC-FT: 100
DEGREE OF SUCCESS: ACT.
OPERATOR(S): LYLE CASHION CO.

SOURCES: 5, 14, 17, 191
CASE 231

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: MISSISSIPPI
COUNTY: WAYNE
DISTRICT:
FIELD NAME: YELLOW CREEK, WEST
NO. OF RESERVOIRS: 6

RESERVOIR INFORMATION

RESERVOIR: EUTAW
NO. OF ZONES: 4
AREA, ACRES: 3560
TOTAL WELLS: 93
SHUT-IN WELLS: 1

DISCOVERY YEAR: 1947
SPACING, ACRES: 38
PRODUCING WELLS: 66
INJECTION WELLS: 26

GEOLOGICAL INFORMATION

FORMATION: EUTAW
GEOLOGICAL AGE: UPPER CRETACEOUS
BASIN: MID-GULF COAST BASIN
TRAP TYPE: STRUCTURAL - GRABEN FAULT
LITHOLOGY: SAND

DEPTH, FT: 4938
GROSS PAY, FT:
POROSITY, %: 26.7
PERMEABILITY, MD: 167
BHT, DEF F: 150
GAS CAP:

GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 62.0
WTR SAT., %: 38.0
GAS SAT., %:
FVF, BBL/STB: 1.060
WOR, BBL/BBL:
GOR, SCF/BBL: 65
BHP, PSI: 2025

NET PAY, FT: 38
RANGE: TO
RANGE: TO 1400
SAT. PRESSURE, PSI: 220
GAS CAP, ACRES:

WETTING PHASE:
CURRENT: OIL SAT., %: 48.0 *
WTR SAT., %: 52.0
GAS SAT., %:
FVF, BBL/STB: 1.010 *
WOR, BBL/BBL:
GOR, SCF/BBL: 25
BHP, PSI: 1000

FLUID CHARACTERISTICS

OIL GRAVITY, API: 20.0
VISCOITY @ BHT, CP: 21.0;
SAYBOLT VISC (100°F), SEC: 450
SULFUR CONTENT, %: 3.85
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 10.3
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM; 6000

294
RESERVES AND PRODUCTION DATA

CASE 231

ORIGINAL OIL IN PLACE, STB: 120,000,000 BBL/AC-FT: 882
ORIGINAL GAS IN PLACE, MCF:

CUM PROD: OIL, BBL: 22,501,149
(GAS, MCF: 1,037,709
WATER, BBL: 50,365,524

1977 ANNUAL PROD: OIL, BBL: 876,868

GAS, MCF:
WATER, BBL: 4,424,426

OIL REMAINING IN PLACE, STB: 96,800,000 BBL/AC-FT: 715

RESERVES (DEC 31, 1977)

PRIMARY PRODUCTION:
MECHANISM: FLUID EXPANSION
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1973-)

AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S):

T.1 POLYMER FLOOD (1973-1982)

AREA, ACRES:
NO. PROD WELLS: 63
NO. INJ WELLS: 26
VOLUME INJECTED: (EQUIV) WATER, BBL: 18,658,252
GAS, MCF;
CUMULATIVE PROD: OIL, BBL: 3,853,756
GAS, MCF: 25,547
WATER, BBL: 3,667,942
RECOVERY FACTOR, %: 9.0
DEGREE OF SUCCESS:
OPERATOR(S): EXXON CORP.

REMARKS: OOIP FROM 1977 STATE O&G BULLETIN

SOURCES: 5, 14, 17, 191; 11, 16, 181, 192
STATE: OKLAHOMA  
COUNTY: GARVIN  
DISTRICT: SOUTH CENTRAL  
FIELD NAME: PAULS VALLEY SOUTHEAST  
NO. OF RESERVOIRS: 5

RESERVOIR INFORMATION

RESERVOIR: OIL CREEK SAND  
NO. OF ZONES: 1  
AREA, ACRES: 325  
TOTAL WELLS:  
SHUT-IN WELLS: 2  
PRODUCING WELLS: 13  
INJECTION WELLS: 5

DISCOVERY YEAR: 1955  
SPACING, ACRES: 16

GEOLOGICAL INFORMATION

FORMATION: OIL CREEK  
GEOLOGICAL AGE: M. ORDOVICIAN  
basin: OKLAHOMA FOLDED BELT  
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINAL NOSE  
lithology: SAND  
DEGREE OF: CONSOLIDATION; UNC DIP, DEG.: 3.0  
HETERGENEITY; MINOR CLAY CONTENT, %:  
FAULTING; NONE  
INTERBEDDED STREAKS: NO  
FRACTURE; MINOR  
BARRIER TO FLOW: NO

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4300  
GROSS PAY, FT: 100  
POROSITY, %: 23.5  
PERMEABILITY, MD: 2000  
BHT, DEF F: 110  
GAS CAP: NO  
GAS CAP/OIL ZONE RATIO:  
INITIAL: OIL SAT., %: 80.0  
WTR SAT., %: 20.0  
GAS SAT., %:  
FVF, BBL/STB: 1.000  
WOR, BBL/BBL:  
GOR, SCF/BBL:  
BHP, PSI: 1850  
NET PAY, FT: 58  
RANGE: TO  
SAT. PRESSURE, PSI:  
GAS CAP, ACRES:  
WETTING PHASE:  
CURRENT: OIL SAT., %:  
WTR SAT., %:  
GAS SAT., %:  
FVF, BBL/STB:  
WOR, BBL/BBL:  
GOR, SCF/BBL:  
BHP, PSI:

FLUID CHARACTERISTICS

OIL GRAVITY, API: 10.0  
VISCOITY @ BHT, CP: 7500.0; @ °F, CP:  
SAYBOLT VISC (100F), SEC:  
SULFUR CONTENT, %:  
CARBON RESIDUE, %:  
CARBON/HYDROGEN RATIO:  
ACID NUMBER:  
OIL TYPE:  
WATER SALINITY, PPM:  
WATER HARDNESS: CA, PPM; MG, PPM:
RESERVES AND PRODUCTION DATA

CASE 234

ORIGINAL OIL IN PLACE, STB: 27,700,000
ORIGINAL GAS IN PLACE, MCF: 1459

CUM PROD: OIL, BBL; 1,502,863
(GAS, MCF; WATER, BBL;

1975 ANNUAL PROD: OIL, BBL; 98,808
GAS, MCF; WATER, BBL;

OIL REMAINING IN PLACE, STB: BBL/AC-FT: 

(PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %: 5.0 BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 PROD WATER REINJ. (1965- )

AREA, ACRES: FLUID INJECTED: WATER
NO. PROD WELLS: NO. INJ WELLS: 2
VOLUME INJECTED: (EQUIV) WATER, BBL; GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S):

T.1 IN-SITU COMBUSTION (1970-1972)

AREA, ACRES: 30 FLUID INJECTED: AIR
NO. PROD WELLS: 2 NO. INJ WELLS: 1
VOLUME INJECTED: (EQUIV) WATER, BBL; GAS, MCF; 886,000
CUMULATIVE PROD: OIL, BBL; 112,000
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: GOOD
OPERATOR(S): SOHIO PET. CO.

SOURCES: 5, 14; 194, 198
STATE: OKLAHOMA
COUNTY: CARTER
DISTRICT: SOUTH CENTRAL
FIELD NAME: SHO-VEL-TUM
NO. OF RESERVOIRS: 51

RESERVOIR INFORMATION

RESERVOIR: 4TH DEESE (DES MOINES OR PENN SD)
NO. OF ZONES: 1
AREA, ACRES: 705
TOTAL WELLS:
SHUT-IN WELLS:
DISCOVERY YEAR: 1925
SPACING, ACRES: 6
PRODUCING WELLS: 103
INJECTION WELLS: 8

GEOLOGICAL INFORMATION

FORMATION: DEESE
GEOLOGICAL AGE: UPPER PENN.
BASIN: OKLAHOMA FOLDED BELT
TRAP TYPE: STRUCT-STRAT
LITHOLOGY: SAND
DIP, DEG.: 45.0
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1400
GROSS PAY, FT:
POROSITY, %: 28.0
PERMEABILITY, MD: 500
BHT, DEF F: 80
GAS CAP:
NET PAY, FT: 50
RANGE:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 78.0
WTR SAT., %; 22.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 75
CURRENT: OIL SAT., %;
WTR SAT., %;
GAS SAT., %;
FVF, BBL/STB;
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 15.0
VISCOITY @ BHT, CP: 1000.0; @ F, CP:
SAYBOLT VISC (100F), SSC: 4000
SULFUR CONTENT, %: 2.00
CARBON RESIDUE, %: 10.0
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: BBL/AC-FT: 1614
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 2,943,371
GAS, MCF;
WATER, BBL;
1976 ANNUAL PROD: OIL, BBL; 97,315
GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB: BBL/AC-FT:
RESERVES (DEC 31, 1976)

PRIMARY PRODUCTION:
MECHANISM: SG & GRAV DRNGE
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1964- )
AREA, ACRES: 450
NO. PROD WELLS: 90
NO. INJ WELLS: 12
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 5,342,225
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): SHELL AND MOBIL
SECONDARY AND TERTIARY RECOVERIES (CONT.)

T.1 STEAM DRIVE (1964- )

AREA, ACRES: 60 FLUID INJECTED: S
NO. PROD WELLS: 20 NO. INJ WELLS: 4
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): SHELL - HEPNER LEASE

T.2 IN-SITU COMBUSTION (1961- )

AREA, ACRES: 94 FLUID INJECTED: A
NO. PROD WELLS: 22 NO. INJ WELLS: 2
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): MOBIL - COX PENN LEASE

REMARKS: THREE SECONDARY WATERFLOOD PROJECTS

SOURCES: 5,14; 11,15,195,196,198
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: OKLAHOMA
COUNTY: CARTER
DISTRICT: SOUTH CENTRAL
FIELD NAME: SHO-VEL-TUM
NO. OF RESERVOIRS: 51

RESERVOIR INFORMATION

RESERVOIR: PONTOTOC (OIL CITY UNIT)
NO. OF ZONES: 1 DISCOVERY YEAR: 1904
AREA, ACRES: 370 SPACING, ACRES: 6
TOTAL WELLS: PRODUCING WELLS: 45
SHUT-IN WELLS: INJECTION WELLS: 10

GEOLOGICAL INFORMATION

FORMATION: PONTOTOC GEOLOGICAL AGE: DESMOINIAN
BASIN: OKLAHOMA FOLDED BELT
TRAP TYPE: STRUCTURAL - LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETERGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1000 GROSS PAY, FT:
POROSITY, %: 25.0 PERMEABILITY, MD: 5000
BHT, DEF F: 80 GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 75.0 *
WTR SAT., %; 25.0 GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 33 RANGE: TO
RANGE: TO SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 72.0 *
WTR SAT., %; 28.0 GAS SAT., %;
FVF, BBL/STB; 1.040 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 21.0
RANGE: TO
VISCOSITY @ BHT, CP: 150.0; @ F, CP:
SAYBOLT VISC (100F), SEC: 530
SULFUR CONTENT, %: 1.50
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 5.5
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM:
WATER HARDNESS: CA, PPM:

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 16,900,000
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1976): OIL, BBL; 556,472
GAS, MCF;
WATER, BBL;
1976 ANNUAL PROD: OIL, BBL; 27,829
GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB: 16,400,000
(DEC 31, 1976)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: FLUID EXPANSION
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1962- )
AREA, ACRES: 300
NO. PROD WELLS: 45
VOLUME INJECTED: (EQUIV) WATER, BBL; 6,490,696
GAS, MCF;
CUMULATIVE PROD (THRU 1976): OIL, BBL; 556,472
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S): TWIN MTN. OIL CO

BBL/AC-FT:

FLUID INJECTED: W
NO. INJ WELLS: 10

REMARKS: FORMERLY WHEELER FIELD (UNTIL 1975)

SOURCES: 5,14; 11,15,196,198
STATE: OKLAHOMA  
COUNTY: STEPHENS  
DISTRICT: SOUTHWEST  
FIELD NAME: LOCO  
NO. OF RESERVOIRS: 3

RESERVOIR INFORMATION

RESERVOIR: LOCO SANDS  
NO. OF ZONES:  
AREA, ACRES: 4000 *  
TOTAL WELLS:  
SHUT-IN WELLS:  
DISCOVERY YEAR: 1917  
SPACING, ACRES:  
PRODUCING WELLS:  
INJECTION WELLS: 

GEOLOGICAL INFORMATION

FORMATION: LOCO AND HOXBAR  
GEOLOGICAL AGE: PENNSYLVANIAN-PERMIAN  
BASIN: OKLAHOMA FOLDED BELT  
TRAP TYPE: STRUCTURAL  
LITHOLOGY: SAND  
DEGREE OF: CONSOLIDATION; UNC DIP, DEG.:  
HETEROGENEITY; MINOR CLAY CONTENT, %:  
FAULTING;  
FRACTURE;  
BARRIER TO FLOW: 

RESERVOIR CHARACTERISTICS

DEPTH, FT: 350  
GROSS PAY, FT:  
POROSITY, %: 27.0  
PERMEABILITY, MD: 500  
BHT, DEF F: 70  
GAS CAP: NO  
GAS CAP/OIL ZONE RATIO:  
INITIAL: OIL SAT., %; 74.0  
WTR SAT., %; 26.0  
GAS SAT.;  
FVF, BBL/STB; 1.050  
WOR, BBL/BBL; 5  
GOR, SCF/BBL;  
BHP, PSI;  
NET PAY, FT: 18  
RANGE: TO  
RANGE: 10 TO 5000  
SAT. PRESSURE, PSI:  
GAS CAP, ACRES:  
WETTING PHASE:  
CURRENT: OIL SAT., %;  
WTR SAT., %;  
GAS SAT., %;  
FVF, BBL/STB;  
WOR, BBL/BBL;  
GOR, SCF/BBL;  
BHP, PSI;
CASE 237

FLUID CHARACTERISTICS

OIL GRAVITY, API: 21.0
RANGE: TO
VISCOSITY @ BHT, CP: 798.0; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 260
WATER HARDNESS: Ca, PPM; 10 Mg, PPM; 18

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB:
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL;
(GDEC 31, ) GAS, MCF;
WATER, BBL;
ANNUAL PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB:
(GDEC 31, )
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: FE, SG AND WD
RECOVERY FACTOR, %: 15.0
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1955- )
AREA, ACRES: 4000
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(GTHRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 15.0
DEGREE OF SUCCESS:
OPERATOR(S):

FLUID INJECTED: W
NO. INJ WELLS:
BBL/AC-FT: 1476
### T.1 IN-SITU COMBUSTION (1975-1980)

<table>
<thead>
<tr>
<th>AREA, ACRES:</th>
<th>24</th>
<th>FLUID INJECTED:</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. PROD WELLS:</td>
<td>25</td>
<td>NO. INJ WELLS:</td>
<td>5</td>
</tr>
<tr>
<td>VOLUME INJECTED:</td>
<td>(EQUIV) WATER, BBL; GAS, MCF;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CUMULATIVE PROD:</td>
<td>OIL, BBL; (THRU ) GAS, MCF; WATER, BBL;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RECOVERY FACTOR, %:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEGREE OF SUCCESS:</td>
<td>POOR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPERATOR(S):</td>
<td>CONOCO</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### T.2 STEAM DRIVE (1976- )

<table>
<thead>
<tr>
<th>AREA, ACRES:</th>
<th>20</th>
<th>FLUID INJECTED:</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. PROD WELLS:</td>
<td>24</td>
<td>NO. INJ WELLS:</td>
<td>5</td>
</tr>
<tr>
<td>VOLUME INJECTED:</td>
<td>(EQUIV) WATER, BBL; GAS, MCF;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CUMULATIVE PROD:</td>
<td>OIL, BBL; (THRU ) GAS, MCF; WATER, BBL;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RECOVERY FACTOR, %: 46.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEGREE OF SUCCESS:</td>
<td>GOOD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPERATOR(S):</td>
<td>CONOCO</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**REMARKS:** ACREAGE REFLECTS SEVERAL POOLS; DATA FOR J SAND. AT LEAST 22 WF PROJ., INCL 1 HOTWATER FLOOD. SEVERAL THERMAL PROJ.; A SD CANDIDATE.

**SOURCES:** 5,14; 11,18,194,196,197,198
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: OKLAHOMA
COUNTY: STEPHENS
DISTRICT: SOUTHWEST
FIELD NAME: SHO-VEL-TUM
NO. OF RESERVOIRS: 51

RESERVOIR INFORMATION

RESERVOIR: HUMPHREY
NO. OF ZONES: 560
AREA, ACRES: 560
TOTAL WELLS: DISCOVERY YEAR: 1959
SHUT-IN WELLS: SPACING, ACRES: 70
PRODUCING WELLS: 6
INJECTION WELLS: 2

GEOLOGICAL INFORMATION

FORMATION: UNCONSOLIDATED HUMPHREY
GEOLOGICAL AGE:
BASIN: OKLAHOMA FOLDED BELT
TRAP TYPE: STRUCTURAL -
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 5000
GROSS PAY, FT:
POROSITY, %: 17.0
PERMEABILITY, MD: 33
BHT, DEP F: 110 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 75.0 *
WTR SAT., %; 25.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 30
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 69.0 *
WTR SAT., %; 31.0
GAS SAT., %;
FVF, BBL/STB; 1.030 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 21.0
VISCOSITY @ BHT, CP: 21.0
RANGE: TO
@ 60F, CP: 29.0
SAYBOLT VISC (100F), SEC: 
SULFUR CONTENT, %: 
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM:
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 15,800,000
ORIGINAL GAS IN PLACE, MCF: 
CUM PROD: OIL, BBL; 
(DEC 31, 1976) GAS, MCF; WATER, BBL; 
1976 ANNUAL PROD: OIL, BBL; GAS, MCF; WATER, BBL;
OIL REMAINING IN PLACE, STB: 14,900,000
(DEC 31, 1976) 
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 PRESSURE MAINTENANCE (1966- )

AREA, ACRES: 560
NO. PROD WELLS: 6
VOLUME INJECTED: (EQUIV) WATER, BBL: 2,980,564
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): GETTY OIL CO

REMARKS: FORMERLY CALLED VELMA UNCONSOLIDATED HUMPHREY FLD

SOURCES: 5,14; 11,15,198
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: OKLAHOMA
COUNTY: STEPHENS
DISTRICT: SOUTHWEST
FIELD NAME: SHO-VEL-TUM
NO. OF RESERVOIRS: 51

RESERVOIR INFORMATION

RESERVOIR: SIMS C-1, C-2
NO. OF ZONES: 2
AREA, ACRES: 2620
TOTAL WELLS: PRODUCING WELLS: 116
SHUT-IN WELLS: INJECTION WELLS: 88

GEOLOGICAL INFORMATION

FORMATION: SIMS
GEOLOGICAL AGE: BASIN: OKLAHOMA FOLDED BELT
TRAP TYPE: STRUCTURAL - LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACUTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 5200
GROSS PAY, FT:
POROSITY, %: 17.0
PERMEABILITY, MD: 164
BHT, DEF F: 110
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 75.0 *
WTR SAT., %: 25.0
GAS SAT., %:
FVF, BBL/STB: 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

NET PAY, FT: 57
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 33.0 *
WTR SAT., %: 67.0
GAS SAT., %:
FVF, BBL/STB: 1.000 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

FLUID CHARACTERISTICS

OIL GRAVITY, API: 25.0
VISCOITY @ BHT, CP: 13.6
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;

308
RESERVES AND PRODUCTION DATA

CASE 239

ORIGINAL OIL IN PLACE, STB: 140,700,000 BBL/AC-FT: 942
ORIGINAL GAS IN PLACE, MCF: 74,960,820
CUM PROD: OIL, BBL; GAS, MCF; WATER, BBL;
(DEC 31, 1976) 1,479,417
1976 ANNUAL PROD: OIL, BBL; GAS, MCF; WATER, BBL;
OIL REMAINING IN PLACE, STB: 65,700,000 BBL/AC-FT: 440
(DEC 31, 1976)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1955-)

AREA, ACRES: 111
NO. PROD WELLS: 111
NO. INJ WELLS: 85
VOLUME INJECTED: (EQUIV) WATER, BBL: 363,421,648
GAS, MCF:
CUMULATIVE PROD: OIL, BBL; GAS, MCF; WATER, BBL;
(THRU 1976) 47,055,166
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): AMOCO PROD CO

S.2 WATERFLOOD (1958-)

AREA, ACRES: 5
NO. PROD WELLS: 5
NO. INJ WELLS: 3
VOLUME INJECTED: (EQUIV) WATER, BBL: 7,472,162
GAS, MCF:
CUMULATIVE PROD: OIL, BBL; GAS, MCF; WATER, BBL;
(THRU 1976) 1,107,654
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): MOBIL OIL CORP

REMARKS: FORMERLY SHOLEM-ALECHEM (UNTIL 1955)

SOURCES: 5,14; 11,15,196,198
CASE 240

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: OKLAHOMA
COUNTY: STEPHENS
DISTRICT: SOUTHWEST
FIELD NAME: SHO-VEL-TUM
NO. OF RESERVOIRS: 51

RESERVOIR INFORMATION

RESERVOIR: TUSSY
NO. OF ZONES: DISCOVERY YEAR: 1945
AREA, ACRES: 1164 SPACING, ACRES: 15
TOTAL WELLS: PRODUCING WELLS: 28
SHUT-IN WELLS: 38 INJECTION WELLS: 8

GEOLOGICAL INFORMATION

FORMATION: TUSSY GEOLOGICAL AGE: DESMOINES
GEOLOGICAL AGE: DESMOINES BASIN: OKLAHOMA FOLDED BELT
TRAP TYPE: STRUCTURAL LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; HIGH DIP, DEG.: 45.0
HETEROGENEITY; HIGH CLAY CONTENT, %:
FAULTING; MINOR INTERBEDDED STREAKS: YES
FRACTURE; MINOR BARRIER TO FLOW: NO

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4098 NET PAY, FT: 55
GROSS PAY, FT: 250 RANGE: TO
POROSITY, %: 22.0 RANGE: TO
PERMEABILITY, MD: 70 SAT. PRESSURE, PSI: 1425
BHT, DEF F: 106 GAS CAP, ACRES:
GAS CAP: NO WETTING PHASE:
GAS CAP/OIL ZONE RATIO: CURRENT: OIL SAT., %; 63.0 *
INITIAL: OIL SAT., %; 73.0 WTR SAT., %; 37.0
WTR SAT., %; GAS SAT., %:
GAS SAT., %:
FVF, BBL/STB; 1.120 FVF, BBL/STB; 1.040
WOR, BBL/BBL; 2 WOR, BBL/BBL; 2
GOR, SCF/BBL; 245 GOR, SCF/BBL; 890
BHP, PSI; 2000. BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 25.0
VISCOSITY @ BHT, CP: 9.6
SAYBOLT VISC (100°F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM:
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 71,200,000 BBL/AC-FT: 1112
ORIGINAL GAS IN PLACE, MCF: 17,356,000
CUM PROD (DEC 31, 1978) GAS, MCF: 10,626,226
CUM PROD (DEC 31, 1978) WATER, BBL: 2,037,743
1978 ANNUAL PROD: OIL, BBL; 153,854
1978 ANNUAL PROD: GAS, MCF; 136,983
1978 ANNUAL PROD: WATER, BBL; 254,512
OIL REMAINING IN PLACE, STB: 65,900,000 BBL/AC-FT: 1029
OIL REMAINING IN PLACE, STB: 65,900,000 BBL/AC-FT: 1029

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %: 4.5
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1968- )
AREA, ACRES: 1164
NO. PROD WELLS: 28
NO. INJ WELLS: 8
VOLUME INJECTED: (EQUIV) WATER, BBL; 6,764,936
GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 2,298,411
CUMULATIVE PROD: GAS, MCF; 4,156,205
CUMULATIVE PROD: WATER, BBL; 2,209,611
RECOVERY FACTOR, %: 3.2
DEGREE OF SUCCESS: POOR
OPERATOR(S): GETTY OIL

SOURCES: 5,14; 11,15,198,292,298
CASE 243
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: ZAUALA
DISTRICT: 1
FIELD NAME: LITTLE TOM
NO. OF RESERVOIRS: 3

RESERVOIR INFORMATION

RESERVOIR: SAN MIGUEL A, A-1, C AND D SANDS
NO. OF ZONES: 4
AREA, ACRES: 5500
DISCOVERY YEAR: 1950
SPACING, ACRES:
TOTAL WELLS:
PRODUCING WELLS: 3
SHUT-IN WELLS: 16
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: SAN MIGUEL
GEOLOGICAL AGE: UPPER CRETACEOUS
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULTED DOMAL CLOSURE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY; MOD
FAULTING; MINOR
FRACTURE;
DIP, DEG.: 2.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2750
GROSS PAY, FT: 35
POROSITY, %: 22.3
PERMEABILITY, MD: 64
BHT, DEF P: 125
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 60.0
WTR SAT., %: 40.0
GAS SAT., %:
FVF, BBL/STB: 1.050
WOR, BBL/BBL:
GOR, SCF/BBL: 77
BHP, PSI: 750
NET PAY, FT: 14
RANGE: TO
RANGE: 31 TO 500
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 60.0 *
WTR SAT., %: 40.0
GAS SAT., %:
FVF, BBL/STB: 1.050
WOR, BBL/BBL:
GOR, SCF/BBL: 77
BHP, PSI: 750

312
FLUID CHARACTERISTICS

**OIL GRAvITY, API:** 14.3 **RANGE:** TO
**VISCOSITY @ BHT, CP:** 90.0; **@ F, CP:**
**SAYBOLT VISC (100F), SEC:**
**SULFUR CONTENT, %:**
**CARBON RESIDUE, %:**
**CARBON/HYDROGEN RATIO:** 1.80
**OIL TYPE:**
**WATER SALINITY, PPM:**
**WATER HARDNESS: CA, PPM;**
**MG, PPM:**

RESERVES AND PRODUCTION DATA

| ORIGINAL OIL IN PLACE, STB: | 76,100,000 | BBL/AC-FT: 989 |
| ORIGINAL GAS IN PLACE, MCF: | |
| CUM PROD (DEC 31, 1977) |:
| OIL, BBL: | 53,343 |
| GAS, MCF: | |
| WATER, BBL: | |
| 1977 ANNUAL PROD: |:
| OIL, BBL: | 7,524 |
| GAS, MCF: | 2,461 |
| WATER, BBL: | |
| OIL REMAINING IN PLACE, STB: | 76,100,000 | BBL/AC-FT: 988 |
| (DEC 31, 1977) RESERVES (DEC 31, ) | |

PRIMARY PRODUCTION:
**MECHANISM:** FLUID EXPANSION
**RECOVERY FACTOR, %:** 3.0  BBL/AC-FT:
**ANNUAL DECLINE RATE, %:**

SECONDARY AND TERTIARY RECOVERIES:

T.1 WET COMBUSTION (1975-1976)

| AREA, ACRES: | 290 |
| NO. PROD WELLS: | 2 |
| NO. INJ WELLS: | 1 |
| VOLUME INJECTED: (EQUIV) WATER, BBL; GAS, MCF; |
| CUMULATIVE PROD: OIL, BBL; GAS, MCF; WATER, BBL; |
| RECOVERY FACTOR, %: 37.0 BBL/AC-FT: |
| DEGREE OF SUCCESS: POOR |
| OPERATOR(S): HANOVER PETR CORP/DOE |

REMARKS: POTENTIAL TERTIARY REC EST 25-32 MMBBL

SOURCES: 5,12,14,200,204,209,211,214,266-7; 16,18,206
STATE: TEXAS
COUNTY: MEDINA
FIELD NAME: TAYLOR INA
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: NAVARRO RESERVOIR
NO. OF ZONES: DISCOVERY YEAR: 1936
AREA, ACRES: 4700 SPACING, ACRES: 7
TOTAL WELLS: PRODUCING WELLS: 595
SHUT-IN WELLS: 43 INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: NAVARRO-OLMOS
GEOLOGICAL AGE: GULF
BASIN: OUACHITA TECTONIC BELT PROVINC
TRAP TYPE: STRUCT-STRAT - FAULTED MONOCLINE
LITHOLOGY: SAND
DIP, DEG.: 3.0
DEGREE OF: CONSOLIDATION; UNC
HETEROGENEITY;
FAULTING; MOD
FRACURE;

RESERVOIR CHARACTERISTICS

DEPTH, FT: 900 NET PAY, FT: 20
GROSS PAY, FT:
POROSITY, %: 32.0 RANGE: 24.7 TO 48.0
PERMEABILITY, MD: 85 RANGE: 20 TO 495
BHT, DEF F: 80 SAT. PRESSURE, PSI: 150
GAS CAP: NO GAS CAP, ACRES:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 55.0 WETTING PHASE:
WTR SAT., %; 45.0 CURRENT: OIL SAT., %; 52.0 *
GAS SAT., %; WTR SAT., %; 48.0
FVF, BBL/STB; 1.040 GAS SAT., %;
WOR, BBL/BBL; FVF, BBL/STB; 1.000
GOR, SCF/BBL; 100 WOR, BBL/BBL;
BHP, PSI; 420 GOR, SCF/BBL;

FLUID CHARACTERISTICS

OIL GRAVITY, API: 16.0 RANGE: TO
VISOSITY @ BHT, CP: 390.0;
SAYBOLT VISc (100F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA,PPM;

ACID NUMBER:

MG,PPM;
RESERVES AND PRODUCTION DATA

CASE 244

ORIGINAL OIL IN PLACE, STB: 123,400,000 BBL/AC-FT: 1313
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL: 2,790,758
(GDEC 31, 1977) GAS, MCF:
WATER, BBL:
1977 ANNUAL PROD: OIL, BBL: 158,213
(GDEC 31, 1977) GAS, MCF:
WATER, BBL:
OIL REMAINING IN PLACE, STB: 120,600,000 BBL/AC-FT: 1283

PRIMARY PRODUCTION:
MECHANISM: GD AND SG
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:
SECONDARY AND TERTIARY RECOVERIES:

T.1 ISC AND SD (1965-1968)

AREA, ACRES: 77 FLUID INJECTED: A/W
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL: 195,000
GAS, MCF:
CUMULATIVE PROD: OIL, BBL:
(THRU ) GAS, MCF:
WATER, BBL:
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: UD
OPERATOR(S): TENNECO/COASTAL STATES

T.2 ELECTROFLOOD, AC (1978-

AREA, ACRES: 36 FLUID INJECTED:
NO. PROD WELLS: 3 NO. INJ WELLS: 3
VOLUME INJECTED: (EQUIV) WATER, BBL:
GAS, MCF:
CUMULATIVE PROD: OIL, BBL:
(THRU 1977) GAS, MCF:
WATER, BBL:
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: VE
OPERATOR(S): PETRO OIL & GAS

REMARKS: ISC: ONE 2.5 AC 5-SPOT INV PATTERN; SD: 75 AC

SOURCES: 5,12,14,200,203-4,206,209,211-12,214,217,266-7
CASE 245

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: ATASCOSA
DISTRICT: 1
FIELD NAME: WEIGANG
NO. OF RESERVOIRS: 3

RESERVOIR INFORMATION

RESERVOIR: CARRIZO SAND
NO. OF ZONES: DISCOVERY YEAR: 1946
AREA, ACRES: 820 SPACING, ACRES: 28
TOTAL WELLS: PRODUCING WELLS: 29
SHUT-IN WELLS: INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: CARRIZO GEOLOGICAL AGE: EOCENE
GEOLGICAL AGE: EOCENE BASIN: GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULT CLOSURE LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC DIP, DEG.:
HETEROGENEITY;
FAULTING;
FRACTURE;
CLAY CONTENT, %:
INTERBEDDED STREAKS: NO BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 3921 NET PAY, FT: 30
GROSS PAY, FT:
POROSITY, %: 28.2 RANGE: TO
PERMEABILITY, MD: 1357 RANGE: TO
BHT, DEF F: 142 SAT. PRESSURE, PSI: 1027
GAS CAP: NO GAS CAP, ACRES:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 73.0 WETTING PHASE:
WTR SAT., %; 27.0 CURRENT: OIL SAT., %; 43.0 *
GAS SAT., %;

FVF, BBL/STB; 1.220 WTR SAT., %; 57.0
WOR, BBL/BBL;
GOR, SCF/BBL; 125 GAS SAT., %;
BHP, PSI; 1620 FVF, BBL/STB; 1.040 *

BHP, PSI; 1447
OIL GRAVITY, API: 24.0

FLUID CHARACTERISTICS

RANGE: TO

VISCOSITY @ BHT, CP: ; @ F, CP:

SAYBOLT VISC (100F), SEC: 47

SULFUR CONTENT, %: .12

CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %: 4.7

ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM;

WATER HARDNESS: CA,PPM; MG,PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 32,200,000

ORIGINAL GAS IN PLACE, MCF:

CUM PROD (DEC 31, 1977) :

OIL, BBL: 9,805,490

GAS, MCF:

WATER, BBL:

1977 ANNUAL PROD:

OIL, BBL: 188,827

GAS, MCF: 65,214

WATER, BBL:

OIL REMAINING IN PLACE, STB: 22,400,000

(DEC 31, 1977)

RESERVES(DEC 31, )

PRIMARY PRODUCTION:

MECHANISM: WATER DRIVE

RECOVERY FACTOR, %:

BBL/AC-FT: 1309

ANNUAL DECLINE RATE, %:

BBL/AC-FT: 910

SOURCES: 5,12,14,200,204,209,211,214,266,267; 218A
### RESERVOIR AND PRODUCTION DATA ELEMENTS

**CASE 246**

**STATE:** TEXAS  
**COUNTY:** VICTORIA  
**DISTRICT:** 2  
**FIELD NAME:** BLOOMINGTON  
**NO. OF RESERVOIRS:** 12

#### RESERVOIR INFORMATION

<table>
<thead>
<tr>
<th>RESERVOIR: 4600</th>
<th>DISCOVERY YEAR: 1947</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. OF ZONES:</td>
<td></td>
</tr>
<tr>
<td>AREA, ACRES:</td>
<td>1556</td>
</tr>
<tr>
<td>TOTAL WELLS:</td>
<td></td>
</tr>
<tr>
<td>SHUT-IN WELLS:</td>
<td>1</td>
</tr>
<tr>
<td>PRODUCING WELLS:</td>
<td></td>
</tr>
<tr>
<td>INJECTION WELLS:</td>
<td></td>
</tr>
</tbody>
</table>

#### GEOLOGICAL INFORMATION

- **FORMATION:** FRIO FM., GRETA SD.  
- **GEOLOGICAL AGE:** OLIGOCENE  
- **BASIN:** GULF COAST BASIN  
- **TRAP TYPE:** STRUCTURAL - ANTICLINE FAULT  
- **LITHOLOGY:** SAND  
- **DEGREE OF:** CONSOLIDATION; HETEROGENEITY; FAULTING; FRACTURE;  
  - **DIP, DEG.:** 1.0  
  - **CLAY CONTENT, %:**  
  - **INTERBEDDED STREAKS:**  
  - **BARRIER TO FLOW:**  

#### RESERVOIR CHARACTERISTICS

- **DEPTH, FT:** 4600  
- **GROSS PAY, FT:**  
- **POROSITY, %:** 34.0  
- **PERMEABILITY, MD:** 1000  
- **BHT, DEF F:** 145  
- **GAS CAP:** NO  
- **GAS CAP/OIL ZONE RATIO:**  
- **INITIAL:** OIL SAT., %: 63.0  
  - WTR SAT., %: 37.0  
  - GAS SAT., %:  
  - FVF, BBL/STB: 1.110  
  - WOR, BBL/BBL:  
  - GOR, SCF/BBL:  
  - BHP, PSI: 2060  
- **NET PAY, FT:** 30  
- **RANGE:** 32.0 TO 34.0  
- **RANGE:** 500 TO 1500  
- **SAT. PRESSURE, PSI:** 1321  
- **GAS CAP, ACRES:**  
- **WETTING PHASE:**  
  - **CURRENT:** OIL SAT., %: 36.0 *  
  - WTR SAT., %: 64.0  
  - GAS SAT., %:  
  - FVF, BBL/STB: 1.090  
  - WOR, BBL/BBL:  
  - GOR, SCF/BBL: 1700  
  - BHP, PSI: 1850
FLUID CHARACTERISTICS

OIL GRAVITY, API: 23.0 RANGE: TO
VISCOITY @ BHT, CP: 3.0; @ F, CP:
SAYBOLT VISC (100F), SEC: 58
SULFUR CONTENT, %: .19 CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: .6 ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 60000
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 69,900,000 BBL/AC-FT: 1497
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL: 29,050,502
(DEC 31, 1977) GAS, MCF; WATER, BBL;
1977 ANNUAL PROD: OIL, BBL: 464,510
GAS, MCF: 460,940
WATER, BBL;
OIL REMAINING IN PLACE, STB: 40,800,000 BBL/AC-FT: 875
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

REMARKS: GAS CAP PRESENT ORIGINALLY

SOURCES: 5, 12, 14, 200, 204, 209, 214, 266-7; 211, 218B
STATE: TEXAS
COUNTY: REFUGIO
DISTRICT: 2
FIELD NAME: BONNIE VIEW
NO. OF RESERVOIRS: 12

RESERVOIR INFORMATION

RESERVOIR: BONNIE VIEW
NO. OF ZONES: DISCOVERY YEAR: 1944
AREA, ACRES: 1750 SPACING, ACRES: 31
TOTAL WELLS: PRODUCING WELLS: 43
SHUT-IN WELLS: 4 INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: GRETA & UPPER PLACEDO OF FRIO FM
GEOLOGICAL AGE: OLIGOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCTURAL - ANTICLINE
LITHOLOGY: SHALY SAND
DEGREE OF: CONSOLIDATION; UNC DIP, DEG.:
HETEROGENEITY; CLAY CONTENT, %:
FAULTING; INTERBEDDED STREAKS: YES
FRACUTRE; BARRIER TO FLOW: NO

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4575
GROSS PAY, FT: 33
POROSITY, %: 30.0
PERMEABILITY, MD: 1000
BHT, DEF F: 130
GAS CAP: 0
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 70.0
WTR SAT., %; 30.0
GAS SAT., %;
FVF, BBL/STB; 1.150
WOR, BBL/BBL;
GOR, SCF/BBL; 170
BHP, PSI; 2044

NET PAY, FT: 20
RANGE: TO
RANGE: 1000 TO
SAT. PRESSURE, PSI: 1500
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 43.0 *
WTR SAT., %; 57.0
GAS SAT., %;
FVF, BBL/STB; 1.130
WOR, BBL/BBL;
GOR, SCF/BBL; 321
BHP, PSI; 1700
FLUID CHARACTERISTICS

OIL GRAVITY, API: 24.0
RANGE: TO
VISCOSITY @ BHT, CP: 10.0
SAYBOLT VISC (100F), SEC: 53
SULFUR CONTENT, %: .18
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: .7
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 60000
WATER HARDNESS: CA, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 49,600,000 BBL/AC-FT: 1417
ORIGINAL GAS IN PLACE, MCF: CUM PROD:
(DEC 31, 1977) OIL, BBL: 18,281,869
GAS, MCF: 119,021 WATER, BBL:
OIL REMAINING IN PLACE, STB: 31,300,000 BBL/AC-FT: 894
(DEC 31, 1977) RESERVES (DEC 31, )
PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SOURCES: 5, 12, 14, 200, 204, 209, 211, 214, 266, 267; 219
STATE: TEXAS
COUNTY: VICTORIA
DISTRICT: 2
FIELD NAME: COLETTO CREEK
NO. OF RESERVOIRS: 6

RESERVOIR INFORMATION

RESERVOIR: 2800' POOL
DISCOVERY YEAR: 1934
NO. OF ZONES: 
SPACING, ACRES: 10
AREA, ACRES: 525
TOTAL WELLS: 
PRODUCING WELLS: 30
SHUT-IN WELLS: 14
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: CATAHOULA FORMATION
GEOLOGICAL AGE: OLIGOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND/SILTY SAND
DEGREE OF: CONSOLIDATION; UNC
HETEROGENEITY;
FAULTING; MINOR
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS: NO
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2776
GROSS PAY, FT: 80
POROSITY, %: 33.0
PERMEABILITY, MD: 500
BHT, DEF F: 128
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 65.0
WTR SAT., %; 35.0
GAS SAT., %;
FVF, BBL/STB; 1.100
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 1234
NET PAY, FT: 28
RANGE: 28.0 TO 35.0
RANGE: TO 2800
SAT. PRESSURE, PSI: 1200
GAS CAP, ACRES:
Wetting PHASE:
CURRENT: OIL SAT., %; 32.0 *
WTR SAT., %; 68.0
GAS SAT., %;
FVF, BBL/STB; 1.000 *
WOR, BBL/BBL;
GOR, SCF/BBL; 175
BHP, PSI; 1182
**FLUID CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil Gravity, API:</td>
<td>21.0</td>
</tr>
<tr>
<td>Range:</td>
<td>To</td>
</tr>
<tr>
<td>Viscosity @ BHT, CP:</td>
<td>74</td>
</tr>
<tr>
<td>@ F, CP:</td>
<td>105</td>
</tr>
<tr>
<td>Saybolt Visc (100F), SEC:</td>
<td>105</td>
</tr>
<tr>
<td>Sulfur Content, %:</td>
<td>0.24</td>
</tr>
<tr>
<td>Carbon/Hydrogen Ratio:</td>
<td></td>
</tr>
<tr>
<td>Acid Number:</td>
<td></td>
</tr>
<tr>
<td>Oil Type:</td>
<td></td>
</tr>
<tr>
<td>Water Salinity, PPM:</td>
<td>27000</td>
</tr>
<tr>
<td>Water Hardness: CA, PPM:</td>
<td>MG, PPM</td>
</tr>
</tbody>
</table>

**RESERVES AND PRODUCTION DATA**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original Oil in Place, STB:</td>
<td>22,200,000</td>
</tr>
<tr>
<td>Cum Prod</td>
<td>10,000,000 *</td>
</tr>
<tr>
<td>(Dec 31, 1977)</td>
<td></td>
</tr>
<tr>
<td>Gas, MCF:</td>
<td></td>
</tr>
<tr>
<td>Water, BBL:</td>
<td></td>
</tr>
<tr>
<td>1977 Annual Prod: OIL, BBL:</td>
<td>27,482</td>
</tr>
<tr>
<td>1977 Annual Prod: GAS, MCF:</td>
<td></td>
</tr>
<tr>
<td>1977 Annual Prod: WATER, BBL:</td>
<td></td>
</tr>
<tr>
<td>Oil Remaining in Place, STB:</td>
<td>12,200,000</td>
</tr>
<tr>
<td>(Dec 31, 1977)</td>
<td></td>
</tr>
<tr>
<td>Reserves (Dec 31, )</td>
<td></td>
</tr>
<tr>
<td>PRIMARY PRODUCTION:</td>
<td></td>
</tr>
<tr>
<td>Mechanism: Water Drive</td>
<td></td>
</tr>
<tr>
<td>Recovery Factor, %:</td>
<td>BBL/AC-FT: 833</td>
</tr>
<tr>
<td>Annual Decline Rate, %:</td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:** Transferred from Old Coletto Creek in 1968

**Sources:** 5, 12, 14, 200, 204, 209, 211, 214, 266, 267; 220
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: JACKSON
DISTRICT: 2
FIELD NAME: GANADO, WEST
NO. OF RESERVOIRS: 19

RESERVOIR INFORMATION

RESERVOIR: 4700 ZONE
NO. OF ZONES: 5
AREA, ACRES: 1132
TOTAL WELLS: 125
SHUT-IN WELLS: 11
DISCOVERY YEAR: 1950
PRODUCING WELLS: 42
INJECTION WELLS: 19

GEOLOGICAL INFORMATION

FORMATION: MARGINULINA
GEOLOGICAL AGE: OLIGOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC
HETEROGENEITY;
FAULTING; MINOR
FRACTURE;
DIP, DEG.: 1.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: NO
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4730
GROSS PAY, FT: 49
POROSITY, %: 33.6
PERMEABILITY, MD: 1411
BHT, DEF F: 146
GAS CAP: YES
GAS CAP/OIL ZONE RATIO: .02
INITIAL: OIL SAT., %; 62.0
WTR SAT., %; 38.0
GAS SAT., %;
FVF, BBL/STB; 1.170
WOR, BBL/BBL;
GOR, SCF/BBL; 330
BHP, PSI; 2129
NET PAY, FT: 44
RANGE: TO
RANGE: 800 TO 1500
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 38.0 *
WTR SAT., %; 62.0 *
GAS SAT., %;
FVF, BBL/STB; 1.000 *
WOR, BBL/BBL;
GOR, SCF/BBL; 224
BHP, PSI; 2000

324
FLUID CHARACTERISTICS

OIL GRAVITY, API: 24.4
VISCOSITY @ BHT, CP: 
VISCOITY @ F, CP: 
SAYBOLT VISC (100F), SEC: 47
SULFUR CONTENT, %: .17
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: .5
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM:
WATER HARDNESS: CA, PPM: MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 68,800,000 BBL/AC-FT: 1381
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL: 20,000,000 *
(GDEC 31, 1977) GAS, MCF:
WATER, BBL:
1977 ANNUAL PROD: OIL, BBL: 782,477
GAS, MCF: 186,131
WATER, BBL:
OIL REMAINING IN PLACE, STB: 48,800,000 BBL/AC-FT: 980
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

REMARKS: SUBDIVIDED FROM GANADO, WEST IN 1963

SOURCES: 5, 12, 14, 200, 204, 209, 211, 214, 266, 267; 221
CASE 251

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: REFUGIO
DISTRICT: 2
FIELD NAME: LAKE PASTURE
NO. OF RESERVOIRS: 26

RESERVOIR INFORMATION

RESERVOIR: H-440 SAND
NO. OF ZONES: DISCOVERY YEAR: 1959
AREA, ACRES: 4725 SPACING, ACRES: 36
TOTAL WELLS: PRODUCING WELLS: 101
SHUT-IN WELLS: 13 INJECTION WELLS: 4

GEOLOGICAL INFORMATION

FORMATION: GRETA
GEOLOGICAL AGE: OLIGOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCTURAL - ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC
HETEROGENEITY;
FAULTING; NONE
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS: NO
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4491
GROSS PAY, FT: 75
POROSITY, %: 32.7
PERMEABILITY, MD: 1197
BHT, DEF P: 150
GAS CAP: YES
GAS CAP/OIL ZONE RATIO: .93
INITIAL: OIL SAT., %: 44.0
WTR SAT., %: 56.0
GAS SAT., %:
FVF, BBL/STB: 1.115
WOR, BBL/BBL:
GOR, SCF/BBL: 212
BHP, PSI: 1893

NET PAY, FT: 50
RANGE: TO
RANGE: 1000 TO 3000
SAT. PRESSURE, PSI: 1970
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 38.0 *
WTR SAT., %: 62.0
GAS SAT., %:
FVF, BBL/STB: 1.090
WOR, BBL/BBL:
GOR, SCF/BBL: 506
BHP, PSI: 1750
FLUID CHARACTERISTICS

OIL GRAVITY, API: 24.0  RANGE: TO  VISCOSITY @ BHT, CP: 240; @ 155F, CP: 2.4
SAYBOLT VISC (100F), SEC: 60  SULFUR CONTENT, %: .20  CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: .7  ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM: 80000  WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 236,500,000  BBL/AC-FT: 1001
ORIGINAL GAS IN PLACE, MCF: 179,300,000
CUM PROD: OIL, BBL; 28,462,126  GAS, MCF;
(DEC 31, 1977) WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 2,844,499  GAS, MCF;
GAS, MCF; 16,120,596  WATER, BBL;
OIL REMAINING IN PLACE, STB: 208,000,000  BBL/AC-FT: 881
(DEC 31, 1977) RESERVES(DEC 31, _)

PRIMARY PRODUCTION:
MECHANISM: WD & SG  RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 PRESSURE MAINTENANCE (1965-1988)

AREA, ACRES: 1890  FLUID INJECTED: G
NO. PROD WELLS: 45  NO. INJ WELLS: 3
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF; 10,439,000
CUMULATIVE PROD: OIL, BBL; 2,037,000  GAS, MCF;
(THRU 1977) WATER, BBL;
RECOVERY FACTOR, %: 6.8  BBL/AC-FT: 59
DEGREE OF SUCCESS: VE  OPERATOR(S): QUINTANA PETR CORP

SOURCES: 5,12,14,200,204,209,211,214,266,267; 11,15,17,223

327
**Case 253**

**Reservoir and Production Data Elements**

*State: Texas*  
*County: Bee*  
*District: 2*  
*Field Name: Papalote, East*  
*No. of Reservoirs: 5*

### Reservoir Information

**Reservoir:** 3250 B  
**No. of Zones:**  
**Area, Acres:** 480  
**Total Wells:** 24  
**Shut-in Wells:** 1  
**Discovery Year:** 1964  
**Spacing, Acres:** 20  
**Producing Wells:** 17  
**Injection Wells:** 1

### Geological Information

**Formation:** Massive Catahoula  
**Geological Age:** Oligocene  
**Basin:** Gulf Coast Basin  
**Trap Type:**  
**Lithology:** Shaly Sand  
**Degree of Consolidation; Unc:**  
**Heterogeneity; Faulting:**  
**Fracture; Barrier to Flow:**

### Reservoir Characteristics

**Depth, Ft:** 3250  
**Gross Pay, Ft:**  
**Porosity, %:** 30.5  
**Permeability, MD:** 1500  
**BHT, Def F:** 106  
**Gas Cap:** No  
**Gas Cap/Oil Zone Ratio:**  
**Initial: Oil Sat., %:** 65.0  
**WTR Sat., %:** 35.0  
**Gas Sat., %:**  
**FVF, BBL/STB:** 1.180  
**WOR, BBL/BBL:**  
**GOR, SCF/BBL:**  
**BHP, PSI:** 1282  
**Net Pay, Ft:** 42  
**Range:**  
**Range:** 742 to 2900  
**Sat. Pressure, PSI:** 1282  
**Gas Cap, Acres:**  
**Wetting Phase:**  
**Current: Oil Sat., %:** 53.0 *  
**WTR Sat., %:** 47.0  
**Gas Sat., %:**  
**FVF, BBL/STB:** 1.050 *  
**WOR, BBL/BBL:**  
**GOR, SCF/BBL:** 1218  
**BHP, PSI:** 1282
FLUID CHARACTERISTICS

OIL GRAVITY, API: 22.0
VISCOSITY @ BHT, CP: RANGE: TO
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM: 32600
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 26,300,000 BBL/AC-FT: 1303
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 2,065,218
(GDEC 31, 1977) GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 117,961
(GDEC 31, 1977) GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB: 24,200,000 BBL/AC-FT: 1201
(GDEC 31, 1977)
RESERVES (GDEC 31, )
PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SOURCES: 5, 12, 14, 200, 204, 209, 211, 214, 266, 267; 225

329
CASE 255

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: REFUGIO
DISTRICT: 2
FIELD NAME: TOM OCONNOR
NO. OF RESERVOIRS: 17

RESERVOIR INFORMATION

RESERVOIR: 4500 GRETA MASS.
NO. OF ZONES: 36
AREA, ACRES: 2198
TOTAL WELLS: 57
SHUT-IN WELLS: 4

DISCOVERY YEAR: 1952
SPACING, ACRES: 36
PRODUCING WELLS: 57
INJECTION WELLS: 

GEOLOGICAL INFORMATION

FORMATION: FRIO FORMATION
GEOLOGICAL AGE: OLIGOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCTURAL - ANTICLINE
LITHOLOGY: SAND
DIP, DEG.: 1.0
CLAY CONTENT, %: 
INTERBEDDED STREAKS:
BARRIER TO FLOW: 

DEGREE OF: CONSOLIDATION; UNC HETEROGENEITY;
FAULTING; NONE FRACTURE;

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4380
GROSS PAY, FT: 
POROSITY, %: 33.2
PERMEABILITY, MD: 2290
BHT, DEF F: 162
GAS CAP: YES
GAS CAP/OIL ZONE RATIO: .22
INITIAL: OIL SAT., %; 68.2
WTR SAT., %; 31.8
GAS SAT., %;
FVF, BBL/STB; 1.120
WOR, BBL/BBL;
GOR, SCF/BBL; 237
BHP, PSI; 1895

NET PAY, FT: 11
RANGE: TO
RANGE: 500 TO 5000
SAT. PRESSURE, PSI: 1893
GAS CAP, ACRES: 1016
WETTING PHASE:
CURRENT: OIL SAT., %; 41.0 *
WTR SAT., %; 59.0
GAS SAT., %;
FVF, BBL/STB; 1.030 *
WOR, BBL/BBL;
GOR, SCF/BBL; 690
BHP, PSI; 1653
CASE 255

FLUID CHARACTERISTICS

OIL GRAVITY, API: 24.0 RANGE: TO
VISCOSITY @ BHT, CP: 2.4; @ F, CP:
SAYBOLT VISC (100F), SEC: 80
SULFUR CONTENT, %: .21 CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: .7 ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 37,900,000 BBL/AC-FT: 1568
ORIGINAL GAS IN PLACE, MCF: 6,360,000
CUM PROD: OIL, BBL: 13,465,063
(G_DEC 31, 1977) GAS, MCF: 553,682
WATER, BBL: 310,540
GAS, MCF: 791,273
1977 ANNUAL PROD: OIL, BBL: 909,568
WATER, BBL:
OIL REMAINING IN PLACE, STB: 24,500,000 BBL/AC-FT: 1011
(G_DEC 31, 1977) RESERVES (DEC
(PRIMARY PRODUCTION:
MECHANISM: WD & SG
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:
SECONDARY AND TERTIARY RECOVERIES:
S.1 PRESSURE MAINTENANCE (-1976)

AREA, ACRES: 320 FLUID INJECTED: G
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL: GAS, MCF: 3,434,000
(CUMULATIVE PROD: OIL, BBL:
(G_DEC 1972) GAS, MCF:
WATER, BBL:
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S): QUINTANA PETR CORP

SOURCES: 5, 12, 14, 200, 204, 209, 211, 214, 266, 267; 11, 15, 226

331
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: JACKSON
DISTRICT: 2
FIELD NAME: WEST RANCH
NO. OF RESERVOIRS: 38

RESERVOIR INFORMATION

RESERVOIR: GRETA SAND
NO. OF ZONES: 
AREA, ACRES: 4700
TOTAL WELLS: 
SHUT-IN WELLS: 27
DISCOVERY YEAR: 1939
SPACING, ACRES: 29
PRODUCING WELLS: 122
INJECTION WELLS: 8

GEOLOGICAL INFORMATION

FORMATION: FRIO
GEOLOGICAL AGE: OLIGOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCTURAL)
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.: 1.0
HETEROGENEITY;
FAULTING; NONE
FRACTURE; MINOR
CLAY CONTENT, %:
INTERBEDDED STREAKS: NO
BARRIER TO FLOW: NO

RESERVOIR CHARACTERISTICS

DEPTH, FT: 5100
GROSS PAY, FT: 
POROSITY, %: 31.9
PERMEABILITY, MD: 1000
BHT, DEP F: 160
GAS CAP: YES
GAS CAP/OIL ZONE RATIO: .13
INITIAL: OIL SAT., %; 67.0
WTR SAT., %; 33.0
GAS SAT., %;
FVF, BBL/STB; 1.159
WOR, BBL/BBL;
GOR, SCF/BBL; 284
BHP, PSI;
NET PAY, FT: 40
RANGE: TO
RANGE: 104 TO 4369
SAT. PRESSURE, PSI: 2357
GAS CAP, ACRES: 
WETTING PHASE:
CURRENT: OIL SAT., %; 48.0 *
WTR SAT., %; 52.0
GAS SAT., %;
FVF, BBL/STB; 1.131
WOR, BBL/BBL;
GOR, SCF/BBL; 705
BHP, PSI; 1705
FLUID CHARACTERISTICS

OIL GRAVITY, API: 24.7  RANGE:  TO
VISCOSITY @ BHT, CP:  1.5; @ F, CP:
SAYBOLT VISC (100F), SEC:  57
SULFUR CONTENT, %:  .16  CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:  .5  ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;  59500
WATER HARDNESS: CA, PPM;  MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB:  223,200,000  BBL/AC-FT: 1431
ORIGINAL GAS IN PLACE, MCF:  
CUM PROD  :  OIL, BBL;  60,850,723
 (DEC 31, 1977)  GAS, MCF;  5,000,000
WATER, BBL;  
1977 ANNUAL PROD:  OIL, BBL;  3,984,304
GAS, MCF;  2,564,414
WATER, BBL;  
OIL REMAINING IN PLACE, STB:  162,300,000  BBL/AC-FT: 1041
 (DEC 31, 1977)  RESERVES (DEC 31, )
PRIMAR Y PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:  BBL/AC-FT:
ANNUAL DECLINE RATE, %:  
SECONDARY AND TERTIARY RECOVERIES:

S.1 PRESSURE MAINTENANCE (1977- )

AREA, ACRES:  4000  FLUID INJECTED: SW
NO. PROD WELLS:  129  NO. INJ WELLS:  6
VOLUME INJECTED: (EQUIV) WATER, BBL;  659,000
GAS, MCF;
CUMULATIVE PROD:  OIL, BBL;  616,000
 (THRU )  GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:  BBL/AC-FT:
DEGREE OF SUCCESS: UD
OPERATOR(S): MOBIL OIL CORP

SOURCES: 5,12,14,200,204,209,211,266-7; 11,15
**CASE 257**

**RESERVOIR AND PRODUCTION DATA ELEMENTS**

**STATE:** TEXAS  
**COUNTY:** WASHINGTON  
**DISTRICT:** 3  
**FIELD NAME:** CLAY CREEK  
**NO. OF RESERVOIRS:** 3

### RESERVOIR INFORMATION

**RESERVOIR:** SPARTA-QUEEN CITY-WILCOX  
**NO. OF ZONES:** DISCOVERY YEAR: 1928  
**AREA, ACRES:** 586  
**TOTAL WELLS:** SPACING, ACRES: 7  
**SHUT-IN WELLS:** PRODUCING WELLS: 64  
**TOTAL WELLS:** INJECTION WELLS: 1

### GEOLOGICAL INFORMATION

**FORMATION:** QUEEN  
**GEOLOGICAL AGE:** EOCENE  
**BASIN:** GULF COAST BASIN  
**TRAP TYPE:** STRUCTURAL - FAULTED SALT DOME  
**LITHOLOGY:** SAND  
**DEGREE OF:** CONSOLIDATION; UNC  
**DIP, DEG.:** HETEROGENEITY;  
**CLAY CONTENT, %:** FAULTING;  
**INTERBEDDED STREAKS:** NO  
**FRACTURE:** BARRIER TO FLOW:

### RESERVOIR CHARACTERISTICS

**DEPTH, FT:** 1125  
**GROSS PAY, FT:**  
**POROSITY, %:** 22.0  
**PERMEABILITY, MD:**  
**BHT, DEF F:** 90 *  
**GAS CAP:**  
**GAS CAP/OIL ZONE RATIO:**  
**INITIAL:** OIL SAT., %; 70.0  
**WTR SAT., %; 30.0  
**GAS SAT., %;  
**FVF, BBL/STB; 1.045**  
**WOR, BBL/BBL;**  
**GOR, SCF/BBL;**  
**BHP, PSI; 630**  
**NET PAY, FT:** 60  
**RANGE:** TO  
**RANGE:** TO  
**SAT. PRESSURE, PSI:** 630  
**GAS CAP, ACRES:**  
**WETTING PHASE:**  
**CURRENT:** OIL SAT., %; 48.0 *  
**WTR SAT., %; 52.0  
**GAS SAT., %;  
**FVF, BBL/STB; 1.000 ***  
**WOR, BBL/BBL;** 3  
**GOR, SCF/BBL;** 261  
**BHP, PSI; 100**
FLUID CHARACTERISTICS

OIL GRAVITY, API: 25.0
RANGE: 23.0 TO 26.0
VISCOSITY @ BHT, CP: 33.9
@ F, CP: 33.9
SAYBOLT VISC (100°F), SEC: 33.9
SULFUR CONTENT, %: 3.5
CARBON/HYDROGEN RATIO: 33.9
CARBON RESIDUE, %: 33.9
ACID NUMBER: 33.9
OIL TYPE: 33.9
WATER SALINITY, PPM: 33.9
WATER HARDINESS: CA, PPM: 33.9
MG, PPM: 33.9

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 40,200,000  BBL/AC-FT: 1143
ORIGINAL GAS IN PLACE, MCF: 33.9
CUM PROD (DEC 31, 1977) OIL, BBL; 11,253,966
GAS, MCF; 33.9
WATER, BBL; 33.9
1977 ANNUAL PROD: OIL, BBL; 150,499
GAS, MCF; 3,521
WATER, BBL; 33.9
OIL REMAINING IN PLACE, STB: 28,900,000  BBL/AC-FT: 823
(DEC 31, 1977)
RESERVES (DEC 31, 1977)

PRIMARY PRODUCTION:
MECHANISM: GAS DRIVE
RECOVERY FACTOR, %: 33.9
ANNUAL DECLINE RATE, %: 33.9

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1967-1972)

AREA, ACRES: 150  FLUID INJECTED: SW
NO. PROD WELLS: 52  NO. INJ WELLS: 1
VOLUME INJECTED: (EQUIV) WATER, BBL; 2,020,000
GAS, MCF; 33.9
CUMULATIVE PROD: OIL, BBL; 1,247,000
(THRU 1977) GAS, MCF;
WATER, BBL; 33.9
RECOVERY FACTOR, %: 33.9
BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): SUN OIL CO.

REMARKS: GAS CAP PRESENT ORIGINALLY

SOURCES: 5, 12, 14, 200, 204, 209, 211, 266-7; 229

335
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: HARRIS
DISTRICT: 3
FIELD NAME: DYERSDALE
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: 4000' SAND
NO. OF ZONES: DISCOVERY YEAR: 1940
AREA, ACRES: 1400
TOTAL WELLS: PRODUCING WELLS: 11
SHUT-IN WELLS: 19 INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: FRIO
GEOLOGICAL AGE: OLIGOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCTURAL - DOMAL CLOSURE
LITHOLOGY: SHALY SAND
DEGREE OF: CONSOLIDATION; UNC
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STreakS: NO
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4076
GROSS PAY, FT: 20
POROSITY, %: 35.0
PERMEABILITY, MD: 1050
BHT, DEF F: 130 *
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 70.0
WTR SAT., %; 30.0
GAS SAT., %;
FVF, BBL/STB; 1.240
WOR, BBL/BBL;
GOR, SCF/BBL; 350
BHP, PSI; 1800
NET PAY, FT: 15
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 36.0 *
WTR SAT., %; 64.0
GAS SAT., %;
FVF, BBL/STB; 1.040 *
WOR, BBL/BBL;
GOR, SCF/BBL; 216
BHP, PSI;
FLUID CHARACTERISTICS

CASE 258

OIL GRAVITY, API: 24.0
RANGE: TO

VISCOSITY @ BHT, CP:

SAYBOLT VISC (100°F), SEC: 115

SULFUR CONTENT, %: .18
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %: 1.2
ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM;

WATER HARDNESS: Ca, PPM;

MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB:
32,200,000
BBL/AC-FT: 1533

ORIGINAL GAS IN PLACE, MCF:
CUM PROD:
(DEC 31, 1977)
OIL, BBL:
12,600,000
GAS, MCF;
WATER, BBL;

1977 ANNUAL PROD:
OIL, BBL:
30,624
GAS, MCF;
WATER, BBL;

WATER, BBL:

OIL REMAINING IN PLACE, STB:
19,600,000
BBL/AC-FT: 933

(DEC 31, 1977)
RESERVES (DEC 31, 1977)

PRIMARY PRODUCTION:
MECHANISM: WD & SG
RECOVERY FACTOR, %:

ANNUAL DECLINE RATE, %:

BBL/AC-FT:

SOURCES: 5, 12, 14, 200, 204, 209, 211, 214, 266, 267; 230
CASE 259

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: WHARTON
DISTRICT: 3
FIELD NAME: MAGNET WITHERS
NO. OF RESERVOIRS: 43

RESERVOIR INFORMATION

RESERVOIR: FIRST FRIO POOL
NO. OF ZONES: 1
AREA, ACRES: 7895
TOTAL WELLS: 
SHUT-IN WELLS: 80
DISCOVERY YEAR: 1936
PRODUCING WELLS: 179
INJECTION WELLS: 3
SPACING, ACRES: 27

GEOLOGICAL INFORMATION

FORMATION: FRIO
GEOLOGICAL AGE: OLIGOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC
HETEROGENEITY;
FAULTING; MINOR
FRACTURE;
DIP, DEG.: 1.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: NO
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 5550
GROSS PAY, FT:
POROSITY, %: 29.0
PERMEABILITY, MD: 1700
BHT, DEF F: 160 *
GAS CAP: YES
GAS CAP/OIL ZONE RATIO: 2.18
INITIAL: OIL SAT., %: 73.0
WTR SAT., %: 27.0
GAS SAT., %:
FVF, BBL/STB: 1.155
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI: 2522
NET PAY, FT: 21
RANGE: TO
RANGE: 100 TO 3000
SAT. PRESSURE, PSI: 2522
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 51.0 *
WTR SAT., %: 49.0
GAS SAT., %:
FVF, BBL/STB: 1.150
WOR, BBL/BBL:
GOR, SCF/BBL: 14400
BHP, PSI: 1800
CASE 259

FLUID CHARACTERISTICS

OIL GRAVITY, API: 25.0
VISCOSITY @ BHT, CP: 2.3
@ F, CP:
SAYBOLT VISC (100°F), SEC: 49
SULFUR CONTENT, %: .19
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: .7
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 70000
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 235,800,000
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 71,747,517
(DEC 31, 1977) GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 2,010,196
GAS, MCF; 21,105,930
WATER, BBL;
OIL REMAINING IN PLACE, STB: 164,000,000
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WD & GC
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 PRESSURE MAINTENANCE (1967-1985)

AREA, ACRES: 970
NO. PROD WELLS: 53
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT: 65
DEGREE OF SUCCESS: ME
OPERATOR(S): EXXON CORP.

SOURCES: 5, 12, 14, 200, 204, 209, 211, 266-7; 11, 17, 231
STATE: TEXAS
COUNTY: FORT BEND
DISTRICT: 3
FIELD NAME: THOMPSON, SOUTH
NO. OF RESERVOIRS: 3

RESERVOIR INFORMATION

RESERVOIR: 4400 SAND (MIocene Y)
NO. OF ZONES: DISCOVERY YEAR: 1939
AREA, ACRES: 680 SPACING, ACRES: 23
TOTAL WELLS: PRODUCING WELLS: 19
SHUT-IN WELLS: 7 INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: MIOCENE
GEOLOGICAL AGE: MIOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCT/STRAT - SAND PINCHOUT ON SALT DOME
LITHOLOGY: SHALY SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.: 8.0
HETEROGENEITY;
FAULTING;
FRACTURE;
CLAY CONTENT, %:
INTERBEDDED STEAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4300
GROSS PAY, FT: 190
POROSITY, %: 29.0
PERMEABILITY, MD: 357
BHT, DEG F: 135
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 71.0
WTR SAT., %; 29.0
GAS SAT., %;
FVF, BBL/STB; 1.115
WOR, BBL/BBL;
GOR, SCF/BBL; 249
BHP, PSI; 2000

NET PAY, FT: 58
RANGE: 26.7 TO 33.7
RANGE: 8 TO 940
SAT. PRESSURE, PSI: 2000
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 42.0 *
WTR SAT., %; 58.0
GAS SAT., %;
FVF, BBL/STB; 1.080
WOR, BBL/BBL;
GOR, SCF/BBL; 317
BHP, PSI; 1950
CASE 260

FLUID CHARACTERISTICS

OIL GRAVITY, API: 24.8
RANGE: TO

VISCOSITY @ BHT, CP: 4.5
@ F, CP:

SAYBOLT VISC (100F), SEC: 126

SULFUR CONTENT, %: .20
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %: 1.2
ACID NUMBER:

OIL TYPE:
WATER SALINITY, PPM: 44200
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 56,500,000
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977): OIL, BBL: 22,032,000
GAS, MCF:
WATER, BBL:

1977 ANNUAL PROD:
OIL, BBL: 1,628,667
GAS, MCF: 579,135
WATER, BBL:

OIL REMAINING IN PLACE, STB: 34,500,000
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

REMARKS: SEPARATED FROM THOMPSON, S., 8-1-56.

SOURCES: 5, 12, 14, 200, 204, 209, 211, 266-7; 11, 15, 232
STATE: TEXAS  
COUNTY: FORT BEND  
DISTRICT: 3  
FIELD NAME: THOMPSON, SOUTH  
NO. OF RESERVOIRS: 3

<table>
<thead>
<tr>
<th>Reservoir Information</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir: FRIO POOL</td>
<td></td>
</tr>
<tr>
<td>No. of Zones:</td>
<td>27</td>
</tr>
<tr>
<td>Area, Acres:</td>
<td>1200</td>
</tr>
<tr>
<td>Total Wells:</td>
<td>28</td>
</tr>
<tr>
<td>Shut-in Wells:</td>
<td>9</td>
</tr>
<tr>
<td>Discovery Year:</td>
<td>1939</td>
</tr>
<tr>
<td>Spacing, Acres:</td>
<td>31</td>
</tr>
<tr>
<td>Producing Wells:</td>
<td>28</td>
</tr>
<tr>
<td>Injection Wells:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Geological Information</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Formation: FRIO</td>
<td></td>
</tr>
<tr>
<td>Geological Age: Oligocene</td>
<td></td>
</tr>
<tr>
<td>Basin: Gulf Coast Basin</td>
<td></td>
</tr>
<tr>
<td>Trap Type: Struct/Strat - Faulted Anticline w/SD Lenses</td>
<td></td>
</tr>
<tr>
<td>Lithology: Shaly Sand</td>
<td></td>
</tr>
<tr>
<td>Degree of: Consolation; Heterogeneity; Faulting; High Fracture;</td>
<td></td>
</tr>
<tr>
<td>Dip, Deg.: 5.0</td>
<td></td>
</tr>
<tr>
<td>Clay Content, %:</td>
<td></td>
</tr>
<tr>
<td>Interbedded Streaks:</td>
<td></td>
</tr>
<tr>
<td>Barrier to Flow:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reservoir Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth, Ft: 5400</td>
<td></td>
</tr>
<tr>
<td>Gross Pay, Ft:</td>
<td></td>
</tr>
<tr>
<td>Porosity, %: 28.0</td>
<td></td>
</tr>
<tr>
<td>Permeability, MD: 900</td>
<td></td>
</tr>
<tr>
<td>BHT, Def F: 155</td>
<td></td>
</tr>
<tr>
<td>Gas Cap: Yes</td>
<td></td>
</tr>
<tr>
<td>Gas Cap/Oil Zone Ratio: .69</td>
<td></td>
</tr>
<tr>
<td>Initial: Oil Sat., %: 68.0</td>
<td></td>
</tr>
<tr>
<td>WTR Sat., %: 32.0</td>
<td></td>
</tr>
<tr>
<td>Gas Sat., %:</td>
<td></td>
</tr>
<tr>
<td>FVF, BBL/STB: 1.161</td>
<td></td>
</tr>
<tr>
<td>WOR, BBL/BBL:</td>
<td></td>
</tr>
<tr>
<td>GOR, SCF/BBL: 324</td>
<td></td>
</tr>
<tr>
<td>BHP, PSI: 2490</td>
<td></td>
</tr>
<tr>
<td>Net Pay, Ft: 29</td>
<td></td>
</tr>
<tr>
<td>Range: 25.0 to 31.0</td>
<td></td>
</tr>
<tr>
<td>Range: To</td>
<td></td>
</tr>
<tr>
<td>Sat. Pressure, PSI: 2490</td>
<td></td>
</tr>
<tr>
<td>Gas Cap, Acres:</td>
<td></td>
</tr>
<tr>
<td>Wetting Phase:</td>
<td></td>
</tr>
<tr>
<td>Current: Oil Sat., %: 38.0 *</td>
<td></td>
</tr>
<tr>
<td>WTR Sat., %: 62.0</td>
<td></td>
</tr>
<tr>
<td>Gas Sat., %:</td>
<td></td>
</tr>
<tr>
<td>FVF, BBL/STB: 1.020 *</td>
<td></td>
</tr>
<tr>
<td>WOR, BBL/BBL: 4775</td>
<td></td>
</tr>
<tr>
<td>GOR, SCF/BBL: 324</td>
<td></td>
</tr>
<tr>
<td>BHP, PSI: 2178</td>
<td></td>
</tr>
</tbody>
</table>
FLUID CHARACTERISTICS

OIL GRAVITY, API: 25.0  RANGE: TO
VISCOSITY @ BHT, CP: 1.9; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: .20  CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM; 57000
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 80,000,000  BBL/AC-FT: 1409
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977): OIL, BBL; 29,303,000
GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 470,255
GAS, MCF; 1,534,803
WATER, BBL;
OIL REMAINING IN PLACE, STB: 51,000,000  BBL/AC-FT: 898
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WD & FE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SOURCES: 5,12,14,200,204,209,211,266-7; 11,15,233
CASE 262
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: BROOKS
DISTRICT: 4
FIELD NAME: ALTA MESA
NO. OF RESERVOIRS: 12

RESERVOIR INFORMATION

RESERVOIR: GARCIA SAND
NO. OF ZONES: 12
AREA, ACRES: 1500
TOTAL WELLS: 23
PRODUCING WELLS: 6
INJECTION WELLS: 8

GEOLOGICAL INFORMATION

FORMATION: CATAHOULA FORMATION
GEOLOGICAL AGE: OLIGOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DEGREE OF CONSOLIDATION; UNC:
HETEROGENEITY;
FAULTING;
FAULTING;
FRACTURE;

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2485
GROSS PAY, FT: 31
POROSITY, %: 26.0
PERMEABILITY, MD: 200
BHT, DEG F: 90 *
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 56.0
WTR SAT., %: 44.0
GAS SAT., %: 100
FVF, BBL/STB: 1.053
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI: 1010

NET PAY, FT: 18
RANGE: TO
RANGE: 1 TO 400
SAT. PRESSURE, PSI: 284
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 38.0 *
WTR SAT., %: 62.0
GAS SAT., %: 100
FVF, BBL/STB: 1.000 *
WOR, BBL/BBL:
GOR, SCF/BBL: 1901
BHP, PSI:
FLUID CHARACTERISTICS

OIL GRAVITY, API: 25.0
RANGE: TO
VISCOSITY @ BHT, CP: 5.1; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 26,800,000 BBL/AC-FT: 1073
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977) OIL, BBL; 7,500,000 *
GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 53,562 GAS, MCF; 25,571 WATER, BBL;
OIL REMAINING IN PLACE, STB: 19,300,000 BBL/AC-FT: 773
(DEC 31, 1977) RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 PM & WF (1948- )
AREA, ACRES: 1380 FLUID INJECTED: SW/G
NO. PROD WELLS: 11 NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL; 6,288,000 GAS, MCF; 1,371,000
CUMULATIVE PROD: OIL, BBL; 2,460,000 (THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 9.5 BBL/AC-FT: 101
DEGREE OF SUCCESS: ME
OPERATOR(S): CHEVRON U.S.A., INC.

SOURCES: 5,12,14,200,204,209,211,266-7; 234
RESERVOIR AND PRODUCTION DATA ELEMENTS

CASE 263

STATE: TEXAS
COUNTY: WEBB
DISTRICT: 4
FIELD NAME: AVIATORS
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: MIRANDO SAND
NO. OF ZONES: DISCOVERY YEAR: 1922
AREA, ACRES: 1840 SPACING, ACRES: 15
TOTAL WELLS: PRODUCING WELLS: 69
SHUT-IN WELLS: 29 INJECTION WELLS: 18

GEOLOGICAL INFORMATION

FORMATION: JACKSON GROUP, MC ELROY FORMATION
GEOLOGICAL AGE: EOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCT/STRAT - SAND LENSES ON MONOCLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.:
HETEROGENEITY;
FAULTING;
FRACTURE;
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1700
GROSS PAY, FT: 150
POROSITY, %: 32.0
PERMEABILITY, MD: 400
BHT, DEF F: 107
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 63.0
WTR SAT., %; 37.0
GAS SAT., %;
FVF, BBL/STB; 1.130
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 700
NET PAY, FT: 16
RANGE: TO
RANGE: 8 TO 3070
SAT. PRESSURE, PSI: 800
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 47.0 *
WTR SAT., %; 53.0
GAS SAT., %;
FVF, BBL/STB; 1.100
WOR, BBL/BBL;
GOR, SCF/BBL; 1
BHP, PSI; 20
CASE 263

FLUID CHARACTERISTICS

OIL GRAVITY, API: 21.0
RANGE: 20.0 TO 24.0

VISCOSITY @ BHT, CP: 32.0
@ F, CP:

SAYBOLT VISC (100F), SEC: 76

SULFUR CONTENT, %: .17
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %: .6
ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;
MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 40,700,000
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 9,750,000
(GDEC 31, 1977) GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 67,614
GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB: 31,000,000
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SG & WD
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1961-1980)

AREA, ACRES: 260
FLUID INJECTED: SW
NO. PROD WELLS: 17
NO. INJ WELLS: 4
VOLUME INJECTED: (EQUIV) WATER, BBL; 5,933,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(GTHRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 34.4
BBL/AC-FT: 173
DEGREE OF SUCCESS: ME
OPERATOR(S): BUCK, GEORGE
SECONDARY AND TERTIARY RECOVERIES (CONT.)

S.2 WATERFLOOD (1969-1987)

<table>
<thead>
<tr>
<th>Area, Acres: 160</th>
<th>Fluid Injected: SW</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Prod Wells: 11</td>
<td>No. Inj Wells: 3</td>
</tr>
<tr>
<td>Volume Injected: (Equiv) Water, BBL: 2,081,000</td>
<td></td>
</tr>
<tr>
<td>(Thru 1977) Gas, MCF: 91,000</td>
<td></td>
</tr>
<tr>
<td>Cumulative Prod: Oil, BBL:</td>
<td></td>
</tr>
<tr>
<td>(Thru 1977) Gas, MCF:</td>
<td></td>
</tr>
<tr>
<td>Water, BBL:</td>
<td></td>
</tr>
<tr>
<td>Recovery Factor, %: 15.0</td>
<td></td>
</tr>
<tr>
<td>BBL/AC-FT: 200</td>
<td></td>
</tr>
<tr>
<td>Degree of Success: ME</td>
<td></td>
</tr>
<tr>
<td>Operator(s): Petroleum Corp. of Texas</td>
<td></td>
</tr>
</tbody>
</table>

S.3 WATERFLOOD (1970- )

<table>
<thead>
<tr>
<th>Area, Acres: 100</th>
<th>Fluid Injected: SW</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Prod Wells: 8</td>
<td>No. Inj Wells: 4</td>
</tr>
<tr>
<td>Volume Injected: (Equiv) Water, BBL: 2,190,000</td>
<td></td>
</tr>
<tr>
<td>(Thru 1977) Gas, MCF: 722,000</td>
<td></td>
</tr>
<tr>
<td>Cumulative Prod: Oil, BBL:</td>
<td></td>
</tr>
<tr>
<td>(Thru 1977) Gas, MCF:</td>
<td></td>
</tr>
<tr>
<td>Water, BBL:</td>
<td></td>
</tr>
<tr>
<td>Recovery Factor, %: 24.0</td>
<td></td>
</tr>
<tr>
<td>BBL/AC-FT: 361</td>
<td></td>
</tr>
<tr>
<td>Degree of Success: ME</td>
<td></td>
</tr>
<tr>
<td>Operator(s): Reynolds, J.C. &amp; W.F.</td>
<td></td>
</tr>
</tbody>
</table>

S.4 WATERFLOOD (1964- )

<table>
<thead>
<tr>
<th>Area, Acres: 109</th>
<th>Fluid Injected: SW</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Prod Wells: 10</td>
<td>No. Inj Wells: 6</td>
</tr>
<tr>
<td>Volume Injected: (Equiv) Water, BBL: 3,811,000</td>
<td></td>
</tr>
<tr>
<td>(Thru 1972) Gas, MCF: 194,000</td>
<td></td>
</tr>
<tr>
<td>Cumulative Prod: Oil, BBL:</td>
<td></td>
</tr>
<tr>
<td>(Thru 1972) Gas, MCF:</td>
<td></td>
</tr>
<tr>
<td>Water, BBL:</td>
<td></td>
</tr>
<tr>
<td>Recovery Factor, %: 11.0</td>
<td></td>
</tr>
<tr>
<td>BBL/AC-FT: 153</td>
<td></td>
</tr>
<tr>
<td>Degree of Success: ME</td>
<td></td>
</tr>
<tr>
<td>Operator(s): King, R.A. and Sons, Ltd</td>
<td></td>
</tr>
</tbody>
</table>

Remarks: Aviators, N. Combined with Aviators in 1949
Sources: 5, 12, 14, 200, 204, 209, 211, 266-7; 235
STATE: TEXAS
COUNTY: DUVAL
FIELD NAME: CEDRO HILL
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: COLE SAND
NO. OF ZONES: DISCOVERY YEAR: 1938
AREA, ACRES: 1800 SPACING, ACRES: 34
TOTAL WELLS: PRODUCING WELLS: 10
SHUT-IN WELLS: 33 INJECTION WELLS: 6

GEOLOGICAL INFORMATION

FORMATION: JACKSON GROUP
GEOLOGICAL AGE: EOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCTURAL - PINCH OUT
LITHOLOGY: SAND

DEGREE OF: CONSOLIDATION; UNC DIP, DEG.:
HETEROGENEITY;
FAULTING;
FRACTURE;

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1440
GROSS PAY, FT: NET PAY, FT: 12
POROSITY, %: 35.0 RANGE: 26.0 TO 35.0
PERMEABILITY, MD: 800 RANGE: 20 TO 1600
BHT, DEF F: 105 * SAT. PRESSURE, PSI:
GAS CAP: NO GAS CAP, ACRES:
GAS CAP/OIL ZONE RATIO: .50 WETTING PHASE:
INITIAL: OIL SAT., %; 70.0 CURRENT: OIL SAT., %; 54.0 *
WTR SAT., %; 30.0 WTR SAT., %; 46.0
GAS SAT., %;
FVF, BBL/STB; 1.080 FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL; 1.000
BHP, PSI; 500

FLUID CHARACTERISTICS

OIL GRAVITY, API: 19.2 RANGE: TO
VISCOSITY @ BHT, CP: @ F, CP:
SAYBOLT VISC (100F), SEC: CARBON/HYDROGEN RATIO:
SULFUR CONTENT, %: ACID NUMBER:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;
### RESERVES AND PRODUCTION DATA

| Original Oil In Place, STB: | 38,000,000 | BBL/AC-FT: 1760 |
| Original Gas In Place, MCF: | 6,403,537 | |
| Cum Prod: OIL, BBL; | 9,271 |
| (DEC 31, 1977) | |
| Gas, MCF; | 33 |
| WATER, BBL; | |
| 1977 Annual Prod: OIL, BBL; | |
| GAS, MCF; | |
| WATER, BBL; | |
| Oil Remaining In Place, STB: | 31,600,000 | BBL/AC-FT: 1463 |
| (DEC 31, 1977) | |

**Primary Production:**
- **Mechanism:** SG & WD
- **Recovery Factor, %:**
- **Annual Decline Rate, %:**

**Secondary and Tertiary Recoveries:**

#### T.1 Thermal Recovery (1968-1978)

| Area, Acres: | 280 |
| No. Prod Wells: | 16 |
| Fluid Injected: SW/A |
| No. Inj Wells: |
| Volume Injected: (EQUIV) WATER, BBL; | 722,000 |
| GAS, MCF; | 2,487,000 |
| Cumulative Prod: OIL, BBL; | 164,000 |
| (THRU 1977) GAS, MCF; | |
| WATER, BBL; | |
| Recovery Factor, %: |
| Degree of Success: |
| Operator(s): STRIPTEX OIL CO. |

#### T.2 Thermal Recovery (1977)

| Area, Acres: | 330 |
| No. Prod Wells: | 15 |
| Fluid Injected: SW |
| No. Inj Wells: |
| Volume Injected: (EQUIV) WATER, BBL; | 414,000 |
| GAS, MCF; |
| Cumulative Prod: OIL, BBL; | 101,000 |
| (THRU 1977) GAS, MCF; | |
| WATER, BBL; | |
| Recovery Factor, %: |
| Degree of Success: |
| Operator(s): STRIPTEX OIL CO. |

**Remarks:** Gas Cap Present Originally

**Sources:** 5, 12, 14, 200, 204, 209, 211, 266-7; 18, 237
STATE: TEXAS
COUNTY: WEBB
DISTRICT: 4
FIELD NAME: COLE, WEST
NO. OF RESERVOIRS: 3

RESERVOIR INFORMATION

RESERVOIR: MIRANDO SAND
NO. OF ZONES: 7
AREA, ACRES: 2375
TOTAL WELLS: 74
SHUT-IN WELLS: 31

DISCOVERY YEAR: 1927
SPACING, ACRES: 21
PRODUCING WELLS: 74
INJECTION WELLS: 5

GEOLOGICAL INFORMATION

FORMATION: MCELROY FORMATION, JACKSON SAND
GEOLOGICAL AGE: EOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULTED ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2375
GROSS PAY, FT: 25
POROSITY, %: 29.0
PERMEABILITY, MD: 850
BHT, DEF F: 115 *
GAS CAP: YES
GAS CAP/OIL ZONE RATIO: .50
INITIAL: OIL SAT., %; 60.0
WTR SAT., %; 40.0
GAS SAT., %;
FVF, BBL/STB; 1.200
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 1100

NET PAY, FT: 16
RANGE: 26.0 TO 30.0
RANGE: 58 TO 1300
SAT. PRESSURE, PSI: 500
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 52.0 *
WTR SAT., %; 48.0
GAS SAT., %;
FVF, BBL/STB; 1.130
WOR, BBL/BBL;
GOR, SCF/BBL; 50
BHP, PSI; 70
FLUID CHARACTERISTICS

OIL GRAVITY, API: 22.0
RANGE: TO
VISCOSITY @ BHT, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM:
WATER HARDNESS: CA, PPM; MG, PPM;
CARBON/HYDROGEN RATIO:
ACID NUMBER:

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 42,700,000
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977) OIL, BBL; 3,190,620
GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 61,503
GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB: 39,600,000
(DEC 31, 1977) RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: GAS CAP EXPANSION
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

REMARKS: ALL PRODUCTION PRIOR TO 1939 INCLUDED IN BRUNI FLD

SOURCES: 5, 12, 14, 200, 204, 209, 211, 214, 266, 267; 238
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: DUVAL
DISTRICT: 4
FIELD NAME: GOVERNMENT WELLS, NORTH
NO. OF RESERVOIRS: 17

RESERVOIR INFORMATION

RESERVOIR: LOWER GOVT. WELLS SAND
NO. OF ZONES: 1  DISCOVERY YEAR: 1928
AREA, ACRES: 8500  SPACING, ACRES: 30
TOTAL WELLS: PRODUCING WELLS: 137
SHUT-IN WELLS: 96  INJECTION WELLS: 42

GEOLOGICAL INFORMATION

FORMATION: JACKSON
GEOLOGICAL AGE: EOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCT/STRAT - FAULTED MONOCLINE W/PINCHOUT
LITHOLOGY: SAND/SHALY SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.: HETEROGENEITY; MOD CLAY CONTENT, %:
FAULTING; MOD INTERBEDDED STREAKS: YES FRACTURE; BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2250
GROSS PAY, FT: 45
POROSITY, %: 28.5
PERMEABILITY, MD: 800
BHT, DEF F: 114
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 73.0 WTR SAT., %: 27.0
GAS SAT., %:
FVF, BBL/STB: 1.070 WOR, BBL/BBL:
GOR, SCF/BBL: 100 BHP, PSI: 875

NET PAY, FT: 20 RANGE: TO
RANGE: 50 TO 3000 SAT. PRESSURE, PSI: 875
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 48.0 * WTR SAT., %: 52.0
GAS SAT., %:
FVF, BBL/STB: 1.010 WOR, BBL/BBL:
GOR, SCF/BBL: 100 BHP, PSI: 50

FLUID CHARACTERISTICS

OIL GRAVITY, API: 21.0 RANGE: TO
VISCOITY @ BHT, CP: 10.0; @ F, CP:
SAYBOLT VISC (100F), SEC: 82
SULFUR CONTENT, %: .22 CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: .6 ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA,PPM;  MG,PPM;
**CASE 268**

**RESERVES AND PRODUCTION DATA**

**ORIGINAL OIL IN PLACE, STB:** 256,400,000  
**ORIGINAL GAS IN PLACE, MCF:** 
**CUM PROD**  
(DEC 31, 1977)  
**1977 ANNUAL PROD:**  
**OIL REMAINING IN PLACE, STB:** 180,200,000  
(DEC 31, 1977) 

**PRIMARY PRODUCTION:**  
**MECHANISM:** WATER DRIVE  
**RECOVERY FACTOR, %:** 41.0 
**ANNUAL DECLINE RATE, %:** 

**SECONDARY AND TERTIARY RECOVERIES:**

**S.1 WATERFLOOD (1951- )**  
**AREA, ACRES:** 660  
**NO. PROD WELLS:** 46  
**NO. INJ WELLS:** 23  
**VOLUME INJECTED:** (EQUIV) WATER, BBL; 73,764,000  
**CUMULATIVE PROD:** OIL, BBL; 1,630,000  
(THRU 1977)  
**WATER, BBL:** 
**RECOVERY FACTOR, %:** 12.0  
**DEGREE OF SUCCESS:** VE  
**OPERATOR(S):** SUN OIL CO  

**S.2 WATERFLOOD (1973-1974)**  
**AREA, ACRES:** 620  
**NO. PROD WELLS:** 3  
**NO. INJ WELLS:**  
**VOLUME INJECTED:** (EQUIV) WATER, BBL;  
**CUMULATIVE PROD:** OIL, BBL; 66,000  
(THRU 1977)  
**WATER, BBL:** 
**RECOVERY FACTOR, %:**  
**DEGREE OF SUCCESS:** 
**OPERATOR(S):** COASTAL ST. GAS PROD CO
SECONDARY AND TERTIARY RECOVERIES (CONT.)

S.3 WATERFLOOD (1965-1978)

AREA, ACRES: 120  FLUID INJECTED: SW
NO. PROD WELLS: 5  NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL; 356,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 15,000
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): MILLER-JONES OIL CO

S.4 WATERFLOOD (-1973)

AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): 4 PROJECTS, TODAY ABND.

T.1 IN-SITU COMBUSTION (1962-)

AREA, ACRES: 600  FLUID INJECTED: A/SW
NO. PROD WELLS: 6  NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL; 1,046,000
GAS, MCF; 9,905,000
CUMULATIVE PROD: OIL, BBL; 666,000
(THRU 1973) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): MOBIL OIL CORP.

REMARKS: CUMULATIVE PRODUCTION FOR TOTAL FIELD
SOURCES: 5,12,14,200,204,209,211,214,266-7; 17,18,240
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: DUVAL
DISTRICT: 4
FIELD NAME: GOVERNMENT WELLS, SOUTH
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: GOVERNMENT WELLS
NO. OF ZONES: DISCOVERY YEAR: 1930
AREA, ACRES: 4500 SPACING, ACRES: 28
TOTAL WELLS: PRODUCING WELLS: 89
SHUT-IN WELLS: 35 INJECTION WELLS: 27

GEOLOGICAL INFORMATION

FORMATION: JACKSON GR., GOVT. WELLS SAND
GEOLOGICAL AGE: EOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRATIGRAPHIC - LENTICULAR
LITHOLOGY: LENTICULAR SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.:
HETEROGENEITY;
FAULTING;
FRACTURE;
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2200
GROSS PAY, FT:
POROSITY, %: 31.0
PERMEABILITY, MD: 1100
BHT, DEF F: 112 *
GAS CAP: NO
GAS CAP/OIL ZONE RATIO: 1.00
INITIAL: OIL SAT., %; 55.0
WTR SAT., %; 45.0
GAS SAT., %;
FVF, BBL/STB; 1.065
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 850
NET PAY, FT: 20
RANGE: TO
RANGE: 200 TO 2000
SAT. PRESSURE, PSI: 850
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 45.0 *
WTR SAT., %; 55.0
GAS SAT., %;
FVF, BBL/STB; 1.010 *
WOR, BBL/BBL;
GOR, SCF/BBL; 440
BHP, PSI; 33
FLUID CHARACTERISTICS

CASE 269

OIL GRAVITY, API: 22.5
RANGE: TO

VISCOSITY @ BHT, CP: @ F, CP:

SAYBOLT VISC (100F), SEC:

SULFUR CONTENT, %: .16
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %:
ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;

MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 111,800,000
ORIGINAL GAS IN PLACE, MCF: CUM PROD:
CUM PROD: OIL, BBL; 15,898,470
(DEC 31, 1977) GAS, MCF;
WATER, BBL;

1977 ANNUAL PROD: OIL, BBL; 245,197
GAS, MCF; 15,560
WATER, BBL; 15,560

OIL REMAINING IN PLACE, STB: 95,900,000
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1963-1990)

AREA, ACRES: 120
NO. PROD WELLS: 11
VOLUME INJECTED: (EQUIV) WATeR, BBL; 3,351,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 331,000
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 16.5
BBL/AC-FT: 138
DEGREE OF SUCCESS: ME
OPERATOR(S): COX, E.L. & J.L. HAMON
SECONDARY AND TERTIARY RECOVERIES (CONT.)

CASE 269

S.2 WATERFLOOD

<table>
<thead>
<tr>
<th>AREA, ACRES: 200</th>
<th>FLUID INJECTED: SW</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. PROD WELLS: 7</td>
<td>NO. INJ WELLS: 5</td>
</tr>
<tr>
<td>VOLUME INJECTED: (EQUIV) WATER, BBL; 1,161,000</td>
<td></td>
</tr>
<tr>
<td>CUMULATIVE PROD: OIL, BBL; 286,000</td>
<td></td>
</tr>
<tr>
<td>(THRU 1977) GAS, MCF; WATER, BBL;</td>
<td></td>
</tr>
<tr>
<td>RECOVERY FACTOR, %:</td>
<td></td>
</tr>
<tr>
<td>DEGREE OF SUCCESS: ME</td>
<td></td>
</tr>
<tr>
<td>OPERATOR(S): LUNDELLS, INC.</td>
<td></td>
</tr>
</tbody>
</table>

S.3 WATERFLOOD

<table>
<thead>
<tr>
<th>AREA, ACRES: 401</th>
<th>FLUID INJECTED: SW</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. PROD WELLS: 9</td>
<td>NO. INJ WELLS: 4</td>
</tr>
<tr>
<td>VOLUME INJECTED: (EQUIV) WATER, BBL; 8,805,000</td>
<td></td>
</tr>
<tr>
<td>CUMULATIVE PROD: OIL, BBL; 316,000</td>
<td></td>
</tr>
<tr>
<td>(THRU 1977) GAS, MCF; WATER, BBL;</td>
<td></td>
</tr>
<tr>
<td>RECOVERY FACTOR, %: 4.2</td>
<td></td>
</tr>
<tr>
<td>DEGREE OF SUCCESS: ME</td>
<td></td>
</tr>
<tr>
<td>OPERATOR(S): MOBIL OIL CORP.</td>
<td></td>
</tr>
</tbody>
</table>

S.4 WATERFLOOD

<table>
<thead>
<tr>
<th>AREA, ACRES: 4500</th>
<th>FLUID INJECTED: SW</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. PROD WELLS: 20</td>
<td>NO. INJ WELLS: 14</td>
</tr>
<tr>
<td>VOLUME INJECTED: (EQUIV) WATER, BBL; 40,855,000</td>
<td></td>
</tr>
<tr>
<td>CUMULATIVE PROD: OIL, BBL; 655,000</td>
<td></td>
</tr>
<tr>
<td>(THRU 1977) GAS, MCF; WATER, BBL;</td>
<td></td>
</tr>
<tr>
<td>RECOVERY FACTOR, %: 9.4</td>
<td></td>
</tr>
<tr>
<td>DEGREE OF SUCCESS: ME</td>
<td></td>
</tr>
<tr>
<td>OPERATOR(S): WORLDWIDE ENERGY CORP</td>
<td></td>
</tr>
</tbody>
</table>

REMARKS: GAS CAP PRESENT ORIGINALLY

SOURCES: 5, 12, 14, 200, 204, 209, 211, 266-7; 241
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: ZAPATA
DISTRICT: 4
FIELD NAME: JENNINGS
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: MIRANDO & MIRANDO #1 SOUTH END
NO. OF ZONES: 2
SPACING, ACRES: 36
TOTAL WELLS: 10
INJECTION WELLS: 11

GEOLOGICAL INFORMATION

FORMATION: JACKSON GROUP: MCELROY FM.
GEOLOGICAL AGE: EOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCT./STRAT - FAULTED MONOCLINE W/PINCHOUT
LITHOLOGY: SAND

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1200
GROSS PAY, FT: 84
POROSITY, %: 32.7
PERMEABILITY, MD: 590
BHT, DEF F: 90 *
GAS CAP: YES
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 70.0
WTR SAT., %; 30.0
GAS SAT., %;
FVF, BBL/STB; 1.074
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 464
NET PAY, FT: 22
RANGE: TO
RANGE: 100 TO 2000
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 53.0 *
WTR SAT., %; 47.0
GAS SAT., %;
FVF, BBL/STB; 1.010 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 230

FLUID CHARACTERISTICS

OIL GRAVITY, API: 21.0
VISCOITY @ BHT, CP: ; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;

359
RESERVES AND PRODUCTION DATA

CASE 271

ORIGINAL OIL IN PLACE, STB: 32,800,000  BBL/AC-FT: 1653
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 6,548,817
(GDEC 31, 1977) GAS, MCF; 1,000
WATER, BBL; 2,925,000
1977 ANNUAL PROD: OIL, BBL; 15,408
GAS, MCF; 120
WATER, BBL;
OIL REMAINING IN PLACE, STB: 26,300,000  BBL/AC-FT: 1323
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD  (1961-1973)
AREA, ACRES: 697  FLUID INJECTED: SW
NO. PROD WELLS: NO. INJ WELLS: 8
VOLUME INJECTED: (EQUIV) WATER, BBL; 17,617,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 2,388,000
(GTHRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S): TEXACO INC

S.2 WATERFLOOD  (1958-1970)
AREA, ACRES: 205  FLUID INJECTED: SW/G
NO. PROD WELLS: NO. INJ WELLS: 3
VOLUME INJECTED: (EQUIV) WATER, BBL; 21,073,000
GAS, MCF; 440,000
CUMULATIVE PROD: OIL, BBL;
(GTHRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S): TEXACO INC

SOURCES: 5, 12, 14, 200, 204, 209, 211, 266-7; 243
STATE: TEXAS
COUNTY: JIM HOGG
DISTRICT: 4
FIELD NAME: LAS ANIMAS-LEFEVRE
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: COLE
NEG. OF ZONES: 1
AREA, ACRES: 1200
TOTAL WELLS: 11
SHUT-IN WELLS: 11

DISCOVERY YEAR: 1937
SPACING, ACRES: 18
PRODUCING WELLS: 32
INJECTION WELLS: 11

GEOLOGICAL INFORMATION

FORMATION: JACKSON
GEOLOGICAL AGE: EOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRATIGRAPHIC -
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC
HETEROGENEITY;
FAULTING;
FRACUTURE;
DIP, DEG.: 
CLAY CONTENT, %:
INTERBEDDED STREAKS: NO
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1800
GROSS PAY, FT: 125
POROSITY, %: 30.0
PERMEABILITY, MD: 1800
BHT, DEF F: 100
GAS CAP: YES
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 70.0
WTR SAT., %; 30.0
GAS SAT., %;
FVF, BBL/STB; 1.110
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

NET PAY, FT: 15
RANGE: 30.0 TO 33.0
RANGE: 50 TO 6000
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 58.0 *
WTR SAT., %; 42.0
GAS SAT., %;
FVF, BBL/STB; 1.050
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 220
FLUID CHARACTERISTICS

OIL GRAVITY, API: 19.0
RANGE: TO
VISCOSITY @ BHT, CP: 40.9; @ 72F, CP: 88.0
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;
CARBON/HYDROGEN RATIO:
ACID NUMBER:
RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 26,400,000
ORIGINAL GAS IN PLACE, MCF: CUM PROD:
(DEC 31, 1977) OIL, BBL; GAS, MCF;
GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB: 23,100,000
(DEC 31, 1977)
RESERVES (DEC 31, )
BBL/AC-FT: 1468
BBL/AC-FT: 1283

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:


SOURCES: 5, 12, 14, 200, 204, 209, 211, 214, 266, 267; 244
### Reservoir and Production Data Elements

**State:** Texas  
**County:** Duval  
**District:** 4  
**Field Name:** Loma Novia  
**No. of Reservoirs:** 3

#### Reservoir Information

**Reservoir:** Loma Novia Sand  
**No. of Zones:** 4  
**Area, Acres:** 7400  
**Total Wells:**  
**Shut-In Wells:** 85  
**Discovery Year:** 1934  
**Spacing, Acres:** 41  
**Producing Wells:** 67  
**Injection Wells:** 25

#### Geological Information

**Formation:** Loma Novia Sand: Jackson Group  
**Geological Age:** Eocene  
**Basin:** Gulf Coast Basin  
**Trap Type:** Stratigraphic - Monocline Lens  
**Lithology:** Sand  
**Dip, Deg.:** 1.0  
**Clay Content, %:**  
**Interbedded Streaks:**  
**Barrier to Flow:**

#### Reservoir Characteristics

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth, Ft.</td>
<td>2600</td>
</tr>
<tr>
<td>Gross Pay, Ft.</td>
<td>96</td>
</tr>
<tr>
<td>Porosity, %</td>
<td>29.0</td>
</tr>
<tr>
<td>Permeability, MD</td>
<td>600</td>
</tr>
<tr>
<td>BHT, Def F.</td>
<td>114</td>
</tr>
<tr>
<td>Gas Cap</td>
<td>No</td>
</tr>
<tr>
<td>Net Pay, Ft.</td>
<td>16</td>
</tr>
<tr>
<td>Range: 25.0 to 30.0</td>
<td></td>
</tr>
<tr>
<td>Range: 7 to 4400</td>
<td></td>
</tr>
<tr>
<td>Sat. Pressure, PSI</td>
<td>868</td>
</tr>
<tr>
<td>Gas Cap, Acres</td>
<td></td>
</tr>
<tr>
<td>Wetting Phase:</td>
<td></td>
</tr>
<tr>
<td>Initial: Oil Sat., %</td>
<td>65.0</td>
</tr>
<tr>
<td>WTR Sat., %</td>
<td>35.0</td>
</tr>
<tr>
<td>Gas Sat., %</td>
<td></td>
</tr>
<tr>
<td>FVF, BBL/STB; 1.100</td>
<td></td>
</tr>
<tr>
<td>WOR, BBL/BBL;</td>
<td></td>
</tr>
<tr>
<td>GOR, SCF/BBL;</td>
<td></td>
</tr>
<tr>
<td>BHP, PSI;</td>
<td>1050</td>
</tr>
<tr>
<td>Current: Oil Sat., %</td>
<td>42.0 *</td>
</tr>
<tr>
<td>WTR Sat., %</td>
<td>58.0</td>
</tr>
<tr>
<td>Gas Sat., %</td>
<td></td>
</tr>
<tr>
<td>FVF, BBL/STB; 1.020</td>
<td></td>
</tr>
<tr>
<td>WOR, BBL/BBL;</td>
<td></td>
</tr>
<tr>
<td>GOR, SCF/BBL;</td>
<td>229</td>
</tr>
<tr>
<td>BHP, PSI;</td>
<td>80</td>
</tr>
</tbody>
</table>
FLUID CHARACTERISTICS

OIL GRAVITY, API: 25.0  
RANGE: TO

RANGE: TO

VISCOSITY @ BHT, CP: 40.0;  
@ 90F, CP: 6.1

SAYBOLT VISC (100F), SEC: 41

SULFUR CONTENT, %: .10

CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %: .3

ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM;

WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 157,400,000  BBL/AC-FT: 1329

ORIGINAL GAS IN PLACE, MCF:

CUM PROD (DEC 31, 1977):

OIL, BBL: 47,297,000

GAS, MCF:

WATER, BBL:

1977 ANNUAL PROD:

OIL, BBL: 133,546

GAS, MCF:

WATER, BBL:

OIL REMAINING IN PLACE, STB: 110,100,000  BBL/AC-FT: 930

(DEC 31, 1977)

RESERVES (DEC 31, )

PRIMARY PRODUCTION:

MECHANISM: SOLUTION GAS

RECOVERY FACTOR, %:

BBL/AC-FT:

ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 PERIPHERAL WF ( -1979)

AREA, ACRES: 320

FLUID INJECTED: SW

NO. PROD WELLS: 3

NO. INJ WELLS: 1

VOLUME INJECTED: (EQUIV) WATER, BBL:

GAS, MCF:

CUMULATIVE PROD:

OIL, BBL:

38,000

GAS, MCF:

WATER, BBL:

RECOVERY FACTOR, %:

BBL/AC-FT:

DEGREE OF SUCCESS: UD

OPERATOR(S): PETR CORP OF TEXAS
SECONDARY AND TERTIARY RECOVERIES (CONT.)

S.2 WATERFLOOD (150 ACRES)

FLUID INJECTED: SW

NO. PROD WELLS: 5
NO. INJ WELLS: 3

VOLUME INJECTED: (EQUIV) WATER, BBL; 94,000

GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 2,000

GAS, MCF;
WATER, BBL;

RECOVERY FACTOR, %:

BBL/AC-FT:

DEGREE OF SUCCESS: UD

OPERATOR(S): WARNER - PAWEL

S.3 WATERFLOOD (1956-1987)

AREA, ACRES: 640

FLUID INJECTED: SW

NO. PROD WELLS: 40
NO. INJ WELLS:

VOLUME INJECTED: (EQUIV) WATER, BBL; 2,495,000

GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 1,702,000

GAS, MCF;
WATER, BBL;

RECOVERY FACTOR, %: 52.0

BBL/AC-FT:

DEGREE OF SUCCESS: ME

OPERATOR(S): WORLDWIDE ENERGY CORP

S.4 WATERFLOOD (1957-1980)

AREA, ACRES: 390

FLUID INJECTED: SW

NO. PROD WELLS: 5
NO. INJ WELLS: 4

VOLUME INJECTED: (EQUIV) WATER, BBL; 18,083,000

GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 51,000

GAS, MCF;
WATER, BBL;

RECOVERY FACTOR, %: 12.0

BBL/AC-FT:

DEGREE OF SUCCESS: UD

OPERATOR(S): PETR CORP OF TEXAS

SOURCES: 5,12,14,200,204,209,211,266-7; 245
STATE: TEXAS
COUNTY: WEBB
DISTRICT: 4
FIELD NAME: LOPEZ
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: MIRANDO SAND
NO. OF ZONES: DISCOVERY YEAR: 1935
AREA, ACRES: 3544 SPACING, ACRES: 28
TOTAL WELLS: PRODUCING WELLS: 45
SHUT-IN WELLS: 40 INJECTION WELLS: 38

GEOLOGICAL INFORMATION

FORMATION: MIRANDO GEOLOGICAL AGE: EOCENE
GEOLICAL AGE: EOCENE BASIN: GULF COAST BASIN
TRAP TYPE: STRATIGRAPHIC - MONOCLINE - PINCHOUT UPDIP
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACUTRE;
DIP, DEG.:
CLAY CONTENT, %: INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2250 NET PAY, FT: 22
GROSS PAY, FT: 84 RANGE:
POROSITY, %: 32.0 TO
PERMEABILITY, MD: 500 RANGE: 15 TO 2500
BHT, DEF F: 140 SAT. PRESSURE, PSI: 780
GAS CAP: NO GAS CAP, ACRES:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 60.0 WETTING PHASE:
WTR SAT., %; 40.0 CURRENT:
GAS SAT., %; OIL SAT., %; 38.0 *
FVF, BBL/STB; 1.150 WTR SAT., %; 62.0
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 780 GAS SAT., %;
FVF, BBL/STB; 1.040 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 720

WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 720
FLUID CHARACTERISTICS

OIL GRAVITY, API: 21.0
RANGE: TO
VISCOSITY @ BHT, CP: 8.9; @ 21F, CP: 21.0
SAYBOLT VISC (100F), SEC: 93
SULFUR CONTENT, %: .31
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 1.0
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;
MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 101,000,000 BBL/AC-FT: 1295
ORIGINAL GAS IN PLACE, MCF: 
CUM PROD (DEC 31, 1977): OIL, BBL: 29,831,386
GAS, MCF: 
WATER, BBL: 
1977 ANNUAL PROD: OIL, BBL: 264,372
GAS, MCF: 48
WATER, BBL: 
OIL REMAINING IN PLACE, STB: 71,200,000 BBL/AC-FT: 913
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %: 
ANNUAL DECLINE RATE, %: 

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1965-1985)

AREA, ACRES: 240
NO. PROD WELLS: 7
VOLUME INJECTED: (EQUIV) WATER, BBL: 5,487,000
GAS, MCF; 
CUMULATIVE PROD: OIL, BBL: 296,000
(GRU 1977) GAS, MCF; 
WATER, BBL; 
RECOVERY FACTOR, %: 15.2
BBL/AC-FT: 243
DEGREE OF SUCCESS: VE
OPERATOR(S): ABEL & HARRISON
SECONDARY AND TERTIARY RECOVERIES (CONT.)

CASE 274

S.2 PERIPHERAL WF (1959-1982)

Area, Acres: 2248
No. Prod Wells: 36
No. Inj Wells: 17
Volume Injected: (equiv) Water, BBL: 114,166,000
Gas, MCF:
Cumulative Prod: Oil, BBL: 5,955,000
Gas, MCF: (thru 1977)
Water, BBL:
Recovery Factor, %: 15.3 BBL/AC-FT: 231
Degree of Success: VE
Operator(s): Tesoro Petroleum Co.

S.3 WATERFLOOD (1955-1973)

Area, Acres: 675
No. Prod Wells: 17
No. Inj Wells:
Volume Injected: (equiv) Water, BBL: 109,987,000
Gas, MCF:
Cumulative Prod: Oil, BBL: (thru 1977)
Gas, MCF: Water, BBL:
Recovery Factor, %:
Degree of Success:
Operator(s): Cox, Edwin L.

T.1 IN-SITU COMBUSTION (1967-1972)

Area, Acres: 675
No. Prod Wells: 17
No. Inj Wells:
Volume Injected: (equiv) Water, BBL: 1,522,000
Gas, MCF: 1,050,000
Cumulative Prod: Oil, BBL: (thru 1977)
Gas, MCF: Water, BBL:
Recovery Factor, %:
Degree of Success:
Operator(s): Cox, Edwin L.

Remarks: Gas Cap Present Originally
Sources: 5,12,14,200,204,209,211,266-7; 18,246
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: DUVAL
DISTRICT: 4
FIELD NAME: LUNDELL
NO. OF RESERVOIRS: 5

RESERVOIR INFORMATION

RESERVOIR: COLE SAND
NO. OF ZONES: 5
AREA, ACRES: 5000
TOTAL WELLS: 52
SHUT-IN WELLS: 6
DISCOVERY YEAR: 1937
SPACING, ACRES: 89
PRODUCING WELLS: 46
INJECTION WELLS: 3

GEOLOGICAL INFORMATION

FORMATION: JACKSON
GEOLOGICAL AGE: EOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCT/STRAT - ANTICLINE BOUND BY SHALE OUT
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.: 1.0
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1550
GROSS PAY, FT: 25
POROSITY, %: 32.0
PERMEABILITY, MD: 2630
BHT, DEG F: 111
GAS CAP: YES
GAS CAP/OIL ZONE RATIO: 2.00
INITIAL: OIL SAT., %; 60.0
WTR SAT., %; 40.0
GAS SAT., %;
FVF, BBL/STB; 1.050
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 700
NET PAY, FT: 12
RANGE: TO
RANGE: 10 TO 4930
SAT. PRESSURE, PSI: 700
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 51.0 *
WTR SAT., %; 49.0
GAS SAT., %;
FVF, BBL/STB; 1.010
WOR, BBL/BBL;
GOR, SCF/BBL; 1573
BHP, PSI; 300
FLUID CHARACTERISTICS

OIL GRAVITY, API: 20.0
RANGE: TO

VISCOSITY @ BHT, CP: 22.5;
@ 100F, CP: 3.5

SAYBOLT VISC (100F), SEC:

SULFUR CONTENT, %:
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %:
ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 85,100,000
ORIGINAL GAS IN PLACE, MCF:

CUM PROD (DEC 31, 1977):
OIL, BBL; 9,542,023
GAS, MCF; 96,409
WATER, BBL;

1977 ANNUAL PROD:
OIL, BBL; 83,759
GAS, MCF;
WATER, BBL;

OIL REMAINING IN PLACE, STB: 75,600,000
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 PRESSURE MAINTENANCE (1945- )

AREA, ACRES: 250
NO. PROD WELLS: 28
VOLUME INJECTED: (EQUIV) WATER, BBL; 122,060,000
GAS, MCF; 5,652,000

CUMULATIVE PROD:
OIL, BBL; 3,672,000
GAS, MCF;
WATER, BBL;

RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: UD
OPERATOR(S): LUNDELLS, INC.

SOURCES: 5, 12, 14, 200, 204, 209, 211, 266-7; 247
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: DUVAL
DISTRICT: 4
FIELD NAME: LUNDELL
NO. OF RESERVOIRS: 5

RESERVOIR INFORMATION

RESERVOIR: PETTUS
NO. OF ZONES:
AREA, ACRES: 800
TOTAL WELLS:
SHUT-IN WELLS: 5
DISCOVERY YEAR: 1950
SPACING, ACRES: 33
PRODUCING WELLS: 15
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: YEGUA PETTUS
GEOLOGICAL AGE: EOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCTURAL - ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2490
GROSS PAY, FT: 107
POROSITY, %: 33.0
PERMEABILITY, MD:
BHT, DEF F: 120 *
GAS CAP: YES
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 60.0
WTR SAT., %; 40.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
NET PAY, FT: 15
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 50.0 *
WTR SAT., %; 50.0
GAS SAT., %;
FVF, BBL/STB; 1.010 *
WOR, BBL/BBL;
GOR, SCF/BBL; 645
BHP, PSI;
FLUID CHARACTERISTICS

CASE 276

OIL GRAVITY, API: 22.2
VISCOSITY @ BHT, CP: @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM:
WATER HARDNESS: CA, PPM:
RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 19,000,000 BBL/AC-FT: 1583
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: ORIGINAL OIL IN PLACE, STB: 19,000,000
(DEC 31, 1977) ORIGINAL GAS IN PLACE, MCF:
GAS, MCF:
WATER, BBL:
OIL, BBL:
1977 ANNUAL PROD:
GAS, MCF:
WATER, BBL:
OIL REMAINING IN PLACE, STB: 16,340,000 BBL/AC-FT: 1362
(DEC 31, 1977) RESERVES (DEC 31, ) RESERVES (DEC 31, )
PRIMARY PRODUCTION:
MECHANISM: SOLUTION GAS
RECOVERY FACTOR, %:
BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SOURCES: 5, 12, 14, 200, 204, 209, 211, 214, 266, 267; 248
CASE 277
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: DUVAL
DISTRICT: 4
FIELD NAME: PIEDRE LUMBRE
NO. OF RESERVOIRS: 3

RESERVOIR INFORMATION

RESERVOIR: GOVERNMENT WELLS SAND
NO. OF ZONES: DISCOVERY YEAR: 1936
AREA, ACRES: 1135 SPACING, ACRES: 25
TOTAL WELLS: PRODUCING WELLS: 28
SHUT-IN WELLS: INJECTION WELLS: 9

GEOLOGICAL INFORMATION

FORMATION: JACKSON
GEOLOGICAL AGE: EOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCTURAL - FAULT CLOSURE ON MONOCLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACUTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1950
GROSS PAY, FT: 30
POROSITY, %: 32.5
PERMEABILITY, MD: 288
BHT, DEF F: 110
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 67.0
WTR SAT., %; 33.0
GAS SAT., %;
FVF, BBL/STB; 1.100
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 800
NET PAY, FT: 18
RANGE: TO
RANGE: 20 TO 1600
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 21.0 *
WTR SAT., %; 79.0
GAS SAT., %;
FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 300

FLUID CHARACTERISTICS

OIL GRAVITY, API: 21.2
VISOSITY @ BHT, CP: 9.8;
@ F, CP: 9.8;
SAYBOLT VISC (100F), SEC: 72
SULFUR CONTENT, %: .14
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: .5
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;

373
RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 31,400,000  
ORIGINAL GAS IN PLACE, MCF:  
CUM PROD: OIL, BBL; 20,405,180  
(GEO 31, 1977) GAS, MCF; WATER, BBL;  
1977 ANNUAL PROD: OIL, BBL; 119,820  
GAS, MCF; 60 WATER, BBL;  
OIL REMAINING IN PLACE, STB: 11,000,000  
(DEC 31, 1977) RESERVES (DEC 31, )  

PRIMARY PRODUCTION:  
MECHANISM: SOLUTION GAS  
RECOVERY FACTOR, %:  
ANNUAL DECLINE RATE, %:  

SECONDARY AND TERTIARY RECOVERIES:  

S.1 WATERFLOOD (1949-1971)  
AREA, ACRES: 600  
NO. PROD WELLS: 4  
NO. INJ WELLS:  
VOLUME INJECTED: (EQUIV) WATER, BBL; 42,958,000  
GAS, MCF;  
CUMULATIVE PROD: OIL, BBL; 1,275,000  
(GEO 1977) GAS, MCF; WATER, BBL;  
RECOVERY FACTOR, %: 8.8  
DEGREE OF SUCCESS: VE  
OPERATOR(S): COASTAL ST. GAS PROD CO  

S.2 WATERFLOOD (1965-1985)  
AREA, ACRES: 160  
NO. PROD WELLS: 12  
NO. INJ WELLS: 5  
VOLUME INJECTED: (EQUIV) WATER, BBL; 9,984,000  
GAS, MCF;  
CUMULATIVE PROD: OIL, BBL; 667,000  
(GEO 1977) GAS, MCF; WATER, BBL;  
RECOVERY FACTOR, %: 17.0  
DEGREE OF SUCCESS: ME  
OPERATOR(S): MOBIL OIL CORP  

374
SECONDARY AND TERTIARY RECOVERIES (CONT.)

S.3 WATERFLOOD (1949-1972)

<table>
<thead>
<tr>
<th>AREA, ACRES: 640</th>
<th>FLUID INJECTED: SW</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. PROD WELLS: 6</td>
<td>NO. INJ WELLS:</td>
</tr>
<tr>
<td>VOLUME INJECTED:</td>
<td>(EQUIV) WATER, BBL;</td>
</tr>
<tr>
<td></td>
<td>8,941,000</td>
</tr>
<tr>
<td>CUMULATIVE PROD:</td>
<td>OIL, BBL;</td>
</tr>
<tr>
<td>(THRU 1972)</td>
<td>553,000</td>
</tr>
<tr>
<td></td>
<td>GAS, MCF;</td>
</tr>
<tr>
<td></td>
<td>WATER, BBL;</td>
</tr>
<tr>
<td>RECOVERY FACTOR, %:</td>
<td>BBL/AC-FT:</td>
</tr>
<tr>
<td>DEGREE OF SUCCESS:</td>
<td></td>
</tr>
<tr>
<td>OPERATOR(S): COASTAL ST. GAS PROD CO</td>
<td></td>
</tr>
</tbody>
</table>

S.4 WATERFLOOD (1964-1985)

<table>
<thead>
<tr>
<th>AREA, ACRES: 315</th>
<th>FLUID INJECTED: SW</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. PROD WELLS: 4</td>
<td>NO. INJ WELLS: 1</td>
</tr>
<tr>
<td>VOLUME INJECTED:</td>
<td>(EQUIV) WATER, BBL;</td>
</tr>
<tr>
<td></td>
<td>14,300,000</td>
</tr>
<tr>
<td>CUMULATIVE PROD:</td>
<td>OIL, BBL;</td>
</tr>
<tr>
<td>(THRU 1977)</td>
<td>339,000</td>
</tr>
<tr>
<td></td>
<td>GAS, MCF;</td>
</tr>
<tr>
<td></td>
<td>WATER, BBL;</td>
</tr>
<tr>
<td>RECOVERY FACTOR, %:</td>
<td>5.1 BBL/AC-FT:</td>
</tr>
<tr>
<td>DEGREE OF SUCCESS: ME</td>
<td></td>
</tr>
<tr>
<td>OPERATOR(S): MOBIL OIL CORP.</td>
<td></td>
</tr>
</tbody>
</table>

T.1 THERMAL RECOVERY (1971-1973)

<table>
<thead>
<tr>
<th>AREA, ACRES: 315</th>
<th>FLUID INJECTED: AIR</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. PROD WELLS: 4</td>
<td>NO. INJ WELLS: 1</td>
</tr>
<tr>
<td>VOLUME INJECTED:</td>
<td>(EQUIV) WATER, BBL;</td>
</tr>
<tr>
<td></td>
<td>992,000</td>
</tr>
<tr>
<td>CUMULATIVE PROD:</td>
<td>OIL, BBL;</td>
</tr>
<tr>
<td>(THRU 1977)</td>
<td>GAS, MCF;</td>
</tr>
<tr>
<td></td>
<td>WATER, BBL;</td>
</tr>
<tr>
<td>RECOVERY FACTOR, %:</td>
<td></td>
</tr>
<tr>
<td>DEGREE OF SUCCESS: ME</td>
<td></td>
</tr>
<tr>
<td>OPERATOR(S): MOBIL OIL CORP.</td>
<td></td>
</tr>
</tbody>
</table>

REMARKS: TERTIARY PROJECT NOW UNDER WATER INJECTION

SOURCES: 5, 12, 14, 200, 204, 209, 211, 266-7; 249
CASE 278

STATE: TEXAS
COUNTY: HIDALGO
DISTRICT: 4
FIELD NAME: SAM FORDYCE
NO. OF RESERVOIRS: 3

RESERVOIR INFORMATION

RESERVOIR: SAM FORDYCE SAND
NO. OF ZONES: DISCOVERY YEAR: 1934
AREA, ACRES: 1177 SPACING, ACRES: 7
TOTAL WELLS: PRODUCING WELLS:
SHUT-IN WELLS: INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: FRIO
GEOLOGICAL AGE: OLIGOCENE
Basin: Gulf Coast Basin
Trap Type: Struct/Strat - Faulted Anticline
Lithology: Sand
Degree Of: Consolidation; Unc
Heterogeneity;
Faulting; High
Fracture;
Dip, Deg.: 2.0
Clay Content, %:
Interbedded Streaks:
Barrier To Flow:

RESERVOIR CHARACTERISTICS

Depth, FT: 2760
Gross Pay, FT: 59
Porosity, %: 30.0
Permeability, MD: 500
BHT, DEF F: 120 *
Gas Cap: No
Gas Cap/Oil Zone Ratio:
Initial: Oil Sat., %: 65.0
WTR Sat., %: 35.0
Gas Sat., %:
FVF, BBL/STB: 1.100
WOR, BBL/BBL:
GOR, SCF/BBL: 1411
BHP, PSI;

Net Pay, FT: 12
Range: To
Range: To
Sat. Pressure, PSI: 1250
Gas Cap, Acres:
Wetting Phase:
Current: Oil Sat., %: 35.0 *
WTR Sat., %: 65.0
Gas Sat., %:
FVF, BBL/STB: 1.000
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI: 795
FLUID CHARACTERISTICS

OIL GRAVITY, API: 21.8
VISCOSITY @ BHT, CP:  
SAYBOLT VISC (100F), SEC: 76
SULFUR CONTENT, %: .51
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 1.0
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 19,400,000 BBL/AC-FT: 1375
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977) GAS, MCF: 7,934,138
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB: 11,500,000 BBL/AC-FT: 814
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SOURCES: 5, 12, 14, 200, 204, 209, 211, 214, 266, 267; 250
CASE 279
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: NUECES
DISTRICT: 4
FIELD NAME: SAXET
NO. OF RESERVOIRS: 9

RESERVOIR INFORMATION

RESERVOIR: OAKVILLE & HETROGTEGINA
NO. OF ZONES: 2
AREA, ACRES: 9900
TOTAL WELLS:
SHUT-IN WELLS: 60

NO. OF ZONES: 2
DISCOVERY YEAR: 1930
SPACING, ACRES: 102
PRODUCING WELLS: 30
INJECTION WELLS: 1

GEOLOGICAL INFORMATION

FORMATION: OAKVILLE & ANAHUAC
GEOLOGICAL AGE: OLIGOCENE-MIOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: STRUCTURAL - ANTICLINAL CLOSURE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING; HIGH
FRACUTRE;

RESERVOIR CHARACTERISTICS

DEPTH, FT: 3380
GROSS PAY, FT:
POROSITY, %: 28.0
PERMEABILITY, MD: 700
BHT, DEP F: 141
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 56.0
WTR SAT., %: 44.0
GAS SAT., %:
FVF, BBL/STB: 1.180
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:

NET PAY, FT: 18
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 35.0 *
WTR SAT., %: 65.0
GAS SAT., %:
FVF, BBL/STB: 1.130
WOR, BBL/BBL:
GOR, SCF/BBL: 1660
BHP, PSI:
FLUID CHARACTERISTICS

OIL GRAVITY, API: 20.0
RANGE: TO
VISCOSITY @ BHT, CP: 80.0; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: .15
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;
MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 183,700,000 BBL/AC-FT: 1031
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 62,245,708
(DEC 31, 1977) GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 88,440
GAS, MCF; 89,177
WATER, BBL;
OIL REMAINING IN PLACE, STB: 121,500,000 BBL/AC-FT: 682
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: SG & WD
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SOURCES: 5, 12, 14, 200, 204, 209, 211, 214, 266, 267; 17, 251
STATE: TEXAS  
COUNTY: DUVAL  
DISTRICT: 4  
FIELD NAME: SEVEN SISTERS  
NO. OF RESERVOIRS: 4

RESERVOIR INFORMATION

RESERVOIR: GOVT. WELLS SAND  
NO. OF ZONES:  
AREA, ACRES: 3600  
TOTAL WELLS:  
SHUT-IN WELLS: 36  
DISCOVERY YEAR: 1935  
SPACING, ACRES: 22  
PRODUCING WELLS: 113  
INJECTION WELLS: 5

GEOLOGICAL INFORMATION

FORMATION: JACKSON  
GEOLOGICAL AGE: EOCENE  
BASIN: GULF COAST BASIN  
TRAP TYPE: STRATIGRAPHIC - PINCH OUT UP-DIP  
LITHOLOGY: SAND  
DEGREE OF: CONSOLIDATION; UNC HETEROGENERITY; FAULTING; FRACTURE; DIP, DEG.: CLAY CONTENT, %: INTERBEDDED STREAKS: BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2112  
GROSS PAY, FT: 81  
POROSITY, %: 30.0  
PERMEABILITY, MD: 225  
BHT, DEF F: 112 *  
GAS CAP: NO  
GAS CAP/OIL ZONE RATIO:  
INITIAL: OIL SAT., %: 60.0  
WTR SAT., %: 40.0  
GAS SAT., %:  
FVF, BBL/STB: 1.050  
WOR, BBL/BBL;  
GOR, SCF/BBL;  
BHP, PSI: 1150  
NET PAY, FT: 12  
RANGE: TO  
RANGE: 10 TO 480  
SAT. PRESSURE, PSI:  
GAS CAP, ACRES:  
WETTING PHASE:  
CURRENT: OIL SAT., %: 43.0 *  
WTR SAT., %: 57.0  
GAS SAT., %:  
FVF, BBL/STB: 1.050  
WOR, BBL/BBL;  
GOR, SCF/BBL;  
BHP, PSI: 250
FLUID CHARACTERISTICS

OIL GRAVITY, API: 22.0
VISCOSITY @ BHT, CP: 90
SAYBOLT VISC (100F), SEC: 92
SULFUR CONTENT, %: 0.23
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 0.7
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM:
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 142,000,000 BBL
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL: 41,300,000
(GEC 31, 1977) GAS, MCF:
WATER, BBL:
1977 ANNUAL PROD: OIL, BBL: 243,216
GAS, MCF: 19,913
WATER, BBL:
OIL REMAINING IN PLACE, STB: 101,000,000 BBL
(DEC 31, 1977) BBL/AC-FT: 946
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 PRESSURE MAINTENANCE (1969-1974)

AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATeR, BBL:
GAS, MCF:
CUMULATIVE PROD: OIL, BBL:
(THRU ) GAS, MCF:
WATER, BBL:
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S): WYNN, H.D.

FLUID INJECTED:
NO. INJ WELLS:

REMARKS: GAS CAP PRESENT ORIGINALy

SOURCES: 5, 12, 14, 200, 204, 209, 211, 266-7; 252

381
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: SAN PATRICIO
DISTRICT: 4
FIELD NAME: TAFT
NO. OF RESERVOIRS: 21

RESERVOIR INFORMATION

RESERVOIR: 4000' SAND
NO. OF ZONES: AREA, ACRES: 770
AREA, ACRES: 770
TOTAL WELLS: 16
SHUT-IN WELLS: 16
DISCOVERY YEAR: 1935
PRODUCING WELLS: 48
INJECTION WELLS: 10
SPACING, ACRES: 9

GEOLOGICAL INFORMATION

FORMATION: CATAHOULA
GEOLOGICAL AGE: OLIGOCENE
BASIN: GULF COAST BASIN
TRAP TYPE: -
LITHOLOGY: SAND
DEGREE OF CONSOLIDATION:
HETEROGENEITY:
FAULTING:
FRACTURE:
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4000
GROSS PAY, FT: 45
POROSITY, %: 26.5
PERMEABILITY, MD: 1500
BHT, DEF F: 145 *
NET PAY, FT: 30
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 65.0
WTR SAT., %: 35.0
GAS SAT., %:
FVF, BBL/STB: 1.050 *
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI: 1800
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 30.0 *
WTR SAT., %: 70.0
GAS SAT., %:
FVF, BBL/STB: 1.000 *
WOR, BBL/BBL:
GOR, SCF/BBL: 906
BHP, PSI: 1606

FLUID CHARACTERISTICS

OIL GRAVITY, API: 22.5
VISCOITY @ BHT, CP: 8
SAYBOLT VISC (100F), SEC: 85
SULFUR CONTENT, %: 0.21
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 0.8
OIL TYPE:
WATER SALINITY, PPM:
WATER HARDNESS: CA,PPM:
RESERVES AND PRODUCTION DATA

CASE 281

ORIGINAL OIL IN PLACE, STB: 29,400,000  BBL/AC-FT: 1273
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 15,250,000 *
(GDEC 31, 1977) GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 3,782
GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB: 14,100,000  BBL/AC-FT: 613
(GDEC 31, 1977)
RESERVES (DEC 31, 1977)

PRIMARY PRODUCTION:
MECHANISM:
RECOVERY FACTOR, %:  
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 PRESSURE MAINTENANCE (1972-1985)

AREA, ACRES: 493  FLUID INJECTED: SW
NO. PROD WELLS: 28  NO. INJ WELLS: 3
VOLUME INJECTED: (EQUIV) WATER, BBL: 49,688,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 162,000
(GTHRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:  
BBL/AC-FT:  
DEGREE OF SUCCESS: ME
OPERATOR(S): EXXON CORP

S.2 PRESSURE MAINTENANCE (1973- )

AREA, ACRES: 189  FLUID INJECTED: SW
NO. PROD WELLS: 12  NO. INJ WELLS: 2
VOLUME INJECTED: (EQUIV) WATER, BBL: 21,217,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 2,208,000
(GTHRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:  
BBL/AC-FT:  
DEGREE OF SUCCESS: UD
OPERATOR(S): OXOCO-TEXAS INC.

REMARKS: TAFT FIELD REORGANIZED IN 1968.

SOURCES: 5, 12, 14, 200, 204, 209, 211, 266-7; 253
STATE: TEXAS  
COUNTY: HOPKINS  
DISTRICT: 5  
FIELD NAME: SULPHUR BLUFF  
NO. OF RESERVOIRS: 1

**RESERVOIR INFORMATION**

**RESERVOIR: PALUXY POOL**  
NO. OF ZONES:  
AREA, ACRES: 1500  
TOTAL WELLS:  
SHUT-IN WELLS: 9  
PRODUCING WELLS: 47  
INJECTION WELLS: 7  
SPACING, ACRES: 21  
DISCOVERY YEAR: 1936

**GEOLOGICAL INFORMATION**

FORMATION: PALUXY  
GEOLOGICAL AGE: COMANCHE (L CRETACEOUS)  
BASIN: EAST TEXAS  
TRAP TYPE: STRUCTURAL - FAULT CLOSURE  
LITHOLOGY: SAND  
DIP, DEG.: 3.0  
CLAY CONTENT, %:  
INTERBEDDED STREAKS: YES  
BARRIER TO FLOW:

**RESERVOIR CHARACTERISTICS**

DEPTH, FT: 4400  
GROSS PAY, FT: 80  
POROSITY, %: 26.0  
PERMEABILITY, MD: 2000  
BHT, DEF F: 140 *  
NET PAY, FT: 25  
GAS CAP: NO  
GAS CAP/OIL ZONE RATIO:  
INITIAL: OIL SAT., %: 64.0  
WTR SAT., %: 36.0  
GAS SAT., %:  
FVF, BBL/STB: 1.110  
WOR, BBL/BBL:  
GOR, SCF/BBL:  
BHP, PSI: 1900  
NET PAY, FT: 25  
RANGE: 24.0 TO 28.0  
RANGE: 765 TO 8000  
SAT. PRESSURE, PSI:  
GAS CAP, ACRES:  
WETTING PHASE:  
CURRENT: OIL SAT., %: 17.0 *  
WTR SAT., %: 83.0  
GAS SAT., %:  
FVF, BBL/STB: 1.000 *  
WOR, BBL/BBL:  
GOR, SCF/BBL:  
BHP, PSI: 1700
CASE 282

FLUID CHARACTERISTICS

OIL GRAVITY, API: 22.0
VISCOSITY @ BHT, CP; @ F, CP:
SAYBOLT VISC (100°F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
OIL TYPE: ASPHALTIC
WATER SALINITY, PPM;
WATER HARDNESS: CA,PPM; MG,PPM;

RANGE: TO
CARBON/HYDROGEN RATIO:
ACID NUMBER:

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE,STB: 43,600,000
ORIGINAL GAS IN PLACE,MCF:
CUM PROD: OIL,BBL; 30,401,440
(GDEC 31, 1977) GAS,MCF; WATER,BBL;
1977 ANNUAL PROD: OIL,BBL; 248,118
GAS,MCF; WATER,BBL;
OIL REMAINING IN PLACE,STB: 13,200,000
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SOURCES: 5,12,14,200,204,209,211,214,266,267; 254
RESERVOIR AND PRODUCTION DATA ELEMENTS

CASE 283

STATE: TEXAS
COUNTY: ANDERSON
DISTRICT: 6
FIELD NAME: CAMP HILL
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: CARRIZO-WILCOX
NO. OF ZONES: 1
AREA, ACRES: 650
TOTAL WELLS: PRODUCING WELLS: 86
SHUT-IN WELLS: 139 INJECTION WELLS: 21
DISCOVERY YEAR: 1955
SPACING, ACRES: 2

GEOLOGICAL INFORMATION

FORMATION: CARRIZO-WILCOX
GEOLOGICAL AGE: EOCENE
BASIN: EAST TEXAS BASIN
TRAP TYPE: STRUCTURAL - FAULTED DOMAL ANTICLINE
LITHOLOGY: SAND
DEGREE OF CONSOLIDATION; UNC
HETEROGENEITY;
FAULTING;
FRACUTRE;
DIP, DEG.: 1.0
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW: NO

RESERVOIR CHARACTERISTICS

DEPTH, FT: 420
GROSS PAY, FT: NET PAY, FT: 25
POROSITY, %: 36.0 RANGE: TO
PERMEABILITY, MD: 12000 RANGE: 300 TO 22000
BHT, DEF F: 85 SAT. PRESSURE, PSI: 150
GAS CAP: NO GAS CAP, ACRES:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 72.0 WETTING PHASE:
WTR SAT., %; 28.0 CURRENT: OIL SAT., %; 68.0 *
GAS SAT., %;
FVF, BBL/STB; 1.010 WTR SAT., %; 32.0
WOR, BBL/BBL; GAS SAT., %;
GOR, SCF/BBL;
BHP, PSI; 85 FVF, BBL/STB; 1.010
WOR, BBL/BBL; 19
GOR, SCF/BBL;
BHP, PSI; 60

386
FLUID CHARACTERISTICS

OIL GRAVITY, API: 19.0
VISCOSITY @ BHT, CP: 600.0;
@ F, CP:
SAYBOLT VISC (100F), SEC: 3600
SULFUR CONTENT, %: 1.36
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %:
OIL TYPE: NAPHTHANIC
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 32,400,000 BBL/AC-FT: 1991
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977): OIL, BBL; 1,790,169
GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 100,226
GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB: 30,600,000 BBL/AC-FT: 1881
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: FE & SG
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 PRESSURE MAINTENANCE (1970-1982)

AREA, ACRES: 135
NO. PROD WELLS: 46
VOLUME INJECTED: (EQUIV) WATER, BBL; 10,660,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
48,000
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 3.0
DEGREE OF SUCCESS: UD
OPERATOR(S): TEXAS RECOVERY CO LTD
SECONDARY AND TERTIARY RECOVERIES (CONT.)

T.1 THERMAL RECOVERY \( (1971-1982) \)

<table>
<thead>
<tr>
<th>Area, Acres:</th>
<th>72</th>
<th>Fluid Injected: S/HW</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Prod Wells:</td>
<td>31</td>
<td>No. Inj Wells: 4</td>
</tr>
<tr>
<td>Volume Injected:</td>
<td>(equiv) Water, BBL; 6,116,000</td>
<td></td>
</tr>
<tr>
<td>Cumulative Prod:</td>
<td>Oil, BBL; 278,000</td>
<td></td>
</tr>
<tr>
<td>Recovery Factor, %:</td>
<td>55.0</td>
<td></td>
</tr>
<tr>
<td>Bbl/AC-FT:</td>
<td>985</td>
<td></td>
</tr>
<tr>
<td>Degree of Success:</td>
<td>Operator(s): CAMP HILL OIL CO LTD</td>
<td></td>
</tr>
</tbody>
</table>

T.2 THERMAL RECOVERY \( (1968-1978) \)

<table>
<thead>
<tr>
<th>Area, Acres:</th>
<th>160</th>
<th>Fluid Injected: FW/S</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Prod Wells:</td>
<td>59</td>
<td>No. Inj Wells:</td>
</tr>
<tr>
<td>Volume Injected:</td>
<td>(equiv) Water, BBL; 6,973,000</td>
<td></td>
</tr>
<tr>
<td>Cumulative Prod:</td>
<td>Oil, BBL; 210,000</td>
<td></td>
</tr>
<tr>
<td>Recovery Factor, %:</td>
<td>50.0</td>
<td></td>
</tr>
<tr>
<td>Bbl/AC-FT:</td>
<td>1023</td>
<td></td>
</tr>
<tr>
<td>Degree of Success:</td>
<td>Operator(s): TENNECO OIL/ TEXAS REC</td>
<td></td>
</tr>
</tbody>
</table>

Sources: 5,12,14,200,204,209,211,214,266-7; 18,206,255
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: WOOD
DISTRICT: 6
FIELD NAME: FOREST HILL
NO. OF RESERVOIRS: 4

RESERVOIR INFORMATION

RESERVOIR: HARRIS SAND (B-F SEGMENTS)
NO. OF ZONES: 1
DISCOVERY YEAR: 1954
AREA, ACRES: 2856
SPACING, ACRES: 77
TOTAL WELLS: 27
PRODUCING WELLS: 27
SHUT-IN WELLS: 5
INJECTION WELLS: 5

GEOLOGICAL INFORMATION

FORMATION: HARRIS SAND - EAGLEFORD GROUP
GEOLOGICAL AGE: GULFIAN, U CRET
BASIN: EAST TEXAS BASIN
TRAP TYPE: STRUCTURAL - FAULT CLOSURE
LITHOLOGY: SAND
DEGREE OF CONSOLIDATION; DIP, DEG.: 2.0
HETEROGENEITY;
FAULTING;
CLAY CONTENT, %;
INTERBEDDED STREAKS;
FRACTURE;
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4800
GROSS PAY, FT:
POROSITY, %: 28.0
PERMEABILITY, MD: 740
BHT, DEP F: 150
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 70.0
WTR SAT., %; 30.0
GAS SAT., %;
FVF, BBL/STB; 1.060
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI: 1675

NET PAY, FT: 13
RANGE: TO
RANGE: 1 TO 3000
SAT. PRESSURE, PSI: 150
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 65.0 *
WTR SAT., %; 35.0
GAS SAT., %;
FVF, BBL/STB; 1.010
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 1000

FLUID CHARACTERISTICS

OIL GRAVITY, API: 9.7
VISCOSITY @ BHT, CP: 9526.0;
SAYBOLT VISC (100F), SEC: 3390
SULFUR CONTENT, %: 3.35
CARBON RESIDUE, %: 4.4
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;

CARBON/HYDROGEN RATIO:
ACID NUMBER:

MG, PPM;
RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 53,300,000 BBL/AC-FT: 1434
ORIGINAL GAS IN PLACE, MCF: 1,057,605
CUM PROD: OIL, BBL; GAS, MCF; WATER, BBL;
(DEC 31, 1977) 1977 ANNUAL PROD: OIL, BBL; GAS, MCF; WATER, BBL;
GAS, MCF; WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 66,186 GAS, MCF; 18,881 WATER, BBL;
OIL REMAINING IN PLACE, STB: 52,200,000 BBL/AC-FT: 1406
(DEC 31, 1977)
RESERVES (DEC 31, 1977)

PRIMARY PRODUCTION:
MECHANISM: SG & FE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 ISC/WATER INJ (1976- )
AREA, ACRES: 1656
FLUID INJECTED: A/W
NO. PROD WELLS: 26
NO. INJ WELLS: 2
VOLUME INJECTED: (EQUIV) WATER, BBL; 9,000
GAS, MCF; 131,000
CUMULATIVE PROD: OIL, BBL; 91,000
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): GREENWICH OIL CORP

T.2 STEAM DRIVE (1965- )
AREA, ACRES: 717
FLUID INJECTED: S
NO. PROD WELLS: 12
NO. INJ WELLS: 1
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): MCWOOD CORP

SOURCES: 5, 12, 14, 200, 204, 209, 211, 214, 266-7; 256
STATE: TEXAS
COUNTY: TITUS
DISTRICT: 6
FIELD NAME: PEWITT RANCH
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: PALUXY
NO. OF ZONES: DISCOVERY YEAR: 1949
AREA, ACRES: 1180 SPACING, ACRES: 13
TOTAL WELLS: PRODUCING WELLS: 76
SHUT-IN WELLS: INJECTION WELLS: 1

GEOLOGICAL INFORMATION

FORMATION: PALUXY
GEOLOGICAL AGE: COMANCHE
BASIN: EAST TEXAS BASIN
TRAP TYPE: STRUCTURAL - FAULT MONOCLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC DIP, DEG.: 1.0
HETEROGENEITY; MINOR CLAY CONTENT, %:
FAULTING;
FRACTURE;
INTERBEDDED STREAKS: YES BARRIER TO FLOW: NO

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4507
GROSS PAY, FT: 29
POROSITY, %: 24.0
PERMEABILITY, MD: 1400
BHT, DEF P: 160
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 90.0
WTR SAT., %: 10.0
GAS SAT., %:
FVF, BBL/STB: 1.044
WOR, BBL/BBL:
GOR, SCF/BBL: 11
BHP, PSI: 1894

NET PAY, FT: 29
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI: 168
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 56.0 *
WTR SAT., %: 44.0
GAS SAT., %:
FVF, BBL/STB: 1.000 *
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI: 
**FLUID CHARACTERISTICS**

- **Oil Gravity, API:** 19.0  
  **Range:** to
- **Viscosity @ BHT, CP:** 32.1;  
  **@ F, CP:**
- **Saybolt Visc (100F), SEC:** 3000
- **Sulfur Content, %:** 3.34
- **Carbon Residue, %:** 5.7
- **Carbon/Hydrogen Ratio:**
- **OIL TYPE:**
- **Water Salinity, PPM:**
- **Water Hardness:** Ca, PPM; Mg, PPM;

**RESERVES AND PRODUCTION DATA**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original Oil in Place, STB</td>
<td>55,000,000</td>
</tr>
<tr>
<td>Original Gas in Place, MCF</td>
<td></td>
</tr>
<tr>
<td>CUM Prod (Dec 31, 1977)</td>
<td></td>
</tr>
<tr>
<td>Cum Prod</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>1977 Annual Prod:</td>
<td></td>
</tr>
<tr>
<td>CUM Prod (Dec 31, 1977)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil Remaining in Place, STB</td>
<td>35,500,000</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Reserves (Dec 31, 1977)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>PRIMARY PRODUCTION:</td>
<td></td>
</tr>
<tr>
<td>Mechanism: Water Drive</td>
<td></td>
</tr>
<tr>
<td>Recovery Factor, %</td>
<td></td>
</tr>
<tr>
<td>Annual Decline Rate, %</td>
<td></td>
</tr>
</tbody>
</table>

**Sources:** 5, 12, 14, 200, 204, 209, 211, 214, 266, 267, 258
STATE: TEXAS
COUNTY: ANDERSON
DISTRICT: 6
FIELD NAME: SLOCUM
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: CARRIZO SAND
NO. OF ZONES: DISCOVERY YEAR: 1955
AREA, ACRES: 2500 SPACING, ACRES: 5
TOTAL WELLS: 500 PRODUCING WELLS: 227
SHUT-IN WELLS: 238 INJECTION WELLS: 29

GEOLOGICAL INFORMATION

FORMATION: CARRIZO
GEOLOGICAL AGE: EOCENE
BASIN: EAST TEXAS BASIN
TRAP TYPE: STRUCTURAL — FAULTED DOMAL ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; DIP, DEG.: HETEROGENEITY; CLAY CONTENT, %:
FAULTING; INTERBEDDED STREAKS:
FRACtURE; BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 530 NET PAY, FT: 25
GROSS PAY, FT: 48 RANGE: 34.0 TO 40.0
POROSITY, %: 37.0 RANGE: 120 TO 10000
PERMEABILITY, MD: 2655 SAT. PRESSURE, PSI:
BHT, DEF F: 75 GAS CAP, ACRES:
GAS CAP/OIL ZONE RATIO: WETTING PHASE:
INITIAL: OIL SAT., %; 66.0 CURRENT: OIL SAT., %; 61.0 *
WTR SAT., %; 34.0 WTR SAT., %; 39.0
GAS SAT., %: GAS SAT., %:
FVF, BBL/STB; 1.017 FVF, BBL/STB; 1.017
WOR, BBL/BBL; WOR, BBL/BBL;
GOR, SCF/BBL; GOR, SCF/BBL;
BHP, PSI; 120 BHP, PSI; 120

FLUID CHARACTERISTICS

OIL GRAVITY, API: 19.0 RANGE: TO
VISCOSITY @ BHT, CP: 1000.0; @ 60F, CP: 2000.0
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %: CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA,PPM; MG,PPM;
RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 114,100,000 BBL/AC-FT: 1863
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 8,029,865
(GKC 31, 1977) GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 245,811
GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB: 106,100,000 BBL/AC-FT: 1732
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: GRAVITY DRAINAGE
RECOVERY FACTOR, %: 1.0
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 STEAM/WATER INJ (1967-1984)

AREA, ACRES: 126 FLUID INJECTED: S/FW
NO. PROD WELLS: 183 NO. INJ WELLS: 29
VOLUME INJECTED: (EQUIV) WATER, BBL; 66,505,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 6,801,000
(GTHRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 28.5
DEGREE OF SUCCESS:
OPERATOR(S): SHELL OIL CO

T.2 THERMAL RECOVERY (1969-1978)

AREA, ACRES: 240 FLUID INJECTED: A/W/S
NO. PROD WELLS: 28 NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL; 8,328,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 601,000
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: 50.0
DEGREE OF SUCCESS: ME
OPERATOR(S): TENNECO

REMARKS: TERTIARY PROJ ABANDONED: TEXACO SD 1970-74, ME

SOURCES: 5,12,14,16,18,200-6,209-11,214,260,266-7
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: TITUS
DISTRICT: 6
FIELD NAME: TALCO
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: PALUXY
NO. OF ZONES: 1
AREA, ACRES: 9500
TOTAL WELLS:
SHUT-IN WELLS: 118
DISCOVERY YEAR: 1936
SPACING, ACRES: 13
PRODUCING WELLS: 539
INJECTION WELLS: 14

GEOLOGICAL INFORMATION

FORMATION: PALUXY
GEOLOGICAL AGE: COMANCHE
BASIN: EAST TEXAS BASIN
TRAP TYPE: STRUCTURAL - GRABEN TYPE FAULT
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.: 1.5
CLAY CONTENT, %:
INTERBEDDED STREAKS: YES
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4290
GROSS PAY, FT: 46
POROSITY, %: 25.5
PERMEABILITY, MD: 100
BHT, DEF F: 147
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 87.0
WTR SAT., %: 13.0
GAS SAT., %;
FVF, BBL/STB: 1.050
GOR, SCF/BBL: 20
BHP, PSI: 1920
NET PAY, FT: 44
RANGE: 25.0 TO 28.0
RANGE: TO 17840
SAT. PRESSURE, PSI: 180
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 58.0 *
WTR SAT., %: 42.0
GAS SAT., %:
FVF, BBL/STB: 1.050
WOR, BBL/BBL:
GOR, SCF/BBL: 71
BHP, PSI: 600
FLUID CHARACTERISTICS

OIL GRAVITY, API: 21.0
RANGE: 20.0 TO 22.0
VISCOSITY @ BHT, CP: 20.0; @ 60F, CP: 500.0
SAYBOLT VISC (100F), SEC: 520
SULFUR CONTENT, %: 3.00
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 2.4
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM: 198000
WATER HARDNESS: CA, PPM; 439 MG, PPM; 55

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 742,000,000
ORIGINAL GAS IN PLACE, MCF:
CUM PROD : OIL, BBL; 246,462,412
(DEC 31, 1977) GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 3,007,195
GAS, MCF; 1,906
WATER, BBL;
OIL REMAINING IN PLACE, STB: 496,000,000
(DEC 31, 1977)
RESERVES (DEC 31, ) 43,538,000

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1967-1981)

AREA, ACRES: 1053
NO. PROD WELLS: 51
VOLUME INJECTED: (EQUIV) WATER, BBL; 20,864,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL; 898,000
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS: VE
OPERATOR(S): EXXON CORP

BBL/AC-FT: 1775
BBL/AC-FT: 1185

396
SECONDARY AND TERTIARY RECOVERIES (CONT.)

S.2 PRESSURE MAINTENANCE (1974-1975)

AREA, ACRES: 580
NO. PROD WELLS: 58
FLUID INJECTED: SW
NO. INJ WELLS: 2
VOLUME INJECTED: (EQUIV) WATER, BBL; 15,000
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: NE
OPERATOR(S): EXXON CORP

S.3 PRESSURE MAINTENANCE (1969- )

AREA, ACRES: 110
NO. PROD WELLS: 9
FLUID INJECTED: SW
NO. INJ WELLS: 1
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: ME
OPERATOR(S): GETTY OIL CO.

T.1 IN-SITU COMBUSTION (1972- )

AREA, ACRES:
NO. PROD WELLS:
FLUID INJECTED: AIR
NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S):

SOURCES: 5,12,14,200,204,209,211,266-7; 16,18,261
**RESERVOIR AND PRODUCTION DATA ELEMENTS**

STATE: TEXAS  
COUNTY: TITUS  
DISTRICT: 6  
FIELD NAME: TRIX-LIZ  
NO. OF RESERVOIRS: 7

### RESERVOIR INFORMATION

<table>
<thead>
<tr>
<th>RESERVOIR: WOODBINE B</th>
<th>DISCOVERY YEAR: 1959</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO. OF ZONES:</td>
<td>SPACING, ACRES: 38</td>
</tr>
<tr>
<td>AREA, ACRES: 850</td>
<td>PRODUCING WELLS: 13</td>
</tr>
<tr>
<td>TOTAL WELLS:</td>
<td>INJECTION WELLS:</td>
</tr>
<tr>
<td>SHUT-IN WELLS: 9</td>
<td></td>
</tr>
</tbody>
</table>

### GEOLOGICAL INFORMATION

FORMATION: WOODBINE  
GEOLOGICAL AGE: GULF  
BASIN: EAST TEXAS BASIN  
TRAP TYPE: STRUCT/STRAT - ANTICLINE WITH PINCHOUT  
LITHOLOGY: SAND  
DEGREE OF: CONSOLIDATION; DIP, DEG.: 1.0  
HETEROGENEITY; HIGH  
FAULTING; INTERBEDDED STREAKS: YES  
FRACTURE; BARRIER TO FLOW:  
CLAY CONTENT, %: 16.0

### RESERVOIR CHARACTERISTICS

<table>
<thead>
<tr>
<th>DEPTH, FT: 3590</th>
<th>NET PAY, FT: 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROSS PAY, FT: 27</td>
<td>RANGE: 28.0 TO 31.0</td>
</tr>
<tr>
<td>POROSITY, %: 29.0</td>
<td>RANGE: 10 TO 300</td>
</tr>
<tr>
<td>PERMEABILITY, MD: 50</td>
<td>SAT. PRESSURE, PSI: 650</td>
</tr>
<tr>
<td>BHT, DEF F: 137</td>
<td>GAS CAP, ACRES:</td>
</tr>
<tr>
<td>GAS CAP: NO</td>
<td>WETTING PHASE:</td>
</tr>
<tr>
<td>GAS CAP/OIL ZONE RATIO:</td>
<td>CURRENT: OIL SAT., %: 56.0 *</td>
</tr>
<tr>
<td>INITIAL: OIL SAT., %: 60.0</td>
<td>WTR SAT., %: 44.0</td>
</tr>
<tr>
<td>WTR SAT., %: 40.0</td>
<td>GAS SAT., %:</td>
</tr>
<tr>
<td>GAS SAT., %:</td>
<td>FVF, BBL/STB: 1.050</td>
</tr>
<tr>
<td>FVF, BBL/STB: 1.050</td>
<td>WOR, BBL/BBL:</td>
</tr>
<tr>
<td>WOR, BBL/BBL:</td>
<td>GOR, SCF/BBL: 60</td>
</tr>
<tr>
<td>GOR, SCF/BBL:</td>
<td>BHP, PSI: 120</td>
</tr>
<tr>
<td>BHP, PSI: 1525</td>
<td></td>
</tr>
</tbody>
</table>
FLUID CHARACTERISTICS

OIL GRAVITY, API: 22.0
VISCOSITY @ BHT, CP: 44.0; @ F, CP:
SAYBOLT VISC (100°F), SEC: 1260
SULFUR CONTENT, %: 2.79
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 5.3
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM: 38000
WATER HARDNESS: CA, PPM;
MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 21,900,000
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 1,250,000
(G Dec 31, 1977) GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 23,516
GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB: 20,600,000
(Dec 31, 1977)
RESERVES (Dec 31, 1977)

PRIMARY PRODUCTION:
MECHANISM: SG & WD
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 INERT GAS (1965-1977)

AREA, ACRES: 162
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU 1977) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS:
OPERATOR(S): SUN OIL CO

FLUID INJECTED: IG
NO. INJ WELLS:
BBL/AC-FT:

SOURCES: 5, 12, 14, 200, 204, 209, 211, 214, 266, 267; 205, 207, 262
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: TEXAS
COUNTY: TITUS
DISTRICT: 6
FIELD NAME: TRIX-LIZ
NO. OF RESERVOIRS: 7

RESERVOIR INFORMATION

RESERVOIR: WOODBINE D
NO. OF ZONES:
AREA, ACRES: 1131
TOTAL WELLS:
SHUT-IN WELLS: 5
DISCOVERY YEAR: 1959
SPACING, ACRES: 18
PRODUCING WELLS: 50
INJECTION WELLS: 1

GEOLOGICAL INFORMATION

FORMATION: WOODBINE
GEOLOGICAL AGE: GULF
 BASIN: EAST TEXAS BASIN
TRAP TYPE: STRUCT/STRAT - ANTICLINE IN GRABEN TYPE FAULT
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
 HETEROGENEITY; HIGH
 FAULTING;
 FRACTURE;
DIP, deg.: 1.0
CLAY CONTENT, %: 16.0
INTERBEDDED STREAKS:
BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 3754
GROSS PAY, FT: 140
POROSITY, %: 30.0
PERMEABILITY, MD: 1260
BHT, DEG F: 140
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 67.0
 WTR SAT., %: 33.0
 GAS SAT., %:
 FVF, BBL/STB: 1.050
 WOR, BBL/BBL: 1.050
 GOR, SCF/BBL: 184
 BHP, PSI: 1627
NET PAY, FT: 23
RANGE: 28.0 TO 33.0
RANGE: 1 TO 13000
SAT. PRESSURE, PSI: 668
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 60.0 *
 WTR SAT., %: 40.0
 GAS SAT., %:
 FVF, BBL/STB: 1.050
 WOR, BBL/BBL: 1.050
 GOR, SCF/BBL: 50
 BHP, PSI: 1598

400
FLUID CHARACTERISTICS

OIL GRAVITY, API: 23.0  
RANGE: TO

VISCOSITY @ BHT, CP: 19.6; @ F, CP:

SAYBOLT VISC (100F), SEC: 982

SULFUR CONTENT, %: 2.87
CARBON HYDROGEN RATIO:

CARBON RESIDUE, %: 6.6
ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM: 38200
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 38,600,000  
BBL/AC-FT: 1485

ORIGINAL GAS IN PLACE, MCF: 4,164,034

CUM PROD: OIL, BBL;
(DEC 31, 1977)  GAS, MCF;
WATER, BBL;

1977 ANNUAL PROD: OIL, BBL;
GAS, MCF;
WATER, BBL;

OIL REMAINING IN PLACE, STB: 34,500,000  
BBL/AC-FT: 1325

(DEC 31, 1977)  RESERVES (DEC 31, )

PRIMARY PRODUCTION:

MECHANISM: WATER DRIVE
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 THERMAL RECOVERY (1969-1970)

AREA, ACRES: 162  FLUID INJECTED: AIR
NO. PROD WELLS: 10  NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;

CUMULATIVE PROD: OIL, BBL;
(THRU 1977)  GAS, MCF;
WATER, BBL;

RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): SUN OIL COMPANY

SOURCES: 5, 12, 14, 200, 204, 209, 211, 266-7; 205, 207, 263
CASE 293

STATE: TEXAS
COUNTY: PECOS
DISTRICT: 8
FIELD NAME: TOBORG
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: TORBORG SAND
NO. OF ZONES: DISCOVERY YEAR: 1929
AREA, ACRES: 5000 SPACING, ACRES: 5
TOTAL WELLS: PRODUCING WELLS: 462
SHUT-IN WELLS: 229 INJECTION WELLS: 152

GEOLOGICAL INFORMATION

FORMATION: TRINITY GROUP
GEOLOGICAL AGE: COMANCHE
BASIN: PERMIAN BASIN
TRAP TYPE: STRUCTURAL - ANTICLINAL CLOSURE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION; UNC DIP, DEG.: 3.5
HETEROGENEITY; HIGH CLAY CONTENT, %:
FAULTING; INTERBEDDED STREAKS: YES
FRACTURE; BARRIER TO FLOW: YES

RESERVOIR CHARACTERISTICS

DEPTH, FT: 500 NET PAY, FT: 27
GROSS PAY, FT: 65 RANGE: 19.0 TO 33.0
POROSITY, %: 30.0 RANGE: 10 TO 4400
PERMEABILITY, MD: 1000 SAT. PRESSURE, PSI:
BHT, DEF F: 73 GAS CAP, ACRES:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 65.0 WETTING PHASE:
WTR SAT., %; 35.0 CURRENT: OIL SAT., %; 53.0 *
GAS SAT., %; WOR, BBL/BBL:
FVF, BBL/STB; 1.000 GOR, SCF/BBL:
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 115 BHP, PSI; 100
FLUID CHARACTERISTICS

OIL GRAVITY, API: 21.0 RANGE: TO VISCOSITY @ BHT, CP: 371.0; @ F, CP: SAYBOLT VISC (100F), SEC: 296 SULFUR CONTENT, %: 2.10 CARBON/HYDROGEN RATIO: CARBON RESIDUE, %: 4.0 ACID NUMBER: OIL TYPE: WATER SALINITY, PPM; WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 204,200,000 BBL/AC-FT: 1513 ORIGNAL GAS IN PLACE, MCF: CUM PROD: OIL, BBL; 38,200,748 GAS, MCF; WATER, BBL; (DEC 31, 1977) 1977 ANNUAL PROD: OIL, BBL; 383,493 GAS, MCF; WATER, BBL; GAS, MCF; WATER, BBL; OIL REMAINING IN PLACE, STB: 166,000,000 BBL/AC-FT: 1230 (DEC 31, 1977) RESERVES (DEC 31, ) PRIMARY PRODUCTION:
MECHANISM: SG & WD RECOVERY FACTOR, %: BBL/AC-FT: ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1973- )
AREA, ACRES: 110 FLUID INJECTED: SW NO. PROD WELLS: 192 NO. INJ WELLS: 48 VOLUME INJECTED: (EQUIV) WATER, BBL; 9,072,000 GAS, MCF; CUMULATIVE PROD: OIL, BBL; 901,000 GAS, MCF; (THRU 1977) WATER, BBL; RECOVERY FACTOR, %: BBL/AC-FT: DEGREE OF SUCCESS: ME OPERATOR(S): GULF OIL CORP.
SECONDARY AND TERTIARY RECOVERIES (CONT.)

S.2 WATERFLOOD (1949–)

AREA, ACRES: 580  
NO. PROD WELLS: 37  
VOLUME INJECTED: (EQUIV) WATER, BBL; 73,158,000  
GAS, MCF;  
CUMULATIVE PROD: OIL, BBL; 4,837,000  
(GAS, MCF;  
WATER, BBL;  
RECOVERY FACTOR, %: BBL/AC-FT:  
DEGREE OF SUCCESS: ME  
OPERATOR(S): HELMERICH & PAYNE INC

S.3 WATERFLOOD (1956–1999)

AREA, ACRES: 242  
NO. PROD WELLS: 64  
VOLUME INJECTED: (EQUIV) WATER, BBL; 26,725,000  
GAS, MCF;  
CUMULATIVE PROD: OIL, BBL; 1,253,000  
(GAS, MCF;  
WATER, BBL;  
RECOVERY FACTOR, %: 40.9 BBL/AC-FT: 516  
DEGREE OF SUCCESS: ME  
OPERATOR(S): HELMERICH & PAYNE INC

S.4 WATERFLOOD (1961–1974)

AREA, ACRES: 235  
NO. PROD WELLS: 26  
VOLUME INJECTED: (EQUIV) WATER, BBL;  
GAS, MCF;  
CUMULATIVE PROD: OIL, BBL;  
(GAS, MCF;  
WATER, BBL;  
RECOVERY FACTOR, %: BBL/AC-FT:  
DEGREE OF SUCCESS:  
OPERATOR(S): AMOCO PROD CO
SECONDARY AND TERTIARY RECOVERIES (CONT.)

T.1 CYCLIC STEAM (1964-1965)

| AREA, ACRES: | 20 | FLUID INJECTED: | S |
| NO. PROD WELLS: | 4 | NO. INJ WELLS: | 2 |
| VOLUME INJECTED: | (EQUIV) WATER, BBL; |
| GAS, MCF; |
| CUMULATIVE PROD: | OIL, BBL; |
| (THRU ) | GAS, MCF; |
| WATER, BBL; |
| RECOVERY FACTOR, %: | BBL/AC-FT: |
| DEGREE OF SUCCESS: | NE |
| OPERATOR(S): | HELMERICH & PAYNE INC |

T.2 STEAM DRIVE (1975-1976)

| AREA, ACRES: | 110 | FLUID INJECTED: | S |
| NO. PROD WELLS: | | NO. INJ WELLS: |
| VOLUME INJECTED: | (EQUIV) WATER, BBL; 287,000 |
| GAS, MCF; |
| CUMULATIVE PROD: | OIL, BBL; |
| (THRU 1977) | GAS, MCF; |
| WATER, BBL; |
| RECOVERY FACTOR, %: | BBL/AC-FT: |
| DEGREE OF SUCCESS: | ME |
| OPERATOR(S): | GULF OIL CORP |

REMARKS: ISC PILOT PROJECT: AMOCO 1963-64, IGNITION FAILURE

SOURCES: 5,12,14,200,204,209,211,214,266-7; 18,206,265
STATE: WYOMING
COUNTY: CAMPBELL
DISTRICT:  
FIELD NAME: CAMP CREEK
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: MINNELUSA
NO. OF ZONES: 
AREA, ACRES: 900
TOTAL WELLS: 
SHUT-IN WELLS: 
DISCOVERY YEAR: 1962
SPACING, ACRES: 80
PRODUCING WELLS: 11
INJECTION WELLS: 1

GEOLOGICAL INFORMATION

FORMATION: MINNELUSA
GEOLOGICAL AGE: WOLFCAMP
BASIN: POWDER RIVER
TRAP TYPE: STRUCT/STRAT - FACIES CHANGE ON ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACUTRE;
DIP, DEG.: 
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 7400
GROSS PAY, FT: 
POROSITY, %: 18.0
PERMEABILITY, MD: 100
BHT, DEG F: 190
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 75.0 *
WTR SAT., %; 25.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 2585

NET PAY, FT: 16
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI: 
GAS CAP, ACRES: 
WETTING PHASE:
CURRENT: OIL SAT., %; 54.0 *
WTR SAT., %; 46.0
GAS SAT., %;
FVF, BBL/STB; 1.000 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 1130
FLUID CHARACTERISTICS

OIL GRAVITY, API: 24.0  
RANGE: TO

VISCOITY @ BHT, CP:  
@ F, CP:

SAYBOLT VISC (100F), SEC:  
SULFUR CONTENT, %:  
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %:  
ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM:

WATER HARDNESS: Ca, PPM;

MG, PPM:

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 14,000,000  
BBL/AC-FT: 997

ORIGINAL GAS IN PLACE, MCF:  
CUM PROD (DEC 31, 1977)  
GAS, MCF;  
WATER, BBL;  
1977 ANNUAL PROD: OIL, BBL;  
GAS, MCF;  
WATER, BBL;  
OIL REMAINING IN PLACE, STB: 10,600,000  
BBL/AC-FT: 754

(DEC 31, 1977)  
RESERVES (DEC 31, 1977) 1,526,213

PRIMARY PRODUCTION:

MECHANISM: WATER DRIVE  
BBL/AC-FT: 300

RECOVERY FACTOR, %:  
ANNUAL DECLINE RATE, %:

SOURCES: 12, 14, 286, 289
CASE 305

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: WYOMING
COUNTY: HOT SPRINGS
DISTRICT:
FIELD NAME: GRASS CREEK
NO. OF RESERVOIRS: 6

RESERVOIR INFORMATION

RESERVOIR: CURTIS
NO. OF ZONES: 1
AREA, ACRES: 5880
TOTAL WELLS:
SHUT-IN WELLS: 45
DISCOVERY YEAR: 1921
SPACING, ACRES:
PRODUCING WELLS: 83
INJECTION WELLS: 34

GEOLOGICAL INFORMATION

FORMATION: CHUGWATER
GEOLOGICAL AGE: TRIASSIC
BASIN: BIG HORN
TRAP TYPE: STRUCTURAL - ASYMMETRIC DOMAL CLOSURE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACATURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 3600
GROSS PAY, FT: 60
POROSITY, %: 17.0
PERMEABILITY, MD: 112
BHT, DEF F: 136
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 94.0
WTR SAT., %; 6.0
GAS SAT., %;
FVF, BBL/STB: 1.200
WOR, BBL/BBL;
GOR, SCF/BBL: 20
BHP, PSI; 681
NET PAY, FT: 20
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 53.0 *
WTR SAT., %; 47.0
GAS SAT., %;
FVF, BBL/STB: 1.170
WOR, BBL/BBL;
GOR, SCF/BBL; 20
BHP, PSI; 432

408
CASE 305

FLUID CHARACTERISTICS

OIL GRAVITY, API: 24.0
RANGE: TO

VISCOSITY @ BHT, CP: 15.0; @ F, CP:

SAYBOLT VISC (100F), SEC: 175

SULFUR CONTENT, %: 2.60
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %: 9.0
ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM: 643
WATER HARDNESS: CA, PPM: 244 MG, PPM:

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 121,500,000 BBL/AC-FT: 1033

ORIGINAL GAS IN PLACE, MCF: CUM PROD:
(DEC 31, 1977) GAS, MCF:

1977 ANNUAL PROD: OIL, BBL: 1,300,000 *
GAS, MCF:
WATER, BBL:

OIL REMAINING IN PLACE, STB: 70,500,000 BBL/AC-FT: 599
(DEC 31, 1977)
RESERVES (DEC 31, 1977) 7,300,000

PRIMARY PRODUCTION:
MECHANISM: WD & SG
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SOURCES: 12, 14, 286, 289; 11, 15, 17
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: WYOMING  
COUNTY: PARK  
FIELD NAME: HALF MOON  
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: EMBAR-TENSLEEP  
NO. OF ZONES:  
AREA, ACRES: 640  
TOTAL WELLS:  
SHUT-IN WELLS:  
DISCOVERY YEAR: 1944  
SPACING, ACRES: 40  
PRODUCING WELLS: 14  
INJECTION WELLS: 2

GEOLOGICAL INFORMATION

FORMATION: EMBAR-TENSLEEP  
GEOLOGICAL AGE: PERM-PENN  
BASIN: BIGHORN  
TRAP TYPE:  
LITHOLOGY: SAND/LIMESTONE  
DEGREE OF: CONSOLIDATION; HETEROGENEITY; FAULTING; FRACTURE;  
DIP, DEG.:  
CLAY CONTENT, %:  
INTERBEDDED STreakS:  
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 3365  
GROSS PAY, FT: 77  
POROSITY, %: 16.0  
PERMEABILITY, MD:  
BHT, DEF F: 110  
GAS CAP:  
GAS CAP/OIL ZONE RATIO:  
INITIAL: OIL SAT., %; 81.0 *  
WTR SAT., %; 19.0  
GAS SAT., %;  
FVF, BBL/STB; 1.050 *  
WOR, BBL/BBL;  
GOR, SCF/BBL;  
BHP, PSI;  
NET PAY, FT: 40  
RANGE: 10.0 TO 23.0  
RANGE: 26 TO 579  
SAT. PRESSURE, PSI:  
GAS CAP, ACRES:  
WETTING PHASE:  
CURRENT: OIL SAT., %; 66.0 *  
WTR SAT., %; 34.0  
GAS SAT., %;  
FVF, BBL/STB; 1.010 *  
WOR, BBL/BBL;  
GOR, SCF/BBL;  
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 18.0 RANGE: TO
VISCOSITY @ BHT, CP: ; @ F, CP:
SAYBOLT VISC (100°F), SEC: 2940
SULFUR CONTENT, %: 2.87 CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 10.7 ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 219
WATER HARDNESS: CA,PPM; MG,PPM; 612 179

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE,STB: 24,500,000 BBL/AC-FT: 958
ORIGINAL GAS IN PLACE,MCF:
CUM PROD : OIL,BBL; 3,907,745
(DEC 31, 1977) GAS,MCF;
WATER,BBL;
1977 ANNUAL PROD: OIL,BBL; 98,796
GAS,MCF;
WATER,BBL;
OIL REMAINING IN PLACE,STB: 20,600,000 BBL/AC-FT: 805
(DEC 31, 1977) RESERVES (DEC 31, 1977) 586,255
PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:
SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1971- )

AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV)WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S):

SOURCES: 12,14,286,289
STATE: WYOMING
COUNTY: WASHAKIE
DISTRICT:
FIELD NAME: HIDDEN DOME
NO. OF RESERVOIRS: 3

RESERVOIR INFORMATION

RESERVOIR: TENSLEEP
NO. OF ZONES: DISCOVERY YEAR: 1947
AREA, ACRES: 450
TOTAL WELLS: PRODUCING WELLS: 15
SHUT-IN WELLS: INJECTION WELLS: 2

GEOLOGICAL INFORMATION

FORMATION: TENSLEEP
GEOLOGICAL AGE: DESMOINES
BASIN: BIG HORN
TRAP TYPE: STRUCTURAL - ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
    HETEROGENEITY;
    FAULTING;
    FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 4550
GROSS PAY, FT: 60
POROSITY, %: 16.0
PERMEABILITY, MD:
BHT, DEF F: 137 *
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 81.0 *
    WTR SAT., %; 19.0
    GAS SAT., %;
    FVF, BBL/STB; 1.050 *
    WOR, BBL/BBL;
    GOR, SCF/BBL;
    BHP, PSI;
NET PAY, FT: 54
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 63.0 *
    WTR SAT., %; 37.0
    GAS SAT., %;
    FVF, BBL/STB; 1.010 *
    WOR, BBL/BBL;
    GOR, SCF/BBL;
    BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 20.0
RANGE: TO
VISCOSITY @ BHT, CP: ; @ F, CP:
SAYBOLT VISC (100F), SEC: 460
SULFUR CONTENT, %: 3.45
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 8.3
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM; 27
WATER HARDNESS: CA, PPM; 59 MG, PPM; 52

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 23,300,000 BBL/AC-FT: 958
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977): OIL, BBL; 4,600,410
GAS, MCF; 22,288,263
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 171,447
GAS, MCF; 11,874
WATER, BBL;
OIL REMAINING IN PLACE, STB: 18,700,000 BBL/AC-FT: 768
(DEC 31, 1977)
RESERVES (DEC 31, 1977) 76,590
PRIMARY PRODUCTION:
MECHANISM:
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:
SECONDARY AND TERTIARY RECOVERIES:

S.L WATERFLOOD (1976- )

AREA, ACRES: FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL; GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S):

REMARKS: PROD & RES INCLUDE ONE OTHER MINOR POOL

SOURCES: 12, 14, 286, 289
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: WYOMING
COUNTY: CAMPBELL
DISTRICT:
FIELD NAME: KUEHNE RANCH, SOUTHEAST
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: MINNELUSA B
NO. OF ZONES: DISCOVERY YEAR: 1966
AREA, ACRES: 846 SPACING, ACRES: 80
TOTAL WELLS: PRODUCING WELLS: 8
SHUT-IN WELLS: INJECTION WELLS: 2

GEOLOGICAL INFORMATION

FORMATION: MINNELUSA
GEOLOGICAL AGE: WOLFCAMP
BASIN: POWDER RIVER
TRAP TYPE: STRATIGRAPHIC - BURIED HILL
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 7894
GROSS PAY, FT:
POROSITY, %: 16.0
PERMEABILITY, MD: 100
BHT, DEF F: 130
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 58.4
WTR SAT., %; 41.6
GAS SAT., %;
FVF, BBL/STB; 1.030
WOR, BBL/BBL;
GOR, SCF/BBL; 50
BHP, PSI; 3280
NET PAY, FT: 18
RANGE: TO
RANGE: TO 1188
SAT. PRESSURE, PSI: 400
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 54.0 *
WTR SAT., %; 46.0
GAS SAT., %;
FVF, BBL/STB; 1.020 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 23.4
VISCOSITY @ BHT, CP: 18.0; @ F, CP:
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA,PPM; MG,PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 10,700,000
ORIGINAL GAS IN PLACE, MCF: 704
CUM PROD:
(DEC 31, 1977) OIL, BBL: 766,963
GAS, MCF: 37,879
WATER, BBL:
1977 ANNUAL PROD:
OIL, BBL: 2,997
GAS, MCF:
WATER, BBL:

OIL REMAINING IN PLACE, STB: 10,000,000
(DEC 31, 1977)
RESERVES (DEC 31, 1977) 30,000

PRIMARY PRODUCTION:
MECHANISM:
RECOVERY FACTOR, %: 10.9
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1975-)
AREA, ACRES:
NO. PROD WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL:
GAS, MCF;
CUMULATIVE PROD:
OIL, BBL:
(GAS, MCF;
(WATER, BBL;
RECOVERY FACTOR, %: 22.4
DEGREE OF SUCCESS:
OPERATOR(S): DAVIS OIL, DYCO PETR.

FLUID INJECTED: W
NO. INJ WELLS:

BBL/AC-FT:

SOURCES: 12, 14, 286, 289; 283
CASE 312
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: WYOMING
COUNTY: CROOK
DISTRICT: FIELD NAME: KUMMERFELD
NO. OF RESERVOIRS: 4

RESERVOIR INFORMATION

RESERVOIR: MINNELUSA (A & B ZONES)
NO. OF ZONES: 2
AREA, ACRES: 712
TOTAL WELLS: 10
SHUT-IN WELLS: 4

DISCOVERY YEAR: 1969
SPACING, ACRES: 80
PRODUCING WELLS: 6
INJECTION WELLS: 3

GEOLoGICAL INFORMATION

FORMATION: MINNELUSA
GEOLOGICAL AGE: U. PENN.
BASIN: POWDER RIVER
TRAP TYPE:
LITHOLOGY: DOLOMITIC SAND

DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRAC TURE;

DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STRE K S:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 7643
GROSS PAY, FT:
POROSITY, %: 16.5
PERMEABILITY, MD: 135
BHT, DEF F: 130
GAS CAP: NO
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 69.0
WTR SAT., %: 31.0
GAS SAT., %:
FVF, BBL/STB: 1.050
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI: 3000

NET PAY, FT: 22
RANGE: TO
RANGE: 15 TO 950
SAT. PRESSURE, PSI: 400
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 54.0 *
WTR SAT., %: 46.0
GAS SAT., %:
FVF, BBL/STB: 1.010 *
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI: 2000

FLUID CHARACTERISTICS

OIL GRAVITY, API: 19.0
VISCOSITY @ BHT, CP: 38.0;
SAYBOLT VISC (100F), SEC:
SULFUR CONTENT, %:
CARBON RESIDUE, %:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: Ca, PPM;

RANGE: TO
@ F, CP:
CARBON/HYDROGEN RATIO:
ACID NUMBER:

MG, PPM;
RESERVES AND PRODUCTION DATA

CASE 312

ORIGINAL OIL IN PLACE, STB: 13,300,000 BBL/AC-FT: 841
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 2,408,000
   (DEC 31, 1977) GAS, MCF; WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 344,000
   GAS, MCF; WATER, BBL;
OIL REMAINING IN PLACE, STB: 10,900,000 BBL/AC-FT: 689
   (DEC 31, 1977) RESERVES (DEC 31, 1977) 1,400,000

PRIMARY PRODUCTION:
   MECHANISM: SOLUTION GAS
   RECOVERY FACTOR, %: 7.0
   ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.I PERIPHERAL WF (1973- )
   AREA, ACRES:
   NO. PROD WELLS:
   VOLUME INJECTED: (EQUIV) WATER, BBL; 6,427,204
   GAS, MCF;
   CUMULATIVE PROD: OIL, BBL;
      (THRU ) GAS, MCF;
      WATER, BBL;
   RECOVERY FACTOR, %:
   DEGREE OF SUCCESS: GOOD
   OPERATOR(S): TERRA RESOURCES, INC

T.I POLYMER FLOOD (1975- )
   AREA, ACRES:
   NO. PROD WELLS:
   VOLUME INJECTED: (EQUIV) WATER, BBL; 2,376,699
   GAS, MCF;
   CUMULATIVE PROD: OIL, BBL; 819,700
      (THRU ) GAS, MCF;
      WATER, BBL;
   RECOVERY FACTOR, %: 20.0
   DEGREE OF SUCCESS: GOOD
   OPERATOR(S): TERRA RESOURCES, INC

SOURCES: 12,14,286,289; 18,275,284,299
CASE 315

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: WYOMING
COUNTY: NATRONA
DISTRICT:
FIELD NAME: NOTCHES
NO. OF RESERVOIRS: 1

RESERVOIR INFORMATION

RESERVOIR: TENSLEEP
NO. OF ZONES: 
AREA, ACRES: 760 *
TOTAL WELLS:
SHUT-IN WELLS: 3

DISCOVERY YEAR: 1923
SPACING, ACRES: 40
PRODUCING WELLS: 16
INJECTION WELLS: 

GEOLOGICAL INFORMATION

FORMATION: TENSLEEP
GEOLOGICAL AGE: DESMOINES
BASIN: POWDER RIVER
TRAP TYPE: STRUCTURAL - ANTIClinton
LITHOLOGY: SAND

DIP, DEG.: 
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2725
GROSS PAY, FT: 45
POROSITY, %: 18.5
PERMEABILITY, MD: 250
BHT, DEF F: 100 *

GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 89.0 *
WTR SAT., %; 11.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 1240

NET PAY, FT: 20
RANGE: 17.0 TO 20.0
RANGE: 100 TO 400
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 54.0 *
WTR SAT., %; 46.0
GAS SAT., %;
FVF, BBL/STB; 1.000 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

418
**CASE 315**

**FLUID CHARACTERISTICS**

- **OIL GRAVITY, API:** 21.0
- **RANGE:** TO
- **VISCOITY @ BHT, CP:** ; @ F, CP:
- **SAYBOLT VISC (100F), SEC:** 290
- **SULFUR CONTENT, %:** 1.70
- **CARBON/HYDROGEN RATIO:**
- **CARBON RESIDUE, %:** 6.7
- **ACID NUMBER:**
- **OIL TYPE:**
- **WATER SALINITY, PPM:**
- **WATER HARDNESS:** CA, PPM;
- **MG, PPM:**

**RESERVES AND PRODUCTION DATA**

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ORIGINAL OIL IN PLACE, STB:</strong></td>
<td>18,500,000</td>
<td>BBL/AC-FT: 1217</td>
</tr>
<tr>
<td><strong>ORIGINAL GAS IN PLACE, MCF:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CUM PROD (DEC 31, 1977): OIL, BBL:</strong></td>
<td>6,679,068</td>
<td></td>
</tr>
<tr>
<td><strong>GAS, MCF:</strong></td>
<td>19,972</td>
<td></td>
</tr>
<tr>
<td><strong>WATER, BBL:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1977 ANNUAL PROD: OIL, BBL:</strong></td>
<td>154,071</td>
<td></td>
</tr>
<tr>
<td><strong>GAS, MCF:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>WATER, BBL:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OIL REMAINING IN PLACE, STB:</strong></td>
<td>11,800,000</td>
<td>BBL/AC-FT: 777</td>
</tr>
<tr>
<td><strong>(DEC 31, 1977) RESERVES (DEC 31, 1977)</strong></td>
<td>1,320,932</td>
<td></td>
</tr>
</tbody>
</table>

**PRIMARY PRODUCTION:**
- **MECHANISM:** WATER DRIVE
- **RECOVERY FACTOR, %:**
- **ANNUAL DECLINE RATE, %:**

**SOURCES:** 12, 14, 286, 289
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: WYOMING
COUNTY: CAMPBELL
FIELD NAME: ROCKY POINT
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: MINNELUSA
NO. OF ZONES: 671
AREA, ACRES: 671
TOTAL WELLS: 15
SHUT-IN WELLS: 15
DISCOVERY YEAR: 1962
SPACING, ACRES: 15
PRODUCING WELLS: 15
INJECTION WELLS: 15

GEOLOGICAL INFORMATION

FORMATION: MINNELUSA
GEOLOGICAL AGE: U. PENN.
BASIN: POWDER RIVER
TRAP TYPE: -
LITHOLOGY: SAND
DEGREE OF CONSOLIDATION:
HETERGENEITY:
FAULTING:
FRACUTURE:
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 5450
GROSS PAY, FT: 350
POROSITY, %: 17.9
PERMEABILITY, MD: 475
BHT, DEF F: 170
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 89.5
WTR SAT., %: 10.5
GAS SAT., %:
FVF, BBL/STB: 1.050
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI: 2270

NET PAY, FT: 43
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %: 65.0 *
WTR SAT., %: 35.0
GAS SAT., %:
FVF, BBL/STB: 1.000 *
WOR, BBL/BBL:
GOR, SCF/BBL:
BHP, PSI:
FLUID CHARACTERISTICS

OIL GRAVITY, API: 18.0
VISCOSITY @ BHT, CP: ; @ F, CP:
SAYBOLT VISC (100°F), SEC: 110
SULFUR CONTENT, %: 3.46
CARBON RESIDUE, %: 13.4
CARBON/HYDROGEN RATIO:
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM;
MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 34,200,000 BBL/AC-FT: 1184
ORIGINAL GAS IN PLACE, MCF:
CUM PROD (DEC 31, 1977): OIL, BBL; 8,081,172
GAS, MCF;
WATER, BBL;
1977 ANNUAL PROD: OIL, BBL; 392,192
GAS, MCF;
WATER, BBL;
OIL REMAINING IN PLACE, STB: 26,100,000 BBL/AC-FT: 904
(DEC 31, 1977)
RESERVES (DEC 31, 1977) 2,500,000

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SOURCES: 12,14,286,289; 294
RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: WYOMING
COUNTY: BIG HORN & PARK
DISTRICT: PARK
FIELD NAME: SAGE CREEK
NO. OF RESERVOIRS: 3

RESERVOIR INFORMATION

RESERVOIR: TENSLEEP
NO. OF ZONES: 3
AREA, ACRES: 760
TOTAL WELLS: 19
PRODUCING WELLS: 19
DISCOVERY YEAR: 1953
SPACING, ACRES: 40
INJECTION WELLS: 2

GEOLOGICAL INFORMATION

FORMATION: TENSLEEP
GEOLOGICAL AGE: DESMOINES
BASIN: BIG HORN
TRAP TYPE: STRUCTURAL - ANTICLINE FAULT
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 3356
GROSS PAY, FT: 195
POROSITY, %: 18.0
PERMEABILITY, MD: 125
BHT, DEF F: 96
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 80.0
WTR SAT., %; 20.0
GAS SAT., %;
FVF, BBL/STB; 1.050 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;

NET PAY, FT: 22
RANGE: 15.0 TO 20.0
RANGE: 50 TO 200
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 57.0 *
WTR SAT., %; 43.0
GAS SAT., %;
FVF, BBL/STB; 1.000 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 24.5
VISCOSITY @ BHT, CP: 
SAYBOLT VISC (100°F), SEC: 115
SULFUR CONTENT, %: 2.85
CARBON/HYDROGEN RATIO:
CARBON RESIDUE, %: 6.9
ACID NUMBER:
OIL TYPE:
WATER SALINITY, PPM:
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 30,120,000 BBL/AC-FT: 1063
ORIGINAL GAS IN PLACE, MCF: 
CUM PROD: OIL, BBL: 7,745,000
(GE 31, 1977) GAS, MCF: 
WATER, BBL: 
1977 ANNUAL PROD: OIL, BBL: 245,979
GAS, MCF: 
WATER, BBL: 
OIL REMAINING IN PLACE, STB: 22,375,000 BBL/AC-FT: 790
(DEC 31, 1977) RESERVES (DEC 31, 1977) 2,454,000

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %: 
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 PERIPHERAL WF (1971-

AREA, ACRES: 
NO. PROD WELLS: 
VOLUME INJECTED: (EQUIV) WATER, BBL: 
GAS, MCF: 
CUMULATIVE PROD: OIL, BBL:
(GE THRU ) GAS, MCF: 
WATER, BBL: 
RECOVERY FACTOR, %: 
BBL/AC-FT: 
DEGREE OF SUCCESS: 
OPERATOR(S): SOHIO

SOURCES: 12, 14, 286, 289, 297

423
CASE 325

RESERVOIR AND PRODUCTION DATA ELEMENTS

STATE: WYOMING
COUNTY: JOHNSON
DISTRICT:
FIELD NAME: TISDALE, EAST
NO. OF RESERVOIRS: 2

RESERVOIR INFORMATION

RESERVOIR: TENSLEEP
NO. OF ZONES: DISCOVERY YEAR: 1959
AREA, ACRES: 500 *
TOTAL WELLS: SPACING, ACRES: 40
SHUT-IN WELLS:

PRODUCING WELLS:
INJECTION WELLS:

GEOLOGICAL INFORMATION

FORMATION: TENSLEEP GEOLOGICAL AGE: DESMOINES
BASIN: POWDER RIVER
TRAP TYPE: STRUCTURAL - ANTICLINE
LITHOLOGY: SAND
DIP, DEG.: CLAY CONTENT, %:
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACTURE;
INTERBEDDED STreakS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 2244 NET PAY, FT: 30
GROSS PAY, FT: 285 RANGE: TO
POROSITY, %: 20.0 RANGE: 150 TO 940
PERMEABILITY, MD: 900 SAT. PRESSURE, PSI:
BHT, DEF P: 90 GAS CAP, ACRES:
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %: 72.0 WETTING PHASE:
WTR SAT., %: 28.0 CURRENT: OIL SAT., %: 57.0 *
GAS SAT., %: WTR SAT., %: 43.0
FVF, BBL/STB; 1.100 GAS SAT., %:
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 1013 FVF, BBL/STB; 1.030 *
WOR, BBL/BBL;
GOR, SCF/BBL;
BHP, PSI; 910
FLUID CHARACTERISTICS

OIL GRAVITY, API: 20.0
VISCOSITY @ BHT, CP:  
SAYBOLT VISC (100F), SEC:  
SULFUR CONTENT, %: 3.00
CARBON RESIDUE, %:  
CARBON/HYDROGEN RATIO:  
ACID NUMBER:  
OIL TYPE:  
WATER SALINITY, PPM:  
WATER HARDNESS: Ca, PPM:  
Mg, PPM:  

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 15,200,000  BBL/AC-FT: 1016
ORIGINAL GAS IN PLACE, MCF:  
CUM PROD: OIL, BBL; 2,411,018  
(GDEC 31, 1977) GAS, MCF; 50,455-  
WATER, BBL;  
1977 ANNUAL PROD: OIL, BBL; 38,677  
GAS, MCF; 10,855  
WATER, BBL;  
OIL REMAINING IN PLACE, STB: 12,800,000  BBL/AC-FT: 855  
(GDEC 31, 1977)  
RESERVES (DEC 31, 1977) 588,982  

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %:  
ANNUAL DECLINE RATE, %:  

SOURCES: 12,14,286,289; 297
**RESERVOIR AND PRODUCTION DATA ELEMENTS**

**CASE 326**

**STATE: WYOMING**

**COUNTY: JOHNSON**

**DISTRICT:**

**FIELD NAME: TISDALE, NORTH**

**NO. OF RESERVOIRS: 3**

**RESERVOIR INFORMATION**

**RESERVOIR: CURTIS**

<table>
<thead>
<tr>
<th>No. of Zones</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area, Acres</td>
<td>360 *</td>
</tr>
<tr>
<td>Total Wells</td>
<td></td>
</tr>
<tr>
<td>Shut-in Wells</td>
<td></td>
</tr>
</tbody>
</table>

**DISCOVERY YEAR: 1952**

**SPACING, ACRES: 10**

**PRODUCING WELLS: 26**

**INJECTION WELLS: 5**

**GEOLOGICAL INFORMATION**

**FORMATION: CURTIS**

**GEOLOGICAL AGE: UPPER JURASSIC**

**BASIN: POWDER RIVER**

**TRAP TYPE: STRUCT/STRAT - FAULT NOSE**

**LITHOLOGY: SAND**

**DIP, DEG.: 3.0**

**CLAY CONTENT, %:**

**INTERBEDDED STREAKS: YES**

**FAULTING:**

**BARRIER TO FLOW:**

**RESERVOIR CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Depth, FT:</th>
<th>900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Pay, FT:</td>
<td>126</td>
</tr>
<tr>
<td>Porosity, %:</td>
<td>24.5</td>
</tr>
<tr>
<td>Permeability, MD:</td>
<td>1034</td>
</tr>
<tr>
<td>BHT, DEF F:</td>
<td>73</td>
</tr>
<tr>
<td>Gas Cap:</td>
<td></td>
</tr>
<tr>
<td>Gas Cap/Oil Zone Ratio:</td>
<td></td>
</tr>
<tr>
<td>Initial: Oil Sat., %: 65.0</td>
<td></td>
</tr>
<tr>
<td>WTR Sat., %: 35.0</td>
<td></td>
</tr>
<tr>
<td>Gas Sat., %:</td>
<td></td>
</tr>
<tr>
<td>FVF, BBL/STB: 1.050 *</td>
<td></td>
</tr>
<tr>
<td>WOR, BBL/BBL:</td>
<td></td>
</tr>
<tr>
<td>GOR, SCF/BBL:</td>
<td></td>
</tr>
<tr>
<td>BHP, PSI: 290</td>
<td></td>
</tr>
<tr>
<td>Net Pay, FT: 54</td>
<td></td>
</tr>
<tr>
<td>Range:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sat. Pressure, PSI:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas Cap, Acres:</td>
<td></td>
</tr>
<tr>
<td>Wetting Phase:</td>
<td></td>
</tr>
<tr>
<td>Current: Oil Sat., %:</td>
<td></td>
</tr>
<tr>
<td>WTR Sat., %:</td>
<td></td>
</tr>
<tr>
<td>Gas Sat., %:</td>
<td></td>
</tr>
<tr>
<td>FVF, BBL/STB:</td>
<td></td>
</tr>
<tr>
<td>WOR, BBL/BBL:</td>
<td></td>
</tr>
<tr>
<td>GOR, SCF/BBL:</td>
<td></td>
</tr>
<tr>
<td>BHP, PSI:</td>
<td></td>
</tr>
</tbody>
</table>

**FLUID CHARACTERISTICS**

| Oil Gravity, API: 21.0 | |
| Viscosity @ BHT, CP: 175.0; @ F, CP: | |
| Saybolt Visc (100F), SEC: | |
| Sulfur Content, %: 2.82 | |
| Carbon/Hydrogen Ratio: | |
| Carbon Residue, %: | |
| Acid Number: | |
| Oil Type: | |
| Water Salinity, PPM: | |
| Water Hardness: CA, PPM: MG, PPM: | |

**426**
RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 22,900,000 BBL/AC-FT: 1177
ORIGINAL GAS IN PLACE, MCF:

CUM PROD: OIL, BBL; 2,741,684
(DEC 31, 1977) GAS, MCF; 44,724
WATER, BBL;

1977 ANNUAL PROD: OIL, BBL; 81,387
GAS, MCF;
WATER, BBL;

OIL REMAINING IN PLACE, STB: BBL/AC-FT:
(DEC 31, ) RESERVES (DEC 31, 1977) 758,311

PRIMARY PRODUCTION:
MECHANISM: WATER DRIVE
RECOVERY FACTOR, %: BBL/AC-FT:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

S.1 WATERFLOOD (1962- )

AREA, ACRES: FLUID INJECTED: W
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS:
OPERATOR(S): HIGHLAND EXP., INC

T.1 IN-SITU COMBUSTION (1959-1963)

AREA, ACRES: 12 FLUID INJECTED: A
NO. PROD WELLS: NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %: BBL/AC-FT:
DEGREE OF SUCCESS: VE
OPERATOR(S): CONOCO

REMARKS: PROD & RES INCLUDE 2 OTHER POOLS

SOURCES: 12, 14, 286, 289; 276
RESERVOIR AND PRODUCTION DATA ELEMENTS

CASE 327

STATE: WYOMING
COUNTY: FREMONT
DISTRICT: 
FIELD NAME: WINKLEMAN DOME
NO. OF RESERVOIRS: 5

RESERVOIR INFORMATION

RESERVOIR: NUGGET
NO. OF ZONES: 
AREA, ACRES: 207
TOTAL WELLS: 
SHUT-IN WELLS: 
DISCOVERY YEAR: 1944
SPACING, ACRES: 10
PRODUCING WELLS: 21
INJECTION WELLS: 15

GEOLOGICAL INFORMATION

FORMATION: NUGGET
GEOLOGICAL AGE: UPPER TRIASSIC
BASIN: WIND RIVER
TRAP TYPE: STRUCTURAL - ANTICLINE
LITHOLOGY: SAND
DEGREE OF: CONSOLIDATION;
HETEROGENEITY;
FAULTING;
FRACHTURE;
DIP, DEG.:
CLAY CONTENT, %:
INTERBEBDDED STREAKS:
BARRIER TO FLOW:

RESERVOIR CHARACTERISTICS

DEPTH, FT: 1286
GROSS PAY, FT: 180
POROSITY, %: 24.0
PERMEABILITY, MD: 431
BHT, DEF F: 81
GAS CAP:
GAS CAP/OIL ZONE RATIO:
INITIAL: OIL SAT., %; 71.0
WTR SAT., %; 29.0
GAS SAT., %;
FVF, BBL/STB; 1.000
WOR, BBL/BBL;
GOR, SCF/BBL; 30
BHP, PSI; 210

NET PAY, FT: 57
RANGE: TO
RANGE: TO
SAT. PRESSURE, PSI:
GAS CAP, ACRES:
WETTING PHASE:
CURRENT: OIL SAT., %; 55.0 *
WTR SAT., %; 45.0
GAS SAT., %;
FVF, BBL/STB; 1.000
WOR, BBL/BBL; 4
GOR, SCF/BBL;
BHP, PSI;
FLUID CHARACTERISTICS

OIL GRAVITY, API: 14.0
RANGE: TO

VISCOSITY @ BHT, CP: 1000.0; @ F, CP:

SAYBOLT VISC (100F), SEC:

SULFUR CONTENT, %:
CARBON/HYDROGEN RATIO:

CARBON RESIDUE, %:
ACID NUMBER:

OIL TYPE:

WATER SALINITY, PPM;
WATER HARDNESS: CA, PPM; MG, PPM;

RESERVES AND PRODUCTION DATA

ORIGINAL OIL IN PLACE, STB: 13,200,000
ORIGINAL GAS IN PLACE, MCF:
CUM PROD: OIL, BBL; 2,653,427
(DEC 31, 1977) GAS, MCF;
WATER, BBL;

1977 ANNUAL PROD: OIL, BBL; 239,417
GAS, MCF;
WATER, BBL;

OIL REMAINING IN PLACE, STB: 10,307,156
(DEC 31, 1977)
RESERVES (DEC 31, )

PRIMARY PRODUCTION:
MECHANISM: FE & WD
RECOVERY FACTOR, %:
ANNUAL DECLINE RATE, %:

SECONDARY AND TERTIARY RECOVERIES:

T.1 STEAM INJECTION (1967- )

AREA, ACRES: 100
FLUID INJECTED: S
NO. PROD WELLS:
NO. INJ WELLS:
VOLUME INJECTED: (EQUIV) WATER, BBL;
GAS, MCF;
CUMULATIVE PROD: OIL, BBL;
(THRU ) GAS, MCF;
WATER, BBL;
RECOVERY FACTOR, %:
DEGREE OF SUCCESS: VE
OPERATOR(S): AMOCO

SOURCES: 12, 14, 286, 289; 268, 273, 278, 279, 287

429
APPENDIX
OPERATORS, PAST RECOVERY DATA AND PROJECT DATA SOURCES FOR CANDIDATE HEAVY OIL RESERVOIRS

TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. OPERATORS AND PAST RECOVERY DATA</td>
<td></td>
</tr>
<tr>
<td>Alaska</td>
<td>432</td>
</tr>
<tr>
<td>Arkansas</td>
<td>432</td>
</tr>
<tr>
<td>California</td>
<td>434</td>
</tr>
<tr>
<td>Colorado</td>
<td>464</td>
</tr>
<tr>
<td>Illinois</td>
<td>465</td>
</tr>
<tr>
<td>Kansas</td>
<td>465</td>
</tr>
<tr>
<td>Kentucky</td>
<td>466</td>
</tr>
<tr>
<td>Louisiana</td>
<td>467</td>
</tr>
<tr>
<td>Mississippi</td>
<td>473</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>477</td>
</tr>
<tr>
<td>Texas</td>
<td>478</td>
</tr>
<tr>
<td>Wyoming</td>
<td>494</td>
</tr>
<tr>
<td>2. PROJECT DATA SOURCES</td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>499</td>
</tr>
<tr>
<td>Alaska</td>
<td>500</td>
</tr>
<tr>
<td>Arkansas</td>
<td>500</td>
</tr>
<tr>
<td>California</td>
<td>501</td>
</tr>
<tr>
<td>Colorado</td>
<td>511</td>
</tr>
<tr>
<td>Illinois</td>
<td>511</td>
</tr>
<tr>
<td>Kansas</td>
<td>512</td>
</tr>
<tr>
<td>Kentucky</td>
<td>513</td>
</tr>
<tr>
<td>Louisiana</td>
<td>513</td>
</tr>
<tr>
<td>Mississippi</td>
<td>514</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>514</td>
</tr>
<tr>
<td>Texas</td>
<td>515</td>
</tr>
<tr>
<td>Wyoming</td>
<td>522</td>
</tr>
<tr>
<td>Company Responses</td>
<td>524</td>
</tr>
</tbody>
</table>
1. OPERATORS AND PAST RECOVERY DATA

Tabulation of the operators for each reservoir, along with past recovery data, is contained alphabetically by state in Exhibit 1-1.
### Exhibit 1-1. Table of Operators and Past Recovery Data

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Thermal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Date</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Thermal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Date</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Other</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Date</td>
<td>Evaluation</td>
</tr>
</tbody>
</table>

**Alaska**

1. 160

**Arkansas**

3. 1900*

Key Oil Co., Inc.
Lowery Oil Co.
Schmidt Prod. Co.

4. 2300

Mobil Oil
Nevada Oil Co.
Trio Prod.

5. 1120

Phillips Petroleum Co.

6, 7, 8, 9, 43970*

American Trav.
Beebe, J.S., Oil Co.
Beebe-Tirk
Benton, J.P.
Berg-Laney-Br

**Evaluation Descriptions**

1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**

1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
### Exhibit 1-1. Table of Operators and Past Recovery Data

(Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery Type</th>
<th>Secondary Recovery Date</th>
<th>Enhanced Recovery Type</th>
<th>Enhanced Recovery Date</th>
<th>Other Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Corley, W.E.</td>
<td>WF 72-</td>
<td></td>
<td></td>
<td>ISC 69-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cross Development Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Daniels, Orlis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gulf Oil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Holloway, D.G. and D.F.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kerr-McGee Corp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MacFarlane Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MacBeebe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mason and Son</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>May, Joe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Milam Brothers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Murphy Corp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pace, H.</td>
<td>WF 71-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phillips Petroleum</td>
<td>WF 54-</td>
<td></td>
<td>SD 69-</td>
<td>ME</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phillips-Monsanto</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Price, N.R.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reynolds, J.D.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rutledge-Daniels</td>
<td>WF 71-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**

1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. FF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acre)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acre)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td>11</td>
<td>997</td>
<td>Rutledge, N.T.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sklar-Beebe</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tennyson Oil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Williams, R.E., Drilling Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>110</td>
<td>Van Horn, James M.</td>
<td>110</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>500</td>
<td>Mobil Oil Corp.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>3500*</td>
<td>Mobil Oil Corp.</td>
<td>880</td>
<td>IS5</td>
<td>59-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teal Petroleum Co.</td>
<td>250</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>2370</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>4200*</td>
<td>Mobil Oil Corp.</td>
<td>2380</td>
<td>WF</td>
<td>56-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>1820</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>200*</td>
<td>Getty Oil Co.</td>
<td>200</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluations Descriptions**
1. ME - Moderately Effective  
2. NE - Not Effective  
3. UD - Undetermined  
4. VE - Very Effective

**Recovery Type Descriptions**
1. CS - Cyclic Steam  
2. ISC - In Situ Combustion  
3. MD - Miscible Displacement  
4. PF - Polymer Flood  
5. PM - Pressure Maintenance  
6. SD - Steam Drive  
7. TH - Thermal  
8. WF - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data
(Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>400*</td>
<td>Chevron USA, Inc.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td>280</td>
<td>WF 76-</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>600*</td>
<td>Southern California Gas Co.</td>
<td>600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>50</td>
<td>McCulloch Oil and Gas Co.</td>
<td>50</td>
<td>WF 70-</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>350</td>
<td>Teal Petroleum Co.</td>
<td>340</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>260</td>
<td>Shell Oil Co.</td>
<td>260</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>50</td>
<td>Union Oil Co.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>910*</td>
<td>Exxon</td>
<td>910</td>
<td>WF 58-69</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PM 54-71</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>140</td>
<td>Morton and Dolley</td>
<td>110</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>100</td>
<td>Union Oil Co.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>425</td>
<td>Union Oil Co.</td>
<td>425</td>
<td>WF 56-59</td>
<td>CS 64-65</td>
</tr>
<tr>
<td>27</td>
<td>190</td>
<td>Arco Oil and Gas Co.</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ojai Oil Co.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>435</td>
<td>Arco Oil and Gas Co.</td>
<td>435</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
1. **ME** - Moderately Effective
2. **NE** - Not Effective
3. **UD** - Undetermined
4. **VE** - Very Effective

**Recovery Type Descriptions**
1. **CS** - Cyclic Steam
2. **ISC** - In Situ Combustion
3. **MD** - Miscible Displacement
4. **PF** - Polymer Flood
5. **PM** - Pressure Maintenance
6. **SD** - Steam Drive
7. **TH** - Thermal
8. **WF** - Water Flood

*Acres estimated.
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Decalta International Corp.</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td>110</td>
<td>WF 64-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>700</td>
<td>Albert, Jacob</td>
<td>40</td>
<td>WF 54-</td>
<td>CS 64-71</td>
<td>ISC 64-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crown Central Petroleum Corp.</td>
<td>270</td>
<td></td>
<td></td>
<td>NE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Riley, Jim</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>430*</td>
<td>Chevron USA, Inc.</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crestmont Oil &amp; Gas Co.</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gulf Energy and Minerals Co.</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Herley Kelley Co.</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Superior Oil Co.</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>70*</td>
<td>Union Oil Co.</td>
<td>70</td>
<td>CS 64-65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>100</td>
<td>Texaco, Inc.</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>240</td>
<td>Feldman, D.D., Oil and Gas</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td>190</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. **ME** - Moderately Effective
2. **NE** - Not Effective
3. **UD** - Undetermined
4. **VE** - Very Effective
5. **PM** - Pressure Maintenance
6. **SD** - Steam Drive
7. **TH** - Thermal
8. **WF** - Water Flood
9. **CS** - Cyclic Steam
10. **ISC** - In Situ Combustion
11. **MD** - Miscible Displacement
12. **PF** - Polymer Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Arco</td>
<td>500</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chevron</td>
<td>270</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Richards Oil Co.</td>
<td>320</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teal Petroleum Co.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td>870</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>2060</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td>980</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Husky Oil Co.</td>
<td>480</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Occidental Petroleum Corp.</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oxy Petroleum, Inc.</td>
<td>(NA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Russell, Robert G. and Son, Inc.</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>480</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chevron</td>
<td>180</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continental Oil Co.</td>
<td>600</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>160</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>1120</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>100*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td>400</td>
<td>WF 68-</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>2780</td>
<td></td>
<td>370</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Husky Oil Co.</td>
<td>270</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. **ME** - Moderately Effective
2. **NE** - Not Effective
3. **UD** - Undetermined
4. **VE** - Very Effective

**Recovery Type Descriptions**

1. **CS** - Cyclic Steam
2. **ISC** - In Situ Combustion
3. **MD** - Miscible Displacement
4. **PF** - Polymer Flood
5. **FM** - Pressure Maintenance
6. **SD** - Steam Drive
7. **TH** - Thermal
8. **WF** - Water Flood

*Acres estimated.*
<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td>40</td>
<td>590</td>
<td>Mobil Oil Corp.</td>
<td>300</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Oil Co.</td>
<td>190</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td>1150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>2930</td>
<td>Getty Oil Co.</td>
<td>490</td>
<td>WF</td>
<td>64-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td>80</td>
<td>WF</td>
<td>64-</td>
</tr>
<tr>
<td>42</td>
<td>650</td>
<td>Getty Oil Co.</td>
<td>130</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Oil Co.</td>
<td>110</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td>2690</td>
<td>WF</td>
<td>54-</td>
</tr>
<tr>
<td>43</td>
<td>1990</td>
<td>Arco Co. (Joint Op.)</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Berwood Corp.</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chevron USA, Inc.</td>
<td>170</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Oil Co. (Joint Op.)</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td>140</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**

1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>2110</td>
<td>Union Oil Co.</td>
<td>2110</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>3670</td>
<td>American Pacific International</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Baumgartner Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reserve Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shell Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>570</td>
<td>Shell Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>230</td>
<td>Husky Oil of Delaware</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>4020</td>
<td>Argo Petroleum Corp.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Husky Oil Co.</td>
<td>180</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kovac, Paul J.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>McFarland Energy, Inc.</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td>3600</td>
<td>WF</td>
<td>51-</td>
</tr>
<tr>
<td>49</td>
<td>120</td>
<td>Husky Oil Co.</td>
<td>120</td>
<td></td>
<td>CS 65-66</td>
</tr>
<tr>
<td>50</td>
<td>600*</td>
<td>Continental Oil Co.</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Husky Oil Co. of Delaware</td>
<td>150</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
1. ME - Moderately Effective  
2. NE - Not Effective  
3. UD - Undetermined  
4. VE - Very Effective

**Recovery Type Descriptions**
1. CS - Cyclic Steam  
2. ISC - In Situ Combustion  
3. MD - Miscible Displacement  
4. PF - Polymer Flood  
5. PM - Pressure Maintenance  
6. SD - Steam Drive  
7. TH - Thermal  
8. WF - Water Flood

*Acres estimated.
Exhibit 1-1. Table of Operators and Past Recovery Data
(Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type Date</td>
<td>Thermal Type Date</td>
</tr>
<tr>
<td>51</td>
<td>450</td>
<td>Shell Oil Co.</td>
<td>170</td>
<td>WF 76-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SM Hydrocarbons, Inc.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td>450</td>
<td>WF 53-</td>
<td>CS 63-65</td>
</tr>
<tr>
<td>52</td>
<td>300</td>
<td>Arco Oil and Gas Co.</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gulf Oil Corp.</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oxy Petroleum, Inc.</td>
<td>(NA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>120</td>
<td>Gulf Oil Corp.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>860*</td>
<td>Brea-Canon Oil Co.</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Copper and Brain-Brea</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shell Oil Co.</td>
<td>500</td>
<td>WF 61-</td>
<td>SD 72-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>705*</td>
<td>Chanslor-Western Oil and Development Co.</td>
<td>170</td>
<td>WF 64-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crestmont Oil and Gas Co.</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shell Oil Co.</td>
<td>240</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td>150</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Evaluation Descriptions
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

Recovery Type Descriptions
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td>56</td>
<td>590</td>
<td>Mobil Oil Corp.</td>
<td>110</td>
<td>WF</td>
<td>65-72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td>480</td>
<td>WF</td>
<td>68-</td>
</tr>
<tr>
<td>57</td>
<td>750</td>
<td>Union Oil Co.</td>
<td>720</td>
<td>WF</td>
<td>69-</td>
</tr>
<tr>
<td>58</td>
<td>200</td>
<td>Anaheim Union Water Co.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td>160</td>
<td>WF</td>
<td>69-</td>
</tr>
<tr>
<td>59</td>
<td>400</td>
<td>Union Oil Co.</td>
<td>400</td>
<td>WF</td>
<td>66-</td>
</tr>
<tr>
<td>60</td>
<td>160</td>
<td>Chevron USA, Inc.</td>
<td>160</td>
<td></td>
<td></td>
</tr>
<tr>
<td>61</td>
<td>80</td>
<td>Chevron USA, Inc.</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>62</td>
<td>2345</td>
<td>Chevron USA, Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Energy Development of California, Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>63</td>
<td>NA</td>
<td>Aminoil USA, Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>1200*</td>
<td>Aminoil USA, Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chevron USA, Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65</td>
<td></td>
<td>Aminoil USA, Inc.</td>
<td></td>
<td>WP</td>
<td>65-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chevron USA, Inc.</td>
<td></td>
<td>WP</td>
<td>65-</td>
</tr>
</tbody>
</table>

**Evaluation Description**
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery Type</th>
<th>Date</th>
<th>Evaluation Type</th>
<th>Date</th>
<th>Enhanced Recovery Type</th>
<th>Date</th>
<th>Other Type</th>
<th>Date</th>
<th>Evaluation Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>66</td>
<td>930</td>
<td>Chevron USA, Inc.</td>
<td></td>
<td>WF</td>
<td>65-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>67</td>
<td></td>
<td>Chevron USA, Inc.</td>
<td></td>
<td>WF</td>
<td>71-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Energy Development of California, Inc.</td>
<td></td>
<td>WF</td>
<td>71-</td>
<td>CS</td>
<td>64-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chevron USA, Inc.</td>
<td>370</td>
<td>WF</td>
<td>71-</td>
<td>CS</td>
<td>64-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>69</td>
<td>1070</td>
<td>Chevron USA, Inc.</td>
<td></td>
<td>WF</td>
<td>68-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td></td>
<td>WF</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>70</td>
<td>Palm Petroleum Corp.</td>
<td></td>
<td>WF</td>
<td>68-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil</td>
<td></td>
<td>WF</td>
<td>68-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>45</td>
<td>Sun Oil Co.</td>
<td></td>
<td>WF</td>
<td>68-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>965</td>
<td>Arco, Inc.</td>
<td></td>
<td>WF</td>
<td>68-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shell Oil Co.</td>
<td></td>
<td>WF</td>
<td>68-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td></td>
<td>WF</td>
<td>68-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>73</td>
<td>650*</td>
<td>Chevron USA, Inc.</td>
<td></td>
<td>WF</td>
<td>53-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td></td>
<td>WF</td>
<td>53-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>74</td>
<td></td>
<td>Kernview Oil Corp.</td>
<td></td>
<td>WF</td>
<td>53-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td>75</td>
<td>625</td>
<td>General Crude Oil</td>
<td>600</td>
<td>F</td>
<td>-</td>
</tr>
<tr>
<td>76</td>
<td>248</td>
<td>Southern California Gas Co.</td>
<td>214</td>
<td>F</td>
<td>-</td>
</tr>
<tr>
<td>77</td>
<td>342</td>
<td>Southern California Gas Co.</td>
<td>342</td>
<td>F</td>
<td>-</td>
</tr>
<tr>
<td>78</td>
<td>1160</td>
<td>Pyramid Oil Co.</td>
<td>60</td>
<td>F</td>
<td>-</td>
</tr>
<tr>
<td>79</td>
<td>350*</td>
<td>Chevron USA, Inc.</td>
<td>210</td>
<td>F</td>
<td>44-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td>140</td>
<td>F</td>
<td>44-</td>
</tr>
<tr>
<td>80</td>
<td>365</td>
<td>Chevron</td>
<td>80</td>
<td>F</td>
<td>-</td>
</tr>
<tr>
<td>81</td>
<td>330</td>
<td>Seaboard Oil and Gas Co.</td>
<td>285</td>
<td>F</td>
<td>-</td>
</tr>
<tr>
<td>82</td>
<td>270</td>
<td>Union Oil Co.</td>
<td>240</td>
<td>F</td>
<td>-</td>
</tr>
<tr>
<td>83</td>
<td>1480</td>
<td>American Pacific International</td>
<td>290</td>
<td>F</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chanslor-Western Oil and Development Co.</td>
<td>70</td>
<td>F</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chevron</td>
<td>200</td>
<td>F</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Driltrol</td>
<td>50</td>
<td>F</td>
<td>-</td>
</tr>
</tbody>
</table>

#### Evaluation Descriptions
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

#### Recovery Type Descriptions
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PP - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
**Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)**

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Exxon Co. USA</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Co.</td>
<td>260</td>
<td></td>
<td></td>
</tr>
<tr>
<td>84</td>
<td>3435</td>
<td>Petro-Lewis Corp.</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Santa Fe Energy Co.</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>American Pacific International</td>
<td>350</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chanslor and Western Oil and Development Co. and Mobil Oil Corp. (Unitized)</td>
<td>650</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cooper and Brain, Inc.</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Decalta International Corp.</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exxon Co. USA</td>
<td>170</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Granes</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Great Lakes, Inc.</td>
<td>230</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>O'Donnell</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Petro-Lewis Corp.</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Superior Oil Co. (Unitized)</td>
<td>780</td>
<td></td>
<td></td>
</tr>
<tr>
<td>85</td>
<td>500*</td>
<td>Chevron USA, Inc.</td>
<td>480</td>
<td>WF</td>
<td>61-</td>
</tr>
<tr>
<td>86</td>
<td>100</td>
<td>Mitchell Energy Corp.</td>
<td>80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. **WE** - Moderately Effective
2. **WE** - Not Effective
3. **UD** - Undetermined
4. **VE** - Very Effective

**Recovery Type Descriptions**

1. **CS** - Cyclic Steam
2. **ISC** - In Situ Combustion
3. **MD** - Miscible Displacement
4. **PF** - Polymer Flood
5. **PM** - Pressure Maintenance
6. **SD** - Steam Drive
7. **TH** - Thermal
8. **WF** - Water Flood

*Acres estimated.
## Exhibit 1-1. Table of Operators and Past Recovery Data
(Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Thums Long Beach Co.</td>
<td>1115</td>
<td>WF</td>
<td></td>
</tr>
<tr>
<td>87</td>
<td>1115</td>
<td>Thums Long Beach Co.</td>
<td>125</td>
<td>WF</td>
<td></td>
</tr>
<tr>
<td>88</td>
<td>125</td>
<td>Thums Long Beach Co.</td>
<td>520</td>
<td>WF</td>
<td></td>
</tr>
<tr>
<td>89</td>
<td>520</td>
<td>Thums Long Beach Co.</td>
<td>270</td>
<td>WF</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>270</td>
<td>Thums Long Beach Co.</td>
<td>213</td>
<td>WF</td>
<td></td>
</tr>
<tr>
<td>91</td>
<td>213</td>
<td>Thums Long Beach Co.</td>
<td>2376</td>
<td>WF</td>
<td></td>
</tr>
<tr>
<td>92</td>
<td>2376</td>
<td>Thums Long Beach Co.</td>
<td>1040</td>
<td>WF</td>
<td></td>
</tr>
<tr>
<td>93</td>
<td>1020</td>
<td>Thums Long Beach Co.</td>
<td>449</td>
<td>WF</td>
<td></td>
</tr>
<tr>
<td>94</td>
<td>449</td>
<td>Thums Long Beach Co.</td>
<td>159</td>
<td>WF</td>
<td></td>
</tr>
<tr>
<td>95</td>
<td>159</td>
<td>Thums Long Beach Co.</td>
<td>128</td>
<td>WF</td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>128</td>
<td>Thums Long Beach Co.</td>
<td>371*</td>
<td>WF</td>
<td></td>
</tr>
<tr>
<td>97</td>
<td>371</td>
<td>Long Beach Oil Development Co.</td>
<td>391</td>
<td>WF</td>
<td></td>
</tr>
<tr>
<td>98</td>
<td>391</td>
<td>Mobil Oil Corp.</td>
<td>93</td>
<td>WF</td>
<td></td>
</tr>
</tbody>
</table>

### Evaluation Descriptions
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

### Recovery Type Descriptions
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
**Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)**

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td>99</td>
<td>630*</td>
<td>Long Beach, Department of Properties</td>
<td>328</td>
<td>WF</td>
<td>58-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td>302</td>
<td>WF</td>
<td>58-</td>
</tr>
<tr>
<td>100</td>
<td>708*</td>
<td>Long Beach Oil Development Co.</td>
<td>323</td>
<td>WF</td>
<td>58-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td>385</td>
<td>WF</td>
<td>58-</td>
</tr>
<tr>
<td>101</td>
<td>2000</td>
<td>Chevron USA, Inc.</td>
<td>230</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long Beach Oil Development Co.</td>
<td>975</td>
<td>WF</td>
<td>61-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td>695</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Powerine Oil Co.</td>
<td>95</td>
<td>WF</td>
<td>61-</td>
</tr>
<tr>
<td>102</td>
<td>859</td>
<td>Long Beach Oil Development Co.</td>
<td>682</td>
<td>WF</td>
<td>60-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Powerine Oil Co.</td>
<td>168</td>
<td>WF</td>
<td>60-</td>
</tr>
<tr>
<td>103</td>
<td>72*</td>
<td>Long Beach Oil Development Co.</td>
<td>72</td>
<td>WF</td>
<td>64-66</td>
</tr>
<tr>
<td>104</td>
<td>366</td>
<td>Long Beach Oil Development Co.</td>
<td>308</td>
<td>WF</td>
<td>53-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Powerine Oil Co.</td>
<td>58</td>
<td>WF</td>
<td>53-</td>
</tr>
<tr>
<td>105</td>
<td>241</td>
<td>Powerine Oil Co.</td>
<td>218</td>
<td>WF</td>
<td>58-</td>
</tr>
<tr>
<td>106</td>
<td>740*</td>
<td>Chevron USA, Inc.</td>
<td>400</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continental Production Co.</td>
<td>79</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long Beach Oil Development Co.</td>
<td>55</td>
<td>WF</td>
<td>56-</td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td>107</td>
<td>199</td>
<td>Powerine Oil Co.</td>
<td>206</td>
<td>WF</td>
<td>56-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Powerine Oil Co.</td>
<td>166</td>
<td>WF</td>
<td>59-</td>
</tr>
<tr>
<td>108</td>
<td>600*</td>
<td>Champlin Petroleum Co.</td>
<td>391</td>
<td>WF</td>
<td>61-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exxon Co., USA</td>
<td>128</td>
<td>WF</td>
<td>61-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td>81</td>
<td>WF</td>
<td>61-</td>
</tr>
<tr>
<td>109</td>
<td>210</td>
<td>Champlin Petroleum Co.</td>
<td>124</td>
<td>WF</td>
<td>59-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long Beach Oil Development Co.</td>
<td>86</td>
<td>WF</td>
<td>59-</td>
</tr>
<tr>
<td>110</td>
<td>180</td>
<td>Champlin Petroleum Co.</td>
<td>174</td>
<td>WF</td>
<td>54-</td>
</tr>
<tr>
<td>111</td>
<td>488</td>
<td>Champlin Petroleum Co.</td>
<td>435</td>
<td>WF</td>
<td>59-</td>
</tr>
<tr>
<td>112</td>
<td>90</td>
<td>Champlin Petroleum Co.</td>
<td>80</td>
<td>WF</td>
<td>60-</td>
</tr>
<tr>
<td>113</td>
<td>64</td>
<td>Champlin Petroleum Co.</td>
<td>64</td>
<td>WF</td>
<td>59-</td>
</tr>
<tr>
<td>114</td>
<td>500*</td>
<td>Champlin Petroleum Co.</td>
<td>372</td>
<td>WF</td>
<td>58-</td>
</tr>
<tr>
<td>115</td>
<td>224*</td>
<td>Champlin Petroleum Co.</td>
<td>202</td>
<td>WF</td>
<td>54-</td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**

1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
## Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Type</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Date</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>116</td>
<td>2095*</td>
<td>Argo Petroleum Corp.</td>
<td>(NA)</td>
<td>WF</td>
<td>VE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exxon Co. USA</td>
<td>1993</td>
<td>59-</td>
<td>VE</td>
</tr>
<tr>
<td>117</td>
<td>235*</td>
<td>Sun Oil Co.</td>
<td>185</td>
<td>WF</td>
<td>59-</td>
</tr>
<tr>
<td>118</td>
<td>104</td>
<td>Champlin Petroleum Co.</td>
<td>45</td>
<td>WF</td>
<td>59-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Oil Co.</td>
<td>52</td>
<td>WF</td>
<td>59-</td>
</tr>
<tr>
<td>119</td>
<td>200</td>
<td>Sun Oil Co.</td>
<td>183</td>
<td>WF</td>
<td>73-</td>
</tr>
<tr>
<td>120</td>
<td>200*</td>
<td>Shell Oil Co.</td>
<td>110</td>
<td></td>
<td>SD</td>
</tr>
<tr>
<td>121</td>
<td>620</td>
<td>Gulf Oil Co.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shell Oil Co.</td>
<td>460</td>
<td>CS</td>
<td>60-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tenneco Oil Co.</td>
<td>60</td>
<td>SD</td>
<td>71-</td>
</tr>
<tr>
<td>122</td>
<td>90*</td>
<td>Shell Oil Co.</td>
<td>90</td>
<td>CS</td>
<td>65-</td>
</tr>
<tr>
<td>123</td>
<td>105</td>
<td>(Many Minor Operators)</td>
<td>100</td>
<td>SD</td>
<td>64-</td>
</tr>
<tr>
<td>124</td>
<td>130</td>
<td>H.H. and W. Exploration Co.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>125</td>
<td>85</td>
<td>Petro-Lewis Corp.</td>
<td>85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>126</td>
<td>285</td>
<td>Chevron USA, Inc.</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Samson Resources Co.</td>
<td>220</td>
<td>WF</td>
<td>59-</td>
</tr>
</tbody>
</table>

### Evaluation Descriptions
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

### Recovery Type Descriptions
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
## Exhibit 1-1. Table of Operators and Past Recovery Data

### (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td>127</td>
<td>145</td>
<td>Shell Oil Co.</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>128</td>
<td>(NA)</td>
<td>Pickrell, D.J.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shell Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>129</td>
<td>265</td>
<td>Shell Oil Co.</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>130</td>
<td>280</td>
<td>Getty Oil Co.</td>
<td>110</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shell Oil Co.</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>131</td>
<td>(NA)</td>
<td>Belridge Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chevron USA, Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Evans and Carey, Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shell Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Virsal Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>132</td>
<td>8610</td>
<td>Belridge Oil Co.</td>
<td>(NA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Berry Oil Co.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chevron USA, Inc.</td>
<td>240</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Evaluation Descriptions
1. MNE - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

### Recovery Type Descriptions
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Daleco Resources</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>K and K Oil Co.</td>
<td>130</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td>1730</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10560*</td>
<td>Petro-Lewis Corp.</td>
<td>180</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rainbow Oil Co.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shell Oil Co.</td>
<td>6010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>133</td>
<td>10560*</td>
<td>Chevron USA, Inc.</td>
<td>4330</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gulf Oil Corp.</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shell Oil Co.</td>
<td>5740</td>
<td></td>
<td></td>
</tr>
<tr>
<td>134</td>
<td>6400*</td>
<td>Central California Oil Co.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chambers - Movren</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chanisor-Western Oil and Development Corp</td>
<td>750</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chevron</td>
<td>2670</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hougham, E.B.</td>
<td>130</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shell Oil Co.</td>
<td>1730</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Evaluation Descriptions:
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

Recovery Type Descriptions:
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. FF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>590</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Whittier, M.H. Corp.</td>
<td>290</td>
<td></td>
<td></td>
</tr>
<tr>
<td>135</td>
<td>160</td>
<td>Mobil Oil Co.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>136</td>
<td>1380</td>
<td>Chevron USA, Inc.</td>
<td>570</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Co.</td>
<td>170</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Oil Co.</td>
<td>110</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Victory Oil Co.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>137</td>
<td>310</td>
<td>Tesoro Petroleum</td>
<td>310</td>
<td>PM</td>
<td>48</td>
</tr>
<tr>
<td>138</td>
<td>170*</td>
<td>California Steam Oil Co.</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>139</td>
<td>160</td>
<td>Killingsworth, C.C.</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tesoro Oil Co.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>140</td>
<td>1670</td>
<td>Chevron Oil Co.</td>
<td>530</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gulf Oil Corp.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Superior Oil Co.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flooding
5. PM - Pressure Maintenance
6. SH - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Type</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Thermal</td>
<td>Other</td>
</tr>
<tr>
<td>141</td>
<td>1600</td>
<td>Union Oil Co.</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Victory Oil Co.</td>
<td>110</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exxon USA, Inc.</td>
<td>710</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Henry, G.A.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jayco, E.M.</td>
<td>170</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Miller, R. Bruce</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Co.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Morris, Mark</td>
<td>280</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>142</td>
<td>1500*</td>
<td>Chapparral Petroleum, Inc.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>EMJAYCO</td>
<td>170</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Energy Production and Sales Co.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exxon USA, Inc.</td>
<td>990</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Co.</td>
<td>130</td>
<td></td>
<td></td>
</tr>
<tr>
<td>143</td>
<td>490</td>
<td>Buttes Resources Co.</td>
<td>140</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Petro-Lewis Corp.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Redbank Oil Co.</td>
<td>150</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
- **ME** - Moderately Effective
- **NE** - Not Effective
- **UD** - Undetermined
- **VE** - Very Effective

**Recovery Type Descriptions**
1. **CS** - Cyclic Steam
2. **ISC** - In Situ Combustion
3. **MD** - Miscible Displacement
4. **PF** - Polymer Flood
5. **PM** - Pressure Maintenance
6. **SD** - Steam Drive
7. **TH** - Thermal
8. **WF** - Water Flood

*Acres estimated.
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>144</td>
<td>1125</td>
<td>Buttes Resources Co.</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chevron, Inc.</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>King Petroleum and Development Corp.</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Morris, Mark, Inc.</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pyramid Oil Co.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Riley, Jim</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rothschild Oil Co.</td>
<td>230</td>
<td></td>
<td></td>
</tr>
<tr>
<td>145</td>
<td>16000</td>
<td>Williams Brothers Engineering</td>
<td>16000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>146</td>
<td>1125</td>
<td>Texaco, Inc.</td>
<td>1125</td>
<td></td>
<td></td>
</tr>
<tr>
<td>147</td>
<td>2680</td>
<td>Aminoil USA, Inc.</td>
<td>220</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ancord-Verde Corp.</td>
<td>190</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Baker, J.E.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Buttes Resources Co.</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crestmont Oil and Gas Co.</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gulf Oil Co.</td>
<td>1280</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Henry, R.W.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lebow and Lebow</td>
<td>160</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Co.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mowhawk Oil Co.</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Montara Petroleum Co.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PSI Land Co.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teal Petroleum Co.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tenneco West, Inc.</td>
<td>110</td>
<td></td>
<td></td>
</tr>
<tr>
<td>148</td>
<td>610</td>
<td>Crestmont Oil and Gas Co.</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>EMJAYCO</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gulf Oil Corp.</td>
<td>280</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Petro-Lewis Corp.</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>149</td>
<td>5540</td>
<td>Arco</td>
<td>230</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Carrec Oil Associates</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Century Oil Management</td>
<td>710</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chanslor-Western Oil and Development Corp</td>
<td>410</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chevron USA, Inc.</td>
<td>1170</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crestmont Oil and Gas Co.</td>
<td>690</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Draucker, C.D.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drinkhouse and Hammerslough</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td>990</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. ME - Moderately Effective  
2. NE - Not Effective  
3. UD - Undetermined  
4. VE - Very Effective

**Recovery Type Descriptions**

1. CS - Cyclic Steam  
2. ISC - In Situ Combustion  
3. MD - Miscible Displacement  
4. PF - Polymer Flood  
5. FM - Pressure Maintenance  
6. SD - Steam Drive  
7. TH - Thermal  
8. WF - Water Flood

*Acres estimated.*
## Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>149 (Cont.)</td>
<td></td>
<td>Mobil Oil Co.</td>
<td>560</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>320</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Whittier, M.H. Corp.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>9435</td>
<td>Chanslor Western Oil and Development Corp</td>
<td>500</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chapparral Petroleum, Inc.</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chevron USA, Inc.</td>
<td>1650</td>
<td>SD 62- VE</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exxon Co., USA</td>
<td>(NA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td>5100</td>
<td>SD 62- VE</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Great Western Properties, Inc.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>McManus Oil Co.</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pacific Leasehold, Inc.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rainbow Oil Co.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Road Oil Sales, Inc.</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shell Oil Co.</td>
<td>1080</td>
<td>SD 62- VE</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Oil Co.</td>
<td>110</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tenneco Oil Co.</td>
<td>540</td>
<td></td>
<td></td>
</tr>
<tr>
<td>151</td>
<td>200</td>
<td>Gulf Oil Corp.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Co.</td>
<td>70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Evaluation Descriptions
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

### Recovery Type Descriptions
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery Type</th>
<th>Date</th>
<th>Evaluation Type</th>
<th>Date</th>
<th>Enhanced Recovery Thermal Type</th>
<th>Date</th>
<th>Evaluation Type</th>
<th>Date</th>
<th>Enhanced Recovery Other Type</th>
<th>Date</th>
<th>Evaluation Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>151 (Cont.)</td>
<td>4000*</td>
<td>Superior Oil Co.</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Arco Oil and Gas Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chevron USA, Inc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>152</td>
<td>360</td>
<td>Superior Oil Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marilyn Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>153</td>
<td>1430</td>
<td>Brogdon Oil Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chevron USA, Inc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Circle Oil Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oxy Petroleum, Inc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>154</td>
<td>360</td>
<td>Superior Oil Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marilyn Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>(NA)</td>
<td>Superior Oil Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texfel Petroleum Corp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Evaluation Descriptions
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

Recovery Type Descriptions
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. FM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area ( Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td>156</td>
<td>(NA)</td>
<td>Arco Oil and Gas Co.</td>
<td></td>
<td>140</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chevron USA, Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>157</td>
<td>430</td>
<td>Chevron USA, Inc.</td>
<td></td>
<td>140</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td></td>
<td>290</td>
<td></td>
</tr>
<tr>
<td>158</td>
<td>(NA)</td>
<td>Chevron USA, Inc.</td>
<td></td>
<td>13647</td>
<td></td>
</tr>
<tr>
<td>159</td>
<td>(NA)</td>
<td>Chapparral Petroleum, Inc.</td>
<td></td>
<td>2193</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>O'Brien-Sill Lease</td>
<td></td>
<td>8530</td>
<td></td>
</tr>
<tr>
<td>160</td>
<td>265</td>
<td>Arco Oil and Gas Co.</td>
<td></td>
<td>130</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Co.</td>
<td></td>
<td>40</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td></td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>162</td>
<td>(NA)</td>
<td>Chevron USA, Inc.</td>
<td></td>
<td>140</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>General American Oil Co. of Texas</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. HD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
Exhibit 1-1. Table of Operators and Past Recovery Data
(Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type Date Evaluation</td>
<td>Type Date Evaluation</td>
<td>Type Date Evaluation</td>
</tr>
<tr>
<td>162 (Cont.)</td>
<td></td>
<td>Mobil Oil Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Petro-Lewis Oil Corp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Oil Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Windes, A.L.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>163</td>
<td>120</td>
<td>Tenneco Oil Co.</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>164</td>
<td>230</td>
<td>Chevron USA, Inc.</td>
<td>170</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Co.</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>165</td>
<td>320</td>
<td>Arco Oil and Gas Co.</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td>150</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>166</td>
<td></td>
<td>Alford/Elliot</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Arco Oil and Gas Co.</td>
<td>1080</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B/R Oil Co.</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Berry/Ewing</td>
<td>680</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Berry Holding</td>
<td>340</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Berry Oil Co.</td>
<td>380</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Big Ten Oil Co.</td>
<td>190</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chanslor and Western Oil Development Corp</td>
<td>4030</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Evaluation Descriptions
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

Recovery Type Descriptions
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
Exhibit 1-1. Table of Operators and Past Recovery Data
(Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Chapparral Petroleum, Inc.</td>
<td>480</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chevron USA, Inc.</td>
<td>4620</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Directors Oil Co.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drilling and Production Co.</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ethel, D. Co.</td>
<td>170</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exeter Oil Co., Ltd.</td>
<td>220</td>
<td></td>
<td></td>
</tr>
<tr>
<td>166 (Cont.)</td>
<td></td>
<td>Formax Oil Co.</td>
<td>270</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gary Drilling Co.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>General American Oil Co. of Texas</td>
<td>210</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td>1380</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gulf Oil Corp.</td>
<td>110</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>McCullogh Oil Corp.</td>
<td>410</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>McFarland Energy, Inc.</td>
<td>490</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td>1850</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Occidental Petroleum Corp.</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overland Petroleum Co.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Petro-Lewis Corp.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pyramid Oil Co.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shell Oil Co.</td>
<td>2000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Evaluation Descriptions:
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

Recovery Type Descriptions:
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TM - Thermal
8. WF - Water Flood

*Acres estimated.
## Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td>166 (Cont.)</td>
<td></td>
<td>Sun Oil Co.</td>
<td>910</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Surprise Oil Co.</td>
<td>160</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tannehill Oil Co.</td>
<td>450</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tenneco Oil Co.</td>
<td>650</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>500</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thomas Oil Co.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td>800</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Victory Oil Co.</td>
<td>280</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Whittier, M.H. Corp.</td>
<td>280</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Williams Oil Co.</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>167</td>
<td></td>
<td>Chevron USA, Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>168</td>
<td></td>
<td>Chanslor-Western Oil and Development Corp.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>McFarland Energy, Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shell Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>169 (NA)</td>
<td></td>
<td>Chanslor-Western Oil and Development Corp.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chevron USA, Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shell Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
- **ME** - Moderately Effective
- **NE** - Not Effective
- **UD** - Undetermined
- **VE** - Very Effective

**Recovery Type Descriptions**
- **CS** - Cyclic Steam
- **ISC** - In Situ Combustion
- **MD** - Miscible Displacement
- **PF** - Polymer Flood
- **PM** - Pressure Maintenance
- **SD** - Steam Drive
- **TH** - Thermal
- **WF** - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>170</td>
<td>(NA)</td>
<td>Chanslor-Western Oil and Development Corp</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>171</td>
<td>250</td>
<td>Chanslor-Western Oil and Development Corp</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>172</td>
<td>665</td>
<td>Brady, Jerry</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crestmont Oil and Gas Co.</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Doe, Robert B.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Schaefer Oil Co.</td>
<td>360</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Steele Petroleum Co.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>173</td>
<td>375</td>
<td>EMJAYCO</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Petro-Lewis Corp.</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Road Oil Sales, Inc.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Santa Fe Energy Co.</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thomas Oil Co.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>174</td>
<td>2220</td>
<td>Shell Oil Co.</td>
<td>2100</td>
<td>CS 63-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>60</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transcon Oil Well Service</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>175</td>
<td>150</td>
<td>Riley, Jim</td>
<td>150</td>
<td>WF 54-68</td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. **ME** - Moderately Effective
2. **NE** - Not Effective
3. **UD** - Undetermined
4. **VE** - Very Effective

**Recovery Type Descriptions**

1. **CS** - Cyclic Steam
2. **ISC** - In Situ Combustion
3. **MD** - Miscible Displacement
4. **PF** - Polymer Flood
5. **PM** - Pressure Maintenance
6. **SD** - Steam Drive
7. **TH** - Thermal
8. **WF** - Water Flood

*Acres estimated.
Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td>176</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>177</td>
<td>165*</td>
<td>Getty Oil Co.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>178</td>
<td>280</td>
<td>Petro-Lewis Corp.</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>179</td>
<td>3285</td>
<td>Atlantic Oil Co.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Century Oil Management, Inc.</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chanslor-Western Oil and Development Corp</td>
<td>240</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chevron USA, Inc.</td>
<td>1670</td>
<td>WF</td>
<td>72-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dougan, L.C.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drinkhouse and Hammerslaugh</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td>270</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marathon Oil Co.</td>
<td>240</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sperry, Kenneth</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tenneco Oil Co.</td>
<td>320</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tesoro Petroleum Corp.</td>
<td>230</td>
<td></td>
<td></td>
</tr>
<tr>
<td>180</td>
<td>140*</td>
<td>General Crude Oil Co.</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>181</td>
<td>285*</td>
<td>Chevron USA, Inc.</td>
<td>285</td>
<td>WF</td>
<td>67-</td>
</tr>
</tbody>
</table>

Evaluation Descriptions
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

Recovery Type Descriptions
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Area Controlled (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
<th>Other</th>
<th>Thermal</th>
</tr>
</thead>
<tbody>
<tr>
<td>182</td>
<td>600</td>
<td>Chevron USA, Inc.</td>
<td>600</td>
<td>WF</td>
<td>55-56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>183</td>
<td>435</td>
<td>Ken-Lynn Corp.</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pacifica Oil Co.</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thomas Oil Co.</td>
<td>270</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>184</td>
<td>990</td>
<td>Getty Oil Co.</td>
<td>520</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pacifica Oil Co.</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shell Oil Co.</td>
<td>160</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thomas Oil Co.</td>
<td>270</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>185</td>
<td>620</td>
<td>Getty Oil Co.</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scoggins, W.E.</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shell Oil Co.</td>
<td>160</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thomas Oil Co.</td>
<td>270</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>186</td>
<td>305*</td>
<td>Drilling &amp; Production Co.</td>
<td>155</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reserve Oil Co.</td>
<td>150</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>187</td>
<td>435</td>
<td>Arco Oil and Gas Co.</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reserve Oil Co.</td>
<td>230</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>188</td>
<td>195</td>
<td>Arco Oil and Gas Co.</td>
<td>195</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>189</td>
<td>540</td>
<td>Chanslor-Western Oil and Development Corp, Drilling and Production Co.</td>
<td>200</td>
<td>WF 60-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>190</td>
<td>170</td>
<td>Arco Oil and Gas Co.</td>
<td>130</td>
<td>WF 62-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>191</td>
<td>310</td>
<td>Arco Oil and Gas Co.</td>
<td>310</td>
<td>WF 62-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>192</td>
<td>410</td>
<td>Callon Petroleum Co.</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>193</td>
<td>90</td>
<td>Occidental Petroleum Corp.</td>
<td>90</td>
<td>CS 64- NE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Colorado</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>194</td>
<td>601</td>
<td>Conoco</td>
<td>601</td>
<td></td>
<td>MD</td>
<td>NE</td>
</tr>
<tr>
<td>195</td>
<td>448</td>
<td>Atlantic Richfield</td>
<td>336</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil</td>
<td>56</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>W.C. McBride</td>
<td>56</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>196</td>
<td>400</td>
<td>Brew, R.D.</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Brunel, John H.</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type   Date  Evaluation</td>
<td>Type Date  Evaluation</td>
</tr>
<tr>
<td>196 (Cont.)</td>
<td></td>
<td>Union Texas Petroleum Illinois</td>
<td>280</td>
<td>WF 66-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barr-Homan-Robinson</td>
<td>180</td>
<td>WF 66-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dobie, G.T.</td>
<td>90</td>
<td>WF 66-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Henigman, W., Estate</td>
<td>60</td>
<td>WF 66-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Neuman, Judith</td>
<td>40</td>
<td>WF 66-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Patillo, Otis, Estate</td>
<td>110</td>
<td>WF 66-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Thermal</td>
</tr>
<tr>
<td>197</td>
<td>800</td>
<td></td>
<td></td>
<td></td>
<td>Other</td>
</tr>
<tr>
<td>198</td>
<td>1240</td>
<td>Bird, Handley L.</td>
<td>60</td>
<td>WF 57-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Colt, Mack C.</td>
<td>720</td>
<td>WF 57-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Steinforth, Lore</td>
<td>240</td>
<td></td>
<td></td>
</tr>
<tr>
<td>199</td>
<td>1910</td>
<td>Boyer, Marvin E., Oil Co. (Don Boyer)</td>
<td>560</td>
<td>ISC 63-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Carmel Energy</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Layton Oil Co.</td>
<td>240</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Royal Oil and Gas</td>
<td>140</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

"Acres estimated."
Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Type</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Date</td>
<td>Evaluation</td>
</tr>
<tr>
<td>200</td>
<td>4520</td>
<td>Banner Oil</td>
<td>40</td>
<td>WF</td>
<td>53-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Colt, Mack C., Inc.</td>
<td>360</td>
<td>WF</td>
<td>76-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ensminger Drilling Co.</td>
<td>640</td>
<td>WF</td>
<td>76-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inexco Oil Co.</td>
<td>2540</td>
<td>WF</td>
<td>76-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aztec Oil</td>
<td>80</td>
<td>WF</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dunigan, E.J. (F.H. Thompson)</td>
<td>80</td>
<td>WF</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fleming and Stubbs (Ray C. Fleming)</td>
<td>80</td>
<td>WF</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>McClure, M.C.</td>
<td>40</td>
<td>WF</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>N and B Enterprises (Ed Noland)</td>
<td>580</td>
<td>WF</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Susmio Oil Co. (Don B. Smith)</td>
<td>140</td>
<td>WF</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tee Drilling Co., Inc. (F.H. Thompkins)</td>
<td>400</td>
<td>WF</td>
<td>75-</td>
</tr>
</tbody>
</table>

Kentucky

Evaluation Descriptions:
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

Recovery Type Descriptions:
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery Type</th>
<th>Date</th>
<th>Evaluation</th>
<th>Enhanced Recovery Type</th>
<th>Date</th>
<th>Evaluation</th>
<th>Other</th>
<th>Date</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>203</td>
<td>900</td>
<td>Louisiana</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bayou State Oil Corp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ISD 63-</td>
<td>ME</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cities Service Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ISD 71-</td>
<td>ME</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ISD 63-</td>
<td>ME</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>204</td>
<td>100480</td>
<td>Allen Brothers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ISD 63-</td>
<td>ME</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Allen, W.C.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amoco Production Co. (R.M. Darling)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B&amp;G Oil Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Backus and Lanford</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bailey, J.W.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bayou Production Co., Inc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bayou State Oil Corp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bonner and Carter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bonner, H.J.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bowers, John C.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Brooks and Lee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cities Service Co. (E.L. Cralle)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cohen and Kosovitz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Evaluation Descriptions:
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

Recovery Type Descriptions:
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PP - Polymer Flood
5. FM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>204 (Cont.)</td>
<td></td>
<td>Conoco, R.H.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dempsey, Jimmy P.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ducote Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Energy Oil and Gas Transportation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fields, Herman</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Four Star Oil Company</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gemini Exploration, Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Goodwill, G.R.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Haddad, George A., Jr.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hardey, B.A., Jr.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hardey Company, The</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hargraves, F.E.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hargraves, F.E. and Son Drilling Co., Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hart and McFarland</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Israel-Atlas Properties</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jeems Bayou Production Corp.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kennedy and Bacheller</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Latham, Gary D.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**

1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data

(Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type Date Evaluation</td>
<td>Type Date Evaluation</td>
</tr>
<tr>
<td>204 (Cont.)</td>
<td>Lewis and Manziel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lynn, Bruce N.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marcom, J.D.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Martin Oil and Gas Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>McGoldrick Oil Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>McKnight, I.W., Production</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mid-Field Oil Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mobil Oil Corp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Morris, C.L.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Morris, C.L., Inc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Muslow and Parker</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>O.P.H., Inc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pardue, N.J.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pen-Tex Corp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Roussel, Louis J.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Schmitz, Herbert J.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Southern Oil and Gas Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Star Falcon Oil Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stewart, Austin E.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. **WE** - Moderately Effective
2. **NE** - Not Effective
3. **UD** - Undetermined
4. **VE** - Very Effective

**Recovery Type Descriptions**

1. **CS** - Cyclic Steam
2. **ISC** - In Situ Combustion
3. **MD** - Miscible Displacement
4. **PF** - Polymer Flood
5. **FM** - Pressure Maintenance
6. **SD** - Steam Drive
7. **TH** - Thermal
8. **WF** - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>204 (Cont.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stinhall Corp.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sugar Oil Co. (Alan Sugar)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sutton, H.E.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc. (R.H. Abbott, Jr.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tholl Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thomas, John W.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>W&amp;K Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>W&amp;L Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>205</td>
<td>9300</td>
<td>Colgrade Investment Corp.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cross Development Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crown Zellerback</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crown Zellerback and Newton</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Energy Management, Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Galoob, Mitton</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Harter Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>RLS Partnership</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>206</td>
<td>1995</td>
<td>Monsanto Co.</td>
<td>WF 55- VE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yellow Dog Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Evaluation Description
- **ME** - Moderately Effective
- **NE** - Not Effective
- **UD** - Undetermined
- **VE** - Very Effective

#### Recovery Type Description
- **CS** - Cyclic Steam
- **ISC** - In Situ Combustion
- **MD** - Miscible Displacement
- **PF** - Polymer Flood
- **PM** - Pressure Maintenance
- **SD** - Steam Drive
- **TH** - Thermal
- **WF** - Water Flood

*Acres estimated.*
## Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (_acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (acres)</th>
<th>Secondary Recovery Type</th>
<th>Date</th>
<th>Evaluation</th>
<th>Enhanced Recovery Type</th>
<th>Date</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>207</td>
<td>8120</td>
<td>Bodcaw Co. (W.L. Davis)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cross Development Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hawkins, H.L. and H.L., Jr.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hunt, Caroline Trust Estate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hunt Petroleum Corp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>James, T.L. and Co., Inc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Justiss-Mears Oil Co., Inc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Placid Oil Co.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reliance Trust</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>208</td>
<td>1290</td>
<td>Caddo Oil Co., Inc. (D.A. Raymond, III)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crown Zellerback and Newton</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ray, S.W., et al.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sour, A.W., Jr.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>209,210</td>
<td>9500</td>
<td>A.A.A. Corp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alexander, E.P.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alexander, E.P., et al.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>American Casing Crews, Inc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>BLSW Pleasure Corp., Inc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Beebe, H.K.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**

1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>211</td>
<td>57</td>
<td>Shell Oil Co. (R.L. Fay)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. **ME** - Moderately Effective
2. **NE** - Not Effective
3. **UD** - Undetermined
4. **VE** - Very Effective

**Recovery Type Descriptions**

1. **CS** - Cyclic Steam
2. **ISC** - In Situ Combustion
3. **MD** - Miscible Displacement
4. **PP** - Polymer Flood
5. **PM** - Pressure Maintenance
6. **SD** - Steam Drive
7. **TH** - Thermal
8. **WF** - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td>212 (Cont.)</td>
<td></td>
<td>Parnes, Irwin H.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Petroleum Management, Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Windfohr Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>213</td>
<td>7020</td>
<td>Auster Oil and Gas, Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Brown, C.L., III</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exchange Oil and Gas Corp.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gulf Oil Corp.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MPS Production Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pickens Co., Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texas Pacific Oil Co. (J.D. Waggoner)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tribal Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Union Oil Co. of California (H.B. Ingram)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mississippi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>214</td>
<td>3080</td>
<td>Exxon Corp.</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gulf Oil Corp.</td>
<td>2500</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>North Central Oil Corp.</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pruett and Hughes Co.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**

1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sun Oil Co.</td>
<td>240</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Superior Oil Co.</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>214 (Cont.)</td>
<td>4280</td>
<td>Gulf Oil Corp.</td>
<td>3400</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Oil Co.</td>
<td>250</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Superior Oil Co.</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>180</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marshall R. Young Oil Co.</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>216</td>
<td>440</td>
<td>Exxon Corp.</td>
<td>110</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gulf Oil Corp.</td>
<td>110</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pruett and Hughes Co.</td>
<td>220</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>217</td>
<td>2360</td>
<td>Amerada Hess Corp.</td>
<td>1400</td>
<td>WF 66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>218</td>
<td>240</td>
<td>Ginther, N.C.</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tyson, R.W., Producing</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>219</td>
<td>1360</td>
<td>Gulf Oil Corp.</td>
<td>8000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lake Ronel Oil Co.</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Oil Co.</td>
<td>200</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. ME - Moderately Effective
2. NE - Not Effective
3. UE - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**

1. CS - Cyclic Steam
2. ISC - In-Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
<td>Evaluation</td>
</tr>
<tr>
<td>220</td>
<td>8360</td>
<td>Atlacex Corp., The Atlantic Richfield Co.</td>
<td>3100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barnhart Co.</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C&amp;K Petroleum, Inc.</td>
<td>220</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Collins, Ora C. Assoc., Inc.</td>
<td>510</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dixie Oil Co.</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gulf Oil Corp.</td>
<td>2800</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hammill, Claud B.</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Heidelberg Oil Co.</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hunt, Hassie, Inc.</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ladd Petroleum Corp.</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lake Ronel Oil Co.</td>
<td>280</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Monsanto Chemical Co.</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Morgan, C.L., et al.</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Oil Co.</td>
<td>360</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tenneco Oil Co.</td>
<td>220</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>221</td>
<td>520</td>
<td>Gulf Oil Corp.</td>
<td>360</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Oil Co.</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**

1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>222</td>
<td>560</td>
<td>Barnhart Co.</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gulf Oil Corp.</td>
<td>480</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tenneco Oil Co.</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>223</td>
<td>554</td>
<td>Gulf Oil Corp.</td>
<td>280</td>
<td>PM 71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>224</td>
<td>1920</td>
<td>American Petrofina Co. of Texas</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barnhart Co.</td>
<td>110</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gulf Oil Corp.</td>
<td>1540</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tenneco Oil Co.</td>
<td>110</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>225</td>
<td>1320</td>
<td>Anderson, Arden A.</td>
<td>420</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clarke Equipment and Supply Co.</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>General Exploration Co.</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oglesby, Marshall</td>
<td>350</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pounds, J.R., Inc.</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Southeastern Public Service Co.</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stack, J.E., Jr.</td>
<td>170</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>226</td>
<td>1320</td>
<td>Anderson, Arden A.</td>
<td>1250</td>
<td>WF 67</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thurber, George, Jr.</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. **ME** - Moderately Effective
2. **NE** - Not Effective
3. **UD** - Undetermined
4. **VE** - Very Effective

**Recovery Type Descriptions**

1. **CS** - Cyclic Steam
2. **ISC** - In Situ Combustion
3. **MD** - Miscible Displacement
4. **PF** - Polymer Flood
5. **PM** - Pressure Maintenance
6. **SD** - Steam Drive
7. **TH** - Thermal
8. **WF** - Water Flood

*Acres estimated.*
## Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td>227</td>
<td>680</td>
<td>Ginther, N.C.</td>
<td>290</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lee-Tyson Companies</td>
<td>390</td>
<td></td>
<td></td>
</tr>
<tr>
<td>228</td>
<td>900</td>
<td>Ainsworth, Otis</td>
<td>260</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Petroleum Management, Inc.</td>
<td>450</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>White, Charles R.</td>
<td>190</td>
<td></td>
<td></td>
</tr>
<tr>
<td>229</td>
<td>600</td>
<td>Triad Oil and Gas Co., Inc.</td>
<td>600</td>
<td>PM</td>
<td>69-71</td>
</tr>
<tr>
<td>230</td>
<td>1040</td>
<td>Cashion, Lyle, Co.</td>
<td>480</td>
<td>WF</td>
<td>72-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Davis, Jimmy B.</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gas Rock Corp.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>McGoldrick Oil Co.</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>McGoldrick and Watson</td>
<td>320</td>
<td></td>
<td></td>
</tr>
<tr>
<td>231</td>
<td>3560</td>
<td>Exxon Corp.</td>
<td>2360</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>232</td>
<td>840</td>
<td>Mobil Oil Corp.</td>
<td>760</td>
<td>WF</td>
<td>51-</td>
</tr>
<tr>
<td>233</td>
<td>5020</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>234</td>
<td>325</td>
<td>Sohio Petroleum Corp.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Evaluation Descriptions
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

### Recovery Type Descriptions
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TD - Thermal
8. WF - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td>235</td>
<td>705</td>
<td>Shell Oil Co.</td>
<td></td>
<td>WF</td>
<td>64-</td>
</tr>
<tr>
<td>236</td>
<td>370</td>
<td>Twin Mountain Oil Co.</td>
<td></td>
<td>WF</td>
<td>62-</td>
</tr>
<tr>
<td>237</td>
<td>4000*</td>
<td>C&amp;S Oil Co.</td>
<td>600</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continental Oil Co.</td>
<td>2300</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flournoy, C.D.</td>
<td>180</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Swan Oil Co.</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weeks, Bill</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>238</td>
<td>560</td>
<td>Getty Oil Co.</td>
<td>560</td>
<td>PM</td>
<td>66-</td>
</tr>
<tr>
<td>239</td>
<td>2620</td>
<td>Amoco Production Co.</td>
<td></td>
<td>WF</td>
<td>55-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td></td>
<td>WF</td>
<td>58-</td>
</tr>
<tr>
<td>240</td>
<td>1164*</td>
<td>Getty Oil Co.</td>
<td>1164</td>
<td>WF</td>
<td>68-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Oil Co.</td>
<td>(NA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>241</td>
<td>1900</td>
<td>Atlantic Richfield Co.</td>
<td>325</td>
<td>PM</td>
<td>68-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td>570</td>
<td>(87)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Oil Co.</td>
<td>220</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**
1. CS - Cyclic Steam
2. ISC - In-Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery Type</th>
<th>Secondary Recovery Date</th>
<th>Enhanced Recovery Type</th>
<th>Enhanced Recovery Date</th>
<th>Enhanced Recovery Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>241 (Cont.)</td>
<td>1290</td>
<td>Texaco, Inc.</td>
<td>760</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B&amp;E Production Co.</td>
<td>50</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Harvey, K.J.</td>
<td>45</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lagerquist, Walter G., Jr.</td>
<td>80</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lama Oil Co.</td>
<td>550</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>McFadden Oil Corp.</td>
<td>440</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Morrill, George P.</td>
<td>60</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>5500</td>
<td>Electrothermics Co., The</td>
<td>500</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Normal Oil and Gas Co. (for Hanover Pet.)</td>
<td>5000</td>
<td>-</td>
<td>ISC 75-76</td>
<td>NE</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>4700</td>
<td>Gillespie, Frank M., Jr.</td>
<td>140</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hydrocarbon Operating Co. of America</td>
<td>90</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jennings, C.A.</td>
<td>140</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Klaeger, G.H.</td>
<td>330</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>McFadden Oil Corp.</td>
<td>640</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medina Exploration, Inc.</td>
<td>60</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moebius, Preston F.</td>
<td>390</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Petro Oil and Gas, Inc.</td>
<td>620</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Production Research of Texas, Inc.</td>
<td>850</td>
<td>SD</td>
<td>78-</td>
<td>VE</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Evaluation Descriptions:
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

Recovery Type Descriptions:
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WR - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data
(Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery Type</th>
<th>Secondary Recovery Date</th>
<th>Enhanced Recovery Type</th>
<th>Enhanced Recovery Date</th>
<th>Other Type</th>
<th>Other Date</th>
<th>Other Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>244 (Cont.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rorico Oil Co.</td>
<td></td>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Texas Secondary Oil Corp.</td>
<td></td>
<td>390</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tex-East Petroleum Corp.</td>
<td></td>
<td>70</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wernette, Louis J.</td>
<td></td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Whitcomb, Gail</td>
<td></td>
<td>600</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>245</td>
<td>820</td>
<td>Allen and Shumate, Inc.</td>
<td>820</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>246</td>
<td>1556</td>
<td>Amerada Hess Corp.</td>
<td>980</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ken Petroleum</td>
<td></td>
<td>230</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reserve Oil Co.</td>
<td></td>
<td>310</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>247</td>
<td>1750</td>
<td>Ashland Exploration, Inc.</td>
<td>790</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exxon Corp.</td>
<td></td>
<td>80</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rutherford Oil Corp.</td>
<td></td>
<td>510</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rutherford Oil Corp./Royal Oil &amp; Gas Co.</td>
<td></td>
<td>340</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>248</td>
<td>525</td>
<td>Averill, W.M., Jr.</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Monsanto Chemical Co.</td>
<td></td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Petro-Lewis Corp.</td>
<td></td>
<td>290</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Petro-Search, Inc.</td>
<td></td>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>120</td>
<td>PM 65-</td>
<td>ME</td>
</tr>
<tr>
<td>249</td>
<td>1132</td>
<td>Hass, Charles P. Union Oil Co.</td>
<td>1010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>5755</td>
<td>American Petrofina Amoco Production Co.</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Atlantic Richfield Co. Expando Production Co.</td>
<td>480</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exxon Corp. Hewitt and Dougherty</td>
<td>1240</td>
<td>PM 65-</td>
<td>ME</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Johns, Edwin M. Oil Co. Josey, Lenoir M., Inc.</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Peet Oil Co. Pennzoil Production Co. Reserve Oil, Inc.</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sohio Sun Oil Co. (Houston)</td>
<td>280</td>
<td>PM 65- (88)</td>
<td>VE</td>
</tr>
<tr>
<td>251</td>
<td>4725</td>
<td>Quintana Petroleum Co. T-C Oil Co. - O'Connor</td>
<td>2090</td>
<td></td>
<td></td>
</tr>
<tr>
<td>252</td>
<td>4007</td>
<td>Exxon Corp. - Houston</td>
<td>4007</td>
<td>PM 71- (91)</td>
<td>ME</td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
### Exhibit 1-1. Table of Operators and Past Recovery Data
(Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td>253</td>
<td>480</td>
<td>Bridwell Oil Co.</td>
<td>260</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hamilton, John M.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wiser Oil Co., The</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td>254</td>
<td>7642</td>
<td>Braman, D.H., Jr.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Copano Co.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exxon Corp.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hewitt and Dougherty</td>
<td>1410</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mellon Oil United</td>
<td>2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pennzoil Producing Co.</td>
<td>1610</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quintana Petroleum Corp.</td>
<td>2310</td>
<td>PM 67-75</td>
<td>UD</td>
</tr>
<tr>
<td>255</td>
<td>2198</td>
<td>Pennzoil Producing Co.</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quintana Petroleum Corp.</td>
<td>2090</td>
<td>PM 76-</td>
<td></td>
</tr>
<tr>
<td>256</td>
<td>4700</td>
<td>Mobil Oil Corp.</td>
<td>4580</td>
<td>PM 77-</td>
<td>UD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exxon</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>257</td>
<td>586</td>
<td>Brenham Drilling Co.</td>
<td>160</td>
<td></td>
<td>WF 67-72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Oil Co.</td>
<td>420</td>
<td>WF 67-72</td>
<td></td>
</tr>
<tr>
<td>258</td>
<td>1400</td>
<td>Anderson Producing, Inc.</td>
<td>225</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Caddo Oil Co., Inc.</td>
<td>320</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intercity Management Corp.</td>
<td>540</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jet Oil Producers</td>
<td>45</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td>258 (Cont.)</td>
<td></td>
<td>Marine Container and Supply, Inc.</td>
<td>90</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marshall, A.B.</td>
<td>140</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smith, D.H.</td>
<td>45</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>259</td>
<td>7895</td>
<td>Amoco Production Co. - Old Ocean</td>
<td>165</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Atlantic Richfield Co.</td>
<td>330</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bass Enterprise Production Co.</td>
<td>50</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dow Chemical Co., The</td>
<td>753</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exxon Corp.</td>
<td>1540</td>
<td>PM</td>
<td>67-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tartan Production Co.</td>
<td>188</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>4707</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Van Norman Oil Co.</td>
<td>80</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>260</td>
<td>680</td>
<td>Exxon Corp.</td>
<td>340</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gulf Oil Corp.</td>
<td>160</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quintana Petroleum Corp.</td>
<td>130</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Swearingen, W.P.</td>
<td>50</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>261</td>
<td>1200</td>
<td>Exxon Corp.</td>
<td>550</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gulf Oil Corp.</td>
<td>100</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quintana Petroleum Corp.</td>
<td>150</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>261 (Cont.)</td>
<td>1500</td>
<td>Swearingen, W.P.</td>
<td>400</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>262</td>
<td>1500</td>
<td>Chevron USA, Inc.</td>
<td>1500</td>
<td>PM 48-</td>
<td>ME</td>
<td></td>
</tr>
<tr>
<td>263</td>
<td>1840</td>
<td>Buck, George</td>
<td>760</td>
<td>WF 61-80</td>
<td>ME</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>King, R.A. and Sons, Ltd.</td>
<td>540</td>
<td>WF 64-</td>
<td>ME</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Petroleum Corporation of Texas</td>
<td>270</td>
<td>WF 69- (87)</td>
<td>ME</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reynolds, J.C. and W.F.</td>
<td>240</td>
<td>WF 70-</td>
<td>ME</td>
<td></td>
</tr>
<tr>
<td>264</td>
<td>1000</td>
<td>Jones, R.W.</td>
<td>460</td>
<td>WF 64-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td>120</td>
<td>WF 51-73</td>
<td>TH 67-85</td>
<td>ME</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Oil Co. - Houston</td>
<td>260</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>265</td>
<td>1800</td>
<td>Horine, Perry W.</td>
<td>1300</td>
<td></td>
<td>TH 68-78</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Speedman Oil Co.</td>
<td>500</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>266</td>
<td>2375</td>
<td>Akers, Bill</td>
<td>65</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Basic Earth Science Systems, Inc.</td>
<td>1220</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>HNG Oil Co.</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hawn Brothers and Venus Oil Co.</td>
<td>300</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Killam and Hurd, Ltd.</td>
<td>620</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type Date Evaluation</td>
<td>Type Date Evaluation</td>
</tr>
<tr>
<td>266</td>
<td>1900</td>
<td>Petroleum Corporation of Texas</td>
<td>85</td>
<td>WF 67- ME</td>
<td></td>
</tr>
<tr>
<td>267</td>
<td>1900</td>
<td>Sun Oil Co.</td>
<td>370</td>
<td></td>
<td></td>
</tr>
<tr>
<td>268</td>
<td>8500</td>
<td>Bleakley, Jack</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Coffield, H.H.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crystal Oil and Land Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dural County Ranch Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horine, Perry W.</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hytech Energy Corp.</td>
<td>1130</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intercity Management Corp.</td>
<td>270</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jones, Terry, and Eddings</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kelley Production Co.</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lundells, Inc.</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Miller-Jones Oil Co.</td>
<td>120</td>
<td>WF 65-78</td>
<td>ISC 62-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td>400</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Morsey-Wells Oil and Gas Corp.</td>
<td>460</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Murrell, Gene</td>
<td>550</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sparks, Sidney A., Trustee</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Oil Co.</td>
<td>3560</td>
<td>WF 51- VE</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>300</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**

1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type Date Evaluation</td>
<td>Type Date Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>268 (Cont.) 269</td>
<td>4500</td>
<td>Yucca Production Co.</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bryant, Harry T., Drilling Co.</td>
<td>260</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chumley, George</td>
<td>140</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cox, Edwin L. and J. L. Hamon</td>
<td>350</td>
<td>WF 63-90 ME</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Freer Oil Co.</td>
<td>170</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Harmon Oil Co.</td>
<td>170</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lundells, Inc.</td>
<td>430</td>
<td>WF 68-82 ME</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>McAnear, John S.</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Miranda Crude Oil Co.</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td>400</td>
<td>WF 68-82 ME</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Morsey-Wells Oil and Gas Corp.</td>
<td>140</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Petroleum Corporation of Texas</td>
<td>430</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Seventy Oil Co.</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worldwide Energy Corp.</td>
<td>1640</td>
<td>WF 70-87 ME</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cox, Edwin L.</td>
<td>2300</td>
<td>WF 48-85 VE</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cox, Edwin L. and Jake L. Hamand</td>
<td>810</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cueller Brothers Oil Co., Inc.</td>
<td>430</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Expando Oil Co.</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hytech Energy Corp.</td>
<td>215</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Johnson, William D.</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Killam and Hurd, Ltd.</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Morsey-Wells Oil and Gas Co.</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Seventy Oil Co.</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Traders Oil and Royalty</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worldwide Energy Corp.</td>
<td>430</td>
<td></td>
<td></td>
</tr>
<tr>
<td>270 (Cont.)</td>
<td></td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>271</td>
<td>902</td>
<td>Texaco, Inc.</td>
<td>870</td>
<td>WF 58-</td>
<td>VE</td>
</tr>
<tr>
<td>272</td>
<td>1200</td>
<td>Sohio Petroleum Co.</td>
<td>880</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teal Petroleum Co.</td>
<td>320</td>
<td></td>
<td></td>
</tr>
<tr>
<td>273</td>
<td>7400</td>
<td>Coffield, H.H.</td>
<td>310</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>General American Oil Co. of Texas</td>
<td>160</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gravis, Blanca R.</td>
<td>160</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gravis Oil Co.</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jones and Terry</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kell Production Co.</td>
<td>160</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>May Belle Oil Co.</td>
<td>80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**

1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. FY - Polymer Flood
5. PH - Pressure Maintenance
6. SH - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>273 (Cont.)</td>
<td></td>
<td>McAnear, John S.</td>
<td>160</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Morsey-Wells Oil and Gas Corp.</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Petroleum Corporation of Texas</td>
<td>870  WF  57-80 UD</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Selman, Thomas L.</td>
<td>160</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sigmor Corp.</td>
<td>630</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smith, R.E.</td>
<td>240</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Terry Enterprises</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>470</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Venus Oil Co.</td>
<td>240</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Warner-Pawel</td>
<td>550  WF</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worldwide Energy Corp.</td>
<td>2870  WF  56-87 ME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>274 3544</td>
<td></td>
<td>Abel and Harbison</td>
<td>240  WF  65-85 VE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cox, Edwin L.</td>
<td>675  WF  55-73 ISC 67-72</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tesoro Petroleum Corp.</td>
<td>3310  WF  59-82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>275 5000</td>
<td></td>
<td>Beissner, F.L.</td>
<td>515</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exxon Corp.</td>
<td>600</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lundells, Inc.</td>
<td>2930  PM  45- UD</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td>600</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>340</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. ME - Moderately Effective  
2. NE - Not Effective  
3. UD - Undetermined  
4. VE - Very Effective

**Recovery Type Descriptions**

1. CS - Cyclic Steam  
2. ISC - In Situ Combustion  
3. MD - Miscible Displacement  
4. PF - Polymer Flood  
5. PM - Pressure Maintenance  
6. SD - Steam Drive  
7. TH - Thermal  
8. WF - Water Flood

*Acres estimated.*
## Exhibit 1-1. Table of Operators and Past Recovery Data

(Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td>276</td>
<td>800</td>
<td>Exxon Corp.</td>
<td>430</td>
<td>WF</td>
<td>64-75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lundells, Inc.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>277</td>
<td>1135</td>
<td>Fletcher, E.B.</td>
<td>360</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td>770</td>
<td>WF</td>
<td>64-75</td>
</tr>
<tr>
<td>278</td>
<td>1177</td>
<td>(No Operators)</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>279</td>
<td>9900</td>
<td>Centurion Energy Resource &amp; Operating Co.</td>
<td>3000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crystal Oil and Land Co.</td>
<td>2700</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dinero Oil Co.</td>
<td>1260</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>E and L Corp.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Expando Production Co.</td>
<td>480</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Frio Exploration Co.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>McGuffin, Joe S.</td>
<td>300</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td>680</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Morsco, Inc.</td>
<td>780</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pearl, Bill Equipment and Rental Co.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Walton, W.W., Jr.</td>
<td>200</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Evaluation Descriptions

1. ME - Moderately Effective
2. NR - Not Effective
3. UD - Undetermined
4. VE - Very Effective

### Recovery Type Descriptions

1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PP - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
Exhibit 1-1. Table of Operators and Past Recovery Data

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>280</td>
<td>3600</td>
<td>American Petrofina Co. of Texas</td>
<td>640</td>
<td>PM 69-74</td>
<td>Thermal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hytech Energy Corp.</td>
<td>220</td>
<td></td>
<td>Other</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jones, R.W. and Co., Ltd.</td>
<td>310</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kelley Production Co.</td>
<td>270</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ladd Petroleum Co.</td>
<td>290</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Petroleum Corporation of Texas</td>
<td>140</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rosenthal, Stanley H.</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teal Petroleum Co.</td>
<td>690</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>690</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Universal Mineral Corp.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wynn, H.D.</td>
<td>110</td>
<td>PM 72-85</td>
<td>ME</td>
</tr>
<tr>
<td>281</td>
<td>770</td>
<td>Exxon Corp.</td>
<td>230</td>
<td>PM 73-</td>
<td>UD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oxoco-Texas, Inc.</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>282</td>
<td>1500</td>
<td>Atlantic Richfield Co.</td>
<td>530</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Goldston Oil Corp.</td>
<td>420</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ridley and Locklin Operating Co., Inc.</td>
<td>220</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yates Petroleum Corp.</td>
<td>330</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Evaluation Descriptions:
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

Recovery Type Descriptions:
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PP - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
### Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery Type</th>
<th>Date</th>
<th>Evaluation Type</th>
<th>Date</th>
<th>Enhanced Recovery Thermal</th>
<th>Date</th>
<th>Other</th>
<th>Type</th>
<th>Date</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>283</td>
<td>650</td>
<td>Camp Hill Oil Co., Ltd.</td>
<td>150</td>
<td>TH</td>
<td>71-82</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tenneco Oil Co.</td>
<td>240</td>
<td>TH</td>
<td>68-78</td>
<td>ME</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texas Recovering Co., Ltd.</td>
<td>260</td>
<td>PM</td>
<td>70-82</td>
<td>UD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>284</td>
<td>2856</td>
<td>Gibson, R.L.</td>
<td>105</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Greenwich Oil Corp.</td>
<td>2640</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Landers, Tom W.</td>
<td>105</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>285</td>
<td>10665</td>
<td>Exxon Corp.</td>
<td>10665</td>
<td>PM</td>
<td>69-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>286</td>
<td>1180</td>
<td>American Petrofina Co. of Texas</td>
<td>410</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C&amp;K Petroleum, Inc.</td>
<td>500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exxon Corp.</td>
<td>270</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>287</td>
<td>945</td>
<td>Buck Royalty Co.</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gulf Oil Corp.</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moss Petroleum Co.</td>
<td>240</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sapron Energy Corp.</td>
<td>310</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>288</td>
<td>2500</td>
<td>Shell Oil Co.</td>
<td>1800</td>
<td>TH</td>
<td>67-84</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tenneco Oil Co.</td>
<td>390</td>
<td>TH</td>
<td>69-78</td>
<td>ME</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>300</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. FF - Polymer Flood
5. PH - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data
(Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td>289</td>
<td>9500</td>
<td>American Petrofina Co. of Texas</td>
<td>160</td>
<td>WF</td>
<td>67-81</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Arcadia Refining Co.</td>
<td>80</td>
<td>PM</td>
<td>74-75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Byars, B.G.</td>
<td>300</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exxon Corp.</td>
<td>4330</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fair, Ralph E., Inc.</td>
<td>190</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Getty Oil Co.</td>
<td>320</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gratton and Vaughan Operating Corp.</td>
<td>340</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hinton Production Co.</td>
<td>420</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hinton, W.B.</td>
<td>470</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lawson Petroleum Co.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>McIlhenny-Powell Operating Co.</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobil Oil Corp.</td>
<td>940</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tenneco Oil Co.</td>
<td>970</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco Inc.</td>
<td>510</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Winchester Oil Co.</td>
<td>130</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>290</td>
<td>850</td>
<td>Jones-O'Brien, Inc.</td>
<td>470</td>
<td>PM</td>
<td>65-77</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Schlachter, David A.</td>
<td>190</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Oil - Longview</td>
<td>190</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. **ME** - Moderately Effective
2. **NE** - Not Effective
3. **UD** - Undetermined
4. **VE** - Very Effective

**Recovery Type Descriptions**

1. **CS** - Cyclic Steam
2. **ISC** - In Situ combustion
3. **MD** - Miscible Displacement
4. **PF** - Polymer Flood
5. **PM** - Pressure Maintenance
6. **SD** - Steam Drive
7. **TH** - Thermal

*Acres estimated.*
<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
<td>Evaluation</td>
</tr>
<tr>
<td>291</td>
<td>1131</td>
<td>Jones-O'Brien, Inc.</td>
<td>355</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Schlachter, David</td>
<td>320</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Oil - Longview</td>
<td>290</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>292</td>
<td>1700</td>
<td>Clemco</td>
<td>420</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Harrison, Sam G.</td>
<td>710</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Schlachter, David A.</td>
<td>570</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>293</td>
<td>5000</td>
<td>Amoco Production Co.</td>
<td>125</td>
<td>WF</td>
<td>61-74</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Corvette Oil Corp.</td>
<td>370</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Energy Reserves' Group, Inc.</td>
<td>240</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gulf Oil Corp.</td>
<td>1510</td>
<td>WF</td>
<td>73-75</td>
<td>ME</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H &amp; L Oil Co.</td>
<td>75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Helmerich and Payne, Inc.</td>
<td>1180</td>
<td>WF</td>
<td>56-99</td>
<td>ME</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Iraan Drilling Co., Inc.</td>
<td>71</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marathon Oil Co.</td>
<td>580</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Roberts, James C.</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Slocum, A.G.</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>T.J.S. Oil Co.</td>
<td>240</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1840</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**

1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Other Type</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Date</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**

1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Descriptions**

1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.*
### Exhibit 1-1. Table of Operators and Past Recovery Data

(Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(Cont.)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>303</td>
<td></td>
<td>Phillips Petroleum Co.</td>
<td>200</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>1000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>304</td>
<td>1220*</td>
<td>Continental Oil Co.</td>
<td>1220</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>305</td>
<td>5880</td>
<td>Marathon Oil Co.</td>
<td>5880</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>306</td>
<td>1315</td>
<td>Marathon Oil Co.</td>
<td>1315</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>307</td>
<td>640</td>
<td>Husky Oil Co.</td>
<td>640</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>308</td>
<td>1750</td>
<td>Mobil Oil Corp.</td>
<td>1750</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>309</td>
<td>2175</td>
<td>Ashland Oil, Inc.</td>
<td>1150</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Atlantic Richfield</td>
<td>840</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oil Development Co. of Texas</td>
<td>180</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>310</td>
<td>450</td>
<td>Homestead Assos.</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marathon Oil Co.</td>
<td>270</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>311</td>
<td>846</td>
<td>Davis Oil Co.</td>
<td>70</td>
<td>WF</td>
<td>75-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dyco Petroleum</td>
<td>100</td>
<td>WF</td>
<td>75-</td>
<td></td>
</tr>
<tr>
<td>312</td>
<td>712</td>
<td>Cities Service Co.</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>National Cooperative Refining Co.</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Descriptions**
- 1. NE - Moderately Effective
- 2. HE - Not Effective
- 3. UD - Undetermined
- 4. VE - Very Effective

**Recovery Type Descriptions**
- 1. CS - Cyclic Steam
- 2. ISC - In Situ Combustion
- 3. MD - Miscible Displacement
- 4. PF - Polymer Flood
- 5. PM - Pressure Maintenance
- 6. SD - Steam Drive
- 7. TH - Thermal
- 8. WF - Water Flood

*Acres estimated.
Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td>312 (Cont.)</td>
<td></td>
<td>Terra Resources, Inc.</td>
<td>560</td>
<td>WF</td>
<td>73-</td>
</tr>
<tr>
<td>313</td>
<td>1770</td>
<td>Amoco Production Co.</td>
<td>1770</td>
<td>WF</td>
<td>66-</td>
</tr>
<tr>
<td>314</td>
<td>1000</td>
<td>Amoco Production Co.</td>
<td>900</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>315</td>
<td>760*</td>
<td>Terra Resources, Inc.</td>
<td>760</td>
<td></td>
<td></td>
</tr>
<tr>
<td>316</td>
<td>10300</td>
<td>Husky Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marathon Oil Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sohio Natural Resources Co.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Texaco, Inc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>317</td>
<td>1640</td>
<td>Husky Oil Co.</td>
<td>1640</td>
<td>WF</td>
<td>58-</td>
</tr>
<tr>
<td>318</td>
<td>680*</td>
<td>Arnell Oil Co.</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bessemer Oil Co.</td>
<td>560</td>
<td></td>
<td></td>
</tr>
<tr>
<td>319</td>
<td>240*</td>
<td>Chevron USA, Inc.</td>
<td>240</td>
<td>WF</td>
<td></td>
</tr>
<tr>
<td>320</td>
<td>671</td>
<td>Amoco Production Co.</td>
<td>360</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>McCulloch Oil and Gas Co.</td>
<td>310</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Evaluation Descriptions
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

Recovery Type Descriptions
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
Exhibit 1-1. Table of Operators and Past Recovery Data (Continued)

<table>
<thead>
<tr>
<th>Reservoir Number</th>
<th>Reservoir Area (Acres)</th>
<th>Names of Operators by States</th>
<th>Area Controlled (Acres)</th>
<th>Secondary Recovery</th>
<th>Enhanced Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type</td>
<td>Date</td>
</tr>
<tr>
<td>321</td>
<td>760</td>
<td>Brehm, C.E.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Holden, Harold B.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pedry, John J.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sohio Petroleum Co.</td>
<td>640</td>
<td>WF</td>
<td>71-</td>
</tr>
<tr>
<td>322</td>
<td>320*</td>
<td>Texaco, Inc.</td>
<td>320</td>
<td>ISC</td>
<td>76-</td>
</tr>
<tr>
<td>323</td>
<td>4160</td>
<td>National Cooperative Refining &amp; Assoc.</td>
<td>4160</td>
<td>WF</td>
<td>70-</td>
</tr>
<tr>
<td>324</td>
<td>200</td>
<td>Continental Oil Co.</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>325</td>
<td>500*</td>
<td>Sohio Petroleum Co.</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Oil Co.</td>
<td>350</td>
<td></td>
<td></td>
</tr>
<tr>
<td>326</td>
<td>360*</td>
<td>Continental Oil Co.</td>
<td>360</td>
<td>ISC</td>
<td>59-63</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Highland Exploration, Inc.</td>
<td>360</td>
<td>WF</td>
<td>62-</td>
</tr>
<tr>
<td>327</td>
<td>207</td>
<td>Amoco Production Co.</td>
<td>207</td>
<td>SD</td>
<td>67-</td>
</tr>
<tr>
<td>328</td>
<td>825</td>
<td>Amoco Production Co.</td>
<td>785</td>
<td>WF</td>
<td>67-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continental Oil Co.</td>
<td>40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Description**
1. ME - Moderately Effective
2. NE - Not Effective
3. UD - Undetermined
4. VE - Very Effective

**Recovery Type Description**
1. CS - Cyclic Steam
2. ISC - In Situ Combustion
3. MD - Miscible Displacement
4. PF - Polymer Flood
5. PM - Pressure Maintenance
6. SD - Steam Drive
7. TH - Thermal
8. WF - Water Flood

*Acres estimated.
2. PROJECT DATA SOURCES

This section contains the listing of all sources utilized in the study for data input. The references are categorized as general for those with multiple data, by state, and by company response. The index numbers are those referred to in the printout for each reservoir.
2.1 General


13. Oil and Gas Production Reports by the Petroleum Information Corporation, Denver, Colo.


2.2 Alaska


2.3 Arkansas


25. SAI, Inc., CO2 PPD 91979.

26. Shreveport Geological Society, Penetration Charts and Reservoir Data Summary, Oil and Gas Fields in South Arkansas and North Louisiana (1953).


2.4 California


86. General Crude Oil Co./DOE Progress Report, "Lynch Canyon Demonstration Project" (1979).


139. Shell Oil Co./DOE, Progress Report of Coalinga Polymer Demonstration Project, DOE Publication SAN/1004.


143. ______, And T.M. Doscher, "Shell Makes a Success of Steamflood at Yorba Linda," Oil and Gas Journal, pp. 71-78 (September 2, 1974).


2.5 Colorado


2.6 Illinois


2.7 Kansas

Bleakley, W.B., "Here are Case Histories of Two Thermal Projects," Oil and Gas Journal, (October 26, 1964).


2.8 Kentucky


2.9 Louisiana


2.10 Mississippi


2.11 Oklahoma


196. "Index to Names of Oil and Gas Fields in Oklahoma," The Interstate Oil Compact Commission, Oklahoma City, Oklahoma (1968).


2.12 Texas


215. The Railroad Commission of Texas, Austin, Texas, "Maximum Efficiency Rate (MER)" and Other Hearing Files: Mobil Oil Corp. (December 14, 1976, May 23, 1978).

216. Bergman & Kins (November 17, 1965); Del-Ko Oil Co. (April 17, 1975).


219. Phillips Petroleum Co. (November 1950); Rutherford Oil Corp. (February 9, 1973); George K. Taggart (March 28, 1973).


221. The Pure Oil Co. (February 25, 1964); Unión Oil Co. of California (October 7, 1970); Unknown (December 7, 1959).
222. The Railroad Commission of Texas, Austin, Texas, "Maximum Efficiency Rate (MER)" and Other Hearing Files: Atlantic Richfield Co. (August 11, 1967); Exxon Corp. (April 12, 1977); Field Report by Oil & Gas Division (1935); Humble Oil & Refining Co. (July 28, 1949, August 18, 1952, September 14, 1964, December 16, 1964, March 16, 1966, September 13, 1967); Quintana Petroleum Corp. (September 17, 1978); Sun Oil Co. (January 18, 1973); Sunray Mid-Continent Oil Co. (June 4, 1957); The Atlantic Refining Co. (September 17, 1953).


225. Frio Drilling, Inc. & Christi, Mitchell & Mitchell (July 25, 1957); Hamilton, J.M., et al. (June 27, 1964)

226. Quintana Petroleum Corp. (June 18, 1965).


234. Chevron Oil Co. (June 6, 1973); Standard Oil Co. of Texas (March 13, 1969, December 17, 1969).


250. Oil & Gas Division Field Report (April 27, 1957); Valley Pipeline Co. (January 17, 1938, November 24, 1939).

251. Independence Drilling Corp. (July 16, 1974); Southern Minerals Corp. (June 2, 1949).


253. Republic Natural Gas Co. (November 8, 1950); Texaco, Inc. (September 28, 1960); Williams, H. Martin (May 31, 1958).

254. Cities Service Oil Co. (October 25, 1954); Goldston Oil Corp. (October 15, 1965); Hager, D.S. (December 9, 1936); Spence, Ralph (March 1, 1968).


Amoco Prod. Co. (April 13, 1972, May 16, 1972, February 23, 1973); Calto Oil Corp. (December 16, 1957); Exxon Corp. (July 1951, September 7, 1976, December 2, 1976, August 23, 1977); Fair Oil Co. (July 31, 1972); Forest Oil Corp. (March 11, 1974); General American Oil Co. of Texas (March 21, 1972); Humble Oil & Refining Co. (June 12, 1968, August 26, 1969, July 7, 1971, November 11, 1971); Mobil Oil Corp. (July 17, 1968, March 5, 1969); Texaco, Inc. (July 17, 1970, February 24, 1972, June 2, 1972, April 6, 1973).

Humble Oil & Refining Co. (February 17, 1973).

Adair, F.M. (Consultant) (October 28, 1958); Oil Management Corp. (October 30, 1968).


Exxon Corp. (May 21, 1973, March 24, 1976); Fair, Ralph E., Inc. (May 17, 1976); Getty Oil Co. (December 30, 1975, February 14, 1977); Hinton Production Co. (April 21, 1977); Humble Oil & Refining Co. (May 25, 1967); Mobil Oil Corp. (February 21, 1978, October 27, 1978, January 10, 1979); Tenneco Oil Co. November 7, 1966); Texaco, Inc. (April 9, 1976);


Clemco (February 14, 1977); Harrison, Sam G. (October 27, 1967); Humble Oil & Refining Co. (December 28, 1949)/


2.13 Wyoming


283. _____: Kuehne Ranch, Southeast Field (1974).

284. _____: Kummerfeld Field (1972).


2.14 Company Responses


291. Exxon Co., USA, E. F. Sabatku, Los Angeles, California (August 7, 1979).

292. Getty Oil Co., Central Exploration and Production Division, R. J. Starrak, Division Production Manager, Tulsa, Oklahoma


294b. McCulloch Oil and Gas Corp., D. E. Sartan, Staff Engineer, Los Angeles, California (August 1, 1979).


296. Shall Oil Division, Coastal Division, J. A. Babin, Production Manager, New Orleans, Louisiana (August 15, 1979).

297. Sohio Petroleum Co., Division of Sohio Natural Resources Co., J. E. Owens, Manager of Production, Oklahoma City, Oklahoma (August 6, 1979).


300. Thums Long Beach Company, P. R. Boyle, Staff Reservoir Engineer, Long Beach, California (August 31, 1979).

301. Union Oil Company of California, Alan P. Smith, Casper, Wyoming (June 29, 1979).