

WILLIAMSON PETROLEUM CONSULTANTS, INC.

HB70045001

PRINT: 07/30/99 14.01.24

FIELD:

SHUGART EAST (DELAWARE) DL

TRACT:

P00200

DELAWARE

OPERATOR YATES HARVEY E CO INC

WELL:

2

LEASE:

SOUTH TAYLOR 13 FEDERAL

ST, CNTY NM, EDDY

DIST: SE*O/G/-

LOCATION 13P 18S 31E

1ST PROD 1988.02 NUMBER WELLS: 1

SOURCE

DSL150.015.18S31E13PM1DL

PG: 0200

JOB FOR 9.8700 INTOLL, INC.

EFF. DATE: 01/01/99

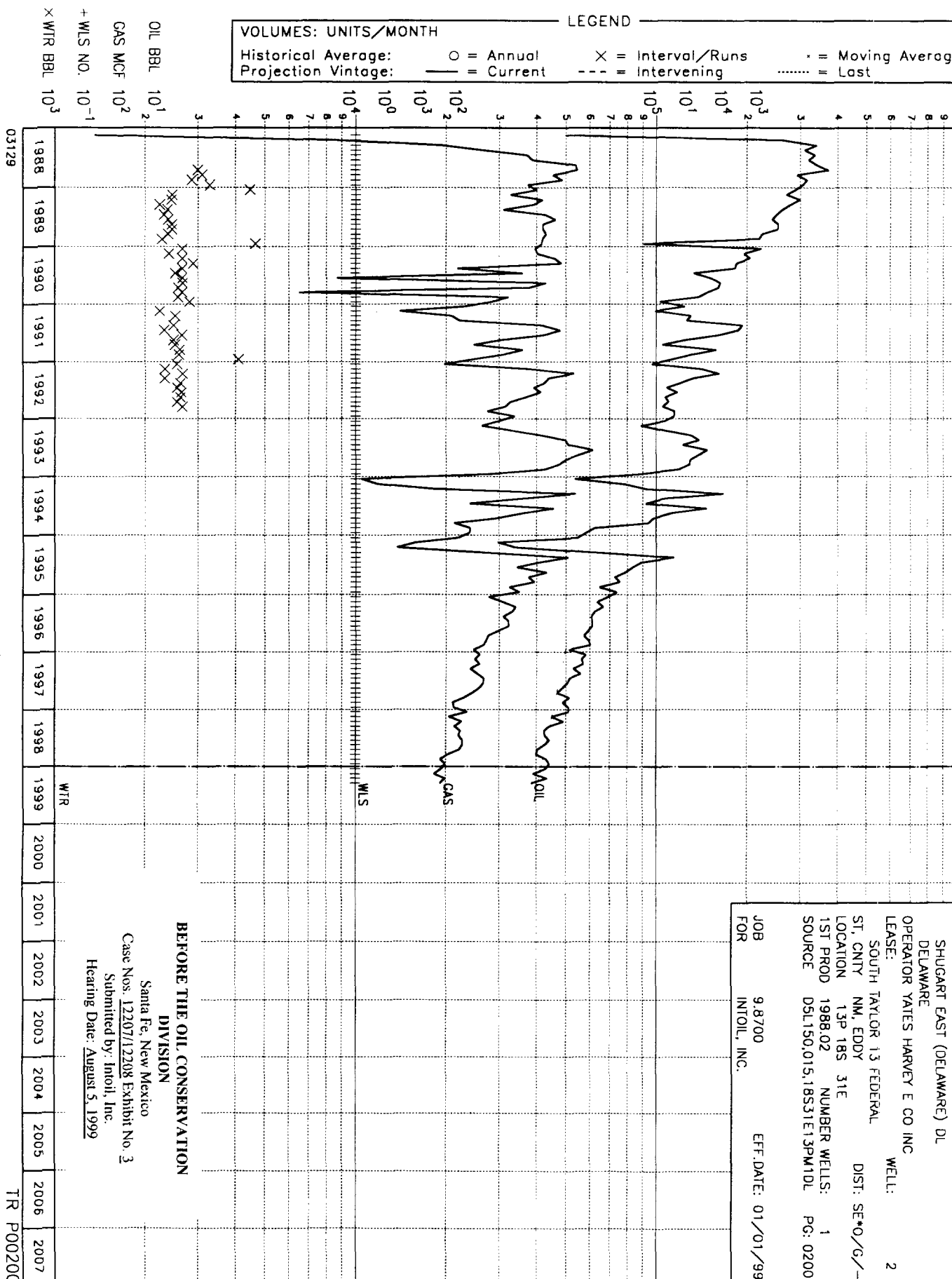
LEGEND

VOLUMES: UNITS/MONTH
Historical Average:
Projection Vintage:

O = Annual
= Current

X = Interval/Runs
- - - = Intervening

* = Moving Average
..... = Last



BEFORE THE OIL CONSERVATION

DIVISION

Santa Fe, New Mexico

Case Nos. 12207/12208 Exhibit No. 3

Submitted by: Intoll, Inc.

Hearing Date: August 5, 1999

Subject to the Qualifications in the Transmittal/Discussion of the Report

WILLIAMSON PETROLEUM CONSULTANTS, INC.

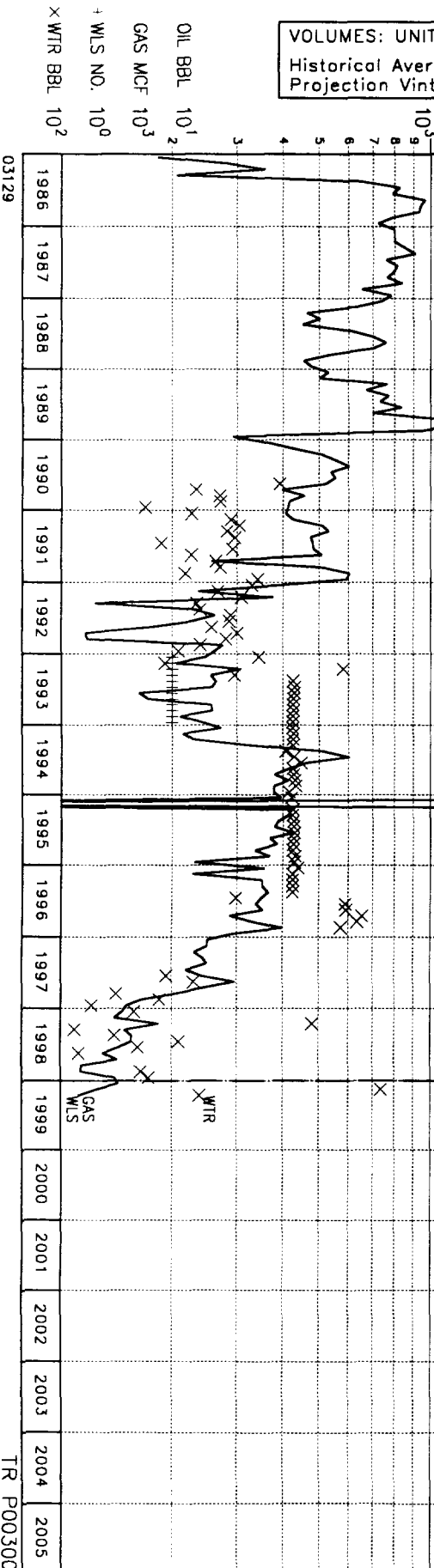
WPT000AS001 PRINT: 07/30/99 14:01:25

FIELD: SHUGART EAST (DELAWARE) DL TRACT: P00300
 DELAWARE
 OPERATOR ST MARY LAND & EXPL CO
 LEASE: 3
 GERONIMO FEDERAL DIST: SE*O/G/-
 ST. CNTY NM, EDDY LOCATION 24A 18S 31E
 1ST PROD 1986.01 NUMBER WELLS: 1
 SOURCE D5L150.015.18S31E24A00DL PG: 0300

JOB 9.8/700 EFF. DATE: 01/01/99
 FOR INTOLL, INC.

VOLUMES: UNITS/MONTH

Historical Average: O = Annual X = Interval/Runs . = Moving Average
 Projection Vintage: — = Current - - = Intervening = Last



03129

TR P00300

Subject to the Qualifications in the Transmittal/Discussion of the Report

WILLIAMSON PETROLEUM CONSULTANTS, INC.

H8700AS001

PRNT: 07/30/99 14.01.26

FIELD:

TRACT:

P00400

SHUGART EAST (DELAWARE) DL
DELAWARE
OPERATOR ST MARY LAND & EXPL CO

LEASE: WELL: 5

GERONIMO FEDERAL
ST. CNTY NM, EDDY

DIST: SE*O/G/-

LOCATION 24B 18S 31E

NUMBER WELLS: 1

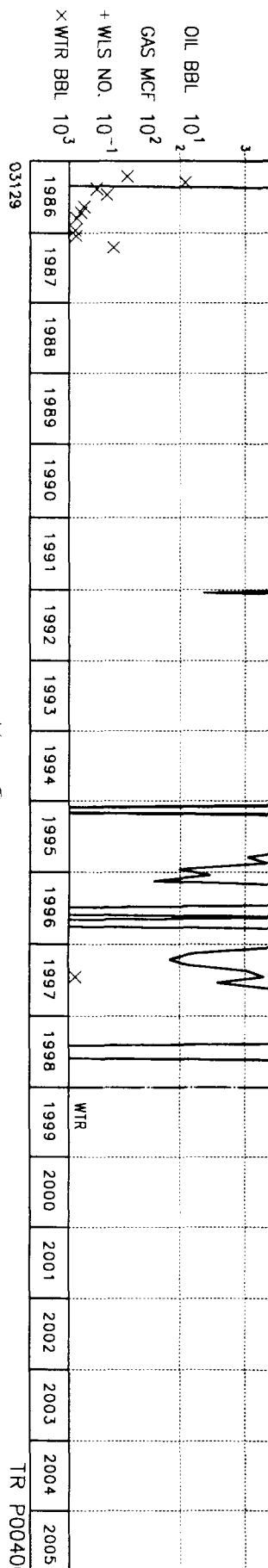
1ST PROD

1986.03 18531E24B00DL PG: 0400

JOB FOR 9.8700 INTOLL, INC.

EFF. DATE: 01/01/99

VOLUMES: UNITS/MONTH
LEGEND
Historical Average: ○ = Annual X = Interval/Runs * = Moving Average
Projection Vintage: — = Current - - - = Intervening = Last



TR P00400

WILLIAMSON PETROLEUM CONSULTANTS, INC.

WPT005001

PRINT: 07/30/99 14:01:26

FIELD:

TRACT:

P00500

SHUGART EAST (DELAWARE) DL
DELAWARE
OPERATOR ST MARY LAND & EXPL CO

LEASE: GERONIMO FEDERAL WELL: 12
ST. CNTY NM, EDDY DIST: SE*O/G/-

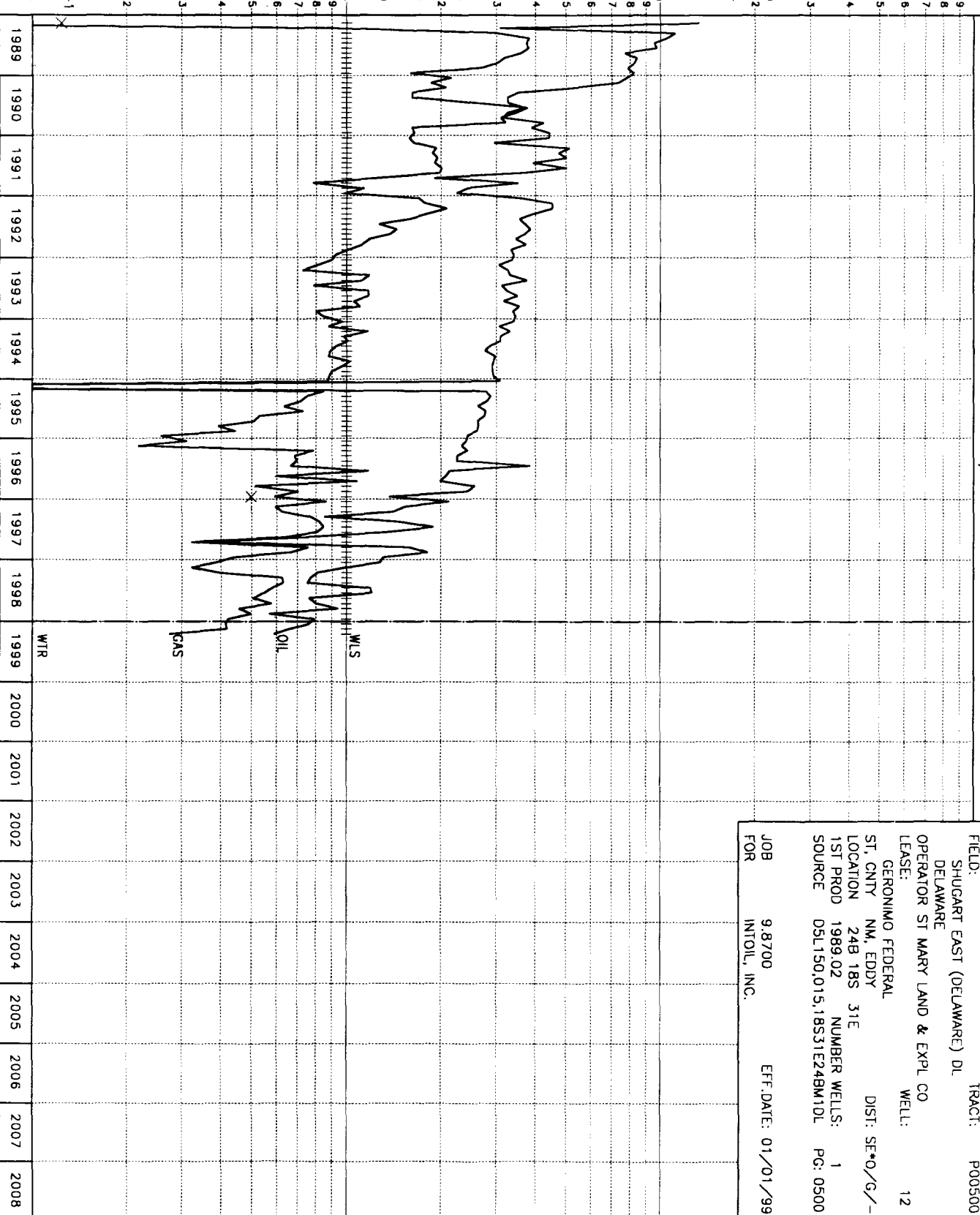
LOCATION 24B 18S 31E
1ST PROD 1989.02 NUMBER WELLS: 1
SOURCE DSL150,015,18S31E24BM1DL PG: 0500

JOB 9.8700 EFF. DATE: 01/01/99
FOR INTOLL, INC.

VOLUMES: UNITS/MONTH

LEGEND

Historical Average: ○ = Annual X = Interval/Runs . = Moving Average
Projection Vintage: — = Current - - = Intervening = Last



Subject to the Qualifications in the Transmittal/Discussion of the Report

WILLIAMSON PETROLEUM CONSULTANTS, INC.

HA700A5001

PRINT: 07/20/99 14.01.27

FIELD:

TRACT:

P00600

SHUGART EAST (DELAWARE) DL
DELAWARE

OPERATOR ST MARY LAND & EXPL CO
LEASE: 9

GERONIMO FEDERAL
ST, CNTY NM, EDDY DIST: SE*O/G/-

LOCATION 24G 18S 31E
1ST/PROD 1985.01 NUMBER WELLS: 1

SOURCE DSL150.015,18S31E24G00DL PG: 0600

JOB FOR 9.8700 INTOLL, INC. EFF. DATE: 01/01/99

LEGEND

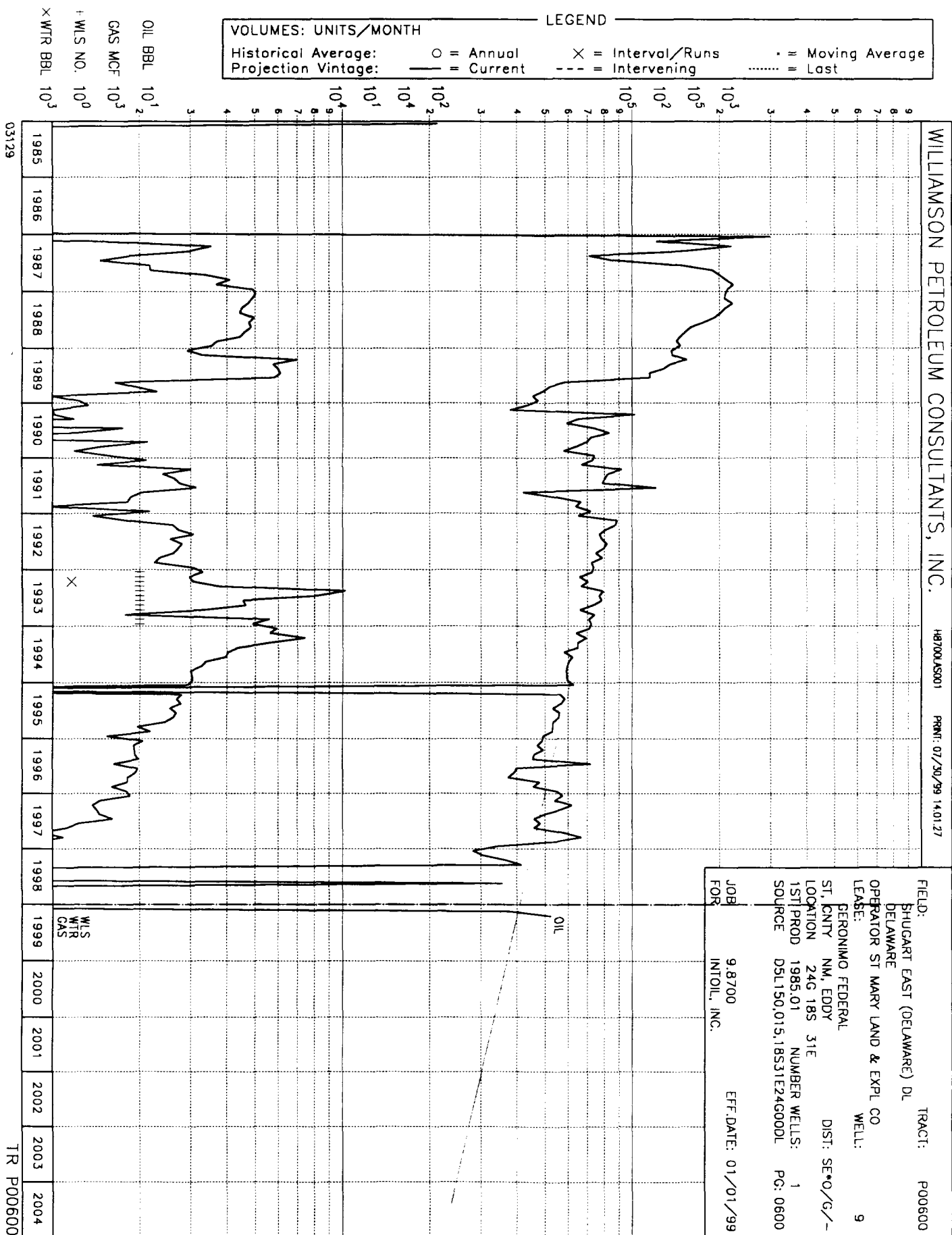
VOLUMES: UNITS/MONTH

Historical Average:
Projection Vintage:

O = Annual
= Current

X = Interval/Runs
- - = Intervening

. = Moving Average
..... = Last



WILLIAMSON PETROLEUM CONSULTANTS, INC.

H8700AS001

PRINT: 07/30/99 14.01.28

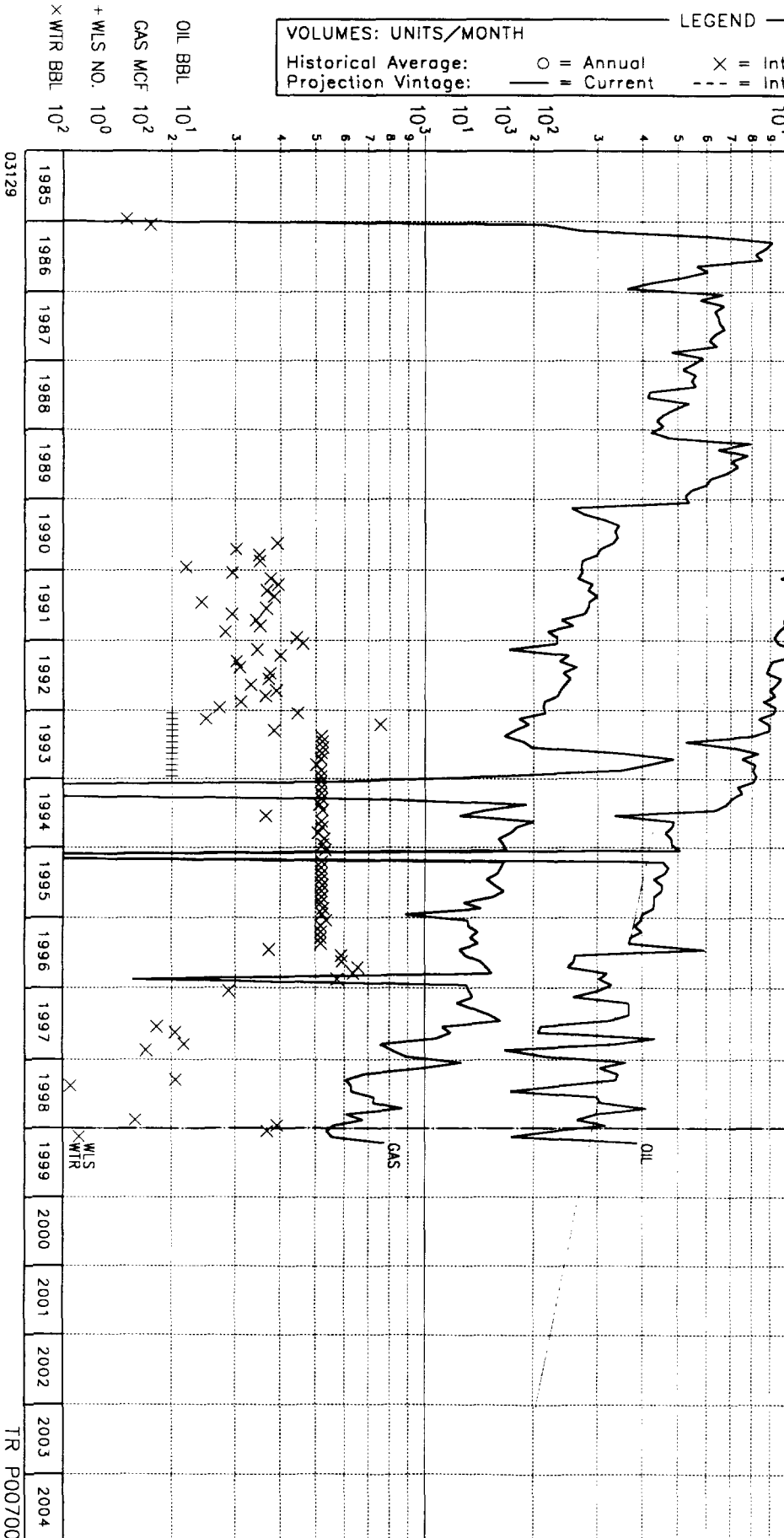
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 DELAWARE
 OPERATOR ST MARY LAND & EXPL CO
 LEASE: GERONIMO FEDERAL
 ST, CNTY NM, EDDY
 LOCATION 24H 18S 31E
 1ST PROD 1985.12 NUMBER WELLS: 1
 SOURCE DSL150,015,18S31E24H00DL PG: 0700

TRACT: P00700
 DIST: SE*O/G/-
 JOB 9,8700 EFF DATE: 01/01/99
 FOR INTOL, INC.

VOLUMES: UNITS/MONTH

LEGEND

Historical Average: ○ = Annual X = Interval/Runs
 Projection Vintage: — = Current - - - = Intervening . . . = Moving Average
 = Last



WILLIAMSON PETROLEUM CONSULTANTS, INC.

HB700AS001

PRINT: 07/30/99 14.01.28

FIELD:

TRACT:

P00800

SHUGART EAST (DELAWARE) DL

DELAWARE

OPERATOR ST MARY LAND & EXPL CO

WELL:

8

LEASE:

DIST: SE*0/G/-

GERONIMO FEDERAL

ST, CNTY NM, EDDY 31E

LOCATION 241 185

1ST PROD 1986.10 NUMBER WELLS: 1

SOURCE DSL150,015,18531E24100DL

PG: 0800

JOB 9.8700 INTOLL, INC.

EFF. DATE: 01/01/99

VOLUMES: UNITS/MONTH

Historical Average: ○ = Annual

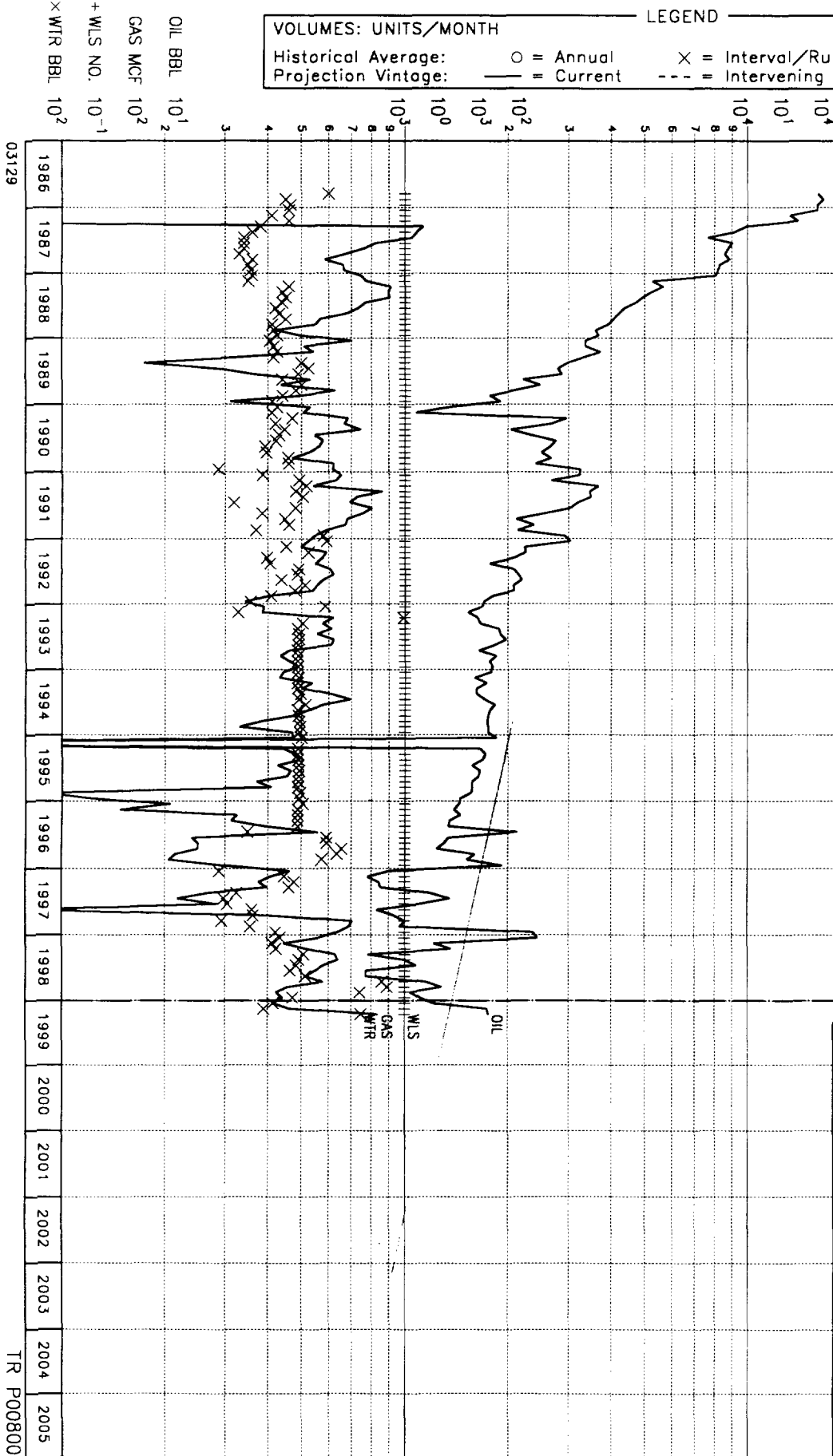
Projection Vintage: — = Current

× = Interval/Runs

- - - = Intervening

· = Moving Average

..... = Last



03129

TR P00800

Subject to the Qualifications in the Transmittal/Discussion of the Report

WILLIAMSON PETROLEUM CONSULTANTS, INC.

H8700LAS001

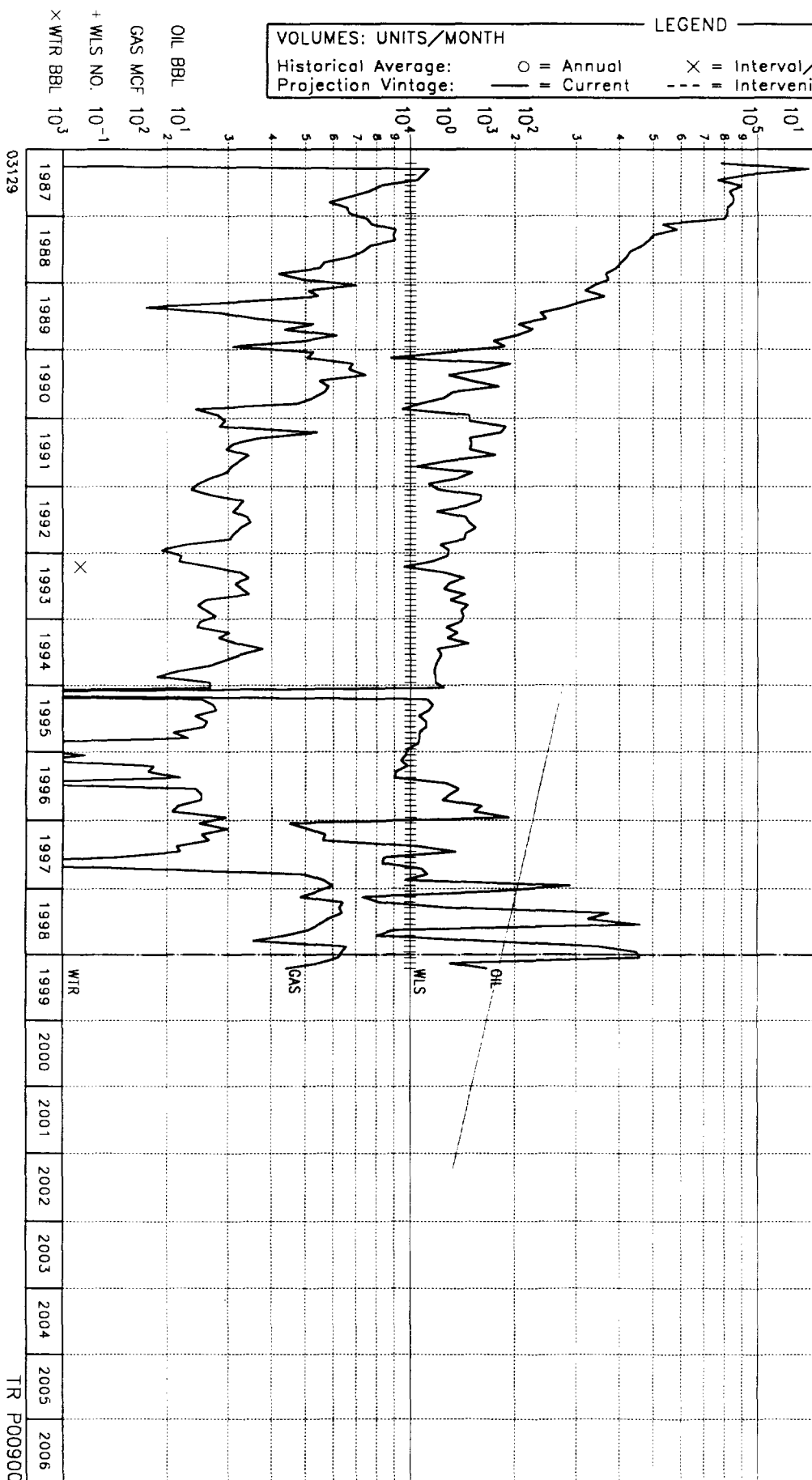
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FIELD: SHUGART EAST (DELAWARE) DL TRACT: P00900
 DELAWARE
 OPERATOR ST MARY LAND & EXPL CO
 LEASE: GERONIMO FEDERAL WELL: 10
 ST. CNTY NM, EDDY DIST: SE*O/G/-
 LOCATION 24J 18S 31E
 1ST PROD 1987.03 NUMBER WELLS: 1
 SOURCE DSL150,015,18S31E24J00DL PG: 0900

JOB 9.8700 EFF. DATE: 01/01/99
 FOR INTOL, INC.

VOLUMES: UNITS/MONTH

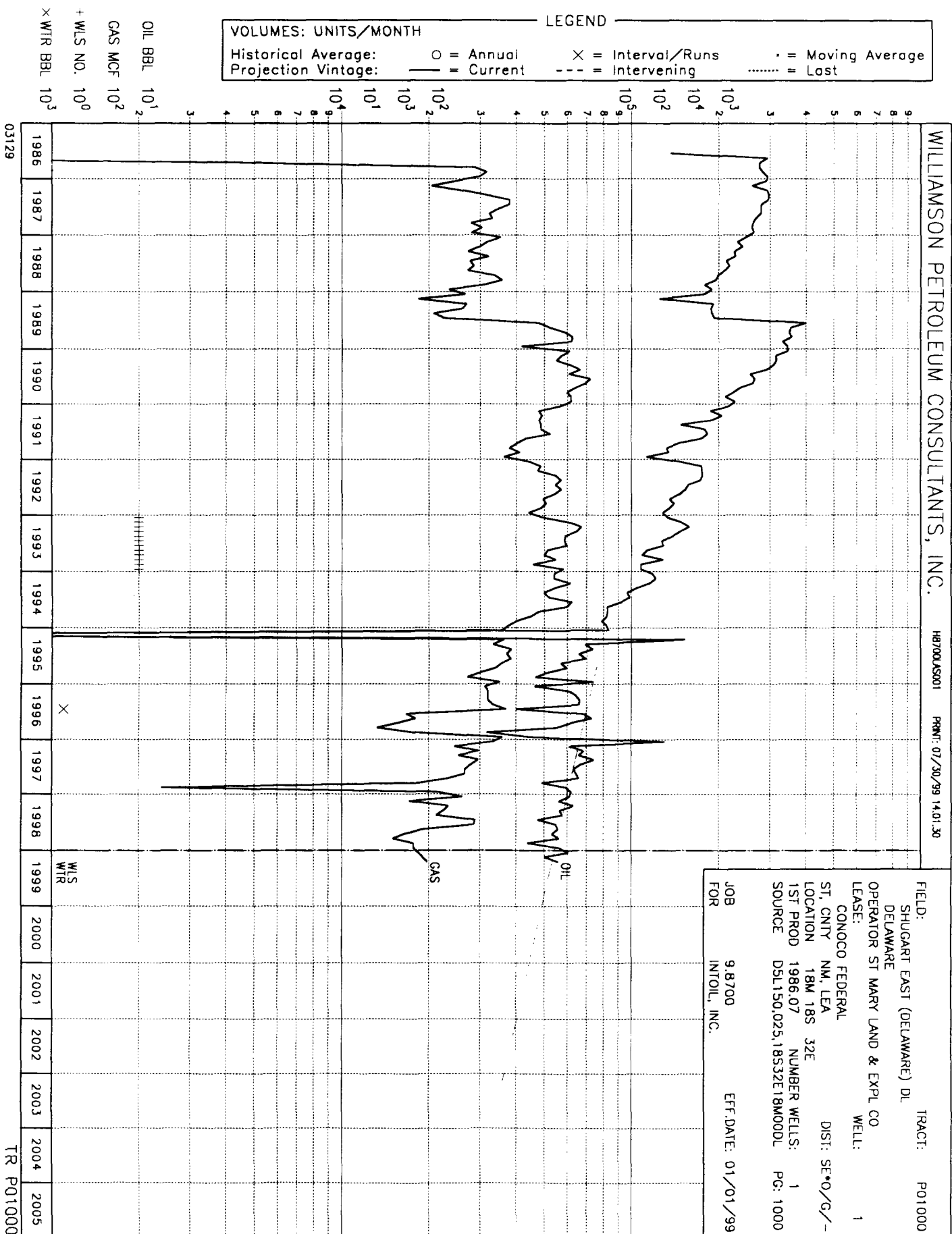
Historical Average: O = Annual X = Interval/Runs
 Projection Vintage: — = Current - - - = Intervening = Moving Average
 = Last



03129

TR P00900

Subject to the Qualifications in the Transmittal/Discussion of the Report



Subject to the Qualifications in the Transmittal/Discussion of the Report

WILLIAMSON PETROLEUM CONSULTANTS, INC.

H8700JAS001

PRINT: 07/30/99 14.01.30

FIELD:

TRACT:

P01100

SHUGART EAST (DELAWARE) DL
DELAWARE
OPERATOR ST MARY LAND & EXPL CO

LEASE:
INCA FEDERAL
ST. CNTY NM, LEA
LOCATION 19C 18S 32E
1ST PROD 1987.08
SOURCE DSL150.025.18532E19C00DL

WELL:

3

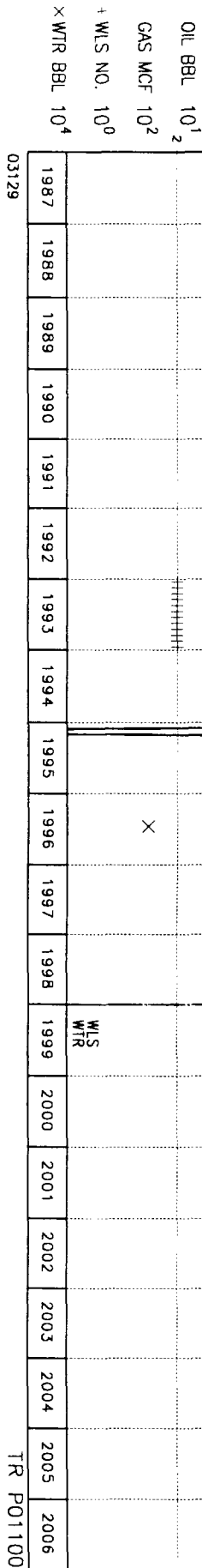
DIST: SE*O/G/-

1

NUMBER WELLS: 1
PG: 1100

JOB 9.8700 EFF. DATE: 01/01/99
FOR INTOL, INC.

VOLUMES: UNITS/MONTH
LEGEND
Historical Average: ○ = Annual
Projection Vintage: — = Current
Interval/Runs: X = Interval/Runs
Intervening: - - - Intervening
Moving Average: Moving Average
Last: Last



FOR P01100

TR P01100

WILLIAMSON PETROLEUM CONSULTANTS, INC.

H8700A5001

PRINT: 07/30/99 14:01:31

FIELD: SHUGART EAST (DELAWARE) DL TRACT: P01200

DELAWARE OPERATOR ST MARY LAND & EXPL CO WELL: 1

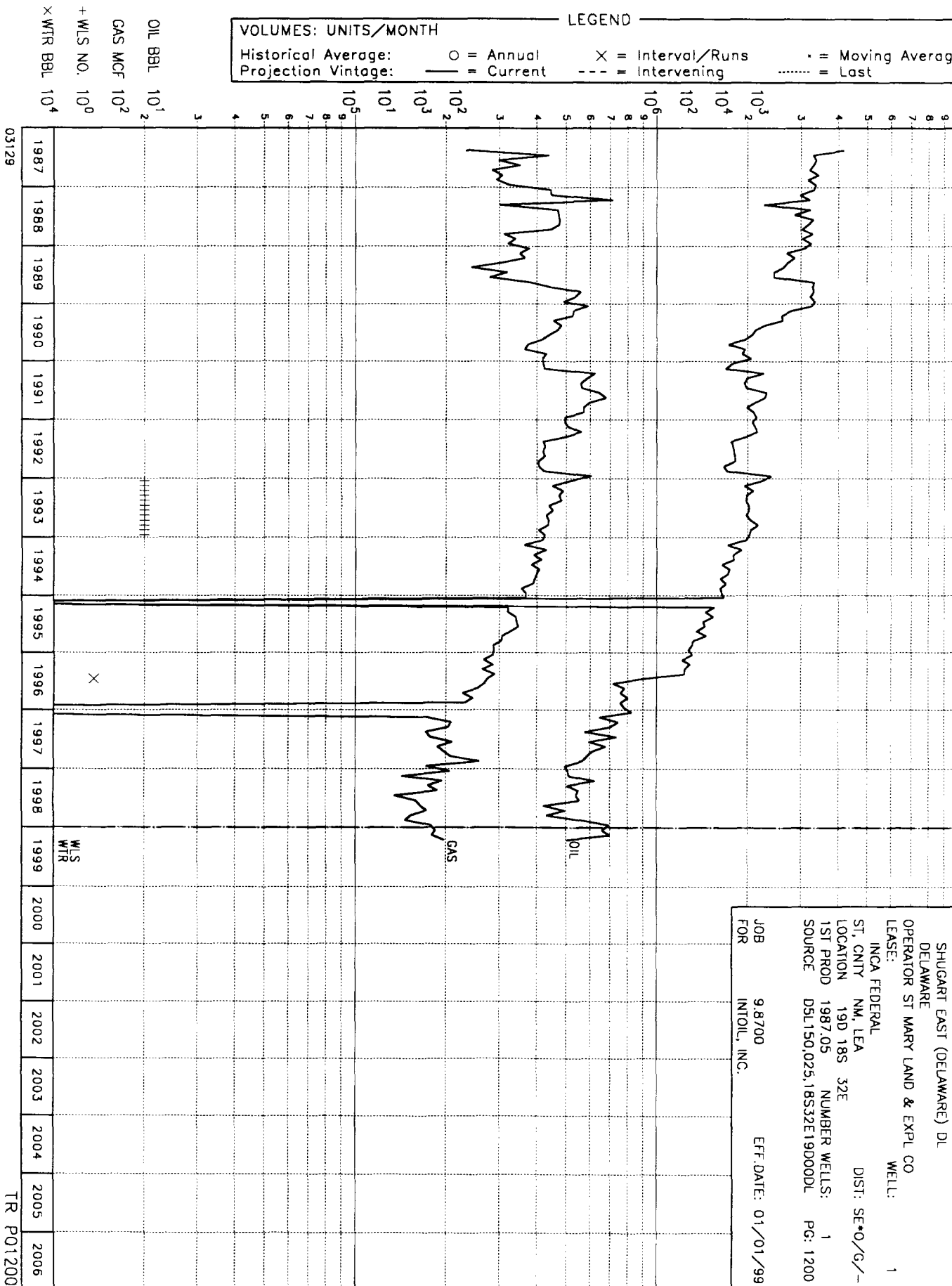
LEASE: INCA FEDERAL ST, CNTY NM, LEA DIST: SE*O/G/-

LOCATION 19D 18S 32E 1ST PROD 1987.05 NUMBER WELLS: 1

SOURCE DSL150.025.18532E19D00DL PG: 1200

JOB FOR 9.8700 INTOL, INC. EFF. DATE: 01/01/99

VOLUMES: UNITS/MONTH
 Historical Average: ○ = Annual X = Interval/Runs
 Projection Vintage: — = Current --- = Intervening = Last
 = Moving Average



03129

TR P01200

Subject to the Qualifications in the Transmittal/Discussion of the Report

WILLIAMSON PETROLEUM CONSULTANTS, INC.

HB700JAS001

PRMT: 07/30/99 14.01.31

FIELD:

SHUGART EAST (DELAWARE) DL

TRACT:

P01300

DELAWARE

OPERATOR ST MARY LAND & EXPL CO

WELL:

2

LEASE:

INCA FEDERAL

DIST: SE*O/G/-

ST. CNTY

NM, LEA

32E

LOCATION 19E 18S

1ST PROD

1987.07

NUMBER WELLS:

1

PG: 1300

SOURCE

DSL150,025,18S32E19E00DL

JOB FOR 9.8700 INTOLL, INC.

EFF. DATE: 01/01/99

LEGEND

VOLUMES: UNITS/MONTH

Historical Average:

O = Annual

X = Interval/Runs

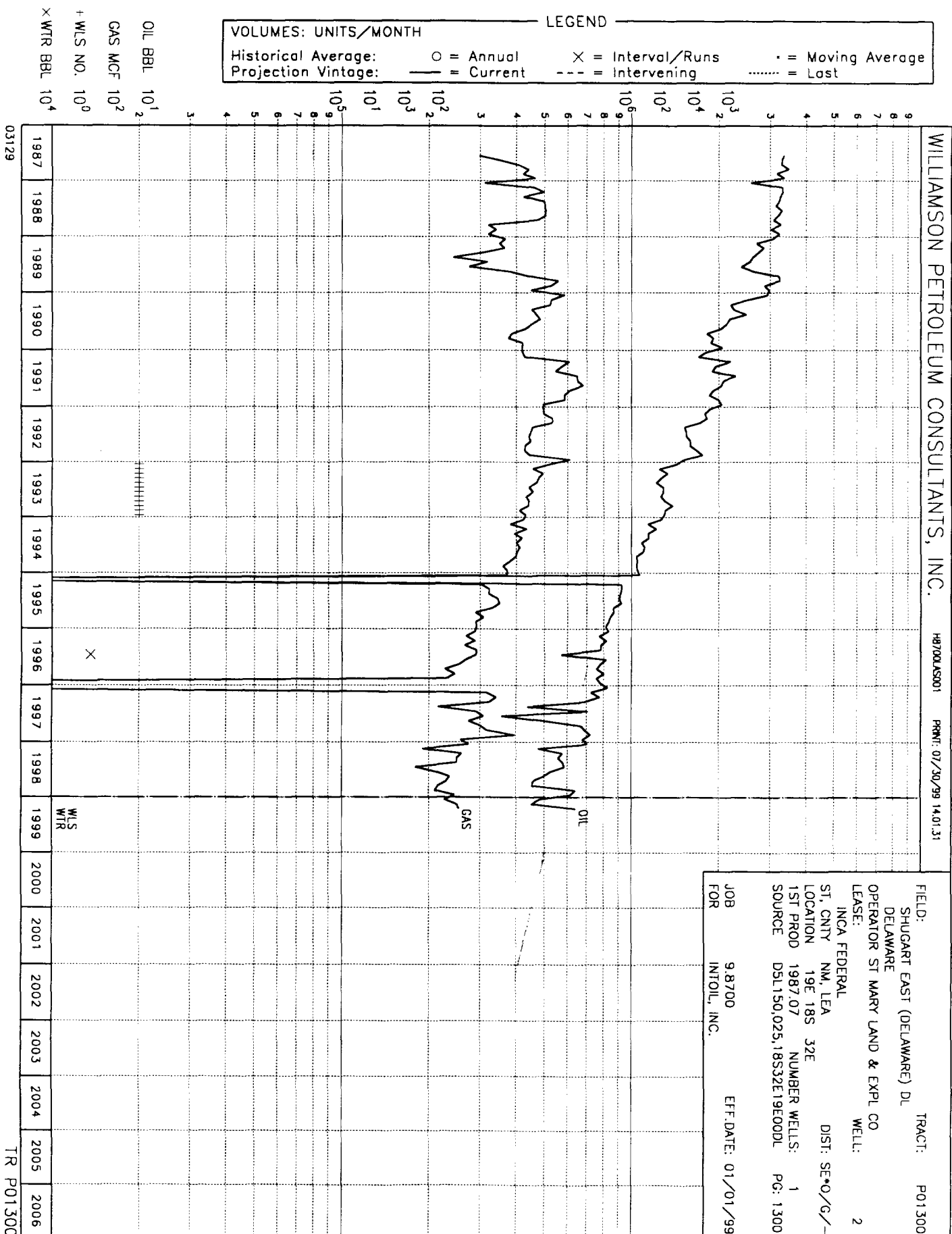
* = Moving Average

Projection Vintage:

— = Current

--- = Intervening

..... = Last



Subject to the Qualifications in the Transmittal/Discussion of the Report

WILLIAMSON PETROLEUM CONSULTANTS, INC.

H8700J5001

PRNT: 07/30/99 14.01.33

FIELD: SHUGART EAST (DELAWARE) DL TRACT: P01500

DELAWARE OPERATOR ST MARY LAND & EXPL CO

LEASE: MOHAWK FEDERAL ST. CNTY NM, LEA DIST: SE*O/G/-

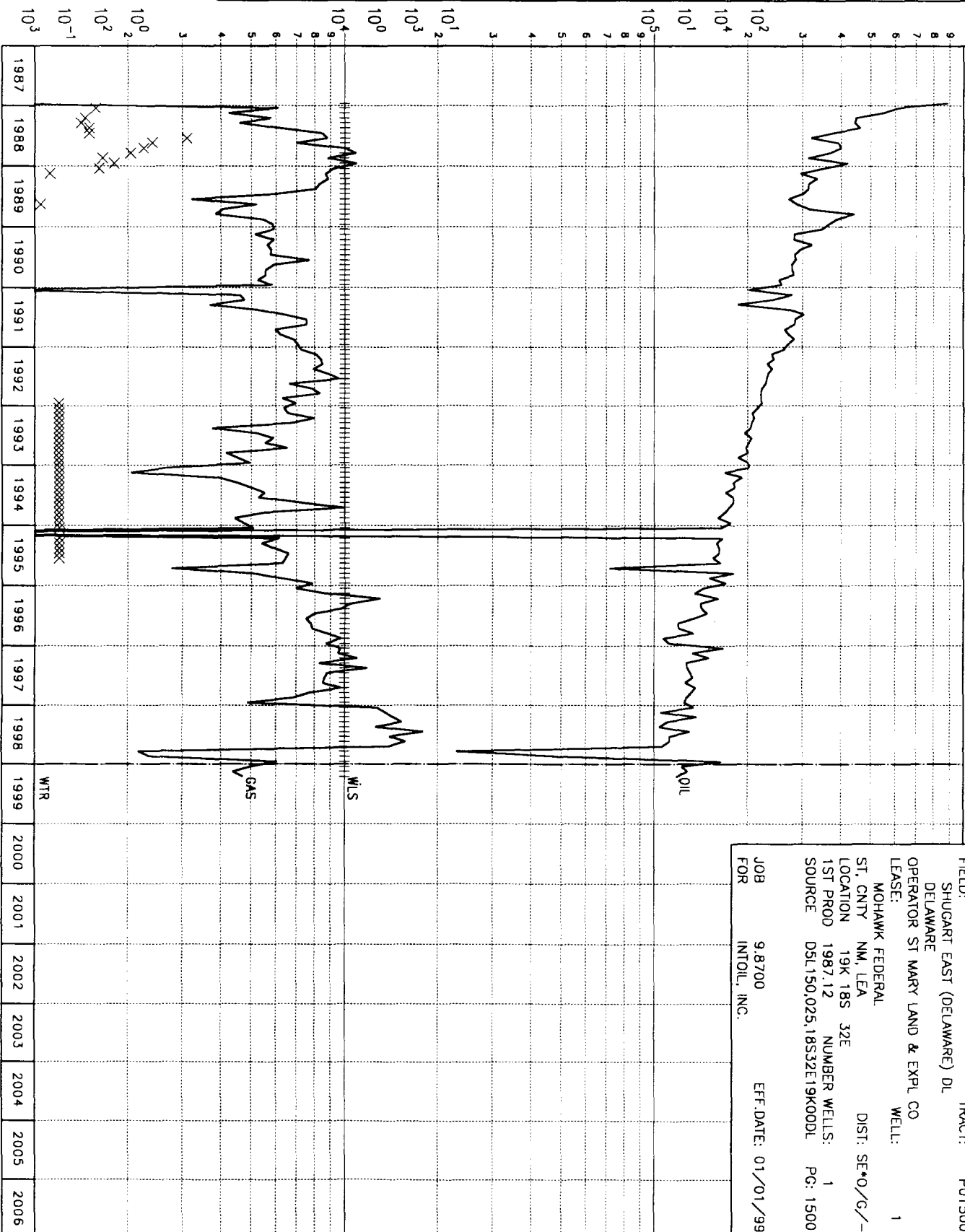
LOCATION 19K 18S 32E NUMBER WELLS: 1

1ST PROD 1987.12 PG: 1500

SOURCE D5L150.025.18S32E19K00DL

JOB FOR 9.8700 INTOLL, INC. EFF. DATE: 01/01/99

VOLUMES: UNITS/MONTH
 Historical Average: O = Annual X = Interval/Runs
 Projection Vintage: — = Current - - - = Intervening . = Moving Average
 . . . = Last



03129

TR P01500

Subject to the Qualifications in the Transmittal/Discussion of the Report

WILLIAMSON PETROLEUM CONSULTANTS, INC.

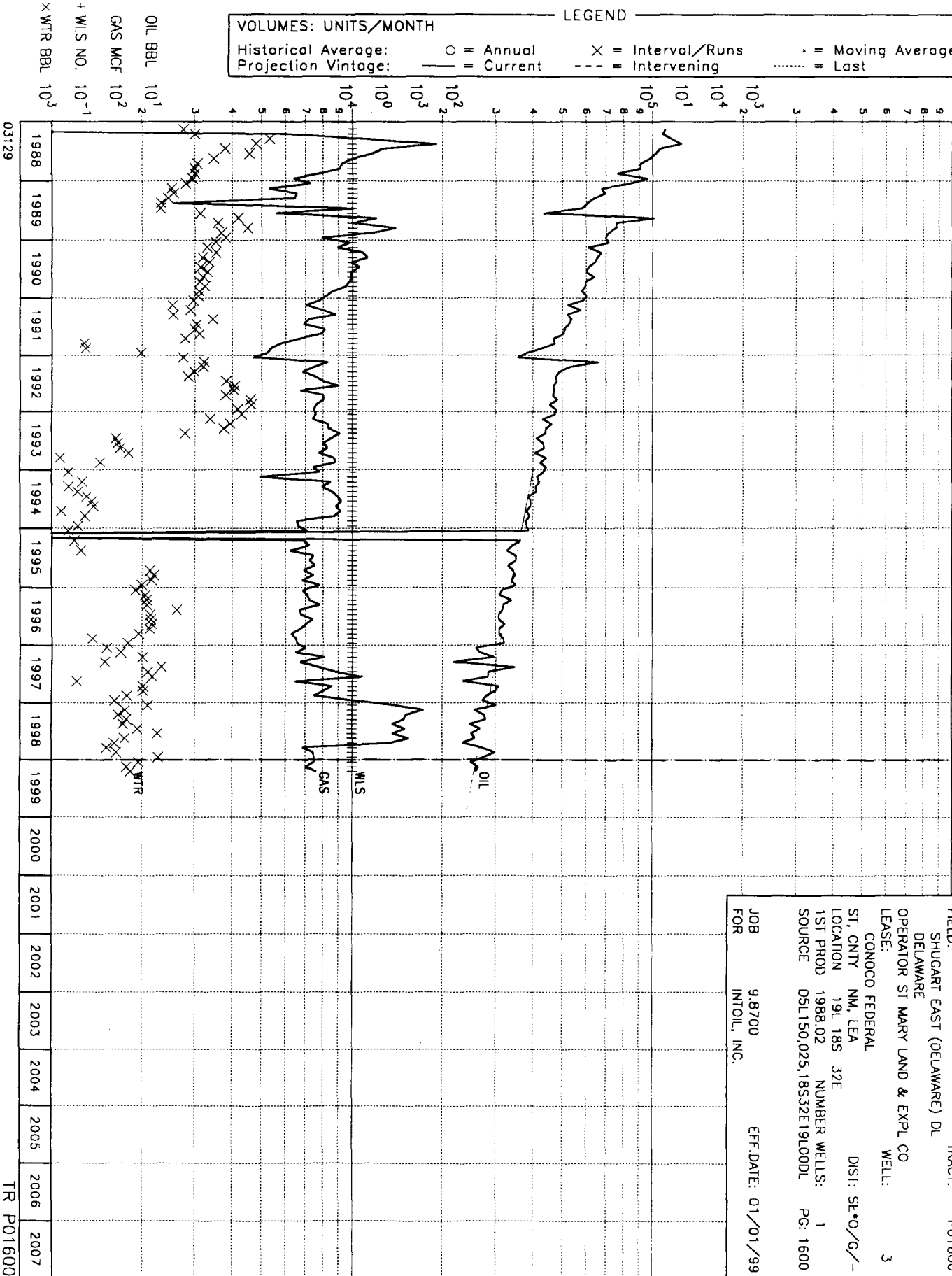
H9700A5001

PRINT: 07/30/99 14:01:33

FIELD:	SHUGART EAST (DELAWARE) DL	TRACT:	P01600
DELAWARE			
OPERATOR ST MARY LAND & EXPL CO			
LEASE:	CONOCO FEDERAL	WELL:	3
ST, CNTY	NM, LEA	DIST:	SE*O/G/-
LOCATION	19L 18S 32E		
1ST PROD	1988.02	NUMBER WELLS:	1
SOURCE	DSL150,025,18S32E19L00DL	PG:	1600
JOB	9.8700	EFF. DATE:	01/01/99
FOR	INTOLL, INC.		

VOLUMES: UNITS/MONTH

Historical Average: ○ = Annual X = Interval/Runs . = Moving Average
 Projection Vintage: — = Current - - - = Intervening = Last



EUR: 85,000,000

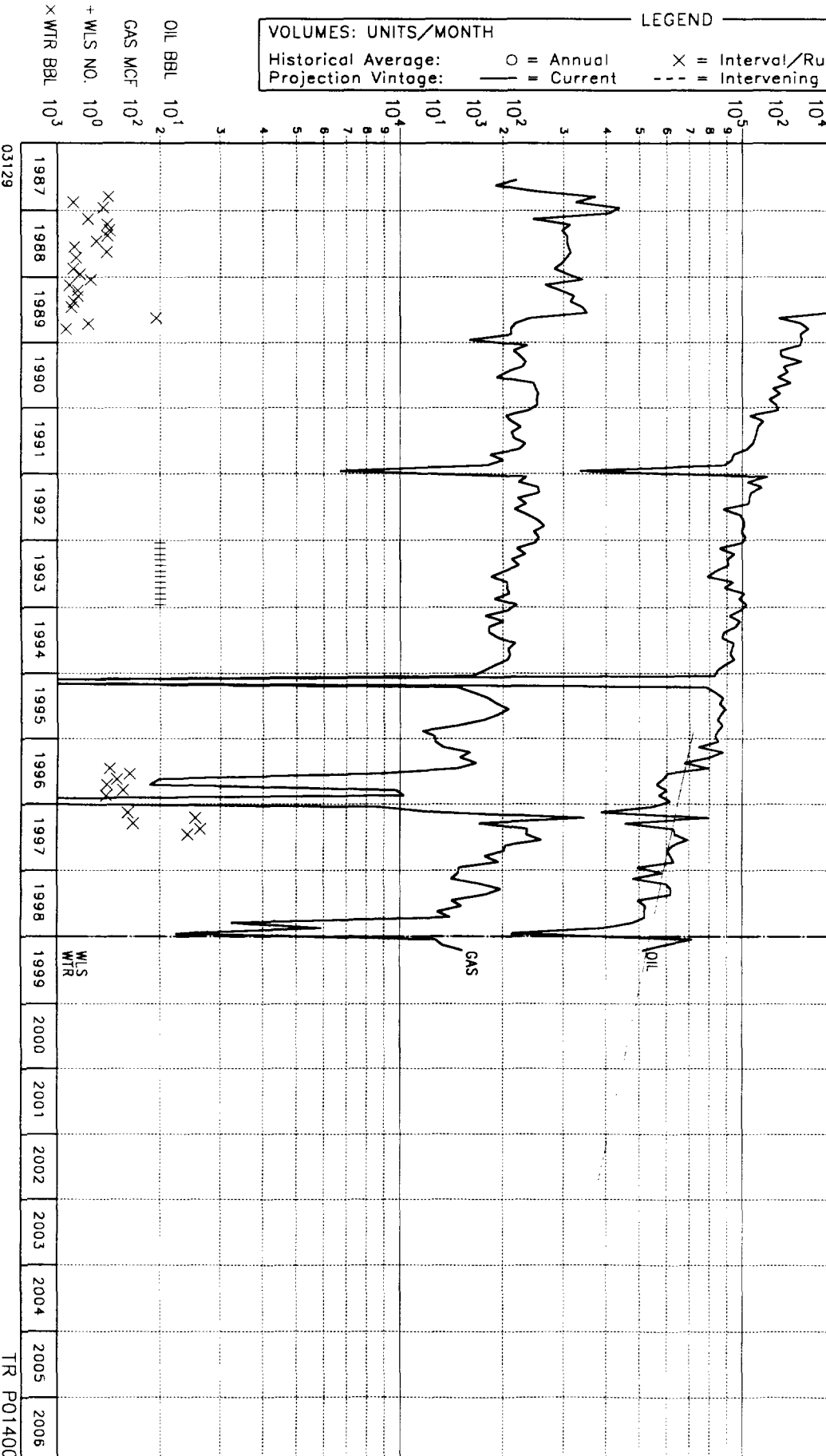
WILLIAMSON PETROLEUM CONSULTANTS, INC.

H8700A5001 PRINT: 07/30/99 14:01:32

FIELD: SHUGART EAST (DELAWARE) DL TRACT: P01400
 DELAWARE
 OPERATOR ST MARY LAND & EXPL CO
 LEASE: JADE FEDERAL WELL: 1
 ST. CNTY NM, LEA DIST: SE*O/G/-
 LOCATION 19F 18S 32E
 1ST PROD 1987.07 NUMBER WELLS: 1
 SOURCE DSL150.025.18S32E19F00DL PG: 1400

JOB 9.8700 EFF. DATE: 01/01/99
 FOR INTOLL, INC.

VOLUMES: UNITS/MONTH
 Historical Average: O = Annual X = Interval/Runs
 Projection Vintage: — = Current - - - = Intervening = Last



**PROPOSED TRACT PARTICIPATION FACTORS
EAST SHUGART DELAWARE UNIT**

TRACT NAME	CUM AT 6-1-98, BO	% OF CUM, OIL	AVG. RATE JAN-MAY 1998, BPM	% OF AVG RATE	REMAINING PRIMARY 7-1-98, BO	% OF REMAINING PRIMARY
S. TAYLOR 2	163,020	7.7434	463.2	8.8698	39,700	8.7639
S. TAYLOR 3						
INCA FED	621,971	29.5437	1473.2	28.2104	137,859	30.4328
CONOCO FED 1	231,077	10.9762	589.4	11.2864	53,963	11.9125
CONOCO FED 3	61,349	2.9141	271.8	5.2047	21,093	4.6563
MOHAWK FED 1	29,467	1.3997	118.0	2.2596	4,157	0.9177
GERONIMO FED 3	331,140	15.7291	649.0	12.4277	64,178	14.1676
GERONIMO FED 4	213,535	10.1429	316.2	6.0549	23,132	5.1065
GERONIMO FED 5	63,008	2.9929	92.0	1.7617	3,651	0.8060
GERONIMO FED 8	44,779	2.1270	136.0	2.6043	5,797	1.2797
GERONIMO FED 9	117,040	5.5594	274.0	5.2468	35,045	7.7363
GERONIMO FED 10	30,756	1.4609	167.6	3.2094	12,620	2.7859
GERONIMO FED 12	39,701	1.8858	92.0	1.7617		
JADE FED 1	158,420	7.5249	579.8	11.1026	51,799	11.4348
TOTAL	2,105,263	100.0000	5222.2	100.0000	452,994	100.0000
JADE 1 INTOIL EST		3.4900		5.0000		7.6300

**BEFORE THE OIL CONSERVATION
DIVISION**

Santa Fe, New Mexico
Case Nos. 12207/12208 Exhibit No. 4
Submitted by: Intoil, Inc.
Hearing Date: August 5, 1999

**PROPOSED TRACT PARTICIPATION FACTORS
EAST SHUGART DELAWARE UNIT**

Created: 8/2/99
Printed: 8/2/99 4:50 PM

	PRIMARY EUR	
	EAST SHUGART DELAWARE UNIT	
TRACT NAME	PDP EUR, BO	% OF EUR
S. TAYLOR 2	203,146	7.925
S. TAYLOR 3		
INCA FED	761,218	29.697
CONOCO FED 1	285,516	11.139
CONOCO FED 3	82,710	3.227
MOHAWK FED 1	33,754	1.317
GERONIMO FED 3	395,892	15.445
GERONIMO FED 4	236,840	9.240
GERONIMO FED 5	66,659	2.601
GERONIMO FED 8	50,684	1.977
GERONIMO FED 9	152,085	5.933
GERONIMO FED 1	43,701	1.705
GERONIMO FED 1	40,326	1.573
JADE FED 1	210,714	8.221
TOTAL	2,563,245	100.000

represent the Tract Participation during Unit Operations if all Tracts in the Unit Area qualify as provided herein. The Tract Participation of each Tract as shown in Exhibit "C" was determined in accordance with the following formula:

- Factor A: 5% of Total Tract Participation
Total number of acres attributable to the Tract divided by the total number of acres in the Unit Area.
- Factor B: 15% of Total Tract Participation
Total cumulative oil production from the Unitized Formation in each Tract as of June 1, 1998 divided by the total cumulative oil production from the Unitized Formation within the Unit Area as of June 1, 1998.
- Factor C: 25% of Total Tract Participation
Rate of oil production from the Unitized Formation in each Tract as determined by average barrels of oil produced each month from January through May, 1998 divided by the total rate of oil production from the Unitized Formation within the Unit Area for the same period of time.
- Factor D: 40% of Total Tract Participation
Original oil in place in the Unitized Formation in each Tract as determined by the reservoir simulation study, East Shugart (Delaware) Field, June 8, 1998, Petroleum Consulting & Engineering, Inc., divided by the original oil in place in the Unitized Formation within the Unit Area as determined by said study.
- Factor E: 15% of Total Tract Participation
Remaining primary oil reserves from the Unitized Formation in each Tract beginning July 1, 1998 as determined by the reservoir simulation study, East Shugart (Delaware) Field, June 8, 1998, Petroleum Consulting & Engineering, Inc., divided by the remaining primary oil reserves from the Unitized Formation within the Unit Area beginning July 1, 1998 as determined by said study.

Tract Participation for each Tract shall equal the total percentages represented by the sum of percentages resulting from the calculations contemplated in Factors A through E above.

INTOIL: (St. Mary Offer)

Unit Rem. Prim. 07/01/98 = 452,994 BO x 0.0454525 = 20,590 BO

Est. Unit Secondary Ult. = 1,486,682 BO x 0.0454525 = 67,573 BO

TOTAL = 88,163 BO

Jade Fed 1 Rem. Prim. 07/01/98 = 51,799 BO x .50 (Intoil Int.) = 25,900 BO

Ratio: Rem. Res., Unit Opns 07/01/98 = 88,163 BO = 3.4/1.0
Rem. Prim 07/01/98 25,900 BO

ALL WORKING INTEREST OWNERS EXCEPT INTOIL:

Unit Rem. Prim. 07/01/98 = 452,994 x 0.9545475 (St. Mary Offer) = 432,404 BO

Est. Unit Secondary Ult. = 1,486,682 BO x 0.9545475 = 1,419,109 BO

TOTAL: 1,851,513 BO

Rem. Prim. All WIO's except Intoil
452,994 - (.5)(51,799 Jade Fed 1) = 427,095 BO

Ratio: Rem. Res. Unit Opns 07/01/98 = 1,851,513 BO = 4.34/1.0
Rem. Prim. 07/01/98 427,095 BO

INTOIL, INC. ALTERNATIVE PARTICIPATION FORMULA 1

Acreage	.05	X	6.666%**	=	0.3333%
6-1-98 Cumulative Oil	.20	X	6.98%**	=	1.3960%
7-1-98 Remaining Primary	.35	X	15.26%**	=	5.3410%
January - May 1998 Oil Rate	.35	X	10.00%**	=	3.5000%
Original-Oil-In-Place	.05	X	7.29%*	=	<u>0.3645%</u>
					10.9348%

$$10.9348\% \times .50 \text{ Intoil WI} = 5.467\%$$

*Parameter factor from Exhibit C Unit Operating Agreement,
East Shugart Delaware Unit

**Parameter factor determined by Intoil, Inc.

INTOIL: (Intoil Formula 1)

Unit Rem. Prim. 07/01/98	= 452,994 BO x 0.0546800	= 24,770 BO
Est. Unit Secondary Ult.	= 1,486,682 BO x 0.0546800	= 81,292 BO
	TOTAL	= 106,062 BO
Jade Fed 1 Rem. Prim. 07/01/98	= 51,799 BO x .50 (Intoil Int.)	= 25,900 BO
Ratio: <u>Rem. Res., Unit Opns 07/01/98</u>	= <u>106,062 BO</u>	= 4.1/1.0
Rem. Prim 07/01/98	25,900 BO	

ALL WORKING INTEREST OWNERS EXCEPT INTOIL:

Unit Rem. Prim. 07/01/98	= 452,994 x 0.9453200	= 428,224
Est. Unit Secondary Ult.	= 1,486,682 BO x 0.9453200	= 1,405,390
	TOTAL:	1,833,614 BO
Rem. Prim. All WIO's except Intoil		
452,994 - (.5)(51,799 Jade Fed 1)		= 427,095 BO
Ratio: <u>Rem. Res. Unit Opns 07/01/98</u>	= <u>1,833,614 BO</u>	= 4.29/1.0
Rem. Prim. 07/01/98	427,095 BO	

INTOIL, INC. ALTERNATIVE PARTICIPATION FORMULA 2

7-1-98 Remaining Primary	.40	X	13.12%*	=	5.2480%
January - May 1998 Oil Rate	.40	X	11.05%*	=	4.4200%
Primary Ultimate	.20	X	8.221%**	=	<u>1.6442%</u>
					11.3122%
			11.3122% X .50 Intoil WI	=	5.656%

*Parameter factor from Exhibit C Unit Operating Agreement,
East Shugart Delaware Unit

**Parameter factor determined by Williamson Petroleum Consultants, Inc.

INTOIL: (Intoil Formula 2)

Unit Rem. Prim. 07/01/98 = 452,994 BO x 0.0565600 = 25,621 BO

Est. Unit Secondary Ult. = 1,486,682 BO x 0.0565600 = 84,087 BO

TOTAL = 109,708 BO

Jade Fed 1 Rem. Prim. 07/01/98 = 51,799 BO x .50 (Intoil Int.) = 25,900 BO

Ratio: $\frac{\text{Rem. Res., Unit Opns 07/01/98}}{\text{Rem. Prim 07/01/98}} = \frac{109,708 \text{ BO}}{25,900 \text{ BO}} = 4.236/1.0$

ALL WORKING INTEREST OWNERS EXCEPT INTOIL:

Unit Rem. Prim. 07/01/98 = 452,994 x 0.9434400 = 427,373

Est. Unit Secondary Ult. = 1,486,682 BO x 0.9434400 = 1,402,595 BO

TOTAL: 1,829,968 BO

Rem. Prim. All WIO's except Intoil
452,994 - (.5)(51,799 Jade Fed 1) = 427,095 BO

Ratio: $\frac{\text{Rem. Res. Unit Opns 07/01/98}}{\text{Rem. Prim. 07/01/98}} = \frac{1,829,968 \text{ BO}}{427,095 \text{ BO}} = 4.285/1.0$

APPLICATIONS OF ST. MARY LAND & EXPLORATION COMPANY
FOR STATUTORY UNITIZATION, APPROVAL OF A WATERFLOOD PROJECT
AND TO QUALIFY THE PROJECT FOR THE
RECOVERED OIL TAX RATE
EDDY AND LEA COUNTIES, NEW MEXICO

SUMMARY COMMENTS

The object of a unit participation formula is to equitably distribute ownership in the remaining value in the unit among the various participants in the unit. The participation formula should protect the current value being received by the owner under current conditions and to properly allocate the value expected to be received from the secondary recovery project to be installed in the unit area.

The expected recovery under secondary recovery operations such as a waterflood is normally related to either original-oil-in-place or to the primary ultimate recovery.

If the original-oil-in-place can be determined accurately, then some percentage of that oil-in-place can be calculated to be recovered by secondary recovery operations. The primary ultimate could also be an indicator of expected recovery under secondary operations if all producing zones are completed. Both evaluation approaches are subject to being able to move water through the reservoir such

**BEFORE THE OIL CONSERVATION
DIVISION**

Santa Fe, New Mexico
Case Nos. 12207/12208 Exhibit No. 11
Submitted by: Intoil, Inc.
Hearing Date: August 5, 1999

that an oil bank is created to displace oil from an injection well to a producing well.

In this proposed unit, the primary ultimate may or may not be representative of waterflood recovery to be expected from a lease since the Delaware producing zones are scattered over an interval of some 300 to 400 feet with poor correlation of the producing zones between well bores. Another way of saying this is that the producing zones are very lenticular and all are not continuous between wells and therefore will present problems in displacing oil from an injection well to a producing well. Likewise, the lack of uniformity in completion intervals between wells could greatly affect the relative value of the primary ultimate recovery from these wells.

Data that can be measured accurately are cumulative recovery, current rate, remaining reserves under current operating conditions, and primary ultimate. The Intoil, Inc. formula includes 20 percent of cumulative oil recovery, 35 percent of remaining primary reserves, 35 percent of oil rate with five percent each being assigned to acreage and original-oil-in-place. This formula emphasizes the values that can be accurately measured for each of the tracts. This formula not only represents the value of a tract under current conditions but likely represents the value of these tracts under secondary recovery operations.

Another participation formula that could properly represent tract values is 40 percent of remaining primary, 40 percent oil rate, and 20 percent primary ultimate. 40 percent of the oil rate and the remaining primary protects the value of the lease under current conditions and bringing in 20 percent of the primary ultimate along with the remaining primary should be a good reflection of value under secondary recovery operations.

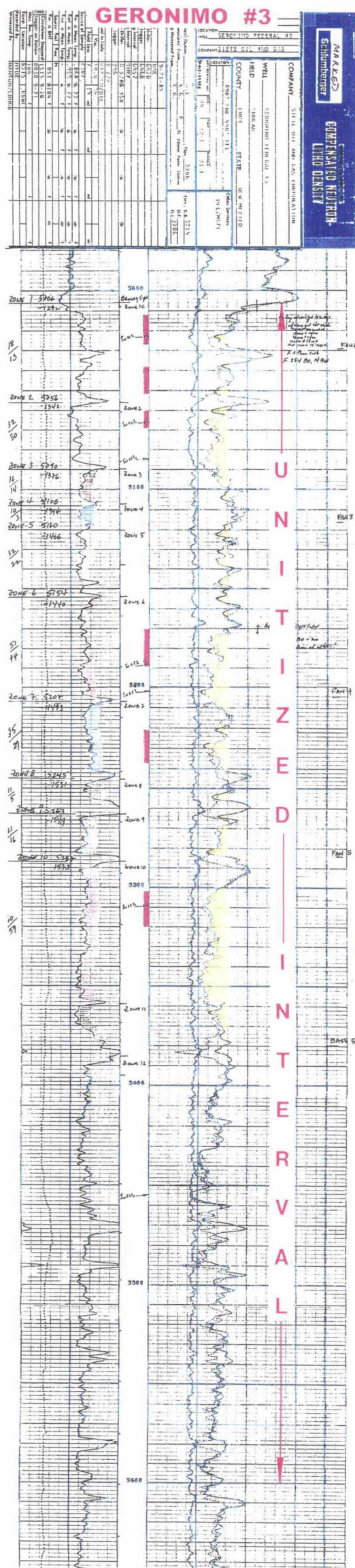
The formula proposed by St. Mary's includes 40 percent of the original-oil-in-place tract participation factor based upon a simulation study which because of the reservoir character may or may not properly represent expected recovery from these leases under secondary recovery operations. The pay zones are lenticular and the areal extent is ill-defined. The expected productivity of a zone is not accurately defined by log analysis.

The formula for participation in this unit, therefore, should depend more heavily upon those parameters that can be measured with a greater degree of accuracy and therefore should more accurately represent the value of these tracts under future unit operations.

16

EX-100

CASINO.



13

18

SOUTH TAYLOR 13 FEDERAL BUFFALO FEDERAL
NO TESTS

5547 6519

5450 5448 5500

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5450 5448 5500

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5450 5448 5500

Sw=81%est.

19

INCA FEDERAL
○ 1
5500

ZONE 1

St. Mary Land & Exploration Co.		
East Shugart Delaware STRUCTURE ZONE 1 C. I. = 5 FT.		
By	Drawn	9/2/99

EXHIBIT 18
CASE NO.

13

18

SOUTH TAYLOR 13 FEDERAL BUFFALO FEDERAL

TITE 1446. 1450.

5537

5519

NO TESTS

SOUTH TAYLOR 13 FEDERAL CONOCO FEDERAL

BUFFALO FEDERAL

5450

5448

5500

1440.

6500

TITE

ARCO FEDERAL

5
4450

GANDHI FEDERAL

1
10000

ARCO FEDERAL

2
4500

ARCO FEDERAL

3
4500

BLACKHAWK FEDERAL

5
4500

BLACKHAWK FEDERAL

3
4500

BLACKHAWK FEDERAL

4
4500

GERONIMO FED

6400

BLACKHAWK FEDERAL

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GERONIMO FEDERAL

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12
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13
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GERONIMO FEDERAL

INCA FEDERAL

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INCA FEDERAL

31
5500

INCA FEDERAL

32
5500

INCA FEDERAL

ZONE 2

St. Mary Land & Exploration Co.

East Shugart Delaware
STRUCTURE ZONE 2
C. I. = 5 FT.

B. Bechman

8/2/99

18



St. Mary Land & Exploration Co.		
East Shugart Delaware STRUCTURE ZONE 3 C. 1. = 5 FT.		
ii. Bachman		9/2/99

18



St. Mary Land & Exploration Co.		
East Shugart Delaware STRUCTURE ZONE 4 C. I. = 5 FT.		
B. Bachman		3/2/99

13

18

SOUTH TAYLOR 13 FEDERAL BUFFALO FEDERAL
NO TESTS

SOUTH TAYLOR 13 FEDERAL CONOCO FEDERAL BUFFALO FEDERAL
1434 1455 1451 1444 1490
5480 5448 5500 6500
NO TESTS

ARCO FEDERAL 5
4450
GANDHI FEDERAL 1
10000

ARCO FEDERAL 2
4500

ARCO FEDERAL 3
4500

BLACKHAWK FEDERAL 5
4500

BLACKHAWK FEDERAL 3
4500

BLACKHAWK FEDERAL 4
4500

GERONIMO PED 6400

BLACKHAWK FEDERAL 7
4500

GERONIMO FEDERAL 10 5500
GERONIMO FEDERAL 8 5600

CONOCO FEDERAL 3 5651
MOHAWK FEDERAL 1 6550
NO TESTS

GERONIMO FEDERAL 11 5500

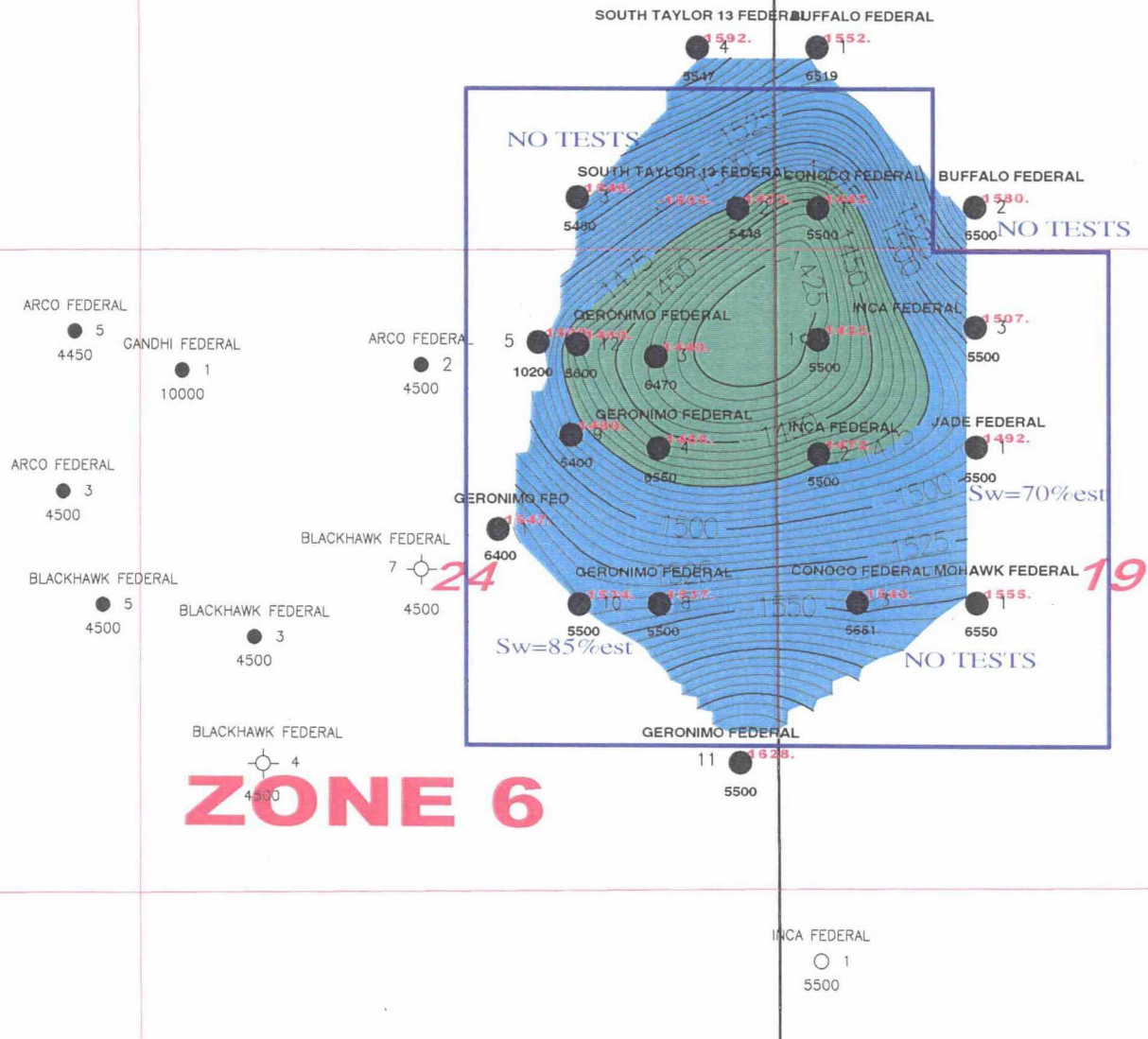
INCA FEDERAL 1
5500

ZONE 5

St. Mary Land & Exploration Co.		
East Shugart Delaware STRUCTURE ZONE 5 C. I. = 5 FT.		
W. Bachman		3/2/99

13

18



St. Mary Land & Exploration Co.		
East Shugart Delaware STRUCTURE ZONE 6 C. I. = 5 FT.		
J. Bachman		9/2/99

13

18

SOUTH TAYLOR 13 FEDERAL BUFFALO FEDERAL

1642. 1612.
5547 5519

SOUTH TAYLOR 13 FEDERAL CONOCO FEDERAL BUFFALO FEDERAL

1642. 1646. 1646.
5450 5418 5500 5500

ARCO FEDERAL

5
4450

GANDHI FEDERAL

1
10000

ARCO FEDERAL

2
4500

ARCO FEDERAL

3
4500

BLACKHAWK FEDERAL

5
4500

BLACKHAWK FEDERAL

3
4500

BLACKHAWK FEDERAL

4
4500

GERONIMO FED

7
4500

NO TESTS

GERONIMO FEDERAL

11
5500

INCA FEDERAL

1
5500

SWB 6-12% O.C.

JADE FEDERAL

1
5500

CONOCO FEDERAL MOHAWK FEDERAL

1605. 1605.
6550 6551

Sw=67%est

ZONE 7

St. Mary Land & Exploration Co.

East Shugart Delaware
STRUCTURE ZONE 7
C. I. = 5 FT.

B. Bachman

8/2/99

13

18

SOUTH TAYLOR 13 FEDERAL BUFFALO FEDERAL

1675. 1656.
5547 6519

SOUTH TAYLOR 13 FEDERAL CONOCO FEDERAL BUFFALO FEDERAL
NDE 5450 5448 5500 1688. 5500

ARCO FEDERAL 5 4450
GANDHI FEDERAL 1 10000

ARCO FEDERAL 2 4500

ARCO FEDERAL 3 4500

BLACKHAWK FEDERAL 5 4500

BLACKHAWK FEDERAL 7 4500

BLACKHAWK FEDERAL 3 4500

BLACKHAWK FEDERAL

4 4500

GERONIMO FEDERAL 5 10200 5600 6470

GERONIMO FEDERAL 3 5500 6470

GERONIMO FEDERAL 10 5500 5500

NO TESTS

GERONIMO FEDERAL

11 5500

INCA FEDERAL 1 5500

CONOCO FEDERAL MOHAWK FEDERAL 3 5651 1 6550

Sw=79%est

Sw=59%est

JADE FEDERAL 1 5500 1595.

INCA FEDERAL 3 5500 1609.

ZONE 8

St. Mary Land & Exploration Co.		
East Shugart Delaware STRUCTURE ZONE 8 C. I. = 5 FT.		
B. Bachman		9/7/99

13

18

SOUTH TAYLOR 13 FEDERAL BUFFALO FEDERAL

1730. 1700.
5847 6519

SOUTH TAYLOR 13 FEDERAL CONOCO FEDERAL BUFFALO FEDERAL

3 2 2
5450 5418 5500 5500 748.
5500

ARCO FEDERAL

5
4450

GANDHI FEDERAL

1
10000

ARCO FEDERAL

2
4500

ARCO FEDERAL

3
4500

BLACKHAWK FEDERAL

5
4500

BLACKHAWK FEDERAL

3
4500

BLACKHAWK FEDERAL

4
4500

BLACKHAWK FEDERAL

7
4500

GERONIMO FED

6400

NO TESTS

GERONIMO FEDERAL

11
5500

INCA FEDERAL

1
5500

NO TESTS

NO TESTS

5651

6550

1704. 1699.

5651 6550

1704. 1699.

5651 6550

1704. 1699.

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1704. 1699.

5651 6550

ZONE 10

St. Mary Land & Exploration Co.

East Shugart Delaware
STRUCTURE ZONE 10
C. I. = 5 FT.

B. Bachman

8/2/99

13

18

SOUTH TAYLOR 13 FEDERAL BUFFALO FEDERAL

4
5547 6519

SOUTH TAYLOR 13 FEDERAL CONOCO FEDERAL BUFFALO FEDERAL

3 2 1 2
5450 5448 5500 6500

ARCO FEDERAL

5
4450

GANDHI FEDERAL

1
10000

ARCO FEDERAL

2
4500

ARCO FEDERAL

3
4500

BLACKHAWK FEDERAL

5
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BLACKHAWK FEDERAL

3
4500

BLACKHAWK FEDERAL

4
4500

GERONIMO FED

1
6400

BLACKHAWK FEDERAL

7
4500

GERONIMO FEDERAL

10
5500

GERONIMO FEDERAL

11
5500

INCA FEDERAL

1
5500

CONOCO FEDERAL MOHAWK FEDERAL

3
5651

JADE FEDERAL

1
6550

INCA FEDERAL

1
5500

INCA FEDERAL

3
5500

GERONIMO FEDERAL

12
5600

GERONIMO FEDERAL

9
5400

INCA FEDERAL

2
5500

JADE FEDERAL

1
5500

GERONIMO FEDERAL

3
6470

GERONIMO FEDERAL

4
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GERONIMO FEDERAL

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GERONIMO FEDERAL

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GERONIMO FEDERAL

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5500

ZONE 2

St. Mary Land & Exploration Co.

East Shugart Delaware
NET SD. ZONE 2

B. Bachman

5/2/99

13

18

SOUTH TAYLOR 13 FEDERAL BUFFALO FEDERAL

5547 1 4
6519 1

SOUTH TAYLOR 13 FEDERAL CONOCO FEDERAL BUFFALO FEDERAL

5450 3 2 1
5448 2 5500 1
6500 2

ARCO FEDERAL

5
4450

GANDHI FEDERAL

1
10000

ARCO FEDERAL

2
4500

ARCO FEDERAL

3
4500

BLACKHAWK FEDERAL

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BLACKHAWK FEDERAL

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BLACKHAWK FEDERAL

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4500

GERONIMO FED

14
6400

GERONIMO FEDERAL

10 8
5500 5500

CONOCO FEDERAL

3
5651

MOHAWK FEDERAL

18 1
6550

GERONIMO FEDERAL

11 4
5500

INCA FEDERAL

1
5500

ZONE 3

St. Mary Land & Exploration Co.

East Shugart Delaware
NET SD. ZONE 3

B. Bachman

8/2/99

13

18

SOUTH TAYLOR 13 FEDERAL BUFFALO FEDERAL

5547 6519

SOUTH TAYLOR 13 FEDERAL CONOCO FEDERAL BUFFALO FEDERAL

5450 5448 5500 6500

ARCO FEDERAL

5
4450

GANDHI FEDERAL

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10000

ARCO FEDERAL

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4500

ARCO FEDERAL

3
4500

BLACKHAWK FEDERAL

5
4500

BLACKHAWK FEDERAL

3
4500

BLACKHAWK FEDERAL

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BLACKHAWK FEDERAL

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4500

GERONIMO FED

6400

GERONIMO FEDERAL

10
5500

GERONIMO FEDERAL

11
5500

INCA FEDERAL

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5500

INCA FEDERAL

1
5500

JADE FEDERAL

1
5500

CONOCO FEDERAL MOHAWK FEDERAL

3
5651

1
6550

ZONE 4

19

St. Mary Land & Exploration Co.

East Shugart Delaware
NET SD. ZONE 4

B. Beckman

5/7/99

13

18

SOUTH TAYLOR 13 FEDERAL BUFFALO FEDERAL

70 4 15
5547 6519

SOUTH TAYLOR 13 FEDERAL CONOCO FEDERAL BUFFALO FEDERAL
5450 5448 5500 6500

ARCO FEDERAL

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GANDHI FEDERAL

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10000

ARCO FEDERAL

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ARCO FEDERAL

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BLACKHAWK FEDERAL

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BLACKHAWK FEDERAL

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BLACKHAWK FEDERAL

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GERONIMO FED

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GERONIMO FEDERAL

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GERONIMO FEDERAL

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GERONIMO FEDERAL

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GERONIMO FEDERAL

12
5600

GERONIMO FEDERAL

14
5600

SOUTH TAYLOR 13 FEDERAL

3
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CONOCO FEDERAL

2
5448

INCA FEDERAL

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5500

INCA FEDERAL

2
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CONOCO FEDERAL

3
5651

GERONIMO FEDERAL

11
5500

BUFFALO FEDERAL

2
6500

INCA FEDERAL

3
5500

JADE FEDERAL

1
5500

CONOCO FEDERAL MOHAWK FEDERAL

1
6550

ZONE 5

INCA FEDERAL

1
5500

St. Mary Land & Exploration Co.

East Shugart Delaware
NET SD. ZONE 5

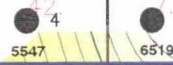
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9/2/99

13

18

SOUTH TAYLOR 13 FEDERAL BUFFALO FEDERAL



SOUTH TAYLOR 13 FEDERAL CONOCO FEDERAL BUFFALO FEDERAL



ARCO FEDERAL



GANDHI FEDERAL



ARCO FEDERAL



ARCO FEDERAL



BLACKHAWK FEDERAL



BLACKHAWK FEDERAL



BLACKHAWK FEDERAL



GERONIMO FED



BLACKHAWK FEDERAL



GERONIMO FEDERAL



GERONIMO FEDERAL



INCA FEDERAL



CONOCO FEDERAL MOHAWK FEDERAL



ZONE 6

St. Mary Land & Exploration Co.		
East Shugart Delaware NET SD. ZONE 6		
B. Bachman		8/2/99

13

18

SOUTH TAYLOR 13 FEDERAL BUFFALO FEDERAL

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5547 6519

SOUTH TAYLOR 13 FEDERAL CONOCO FEDERAL BUFFALO FEDERAL

3 2 2
5450 5448 5500 6500

ARCO FEDERAL

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4450

GANDHI FEDERAL

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ARCO FEDERAL

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ARCO FEDERAL

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BLACKHAWK FEDERAL

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GERONIMO FED

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GERONIMO FEDERAL

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INCA FEDERAL

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GERONIMO FEDERAL

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10200 5600 6470

GERONIMO FEDERAL

9 4
5400 6550

GERONIMO FEDERAL

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5500 5500

INCA FEDERAL

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5500 5500

INCA FEDERAL

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5500

JADE FEDERAL

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CONOCO FEDERAL

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5651

MOHAWK FEDERAL

4 1
6550

ZONE 7

St. Mary Land & Exploration Co.

East Shugart Delaware
NET SD. ZONE 7

8. Bedman

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18

SOUTH TAYLOR 13 FEDERAL BUFFALO FEDERAL

5547 6519

SOUTH TAYLOR 13 FEDERAL CONOCO FEDERAL BUFFALO FEDERAL
5450 5448 5500 6500

ARCO FEDERAL 5 4450
GANDHI FEDERAL 1 10000

ARCO FEDERAL 2 4500

GERONIMO FEDERAL 5 10200 5600 6470

INCA FEDERAL 1 5500 3 5500

ARCO FEDERAL 3 4500

BLACKHAWK FEDERAL 5 4500

BLACKHAWK FEDERAL 3 4500

BLACKHAWK FEDERAL 7 4500

GERONIMO FED 1 6400

GERONIMO FEDERAL 10 5500 8 5500

CONOCO FEDERAL 3 5651 1 6550

BLACKHAWK FEDERAL 4 4500

GERONIMO FEDERAL 11 5500

INCA FEDERAL 1 5500

ZONE 8

St. Mary Land & Exploration Co.

East Shugart Delaware
NET SD. ZONE 8

B. Beckman

9/2/99

13

18

SOUTH TAYLOR 13 FEDERAL BUFFALO FEDERAL

22 4
5547 6519

SOUTH TAYLOR 13 FEDERAL CONOCO FEDERAL BUFFALO FEDERAL
3 2 16 2
5450 5448 5500 6500

ARCO FEDERAL 5
4450
GANDHI FEDERAL 1
10000

ARCO FEDERAL 2
4500

ARCO FEDERAL 3
4500

BLACKHAWK FEDERAL 5
4500

BLACKHAWK FEDERAL 3
4500

BLACKHAWK FEDERAL 4
4500

BLACKHAWK FEDERAL 7
4500

GERONIMO FED 10
6400

GERONIMO FEDERAL 5 12 16 3
10200 5600 6470

GERONIMO FEDERAL 9 4
5400 6550

GERONIMO FEDERAL 10 8
5500 5500

GERONIMO FEDERAL 11
5500

INCA FEDERAL 19 3
5500 5500

INCA FEDERAL 19 2
5500 5500

CONOCO FEDERAL 13
5651

MOHAWK FEDERAL 10 1
6550

INCA FEDERAL 1
5500

ZONE 9

St. Mary Land & Exploration Co.

East Shugart Delaware
NET SD. ZONE 9

B. Beckman

8/2/99

13

18

SOUTH TAYLOR 13 FEDERAL BUFFALO FEDERAL

4
5547

861
6519

SOUTH TAYLOR 13 FEDERAL CONOCO FEDERAL BUFFALO FEDERAL

3
5450

2
5448

861
5500

862
6500

ARCO FEDERAL

5
4450

GANDHI FEDERAL

1
10000

ARCO FEDERAL

2
4500

GERONIMO FEDERAL

5
10200

57
5600

12
6470

9
5400

8
6550

GERONIMO PED

59
6400

10
5500

8
5500

GERONIMO FEDERAL

GERONIMO FEDERAL

11
5500

INCA FEDERAL

88
5500

INCA FEDERAL

46
5500

CONOCO FEDERAL

81
5651

MOHAWK FEDERAL

81
6550

INCA FEDERAL

3
5500

JADE FEDERAL

83
5500

JADE FEDERAL

83
5500

CONOCO FEDERAL

81
5651

MOHAWK FEDERAL

81
6550

BLACKHAWK FEDERAL

7
4500

BLACKHAWK FEDERAL

3
4500

BLACKHAWK FEDERAL

4
4500

ZONE 10

INCA FEDERAL

1
5500

St. Mary Land & Exploration Co.

East Shugart Delaware
NET SD. ZONE 10

B. Bachman

8/2/99

13

B

18

SOUTH TAYLOR 13 FEDERAL

● 4
5547

BUFFALO FEDERAL

● 1
6519

SOUTH TAYLOR 13 FEDERAL

● 3
5450● 1
5410● 2
5448

CONOCO FEDERAL

● 2
5500 4500

BUFFALO FEDERAL

● 2
6500

GERONIMO FED

● 5
10200 5600● 6
6470 4450

INCA FEDERAL

● 4
5500 4500

INCA FEDERAL

● 3
5500

ARCO FEDERAL

● 2
4500

GERONIMO FEDERAL

● 9
5400● 7
4500 6550

INCA FEDERAL

● 2
5500

JADE FEDERAL

● 2
5500 4525

GERONIMO FED

● 1
6400

MOHAWK FEDERAL

○ 2
4500

KEOHANE FEDERAL

● 2
4500

GERONIMO FEDERAL

● 10
5500○ 8
5500

○ 4

ORION FEDERAL

● 3
4500

CONOCO FEDERAL

● 3
5650

MOHAWK FEDERAL

● 1
6550

GERONIMO FEDERAL

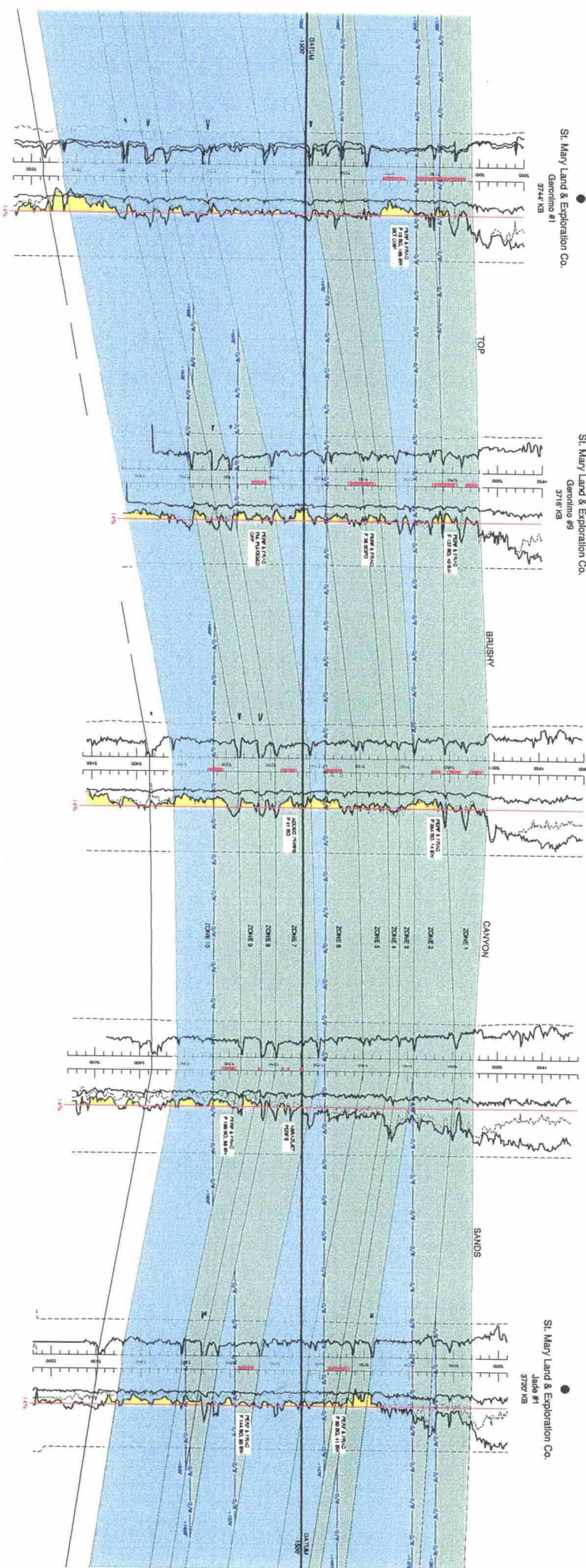
● 11
5500

INCA FEDERAL

○ 1
5500

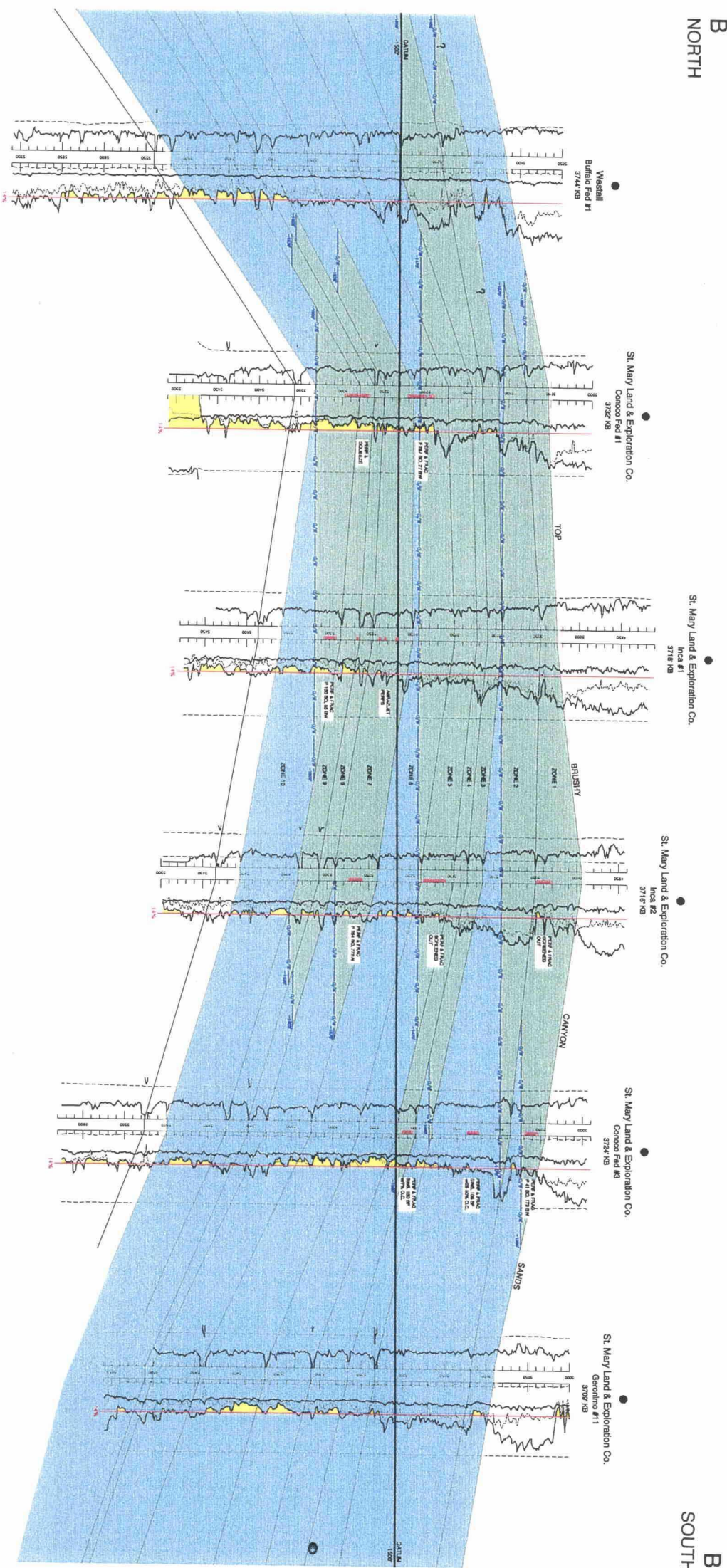
20

A
WEST



A'
EAST

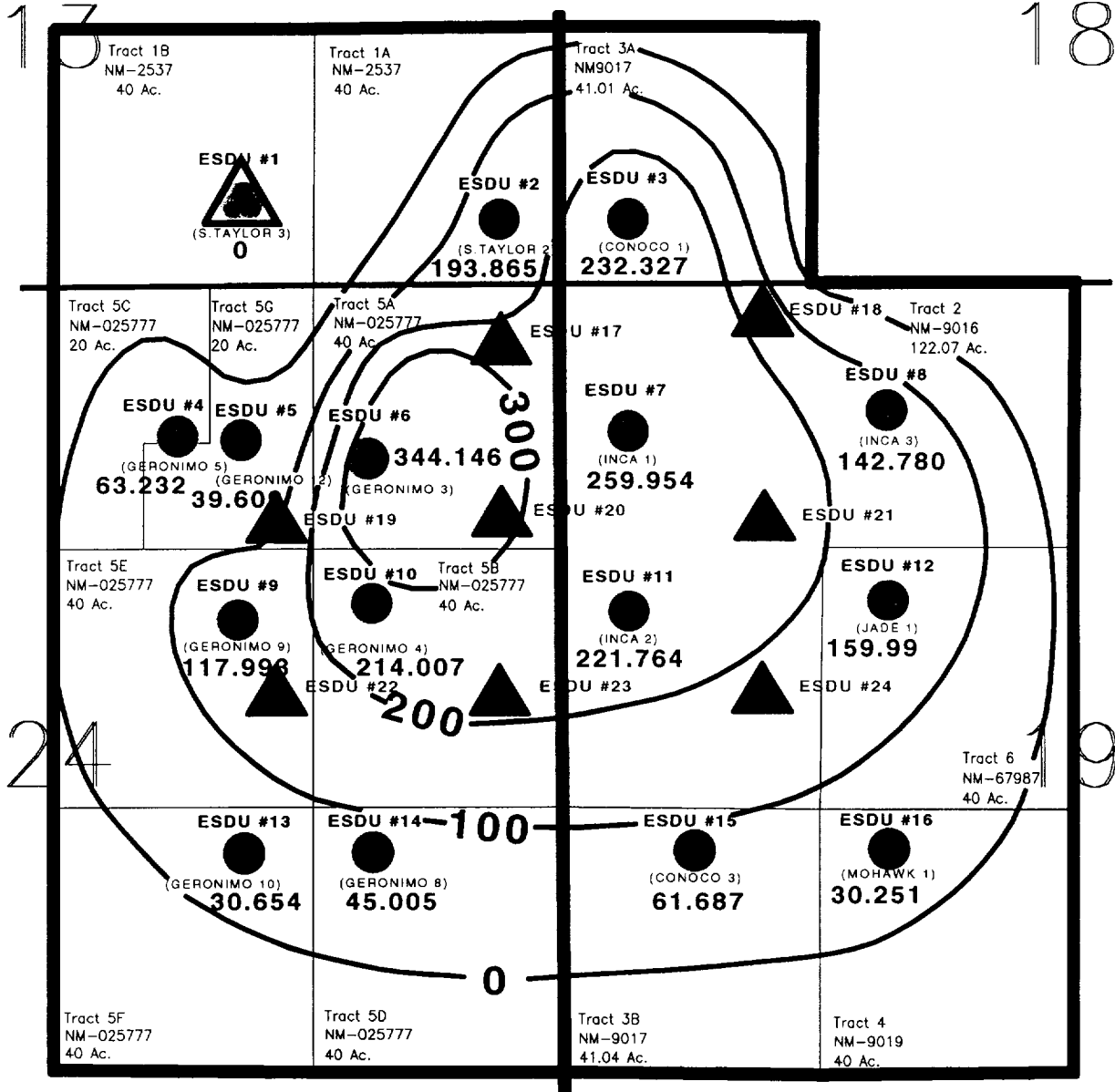
B
NORTH



B'
SOUTH

R 31 E

R 32 E



T
18
S

ST. Mary Land & Exploration Co.

EAST SHUGART DELAWARE UNIT
PROPOSED WATERFLOOD
Cum Prod. (STBO)

C.I. = 100 MBO

Scale 1 : 3000

LEGEND

Proposed Well #
(Former Well Name)



Delaware Producer

Proposed Conversion

Proposed Injection Well

1000000
100000
10000
1000

100000
10000
1000

WTR-BPD
GAS-MPD
OIL-BPD

10000
1000
10

1000
100

EAST SHUGART DELAWARE
PDP (RL) : PNP, PUD (BP99)

OIL-BPD
Ref = 02/99
Cum = 2177.227

GAS-MPD
Ref = 02/99
Cum = 4937.200

WTR-BPD
Ref = 02/99
Cum = 1839.910

Workover & Waterflood Reserves = 3713 MBO

Cumulative Primary
Oil @ 2/99 = 2205 MBO

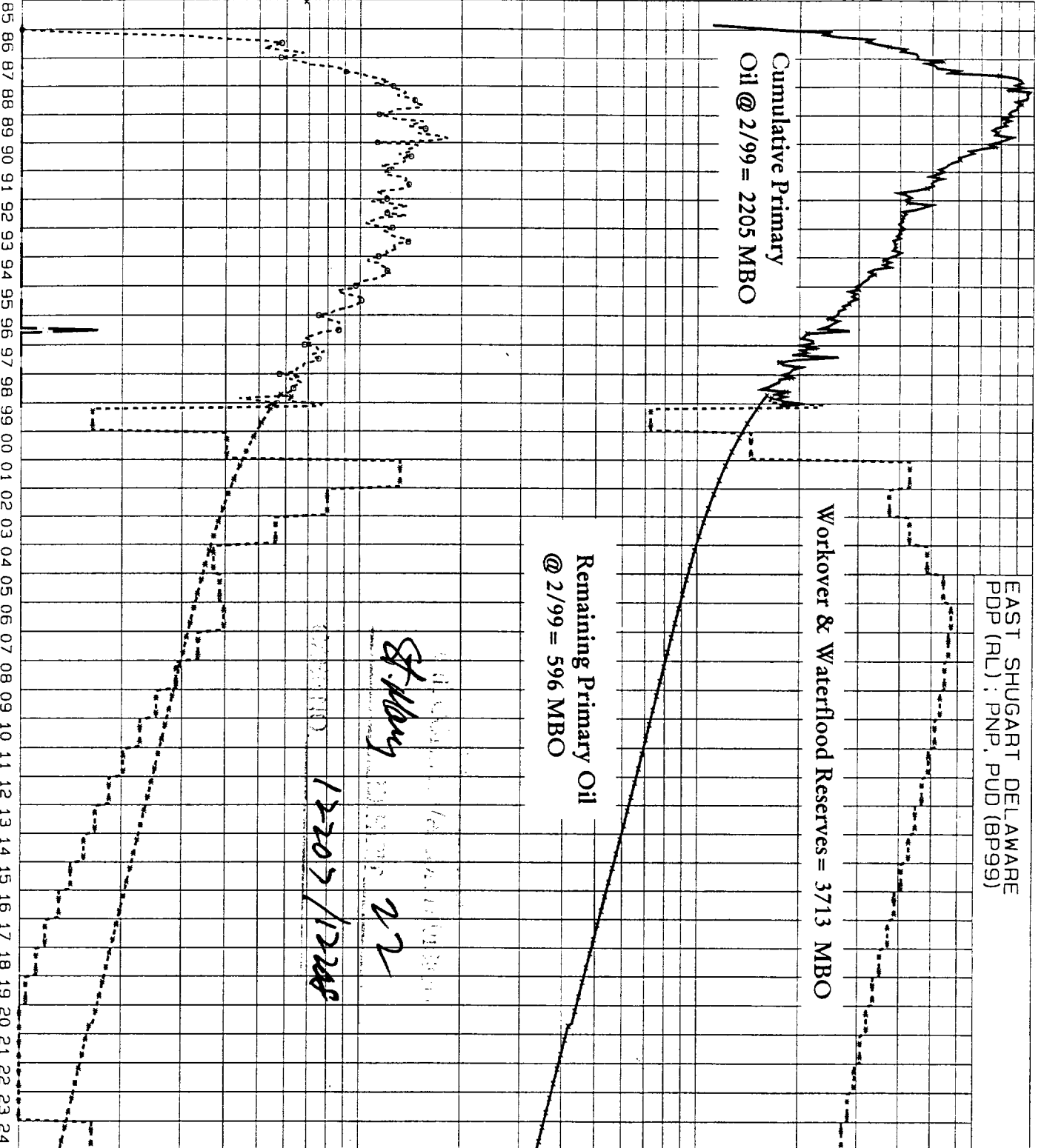
Remaining Primary Oil
@ 2/99 = 596 MBO

St. Mary

22

12207/12208

DATE



OIL-BPD
Ref = 02/99
Cum = 2177.227

GAS-MPD
Ref = 02/99
Cum = 4937.200

WTR-BPD
Ref = 02/99
Cum = 1839.910

OIL-BPD
Ref = 02/99
Cum = 2177.227

GAS-MPD
Ref = 02/99
Cum = 4937.200

WTR-BPD
Ref = 02/99
Cum = 1839.910

OIL-BPD
Ref = 02/99
Cum = 2177.227

GAS-MPD
Ref = 02/99
Cum = 4937.200

WTR-BPD
Ref = 02/99
Cum = 1839.910

SHUGRES2

EAST SHUGART DELAWARE UNIT RESERVES TABLE

	<u>RESERVES</u>	<u>% OF OOIP</u>
CUMULATIVE PRODUCTION @ 2/99	2205 MBO 4934 MMCF 2112 MBW	7.0
REMAINING PRIMARY RESERVES (PDP)	596 MBO 2195 MMCF	1.9
INCREMENTAL W/O RESERVES (PDNP)	822 MBO 3695 MMCF	2.6
TOTAL PRIMARY RESERVES	3623 MBO 10824 MMCF	11.5
INCREMENTAL WATERFLOOD RESERVES (PUD)	2891 MBO -2495 MMCF	9.1
TOTAL REMAINING RESERVES PRIMARY + W/O + WATERFLOOD	4309 MBO 3395 MMCF	13.6
ULTIMATE RECOVERY	6514 MBO 8329 MMCF	20.6

OOIP = 31645 MBO

S/P RATIO = $2891/3623 = .80$

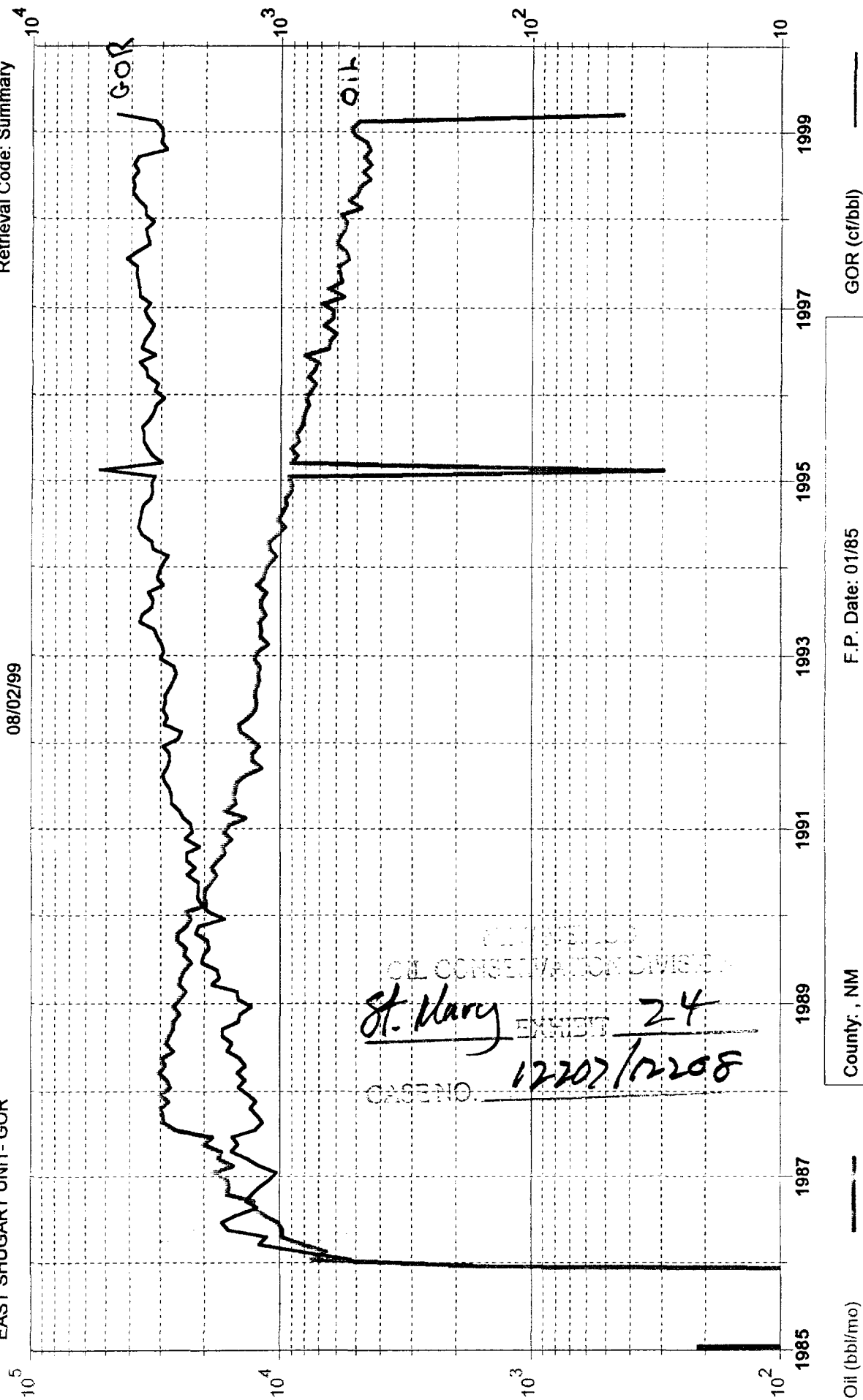
CALCULATED BY: J. D. HICKS
J. Mary EXHIBIT 23
 CASE NO. 12207/12208

Dwights

EAST SHUGART UNIT- GOR

08/02/99

Retrieval Code: Summary



ST. MARY
CASE NO. 12207/12208
24

County: NM	F.P. Date: 01/85
Field: SHUGART EAST (DELAWARE) DL	Oil Cum: 2180 mbbl
Reservoir: DELAWARE	Gas Cum: 4937 mmcf
Operator:	Location: 19L 18S 32E

SHI GPROP/WELL

EAST SHUGART DELAWARE UNIT
PROPOSED WELL NAMES

OPERATOR	CURRENT WELL NAME	PROPOSED WELL NAME	API #	S-T-R	LOCATION	CURRENT STATUS	PROPOSED STATUS
ST. MARY	GERONIMO #3	ESDU #6	30-15-25385	24-T18S-R31E	890' FNL 990' FEL	PROD. OIL	PROD. OIL
ST. MARY	GERONIMO #4	ESDU #10	30-15-25457	24-T18S-R31E	1650' FNL 990' FEL	PROD. OIL	PROD. OIL
ST. MARY	GERONIMO #5	ESDU #4	30-15-25546	24-T18S-R31E	765' FNL 1980' FEL	PROD. OIL	PROD. OIL
ST. MARY	GERONIMO #8	ESDU #14	30-15-25652	24-T18S-R31E	2310' FSL 990' FEL	PROD. OIL	PROD. OIL
ST. MARY	GERONIMO #9	ESDU #9	30-15-25723	24-T18S-R31E	1730' FNL 1650' FEL	PROD. OIL	PROD. OIL
ST. MARY	GERONIMO #10	ESDU #13	30-15-25735	24-T18S-R31E	2310' FSL 1650' FEL	PROD. OIL	PROD. OIL
ST. MARY	GERONIMO #12	ESDU #5	30-15-26022	24-T18S-R31E	990' FNL 1650' FEL	PROD. OIL	PROD. OIL
HEYCO	SO. TAYLOR 13 #2	ESDU #2	30-15-25847	13-T18S-R31E	330' FSL 330' FEL	PROD. OIL	PROD. OIL
HEYCO	SO. TAYLOR 13 #3	ESDU #1	30-15-25741	13-T18S-R31E	430' FSL 1650' FEL	PROD. OIL	INJECTOR
ST. MARY	CONOCO #1	ESDU #3	30-25-29694	18-T18S-R32E	330' FSL 330' FWL	PROD. OIL	PROD. OIL
ST. MARY	JADE #1	ESDU #12	30-25-29939	19-T18S-R32E	1650' FNL 1650' FWL	PROD. OIL	PROD. OIL
ST. MARY	INCA #1	ESDU #7	30-25-29887	19-T18S-R32E	760' FNL 440' FWL	PROD. OIL	PROD. OIL
ST. MARY	INCA #2	ESDU #11	30-25-29940	19-T18S-R32E	1700' FNL 330' FWL	PROD. OIL	PROD. OIL
ST. MARY	INCA #3	ESDU #8	30-25-29978	19-T18S-R32E	660' FNL 1650' FWL	PROD. OIL	PROD. OIL
ST. MARY	CONOCO #3	ESDU #15	30-25-30187	19-T18S-R32E	2310' FSL 660' FWL	PROD. OIL	PROD. OIL
ST. MARY	MOHAWK #1	ESDU #16	30-25-30111	19-T18S-R32E	2310' FSL 1650' FWL	PROD. OIL	PROD. OIL
ST. MARY	ESDU #17	ESDU #17	NA	24-T18S-R31E	248' FNL 302' FEL	NOT DRILLED	INJECTOR
ST. MARY	ESDU #18	ESDU #18	NA	19-T18S-R32E	190' FNL 1045' FWL	NOT DRILLED	INJECTOR
ST. MARY	ESDU #19	ESDU #19	NA	24-T18S-R31E	1288' FNL 1361' FEL	NOT DRILLED	INJECTOR
ST. MARY	ESDU #20	ESDU #20	NA	24-T18S-R31E	1250' FNL 303' FEL	NOT DRILLED	INJECTOR
ST. MARY	ESDU #21	ESDU #21	NA	19-T18S-R32E	1193' FNL 1018' FWL	NOT DRILLED	INJECTOR
ST. MARY	ESDU #22	ESDU #22	NA	24-T18S-R31E	2330' FNL 1320' FEL	NOT DRILLED	INJECTOR
ST. MARY	ESDU #23	ESDU #23	NA	24-T18S-R31E	2322' FNL 248' FEL	NOT DRILLED	INJECTOR
ST. MARY	ESDU #24	ESDU #24	NA	19-T18S-R32E	2322' FNL 1073' FWL	NOT DRILLED	INJECTOR

ST. MARY
EXHIBIT 25
CASE NO. 12207/2208

WATER
WELLS
INJ-BPD
GOR
OIL-BPD

100000
10000
100000000

10000
1000
1000000

1000
100
100000

100
10
10000

10
1
1000

1
1
100
100
100

PARKWAY DELAWARE UNIT TOTAL

OIL-BPD

GOR

WATER

WELLS

INJ-BPD

PERMITS

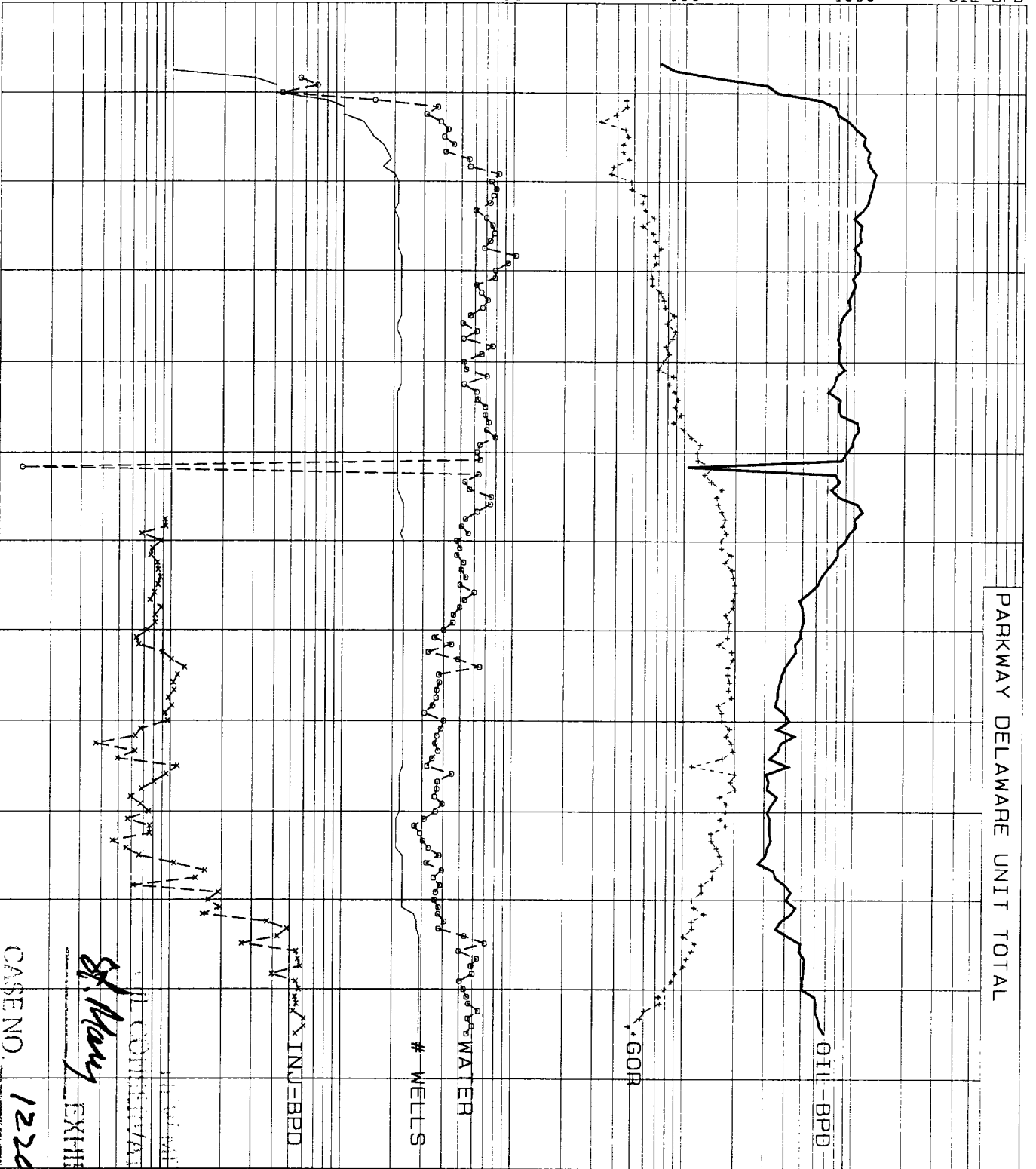
REGISTRATION DIVISION

St Mary EXHIBIT 26

CASE NO. 12207/12208

DATE

88 89 90 91 92 93 94 95 96 97 98 99 00



shugcap

EAST SHUGART DELAWARE UNIT CAPITAL

	<u>M\$</u>
Drill 8 wells @ 400 M\$ ea.	3200.0
Facilities	420.0
Conversion	40.0
Add pay & frac 16 wells @ 124.3 M\$ ea.	<u>1988.8</u>
TOTAL	5648.8

NEW MEXICO
OIL CONSERVATION DIVISION
St. Mary EXHIBIT 27
CASE NO. 12207/12208

shugacon

EAST SHUGART DELAWARE UNIT ECONOMICS TABLE

	<u>CURRENT OPERATIONS</u>	<u>INCREMENTAL PROPOSED UNIT</u>
RESERVES	596 MBO 2195 MMCF	3713 MBO 1200 MMCF
CAPITAL	0 M\$	5649 M\$
UNDISCOUNTED INCOME	5,852 M\$	50,154 M\$
PWP @ 10%	3086 M\$	14,506 M\$

PRICE SCENARIO

<u>YEAR</u>	<u>OIL PRICE \$/BBL</u>	<u>GAS PRICE \$/MMCF</u>
1999	15.87	\$2.41
2000	15.87	\$2.41
2001	15.97	\$2.42
	Esc 4.2 % Thereafter	Esc 4.0 % Thereafter

NEW MEXICO
OIL CONSERVATION DIVISION
St. Mary EXHIBIT **28**
CASE NO. 12207/12208

EAST SHUGART DELAWARE

WATERFLOOD UNIT

OCD FORM C-108

OPERATOR

ST. MARY LAND AND EXPLORATION

BEFORE EXAMINER CATANACH	
OIL CONSERVATION DIVISION	
EXHIBIT NO.	29
CASE NO.	12207/12208

January 1999

Prepared by
LEE ENGINEERING
Midland, Texas

APPLICATION FOR AUTHORIZATION TO INJECT

- I. PURPOSE: ☒ Secondary Recovery ☐ Pressure Maintenance ☐ Disposal ☐ Storage
Application qualifies for administrative approval? ☐ Yes ☒ No
- II. OPERATOR: St. Mary Land & Exploration Company
ADDRESS: 1776 Lincoln St., Ste. 1100, Denver Co. 80203
CONTACT PARTY: Mr. Bob Bachman PHONE: (303)-863-4327
Mr. Robert Lee (915) -682-1251
- III. WELL DATA: Complete the data required on the reverse side of this form for each well processed for injection.
Additional sheets may be attached, if necessary.
- IV. Is this an expansion of an existing project: ☐ Yes ☒ No
If yes, give the Division order number authorizing the project _____
- V. Attach a map that identifies all wells and leases within two miles of any proposed injection well within a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.
- VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.
- VII. Attach data on the proposed operation, including:
1. Proposed average and maximum daily rate and volume of fluids to be injected;
 2. Whether the system is open or closed;
 3. Proposed average and maximum injection pressure;
 4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
 5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).
- *VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.
- IX. Describe the proposed stimulation program, if any.
- *X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted.)
- *XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.
- XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source drinking water.
- XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.
- XIV. Certifications: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.
- NAME: Robert Lee TITLE: Consulting Engineer
SIGNATURE: Robert Lee DATE: January 25, 1999

* If the information required under Section VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal. _____

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

- (1) Lease name; Well No.; Location by Section, Township, and Range; and footage location within the section.
- (2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.
- (3) A description of the tubing to be used including its size, lining material, and setting depth.
- (4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

- (1) The name of the injection formation and, if applicable, the field or pool name.
- (2) The injection interval and whether it is perforated or open-hole.
- (3) State if the well was drilled for injection or, if not, the original purpose of the well.
- (4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.
- (5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

- (1) The name, address, phone number, and contact party for the applicant;
- (2) The intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;
- (3) The formation name and depth with expected maximum injection rates and pressures; and
- (4) A notation that interested parties must file objection or requests for hearing with the Oil Conservation Division, P.O. Box 2088, Santa Fe, New Mexico 87504-2088 within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

SOUTH TAYLOR 13 #3
CONVERT TO INJECTION
NMOCD Form C-108 Section III

III. Data on injection well(s)

A. Injection well information (see attached schematic)

Tabular data

1. Lease: South Taylor 13

Well No: 3 (To be renamed ESDU #1)

Location: 430' FSL & 1650' FEL, Sec 13 T-18-S
R-31-E, Eddy County, NM
2. Casing: 8 5/8", 24 #/ft, surface @ 366' in 12 1/4" hole ,
cemented w/230 sx. TOC @ surf.

5 1/2", 15.5 #/ft, production casing @ 5450' in
7 7/8" hole, cemented w/ 1950 sx. TOC @ surf.
3. Injection tubing: + or - 156 jts 2 3/8", 4.7 lb/ft,
J-55 Duoline PVC lined tubing.:
4. Packer: An internally plastic coated Baker-Loc Set
injection packer set @ +/- 5000'.

B. Other well information

1. Injection formation: Delaware

Field: East Shugart
2. Existing perforations: 4848-70 & 4330-4428 (These will be
squeezed off with cement.)

Proposed perfs: 5090-5420 w/ 2 JSPF
3. This well was drilled as a Delaware oil well.
4. There are no other perfed or tested intervals in
this well.
5. Within the area of this well the Grayburg is productive at a
depth of 4300'. The Bone Spring is productive at a depth of
7800'.

ST. MARY LAND & EXPLORATION CURRENT

WELL: SOUTH TAYLOR 13 #3
FIELD: EAST SHUGART
INTERVAL: DELAWARE

LOCATION:
430' FSL & 1650' FEL
SECTION 13
TWP-18-S, RNG-31-E
EDDY COUNTY, NM

SURFACE CASING:
RAN 24# 8 5/8" J-55 CSG, SET @ 366' CMT W/230 SXS
TOC @ SURFACE.

PRESENT COMPLETION INTERVAL:

DELAWARE - 4848-70'
GRAYBURG - 4330-4428'

PRODUCTION CASING:
RAN 15.5# 5 1/2" J-55 CSG, SET @ 5450'.
CMT W/1950 SXS, TOC @ SURFACE.

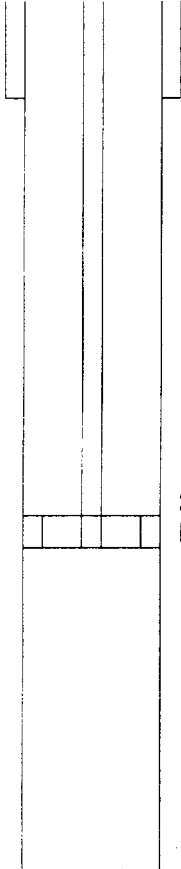
CIBP @ 4781'

TD: 5450'
PBTD: 4781'

ST. MARY LAND & EXPLORATION PROPOSED

WELL: ESDU #1 (FORMERLY SOUTH TAYLOR 13 #3)
FIELD: EAST SHUGART
INTERVAL: DELAWARE

LOCATION:
430' FSL & 1650' FEL
SECTION 13
TWP-18-S, RNG-31-E
EDDY COUNTY, NM



SURFACE CASING:

RAN 24# 8 5/8" J-55 CSG, SET @ 366' CMT W/230 SXS
TOC @ SURFACE.

PROPOSED COMPLETION INTERVAL:

SQUEEZE OFF GRAYBURG AND CHERRY CANYON
PERFS WITH CEMENT.

PERFORATE THE BRUSHY CANYON AT
5090-5420'

2 3/8" PLASTIC COATED TUBING SET @ 5000' WITH A
PLASTIC COATED BAKER LOC-SET PACKER

PRODUCTION CASING:

RAN 15.5# J-55 CSG, SET @ 5450'.
CMT W/1950 SXS, TOC @ SURFACE.

TD: 5450'
PBTD: 4781'

ESDU #17
DRILL AS INJECTOR
NMOCD Form C-108 Section III

III. Data on injection well(s)

A. Injection well information (see attached schematic)

Tabular data

1. Lease: East Shugart Delaware Unit (ESDU)

Well No: 17

Location: 248' FNL & 302' FEL, Sec 24 T-18-S
R-31-E, Eddy County, NM
2. Casing: 8 5/8", 24 #/ft, surface @ 350' in 12 1/4" hole.
TOC @ surf.

5 1/2", 15.5 #/ft, production casing @ 5500' in
7 7/8" hole, TOC @ surf.
3. Injection tubing: + or - 156 jts 2 3/8", 4.7 lb/ft,
J-55 Duoline PVC lined tubing.
4. Packer: An internally plastic coated Baker Loc-set
injection packer set @ +/- 5000'.

B. Other well information

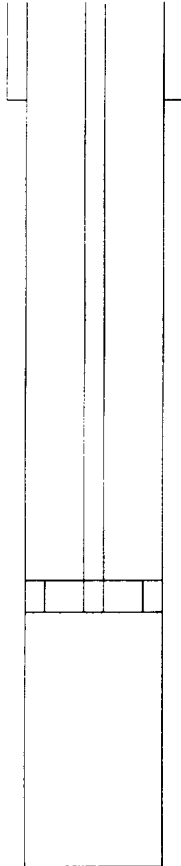
1. Injection formation: Delaware

Field: East Shugart
2. Proposed perfs: 5030'-5310' w/ 2 JSPF
3. This well will be drilled as a Delaware injection well.
4. No other intervals will be perfed or tested in this well.
5. Within the area of this well the Grayburg is productive at a
depth of 4300'. The Bone Spring is productive at a depth of
7800'.

**ST. MARY LAND & EXPLORATION
PROPOSED
(TO BE DRILLED)**

WELL: ESDU #17
FIELD: EAST SHUGART
INTERVAL: DELAWARE

LOCATION:
248' FNL & 302' FEL
SECTION 24
TWP-18-S, RNG-31-E
EDDY COUNTY, NM



SURFACE CASING:
24#, J-55, 8 5/8" CSG, SET @ 350'
TOC @ SURFACE.

PROPOSED COMPLETION INTERVAL:

DELAWARE - 5030' - 5310'

2 3/8" DUOLINE PVC LINED TUBING SET @ 5000' WITH A
PLASTIC COATED BAKER LOC-SET PACKER

PRODUCTION CASING:
15.5#, J-55, 5 1/2" CSG, SET @ 5500'.
TOC @ SURFACE.

TD= 5500'

ESDU #18
DRILL AS INJECTOR
NMOCD Form C-108 Section III

III. Data on injection well(s)

A. Injection well information (see attached schematic)

Tabular data

1. Lease: East Shugart Delaware Unit (ESDU)

Well No: 18

Location: 190' FNL & 1045' FWL, Sec 19 T-18-S
R-32-E, Lea County, NM
2. Casing: 8 5/8", 24 #/ft, surface @ 350' in 12 1/4" hole
TOC @ surf.

5 1/2", 15.5 #/ft, production casing @ 5500' in
7 7/8" hole, TOC @ surf.
3. Injection tubing: + or - 156 jts 2 3/8", 4.7 lb/ft,
J-55 Duoline PVC lined tubing.:
4. Packer: An internally plastic coated Baker Loc-set
injection packer set @ +/- 5000'.

B. Other well information

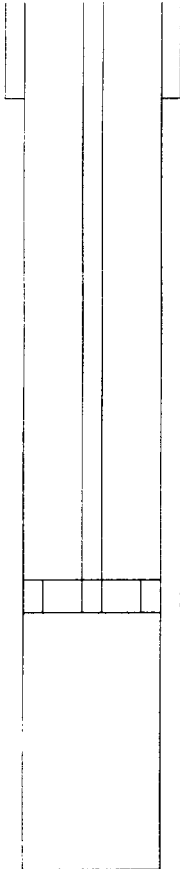
1. Injection formation: Delaware

Field: East Shugart
2. Proposed perfs: 5065'- 5320' w/ 2 JSPF
3. This well will be drilled as a Delaware injection well.
4. No other intervals will be perfed or tested in this well.
5. Within the area of this well the Grayburg is productive at a
depth of 4300'. The Bone Spring is productive at a depth of
7800'.

**ST. MARY LAND & EXPLORATION
PROPOSED
(TO BE DRILLED)**

WELL: ESDU #18
FIELD: EAST SHUGART
INTERVAL: DELAWARE

LOCATION:
190' FNL & 1045' FWL
SECTION 19
TWP-18-S, RNG-32-E
LEA COUNTY, NM



SURFACE CASING:
24#, J-55, 8 5/8" CSG, SET @ 350'
TOC @ SURFACE.

PROPOSED COMPLETION INTERVAL:

DELAWARE - 5065' - 5320'

2 3/8" DUOLINE PVC LINED TUBING SET @ 5000' WITH A
PLASTIC COATED BAKER LOC-SET PACKER

PRODUCTION CASING:
15.5#, J-55, 5 1/2" CSG, SET @ 5500'.
TOC @ SURFACE.

TD = 5500'

ESDU #19
DRILL AS INJECTOR
NMOCD Form C-108 Section III

III. Data on injection well(s)

A. Injection well information (see attached schematic)

Tabular data

1. Lease: East Shugart Delaware Unit (ESDU)

Well No: 19

Location: 1288' FNL & 1361' FEL, Sec 24 T-18-S
R-31-E, Eddy County, NM
2. Casing: 8 5/8", 24 #/ft, surface @ 350' in 12 1/4" hole
TOC @ surf.

5 1/2", 15.5 #/ft, production casing @ 5550' in
7 7/8" hole, TOC @ surf.
3. Injection tubing: + or - 156 jts 2 3/8", 4.7 lb/ft,
J-55 Duoline PVC lined tubing.:
4. Packer: An internally plastic coated Baker Loc-set
injection packer set @ +/- 5000'.

B. Other well information

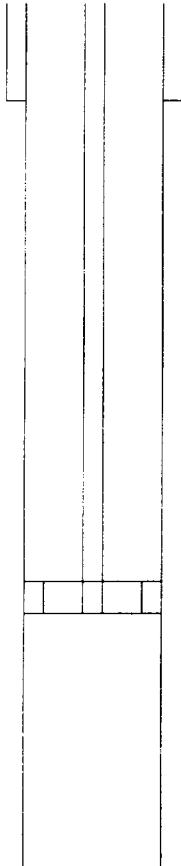
1. Injection formation: Delaware

Field: East Shugart
2. Proposed perfs: 5020' - 5310' w/ 2 JSPF
3. This well will be drilled as a Delaware injection well.
4. No other intervals will be perfed or tested in this well.
5. Within the area of this well the Grayburg is productive at a
depth of 4300'. The Bone Spring is productive at a depth of
7800'.

**ST. MARY LAND & EXPLORATION
PROPOSED
(TO BE DRILLED)**

WELL: ESDU #19
FIELD: EAST SHUGART
INTERVAL: DELAWARE

LOCATION:
1288' FNL & 1361' FEL
SECTION 24
TWP-18-S, RNG-31-E
EDDY COUNTY, NM



SURFACE CASING:
24#, J-55, 8 5/8" CSG, SET @ 350'
TOC @ SURFACE.

PROPOSED COMPLETION INTERVAL:

DELAWARE-- 5020' - 5310'

2 3/8" DUOLINE PVC LINED TUBING SET @ 5000' WITH A
PLASTIC COATED BAKER LOC--SET PACKER

PRODUCTION CASING:
15.5#, J-55, 5 1/2" CSG, SET @ 5500'.
TOC @ SURFACE.

TD= 5500'

ESDU #20
DRILL AS INJECTOR
NMOCD Form C-108 Section III

III. Data on injection well(s)

A. Injection well information (see attached schematic)

Tabular data

1. Lease: East Shugart Delaware Unit (ESDU)

Well No: 20

Location: 1250' FNL & 303' FEL, Sec 24 T-18-S
R-31-E, Eddy County, NM
2. Casing: 8 5/8", 24 #/ft, surface @ 350' in 12 1/4" hole
TOC @ surf.

5 1/2", 15.5 #/ft, production casing @ 5550' in
7 7/8" hole, TOC @ surf.
3. Injection tubing: + or - 156 jts 2 3/8", 4.7 lb/ft,
J-55 Duoline PVC lined tubing.:
4. Packer: An internally plastic coated Model R Lockset
injection packer set @ +/- 5000'.

B. Other well information

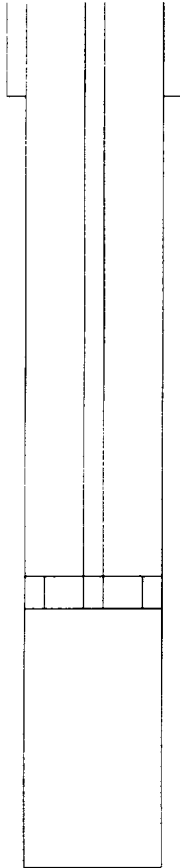
1. Injection formation: Delaware

Field: East Shugart
2. Proposed perfs: 5020'- 5310' w/ 2 JSPF
3. This well will be drilled as a Delaware injection well.
4. No other intervals will be perfed or tested in this well.
5. Within the area of this well the Grayburg is productive at a
depth of 4300'. The Bone Spring is productive at a depth of
7800'.

**ST. MARY LAND & EXPLORATION
PROPOSED
(TO BE DRILLED)**

WELL: ESDU #20
FIELD: EAST SHUGART
INTERVAL: DELAWARE

LOCATION:
1250' FNL & 303' FEL
SECTION 24
TWP-18-S, RNG-31-E
EDDY COUNTY, NM



SURFACE CASING:
24#, J-55, 8 5/8" CSG, SET @ 350'
TOC @ SURFACE.

PROPOSED COMPLETION INTERVAL:
DELAWARE - 5020' - 5310'

2 3/8" DUOLINE PVC LINED TUBING SET @ 5000' WITH A
PLASTIC COATED BAKER LOC-SET PACKER

PRODUCTION CASING:
15.5#, J-55, 5 1/2" CSG, SET @ 5500'.
TOC @ SURFACE.

TD= 5500'

ESDU #21
DRILL AS INJECTOR
NMOCD Form C-108 Section III

III. Data on injection well(s)

A. Injection well information (see attached schematic)

Tabular data

1. Lease: East Shugart Delaware Unit (ESDU)

Well No: 21

Location: 1193' FNL & 1018' FWL, Sec 19 T-18-S
R-32-E, Lea County, NM
2. Casing: 8 5/8", 24 #/ft, surface @ 350' in 12 1/4" hole
TOC @ surf.

5 1/2", 15.5 #/ft, production casing @ 5550' in
7 7/8" hole, TOC @ surf.
3. Injection tubing: + or - 156 jts 2 3/8", 4.7 lb/ft,
J-55 Duoline PVC lined tubing.
4. Packer: An internally plastic coated Baker Loc-set
injection packer set @ +/- 5000'.

B. Other well information

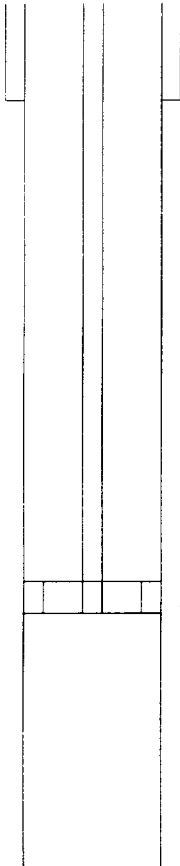
1. Injection formation: Delaware

Field: East Shugart
2. Proposed perfs: 5015'- 5330' w/ 2 JSPF
3. This well will be drilled as a Delaware injection well.
4. No other intervals will be perfed or tested in this well.
5. Within the area of this well the Grayburg is productive at a
depth of 4300'. The Bone Spring is productive at a depth of
7800'.

**ST. MARY LAND & EXPLORATION
PROPOSED
(TO BE DRILLED)**

WELL: ESDU #21
FIELD: EAST SHUGART
INTERVAL: DELAWARE

LOCATION:
1193' FNL & 1018' FWL
SECTION 19
TWP-18-S, RNG-32-E
LEA COUNTY, NM



SURFACE CASING:
24#, J-55, 8 5/8" CSG, SET @ 350'
TOC @ SURFACE.

PROPOSED COMPLETION INTERVAL:
DELAWARE - 5015' - 5330'

2 3/8" DUOLINE PVC LINED TUBING SET @ 5000' WITH A
PLASTIC COATED BAKER LOC-SET PACKER

PRODUCTION CASING:
15.5#, J-55, 5 1/2" CSG, SET @ 5500'.
TOC @ SURFACE.

TD= 5500'

ESDU #22
DRILL AS INJECTOR
NMOCD Form C-108 Section III

III. Data on injection well(s)

A. Injection well information (see attached schematic)

Tabular data

1. Lease: East Shugart Delaware Unit (ESDU)

Well No: 22

Location: 2330' FNL & 1320' FEL, Sec 24 T-18-S
R-31-E, Eddy County, NM
2. Casing: 8 5/8", 24 #/ft, surface @ 350' in 12 1/4" hole
TOC @ surf.

5 1/2", 15.5 #/ft, production casing @ 5550' in
7 7/8" hole, TOC @ surf.
3. Injection tubing: + or - 156 jts 2 3/8", 4.7 lb/ft,
J-55 Duoline PVC lined tubing.:
4. Packer: An internally plastic coated Baker Loc-set
injection packer set @ +/- 5000'.

B. Other well information

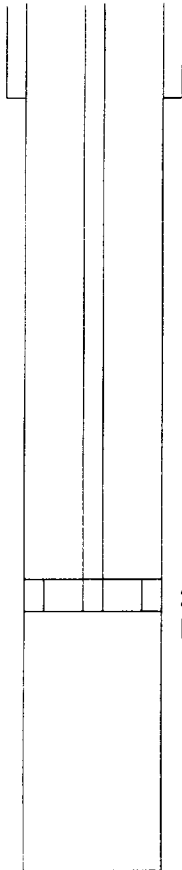
1. Injection formation: Delaware

Field: East Shugart
2. Proposed perfs: 5030' - 5340' w/ 2 JSPF
3. This well will be drilled as a Delaware injection well.
4. No other intervals will be perfed or tested in this well.
5. Within the area of this well the Grayburg is productive at a
depth of 4300'. The Bone Spring is productive at a depth of
7800'.

**ST. MARY LAND & EXPLORATION
PROPOSED
(TO BE DRILLED)**

WELL: ESDU #22
FIELD: EAST SHUGART
INTERVAL: DELAWARE

LOCATION:
2330' FNL & 1320' FEL
SECTION 24
TWP-18-S, RNG-31-E
EDDY COUNTY, NM



SURFACE CASING:
24#, J-55, 8 5/8" CSG, SET @ 350'
TOC @ SURFACE.

PROPOSED COMPLETION INTERVAL:

DELAWARE- 5030' - 5340'

2 3/8" DUOLINE PVC LINED TUBING SET @ 5000' WITH A
PLASTIC COATED BAKER LOC-SET PACKER

PRODUCTION CASING:
15.5#, J-55, 5 1/2" CSG, SET @ 5500'.
TOC @ SURFACE.

TD= 5500'

ESDU #23
DRILL AS INJECTOR
NMOCD Form C-108 Section III

III. Data on injection well(s)

A. Injection well information (see attached schematic)

Tabular data

1. Lease: East Shugart Delaware Unit (ESDU)

Well No: 23

Location: 2322' FNL & 248' FEL, Sec 24 T-18-S
R-31-E, Eddy County, NM
2. Casing: 8 5/8", 24 #/ft, surface @ 350' in 12 1/4" hole
TOC @ surf.

5 1/2", 15.5 #/ft, production casing @ 5500' in
7 7/8" hole, TOC @ surf.
3. Injection tubing: + or - 156 jts 2 3/8", 4.7 lb/ft,
J-55 Duoline PVC lined tubing.:
4. Packer: An internally plastic coated Baker Loc-set
injection packer set @ +/- 5000'.

B. Other well information

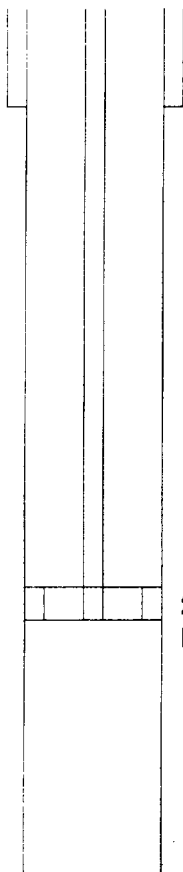
1. Injection formation: Delaware

Field: East Shugart
2. Proposed perfs: 5025' - 5345' w/ 2 JSPF
3. This well will be drilled as a Delaware injection well.
4. No other intervals will be perfed or tested in this well.
5. Within the area of this well the Grayburg is productive at a
depth of 4300'. The Bone Spring is productive at a depth of
7800'.

**ST. MARY LAND & EXPLORATION
PROPOSED
(TO BE DRILLED)**

WELL: ESDU #23
FIELD: EAST SHUGART
INTERVAL: DELAWARE

LOCATION:
2322' FNL & 248' FEL
SECTION 24
TWP-18-S, RNG-31-E
EDDY COUNTY, NM



SURFACE CASING:
24#, J-55, 8 5/8" CSG, SET @ 350'
TOC @ SURFACE.

PROPOSED COMPLETION INTERVAL:

DELAWARE - 5025' - 5345'

2 3/8" DUOLINE PVC LINED TUBING SET @ 5000' WITH A
PLASTIC COATED BAKER LOC-SET PACKER

PRODUCTION CASING:
15.5#, J-55, 5 1/2" CSG, SET @ 5500'.
TOC @ SURFACE.

TD= 5500'

ESDU #24
DRILL AS INJECTOR
NMOCD Form C-108 Section III

III. Data on injection well(s)

A. Injection well information (see attached schematic)

Tabular data

1. Lease: East Shugart Delaware Unit (ESDU)

Well No: 24

Location: 2322' FNL & 1073' FWL, Sec 19 T-18-S
R-32-E, Lea County, NM
2. Casing: 8 5/8", 24 #/ft, surface @ 350' in 12 1/4" hole
TOC @ surf.

5 1/2", 15.5 #/ft, production casing @ 5500' in
7 7/8" hole, TOC @ surf.
3. Injection tubing: + or - 156 jts 2 3/8", 4.7 lb/ft,
J-55 Duoline PVC lined tubing.:
4. Packer: An internally plastic coated Baker Loc-set
injection packer set @ +/- 5000'.

B. Other well information

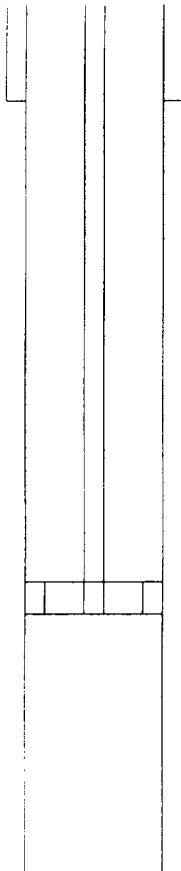
1. Injection formation: Delaware

Field: East Shugart
2. Proposed perfs: 5030' - 5360' w/ 2 JSPF
3. This well will be drilled as a Delaware injection well.
4. No other intervals will be perfed or tested in this well.
5. Within the area of this well the Grayburg is productive at a
depth of 4300'. The Bone Spring is productive at a depth of
7800'.

**ST. MARY LAND & EXPLORATION
PROPOSED
(TO BE DRILLED)**

WELL: ESDU #24
FIELD: EAST SHUGART
INTERVAL: DELAWARE

LOCATION:
2322' FNL & 1073' FWL
SECTION 19
TWP-18-S, RNG-32-E
LEA COUNTY, NM



SURFACE CASING:
24#, J-55, 8 5/8" CSG, SET @ 350'
TOC @ SURFACE.

PROPOSED COMPLETION INTERVAL:
DELAWARE - 5030' - 5360'

2 3/8" DUOLINE PVC LINED TUBING SET @ 5000' WITH A
PLASTIC COATED BAKER LOC-SET PACKER

PRODUCTION CASING:
15.5#, J-55, 5 1/2" CSG, SET @ 5500'.
TOC @ SURFACE.

TD= 5500'

OPERATOR	CURRENT WELL NAME	API #	S-T-R	LOCATION	Σ
ST. MARY	ARCO #1	30-15-25218	24-T18S-R31E	1830' FNL 660' FWL	)} 'D PD
ST. MARY	GERONIMO #1	30-15-24927	24-T18S-R31E	2310' FNL 2310' FEL	)} 'D PD
ST. MARY	GERONIMO #3	30-15-25385	24-T18S-R31E	890' FNL 990' FEL	)} 'D PD
ST. MARY	GERONIMO #4	30-15-25457	24-T18S-R31E	1650' FNL 990' FEL	)} 'D PD
ST. MARY	GERONIMO #5	30-15-25546	24-T18S-R31E	765' FNL 1980' FEL	)} 'D PD
ST. MARY	GERONIMO #8	30-15-25652	24-T18S-R31E	2310' FSL 990' FEL	)} 'D PD
ST. MARY	GERONIMO #9	30-15-25723	24-T18S-R31E	1730' FNL 1650' FEL	)} 'D PD
ST. MARY	GERONIMO #10	30-15-25735	24-T18S-R31E	2310' FSL 1650' FEL	)} 'D PD
ST. MARY	GERONIMO #11	30-15-25803	24-T18S-R31E	990' FSL 330' FEL	)} 'D PD
ST. MARY	GERONIMO #12	30-15-26022	24-T18S-R31E	990' FNL 1650' FEL	)} 'D PD
K. O BUTLER	GHANDI #1	30-15-26243	24-T18S-R31E	990' FNL 330' FWL	)} 'D PD
HEYCO	SO. TAYLOR 13 #1	30-15-25594	13-T18S-R31E	330' FSL 990' FEL	)} 'D PD 'D PD
HEYCO	SO. TAYLOR 13 #2	30-15-25847	13-T18S-R31E	330' FSL 330' FEL	)} 'D PD
HEYCO	SO. TAYLOR 13 #3	30-15-25741	13-T18S-R31E	430' FSL 1650' FEL	)} 'D PD 'D PD
HEYCO	SO. TAYLOR 13 #4	30-15-26150	13-T18S-R31E	1650' FSL 660' FEL	)} 'D PD
WESTALL	BUFFALO #1	30-25-29985	18-T18S-R32E	1650' FSL 330' FWL	)} 'D PD
WESTALL	BUFFALO #2	30-25-30013	18-T18S-R32E	330' FSL 1650' FWL	)} 'D PD
ST. MARY	CONOCO #1	30-25-29694	18-T18S-R32E	330' FSL 330' FWL	)} 'D PD
ST. MARY	JADE #1	30-25-29939	19-T18S-R32E	1650' FNL 1650' FWL	)} 'D PD
ST. MARY	INCA #1	30-25-29887	19-T18S-R32E	760' FNL 440' FWL	)} 'D PD
ST. MARY	INCA #2	30-25-29940	19-T18S-R32E	1700' FNL 330' FWL	)} 'D PD
ST. MARY	INCA #3	30-25-29978	19-T18S-R32E	660' FNL 1650' FWL	)} 'D PD
ST. MARY	CONOCO #3	30-25-30187	19-T18S-R32E	2310' FSL 660' FWL	)} 'D PD
ST. MARY	MOHAWK #1	30-25-30111	19-T18S-R32E	2310' FSL 1650' FWL	)} 'D PD

THE FOLLOWING WELLS ARE WITHIN THE AREA OF REVIEW BUT DID NOT PENETRATE THE DELAWARE.

OPERATOR	CURRENT WELL NAME	API #	S-T-R	LOCATION	STATUS	SPUD DATE	COMP. DATE	TD	PBTD
ST. MARY	ARCO #2	30-15-25624	24-T18S-R31E	950' FNL 2310' FWL	PROD	6/2/86	6/21/86	4500'	4487'
ST. MARY	GERONIMO #2	30-15-25244	24-T18S-R31E	950' FNL 2310' FEL	INJ.	4/3/86	4/26/85	4702'	4691'
ST. MARY	GERONIMO #6	30-15-25597	24-T18S-R31E	790' FNL 940' FEL	PROD	4/10/86	4/26/86	4450'	4407'
ST. MARY	GERONIMO #7	30-15-25598	24-T18S-R31E	1750' FNL 990' FEL	INJ	4/21/86	5/6/86	4500'	4489'
ST. MARY	JADE #2	30-25-30038	19-T18S-R32E	1650' FNL 1750' FWL	PROD	12/15/87	1/25/88	4525'	4320'
ST. MARY	INCA #4	30-25-30039	19-T18S-R32E	760' FNL 430' FWL	INJ	1/7/88	2/5/88	4500'	4244'
THUNDERBOL PETROLEUM	ORION #1	30-25-33140	19-T18S-R32E	2310' FSL 500' FWL	PROD	11/12/95	2/2/96	4500'	4454'
WESTALL	KEOHANE FED #2	30-15-25441	24-T18S-R31E	2310' FSL 2200' FEL	PROD	10/18/85	12/11/85	4500'	
WESTALL	KEOHANE FED #3	30-15-25814	24-T18S-R31E	2200' FSL 990' FEL	PROD	10/30/87	11/25/87	4500'	
ST. MARY	BLACKHAWK #1	30-15-25235	24-T18S-R31E	2310' FSL 1650' FWL	SHUT IN PROD	3/24/85	4/18/85	4527'	4485'
ST. MARY	BLACKHAWK #2	30-15-25360	24-T18S-R31E	2310 FNL 1980' FWL	SHUT IN PROD	8/4/85	9/5/85	4500'	4490'
ST. MARY	BLACKHAWK #7	30-15-26500	24-T18S-R31E	2630' FNL 2310' FWL	INJ	11/23/90	11/23/90	4500'	4455'
ST. MARY	CONOCO #2	30-25-29803	18-T18S-R32E	400' FSL 400' FWL	PROD	12/13/86	1/12/87	4500'	4487'
ST. MARY	KEOHANE FED #1	30-15-NA	24-T18S-R31E	330' FNL 2260' FEL	P & A	3/12/61	5/3/61	4232'	

NMOCD Form C-108 Sections VII thru XII

VII. Data on proposed operation.

1. Proposed average injection rate: 150 BWPD per well
Proposed maximum injection rate: 300 BWPD per well
2. The system will be a closed system.
3. Proposed average injection pressure: 700 PSI
Proposed maximum injection pressure: 1000 PSI
(This complies with the .2 psi/ft injection pressure limitation. If greater pressures are necessary in the future the appropriate step rate tests will be performed and submitted.)
4. The proposed injection fluid is produced water and is compatible with the reservoir fluids in the proposed injection horizon. This is shown on the attached compatibility analysis.
5. A chemical analysis of the formation water in the proposed injection horizon is attached.

VIII. The proposed injection interval is located in the Delaware Sand formation. The Shugart East Field is located within Sections 13 and 24, T-18-S, R-31-E, Eddy County and Sections 18 and 19 T-18-S, R-32-E, Lea County New Mexico. Production is from the lower Guadalupian (Permian) Brushy Canyon Formation of the Delaware Mountain Group.

The Brushy Canyon reservoirs of the Shugart East Field are combination stratigraphic-structural traps. Ten (10) discrete sand packages are draped over a structural high. A depositional model is a sand rich submarine fan/channel complex. The sands are sourced from the north and northeast.

The Shugart East structure is an asymmetrical high with about 75' of closure centered in the NE/4 Section 24, T-18-S, R-31-E. The closure is probably due to differential compaction of the sand thicks versus the surrounding shale interval. The productive interval has a gross thickness of 300 to 400' at a depth of 5000' to 5400'. Individual sand bodies vary in thickness from 10' to over 100'. Porosity in the producing intervals range from 14% to 20% with an average of 17%.

There are no fresh water zones within the area of these injection wells above or below the proposed injection horizon.

- IX. It is anticipated the South Taylor 13 #3 will have additional pay perped and fraced from 5090-5420' prior to conversion to injection.
- X. Logs have previously been submitted to the OCD.
- XI. There are no fresh water wells of record within one mile of the proposed injection wells.
- XII. An examination of this area has determined there are no open faults or other hydrologic connection between the disposal zone and any underground drinking water.



Water Analysis Report by Baker Petrolite

**COASTAL
GERONIMO
WATER PLANT
TANK**

Account Manager
WAYNE PETERSON

Summary		Analysis of Sample 106238 @ 75°F					
Sampling Date	1/6/99	Anions	mg/l	meq/l	Cations	mg/l	meq/l
Analysis Date	1/13/99	Chloride	153487	4379	Sodium	79884	3475
Analyst	SHEILA HERNANDEZ	Bicarbonate	82.8	1.02	Magnesium	2070	311
		Carbonate	0.00	0.00	Calcium	12651	631
TDS (mg/l or g/m ³)	250813	Sulfate	900	18.7	Strontium	339	7.74
Density (g/cm ³ or tonne/m ³)	1.163	Phosphate	N/A	N/A	Barium	0.30	0.00
Anion/Cation Ratio	1.00	Borate	N/A	N/A	Iron	5.50	0.20
		Silicate	N/A	N/A	Potassium	919	23.5
Carbon Dioxide	210 PPM				Aluminum	N/A	N/A
Oxygen		Hydrogen Sulfide		2 PPM	Chromium	N/A	N/A
					Copper	N/A	N/A
		pH at time of sampling		6.90	Lead	N/A	N/A
		pH at time of analysis			Manganese	N/A	N/A
		pH used in Calculations		6.90	Nickel	N/A	N/A

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000bbl										
Temp.	Gauge Press.	Calcite CaCO ₃		Gypsum CaSO ₄ · 2H ₂ O		Anhydrite CaSO ₄		Celestite SrSO ₄		Barite BaSO ₄		CO ₂ Press.
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0.	0.60	2.67	-0.05		0.00	3.20	-0.00		-0.01		0.05
100	0.	0.62	3.06	-0.13		-0.01		-0.08		-0.21		0.06
120	0.	0.63	3.49	-0.20		-0.01		-0.10		-0.39		0.08
140	0.	0.64	3.97	-0.26		0.02	19.1	-0.10		-0.54		0.11

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

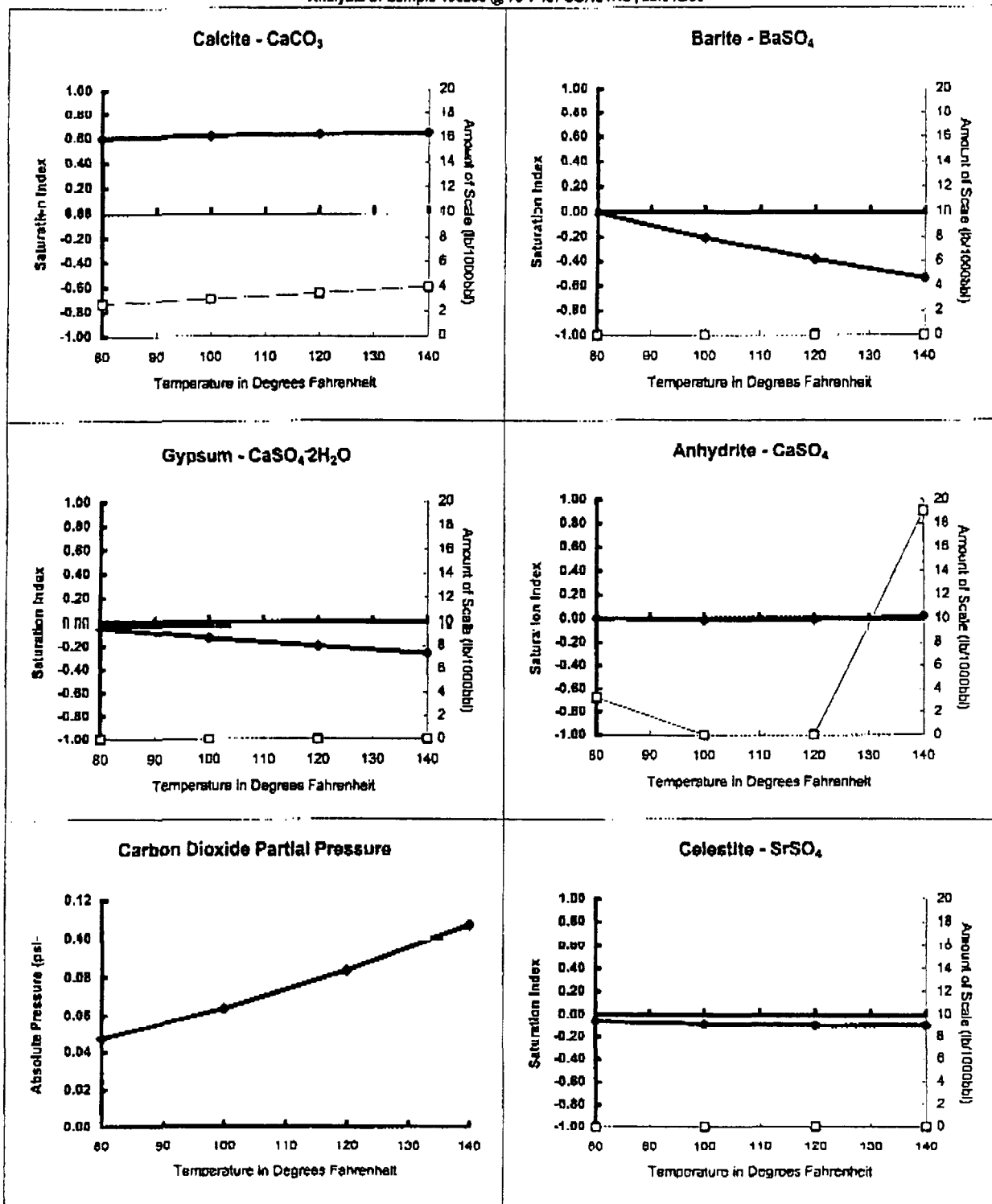
Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: The reported CO₂ pressure is actually the calculated CO₂ fugacity. It is usually nearly the same as the CO₂ partial pressure.



Scale Predictions from Baker Petrolite

Analysis of Sample 106236 @ 75°F for COASTAL, Jan/13/99





Water Analysis Report by Baker Petrolite

MARATHON
TORANO
WATER PLANT
TANK

Account Manager
WAYNE PETERSON

Summary			Analysis of Sample 106237 @ 75°F					
Sampling Date	1/6/99		Anions	mg/l	meq/l	Cations	mg/l	meq/l
Analysis Date	1/13/99		Chloride	89691	2530	Sodium	51718	2250
Analyst	SHEILA HERNANDEZ		Bicarbonate	187	3.06	Magnesium	1340	110
			Carbonate	0.00	0.00	Calcium	4395	219
TDS (mg/l or g/m ³)	150848		Sulfate	2929	61.0	Strontium	122	2.78
Density (g/cm ³ or tonne/m ³)	1.096		Phosphate	N/A	N/A	Barium	0.10	0.00
Anion/Cation Ratio	1.00		Borate	N/A	N/A	Iron	4.50	0.16
			Silicate	N/A	N/A	Potassium	462	11.8
Carbon Dioxide	135 PPM					Aluminum	N/A	N/A
Oxygen			Hydrogen Sulfide		9 PPM	Chromium	N/A	N/A
						Copper	N/A	N/A
			pH at time of sampling		7.10	Lead	N/A	N/A
			pH at time of analysis			Manganese	N/A	N/A
			pH used in Calculations		7.10	Nickel	N/A	N/A

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000bbl										
Temp.	Gauge Press.	Calcite CaCO ₃		Gypsum CaSO ₄ · 2H ₂ O		Anhydrite CaSO ₄		Celestite SrSO ₄		Barite BaSO ₄		CO ₂ Press.
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0.	0.70	11.1	0.07	216	0.08	177	0.24	33.5	0.26	0.02	0.11
100	0.	0.73	13.0	0.01	27.4	0.08	181	0.21	30.9	0.06	0.01	0.16
120	0.	0.76	15.0	-0.04		0.10	240	0.20	29.5	-0.11		0.21
140	0.	0.79	17.2	-0.09		0.15	338	0.20	29.2	-0.25		0.29

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

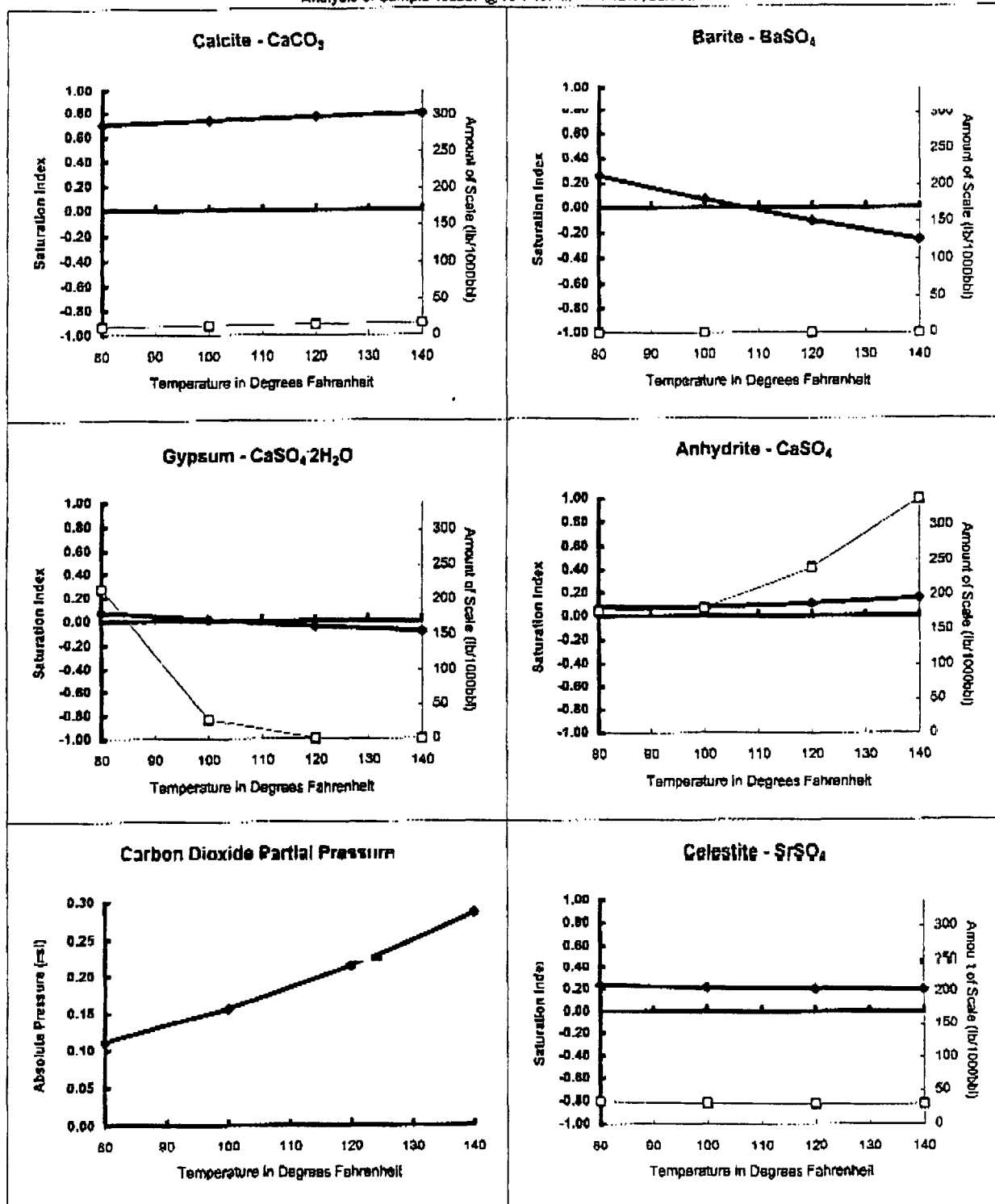
Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: The reported CO₂ pressure is actually the calculated CO₂ fugacity. It is usually nearly the same as the CO₂ partial pressure.



Scale Predictions from Baker Petrolite

Analysis of Sample 108237 @ 75°F for MARATHON, Jan/13/98

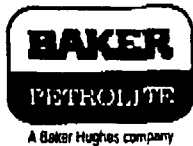




Analysis: 22546

Water Analysis Report from Baker Petrolite

Summary of Mixing Waters			
Sample Number	106238	106237	106640
Company	COASTAL	MARATHON	HEYCO
Lease	GERONIMO	TORANO	YOUNG DEEP
Well	WATER PLANT	WATER PLANT	
Sample Location	TANK	TANK	I.P.D.
Anions (mg/L)			
Chloride	153,482	89,691	106,932
Bicarbonate	62.0	187	354
Carbonate	0.00	0.00	0.00
Sulfate	900	2,929	1,416
Phosphate	0.00	0.00	0.00
Borate	0.00	0.00	0.00
Silicate	0.00	0.00	0.00
Cations (mg/L)			
Sodium	79,884	51,718	54,936
Magnesium	2,570	1,340	1,975
Calcium	12,651	4,395	8,961
Strontium	339	122	188
Barium	0.30	0.10	0.20
Iron	5.50	4.50	4.00
Potassium	919	462	1,869
Aluminum	0.00	0.00	0.00
Chromium	0.00	0.00	0.00
Copper	0.00	0.00	0.00
Lead	0.00	0.00	0.00
Manganese	0.00	0.00	0.00
Nickel	0.00	0.00	0.00
Anion/Cation Ratio	1.00	1.00	1.00
TDS (mg/L)	250,813	150,848	176,635
Density (g/cm)	1.16	1.10	1.12
Sampling Date	1/6/99	1/6/99	8/3/98
Account Manager	WAYNE PETERSON	WAYNE PETERSON	FRANK WONER
Analyst	SHEILA HERNANDEZ	SHEILA HERNANDEZ	SHEILA DEARMAN
Analysis Date	1/13/99	1/13/99	8/6/98
pH at time of sampling	6.90	7.10	6.45
pH at time of analysis	6.90	7.10	6.45
pH used in Calculations	6.90	7.10	6.45



Analysis: 22546

Water Analysis Report from Baker Petrolite

Mixes at 80°F and 0 psi with 106237

Predictions of Carbon Dioxide Pressure, Saturation Index and Amount of Scale in lb/1000bbl

Mix Waters		CO ₂	Calcite CaCO ₃		Gypsum CaSO ₄ ·2H ₂ O		Anhydrite CaSO ₄		Celestite SrSO ₄		Barite BaSO ₄	
106238	106640	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount
20%	40%	0.39	0.57	15.4	0.10	200	0.11	182	0.16	36.9	0.24	0.04

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: CO₂ Pressure is absolute pressure. Total Pressure is gauge pressure.

Compositions of the Mixed Waters used for the Calculations

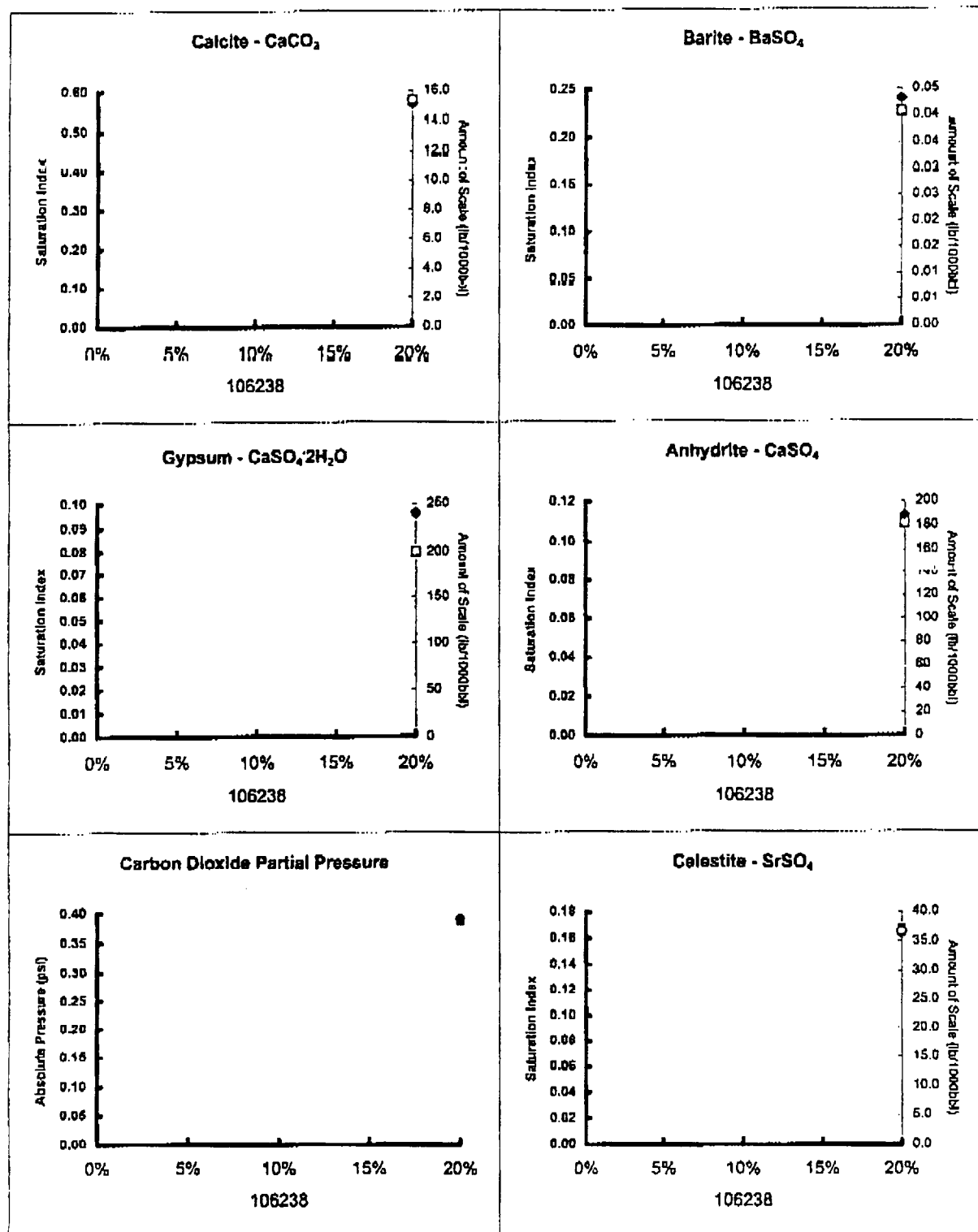
106238	106237	106640
20.0%	40.0%	40.0%

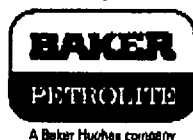


Analysis: 22546

Mixture Predictions from Baker-Petrolite

106238 with 106237 and with 106640 at 80°F and 0 psi





Analysis: 22546

Water Analysis Report from Baker Petrolite

Mixes at 100°F and 0 psi with 106237

Predictions of Carbon Dioxide Pressure, Saturation Index and Amount of Scale in lb/1000bbl

Mix Waters		CO ₂	Calcite CaCO ₃		Gypsum CaSO ₄ ·2H ₂ O		Anhydrite CaSO ₄		Celestite SrSO ₄		Barite BaSO ₄	
106238	106640	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount
20%	40%	0.49	0.64	17.9	0.03	61.4	0.11	178	0.14	32.3	0.04	0.01

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: CO₂ Pressure is absolute pressure. Total Pressure is gauge pressure.

Compositions of the Mixed Waters used for the Calculations

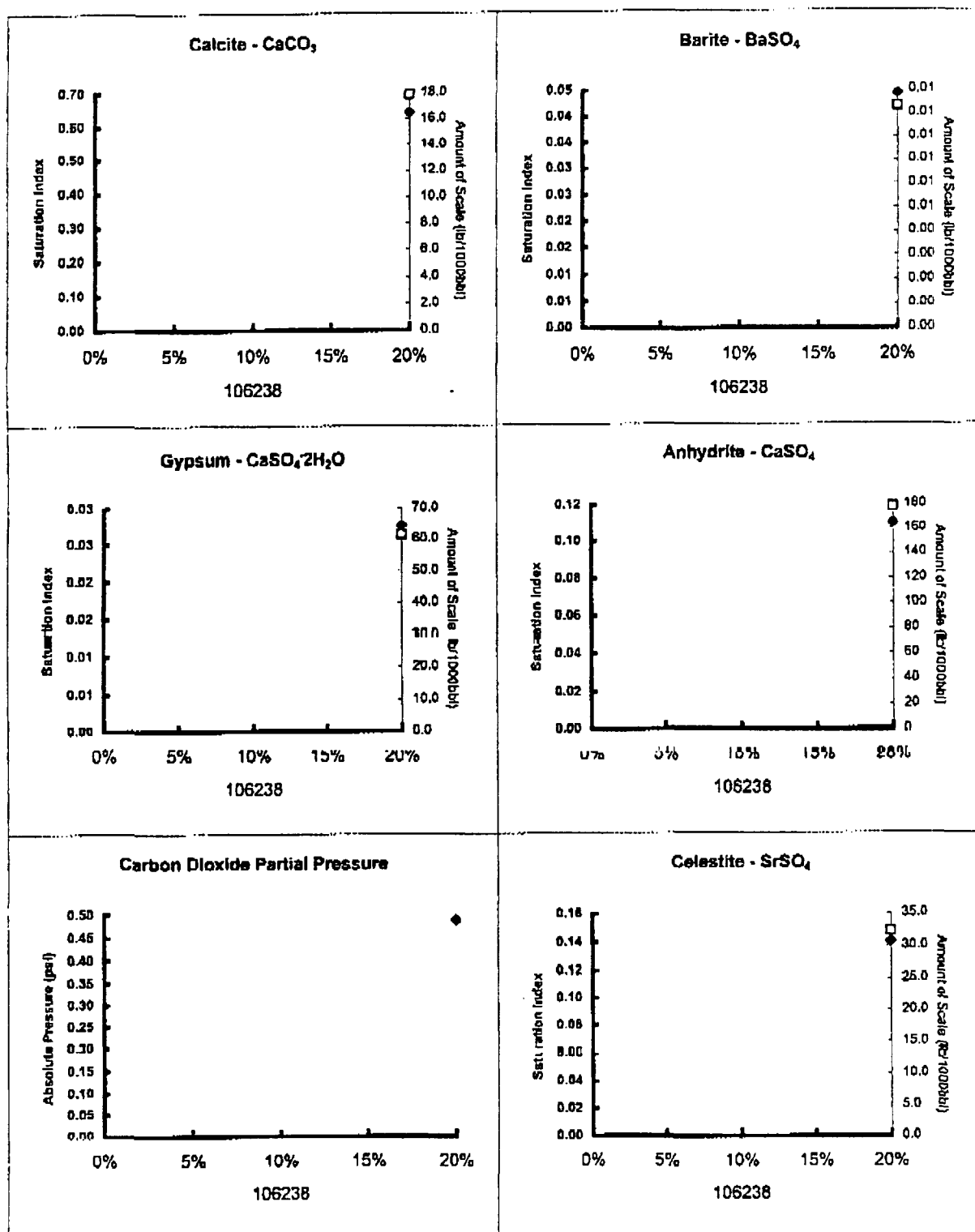
106238	106237	106640
20.0%	40.0%	40.0%

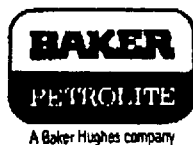


Analysis: 22546

Mixture Predictions from Baker-Petrolite

106238 with 106237 and with 106640 at 100°F and 0 psi





Analysis: 22546

Water Analysis Report from Baker Petrolite

Mixes at 120°F and 0 psi with 106237

Predictions of Carbon Dioxide Pressure, Saturation Index and Amount of Scale in lb/1000bbl

Mix Waters		CO ₂	Calcite CaCO ₃		Gypsum CaSO ₄ ·2H ₂ O		Anhydrite CaSO ₄		Celestite SrSO ₄		Barite BaSO ₄	
106238	106640	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount
20%	40%	0.59	0.71	20.5	-0.03		0.13	210	0.13	30.1	-0.13	

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: CO₂ Pressure is absolute pressure. Total Pressure is gauge pressure.

Compositions of the Mixed Waters used for the Calculations

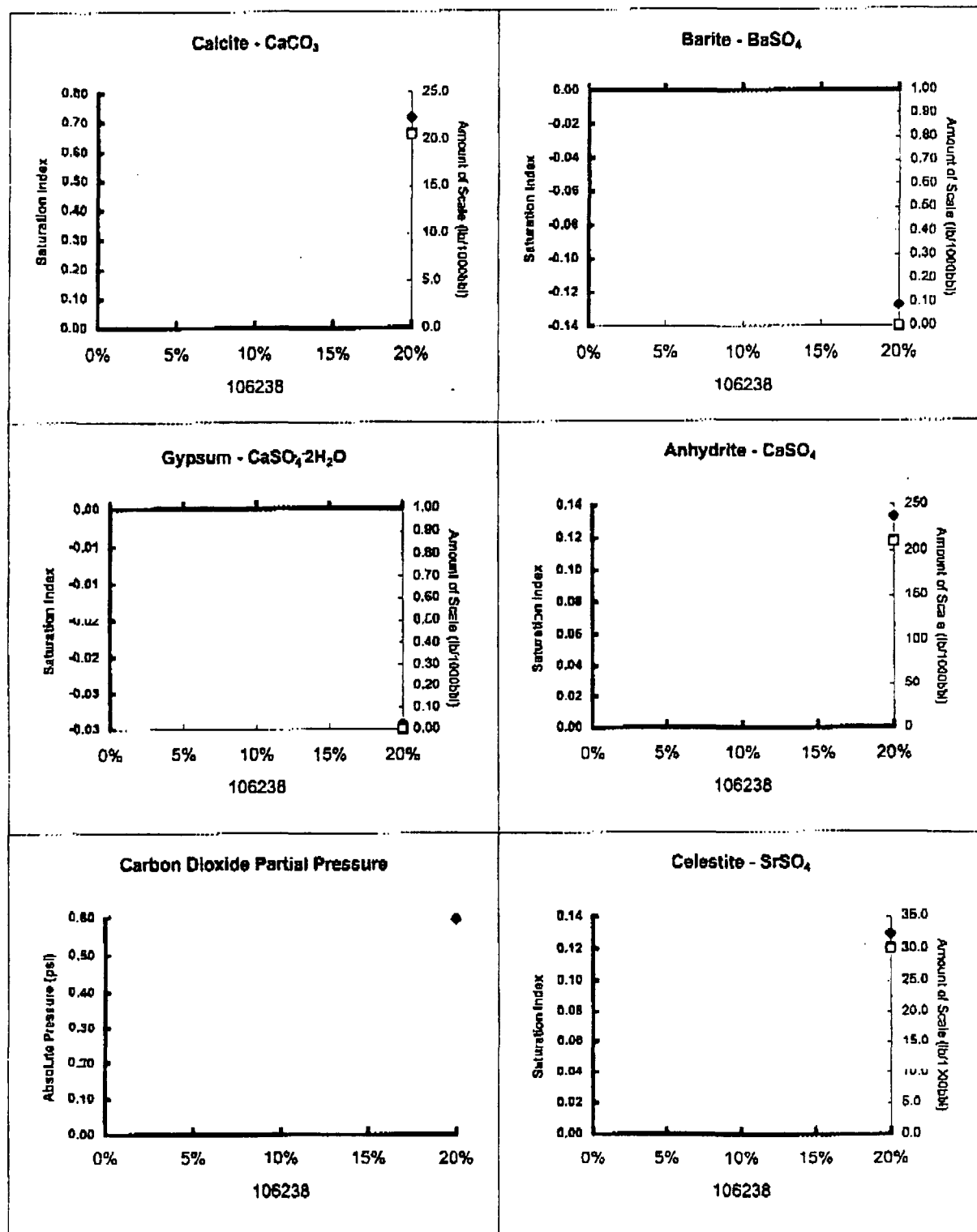
106238	106237	106640
20.0%	40.0%	40.0%



Analysis: 22546

Mixture Predictions from Baker-Petrolite

106230 with 106237 and with 106640 at 120°F and 0 psi





Analysis: 22546

Water Analysis Report from Baker Petrolite

Mixes at 140°F and 0 psi with 106237

Predictions of Carbon Dioxide Pressure, Saturation Index and Amount of Scale in lb/1000bbl

Mix Waters		CO ₂	Calcite CaCO ₃		Cypsum CaSO ₄ ·2H ₂ O		Anhydrite CaSO ₄		Celestite SrSO ₄		Barite BaSO ₄	
106238	106640	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount
20%	40%	0.71	0.78	23.3	-0.08		0.18	269	0.13	29.8	-0.20	

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: CO₂ Pressure is absolute pressure. Total Pressure is gauge pressure.

Compositions of the Mixed Waters used for the Calculations

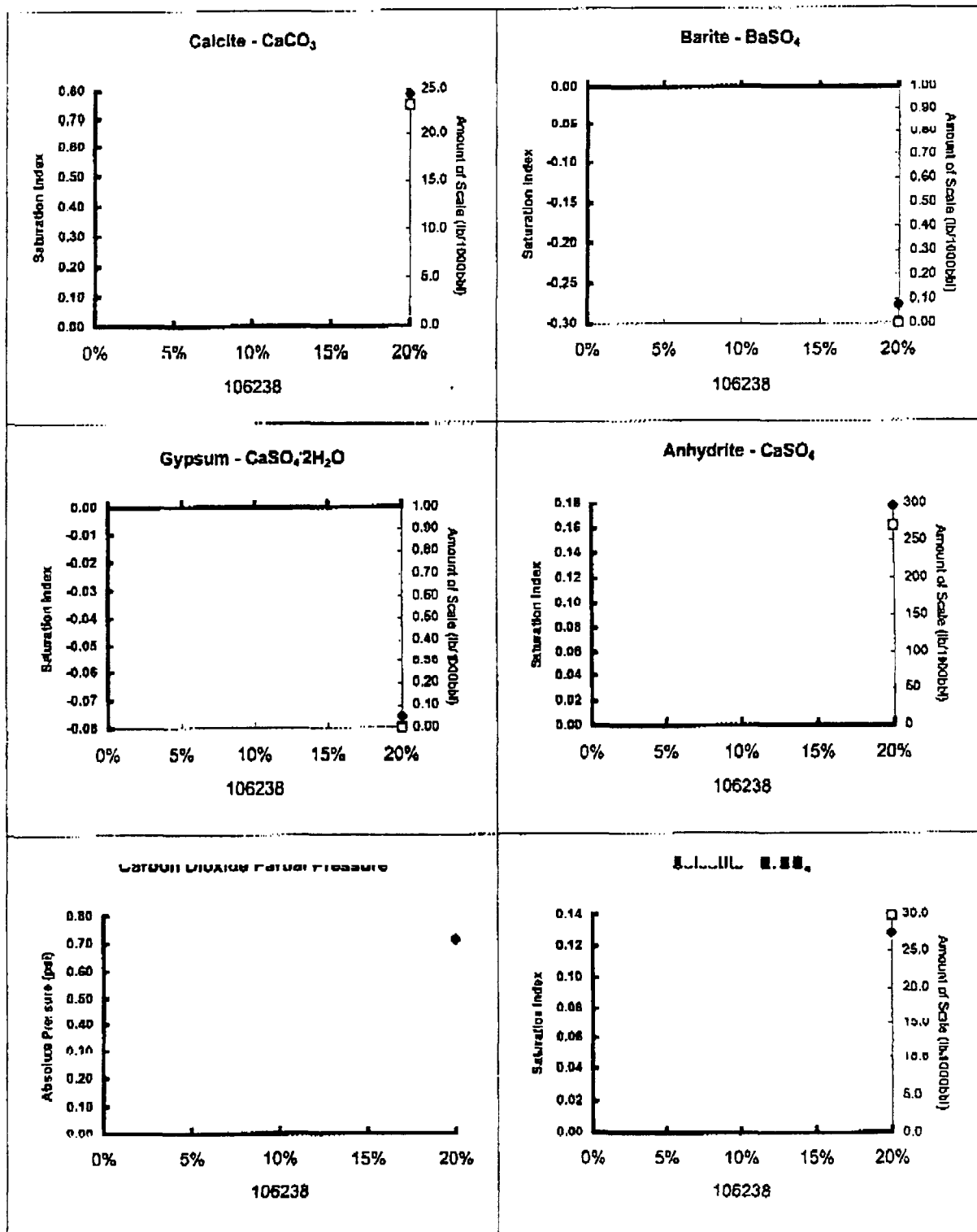
106238	106237	106640
20.0%	40.0%	40.0%



Analysis: 22546

Mixture Predictions from Baker-Petrolite

106238 with 106237 and with 106640 at 140°F and 0 psi





Analysis: 22535

Water Analysis Report from Baker Petrolite

Summary of Mixing Waters		
Sample Number	106237	106238
Company	MARATHON	COASTAL
Lease	TORANO	GERONIMO
Well	WATER PLANT	WATER PLANT
Sample Location	TANK	TANK
Anions (mg/L)		
Chloride	89,691	153,482
Bicarbonate	187	62.0
Carbonate	0.00	0.00
Sulfate	2,929	900
Phosphate	0.00	0.00
Borate	0.00	0.00
Silicate	0.00	0.00
Cations (mg/L)		
Sodium	51,718	79,884
Magnesium	1,340	2,570
Calcium	4,385	12,651
Strontium	122	339
Barium	0.10	0.30
Iron	4.50	5.50
Potassium	462	919
Aluminum	0.00	0.00
Chromium	0.00	0.00
Copper	0.00	0.00
Lead	0.00	0.00
Manganese	0.00	0.00
Nickel	0.00	0.00
Anion/Cation Ratio	1.00	1.00
TDS (mg/L)	150,848	250,813
Density (g/cm)	1.10	1.16
Sampling Date	1/6/99	1/6/99
Account Manager	WAYNE PETERSON	WAYNE PETERSON
Analyst	SHEILA HERNANDEZ	SHEILA HERNANDEZ
Analysis Date		1/13/99
pH at time of sampling	7.10	6.90
pH at time of analysis		
pH used in Calculations	7.10	6.90



Analysis: 22535

Water Analysis Report from Baker Petrolite

Mixes at 80°F and 0 psi

Predictions of Carbon Dioxide Pressure, Saturation Index and Amount of Scale in lb/1000bbl

Mix Waters		CO ₂	Calcite CaCO ₃		Gypsum CaSO ₄ ·2H ₂ O		Anhydrite CaSO ₄		Celestite SrSO ₄		Barite BaSO ₄	
106237	106238	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount
0%	100%	0.05	0.60	2.7	-0.05		0.00	3	-0.06		-0.01	
10%	90%	0.06	0.65	3.6	0.01	14	0.06	56	0.02	6.7	0.07	0.02
20%	80%	0.06	0.68	4.5	0.05	79	0.10	106	0.08	26.4	0.13	0.03
30%	70%	0.07	0.71	5.5	0.09	141	0.12	153	0.13	39.7	0.18	0.04
40%	60%	0.08	0.73	6.6	0.11	197	0.14	195	0.17	47.7	0.22	0.05
50%	50%	0.09	0.74	7.6	0.12	245	0.15	230	0.20	51.7	0.25	0.05
60%	40%	0.09	0.75	8.5	0.13	283	0.15	257	0.23	52.4	0.27	0.04
70%	30%	0.10	0.75	9.4	0.13	307	0.15	271	0.24	50.5	0.28	0.04
80%	20%	0.10	0.74	10.2	0.12	311	0.13	268	0.25	48.4	0.29	0.04
90%	10%	0.11	0.73	10.8	0.10	286	0.11	241	0.25	40.6	0.28	0.03
100%	0%	0.11	0.70	11.1	0.07	218	0.08	178	0.24	33.4	0.26	0.02

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

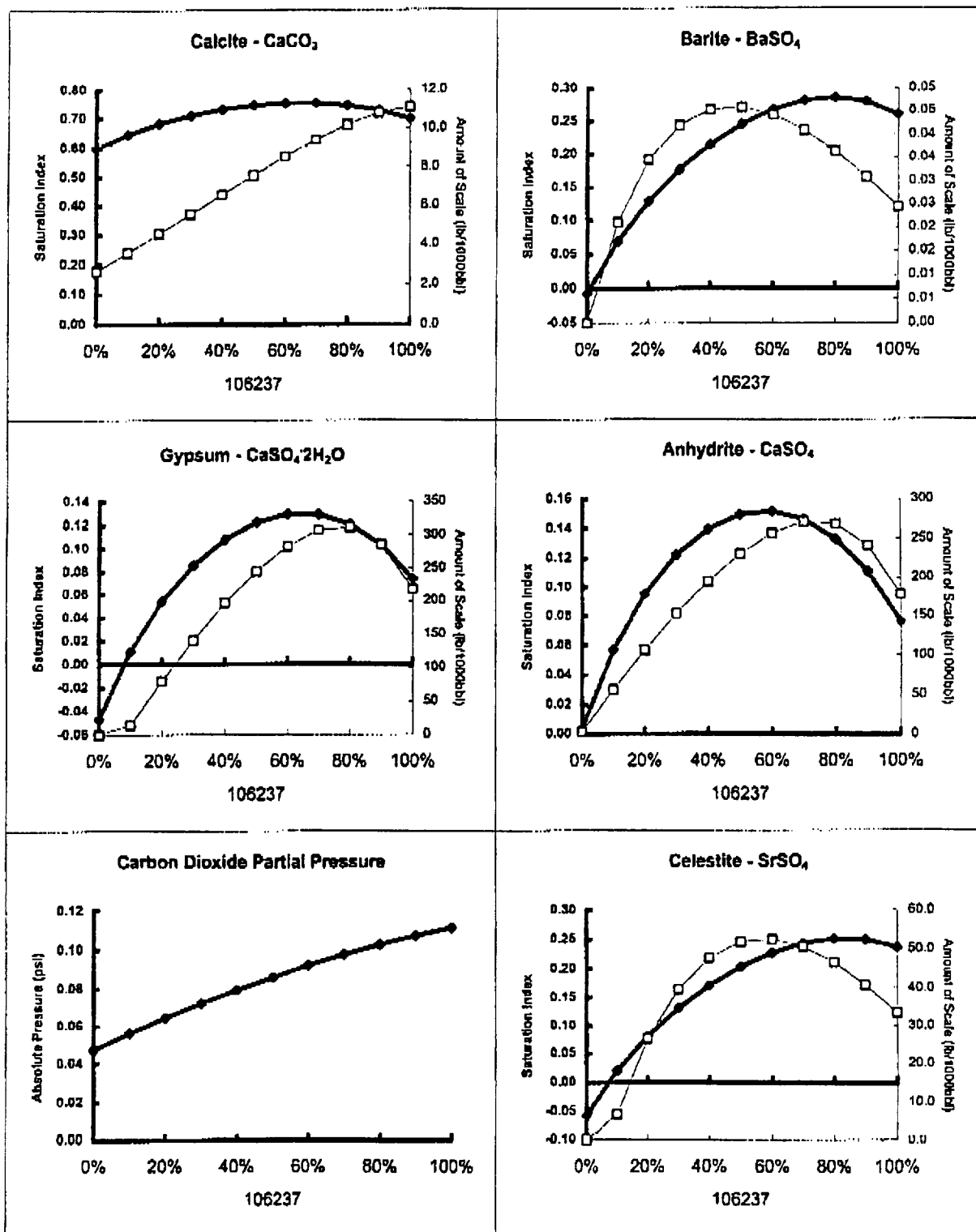
Note 3: CO₂ Pressure is absolute pressure. Total Pressure is gauge pressure.



Analysis: 22535

Mixture Predictions from Baker-Petrolite

106237 with 106238 at 80°F and 0 psi





Analysis: 22535

Water Analysis Report from Baker Petrolite

Mixes at 100°F and 0 psi

Predictions of Carbon Dioxide Pressure, Saturation Index and Amount of Scale in lb/1000bbl

Mix Waters		CO ₂	Calcite CaCO ₃		Gypsum CaSO ₄ ·2H ₂ O		Anhydrite CaSO ₄		Celestite SrSO ₄		Barite BaSO ₄	
106237	106238	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount
0%	100%	0.06	0.62	3.0	-0.13		-0.01		-0.08		-0.21	
10%	90%	0.08	0.66	4.1	-0.07		0.04	41	-0.01		-0.13	
20%	80%	0.09	0.70	5.2	-0.03		0.08	92	0.05	18.3	-0.07	
30%	70%	0.10	0.73	6.3	0.01	13	0.11	139	0.10	32.5	-0.02	
40%	60%	0.11	0.75	7.5	0.03	63	0.13	183	0.15	41.5	0.02	0.00
50%	50%	0.12	0.77	8.6	0.05	104	0.14	219	0.18	46.3	0.05	0.01
60%	40%	0.13	0.78	9.7	0.06	135	0.15	248	0.20	47.7	0.07	0.01
70%	30%	0.13	0.78	10.8	0.06	150	0.14	265	0.22	46.4	0.08	0.02
80%	20%	0.14	0.77	11.7	0.05	144	0.13	265	0.23	42.9	0.09	0.01
90%	10%	0.15	0.76	12.5	0.04	109	0.11	241	0.23	37.6	0.08	0.01
100%	0%	0.16	0.73	12.9	0.01	30	0.08	182	0.21	30.8	0.06	0.01

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

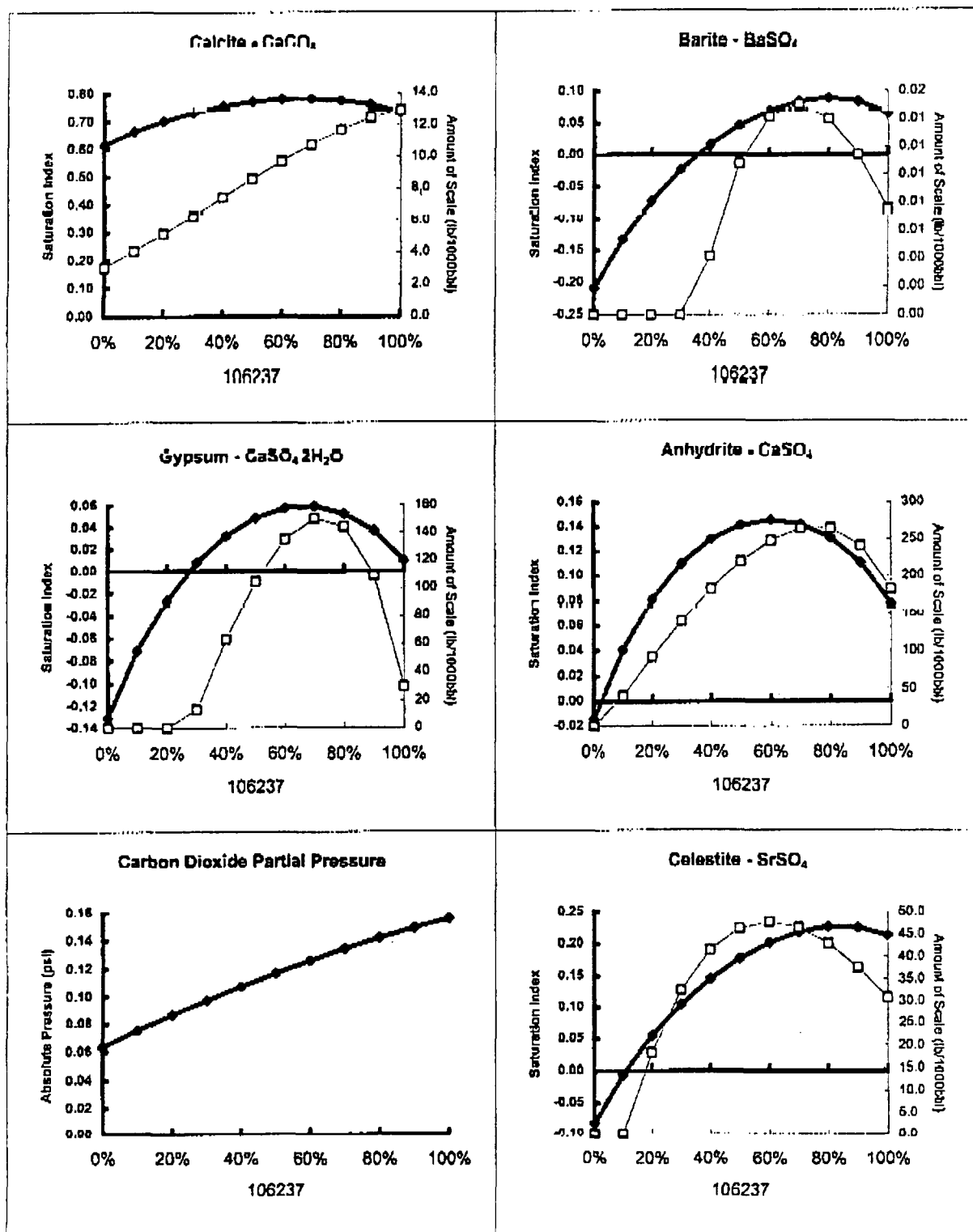
Note 3: CO₂ Pressure is absolute pressure. Total Pressure is gauge pressure.



Analysis: 22535

Mixture Predictions from Baker-Petrolite

106237 with 106238 at 100°F and 0 psi





Analysis: 22535

Water Analysis Report from Baker Petrolite

Mixes at 120°F and 0 psi

Predictions of Carbon Dioxide Pressure, Saturation Index and Amount of Scale in lb/1000bbl

Mix Waters		CO ₂	Calcite CaCO ₃		Gypsum CaSO ₄ ·2H ₂ O		Anhydrite CaSO ₄		Celestite SrSO ₄		Barite BaSO ₄	
106237	106238	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount
0%	100%	0.08	0.63	3.5	-0.20		-0.01		-0.10		-0.39	
10%	90%	0.10	0.68	4.6	-0.14		0.05	50	-0.02		-0.31	
20%	80%	0.11	0.72	5.8	-0.09		0.09	103	0.04	14.2	-0.25	
30%	70%	0.13	0.75	7.1	-0.06		0.12	154	0.09	28.9	-0.20	
40%	60%	0.14	0.77	8.4	-0.03		0.14	201	0.13	38.3	-0.16	
50%	50%	0.16	0.79	9.7	-0.01		0.16	242	0.16	43.5	-0.13	
60%	40%	0.17	0.80	11.0	-0.00		0.16	276	0.19	45.3	-0.10	
70%	30%	0.18	0.80	12.2	0.00	2.28	0.16	298	0.21	44.3	-0.09	
80%	20%	0.19	0.80	13.3	-0.00		0.15	305	0.21	41.1	-0.08	
90%	10%	0.20	0.79	14.3	-0.02		0.14	290	0.21	36.1	-0.09	
100%	0%	0.21	0.76	14.9	-0.04		0.11	241	0.20	29.4	-0.11	

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

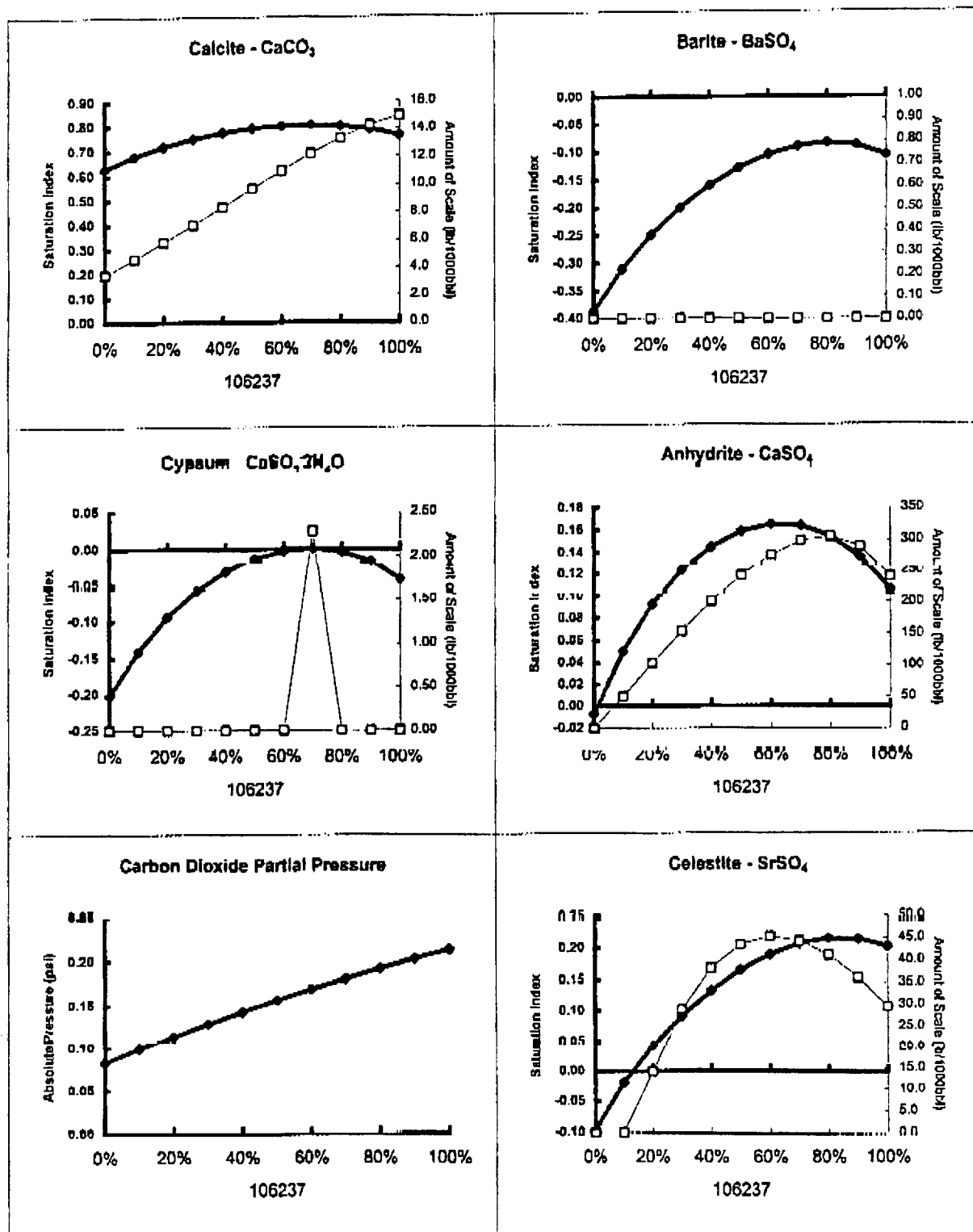
Note 3: CO₂ Pressure is absolute pressure. Total Pressure is gauge pressure.



Analysis: 22535

Mixture Predictions from Baker-Petrolite

106237 with 106238 at 120°F and 0 psi





Analysis: 22535

Water Analysis Report from Baker Petrolite

Mixes at 140°F and 0 psi

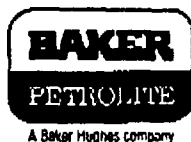
mixes at 140 F and 0 psi

Predictions of Carbon Dioxide Pressure, Saturation Index and Amount of Scale in lb/1000bbl												
Mix Waters		CO ₂	Calcite CaCO ₃		Gypsum CaSO ₄ ·2H ₂ O		Anhydrite CaSO ₄		Celestite SrSO ₄		Barite BaSO ₄	
106237	106238	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount
0%	100%	0.11	0.64	3.9	-0.26		0.02	19	-0.10		-0.54	
10%	90%	0.13	0.69	5.2	-0.20		0.08	79	-0.02		-0.46	
20%	80%	0.15	0.73	6.6	-0.15		0.13	136	0.04	13.4	-0.40	
30%	70%	0.17	0.77	8.0	-0.11		0.16	192	0.09	28.1	-0.35	
40%	60%	0.19	0.79	9.5	-0.09		0.18	244	0.13	37.6	-0.31	
50%	50%	0.20	0.81	10.9	-0.07		0.20	291	0.16	42.9	-0.28	
60%	40%	0.22	0.82	12.4	-0.05		0.21	331	0.19	44.7	-0.26	
70%	30%	0.24	0.83	13.8	-0.05		0.21	362	0.20	43.8	-0.24	
80%	20%	0.25	0.82	15.1	-0.05		0.20	379	0.21	40.7	-0.23	
90%	10%	0.27	0.81	16.3	-0.06		0.18	375	0.21	35.7	-0.24	
100%	0%	0.29	0.79	17.1	-0.09		0.16	339	0.20	29.2	-0.25	

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

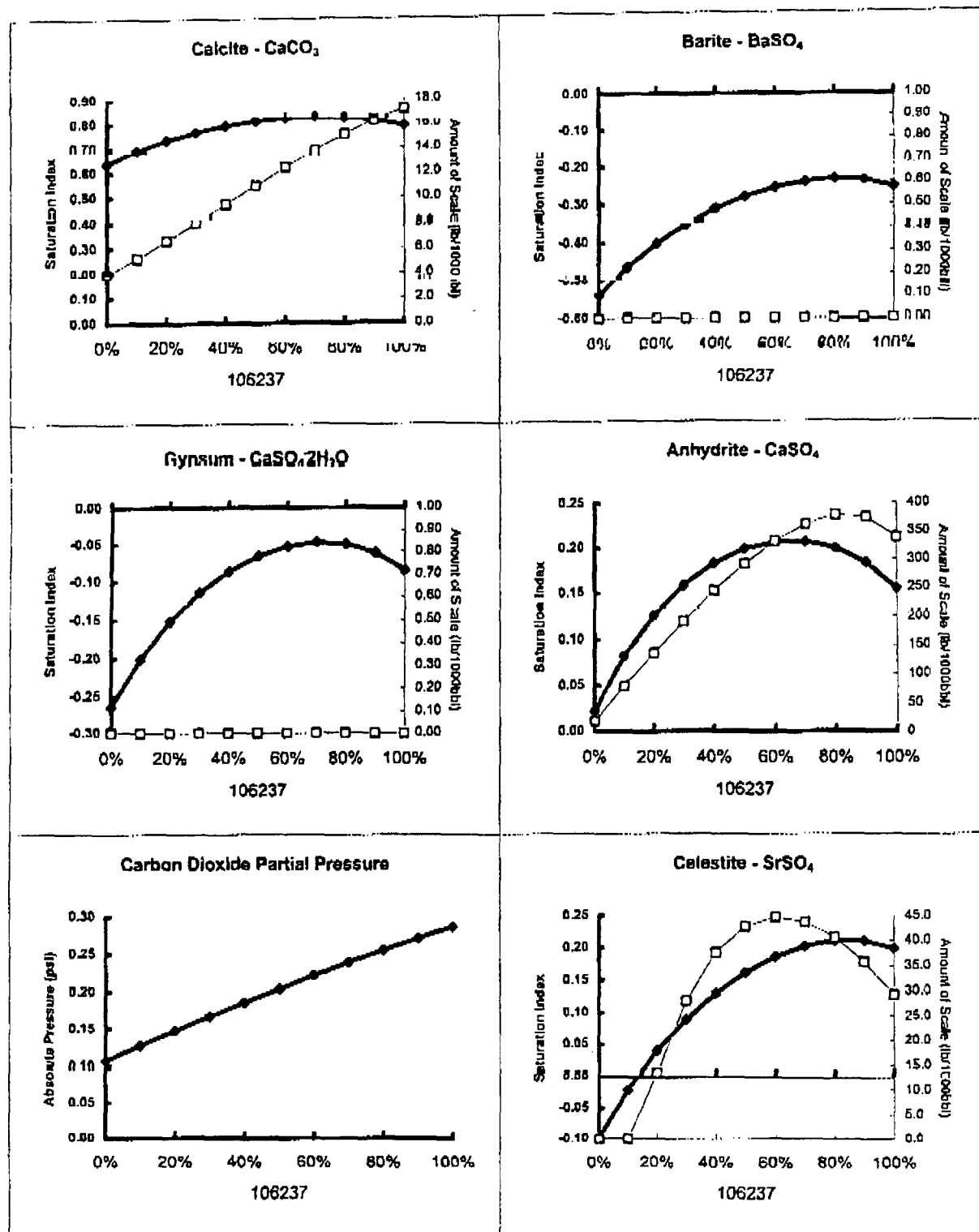
Note 3: CO₂ Pressure is absolute pressure. Total Pressure is gauge pressure.



Analysis: 22535

Mixture Predictions from Baker-Petrolite

106237 with 106238 at 140°F and 0 psi



**RESERVOIR SIMULATION STUDY
EAST SHUGART (Delaware) FIELD
Eddy & Lea Counties, New Mexico**

RESERVOIR DATA

- ★ **Computerized analysis of modern logs from 19 wells**
- ★ **Geologic maps - Structure top, gross thickness, net thickness & porosity**
- ★ **Well Completion Reports**
- ★ **Acoustic Buildup tests from Geronimo 4, Conoco 1 & Inca 2 wells**
- ★ **Production Test Data**
- ★ **Allocated Monthly Production Data by well**

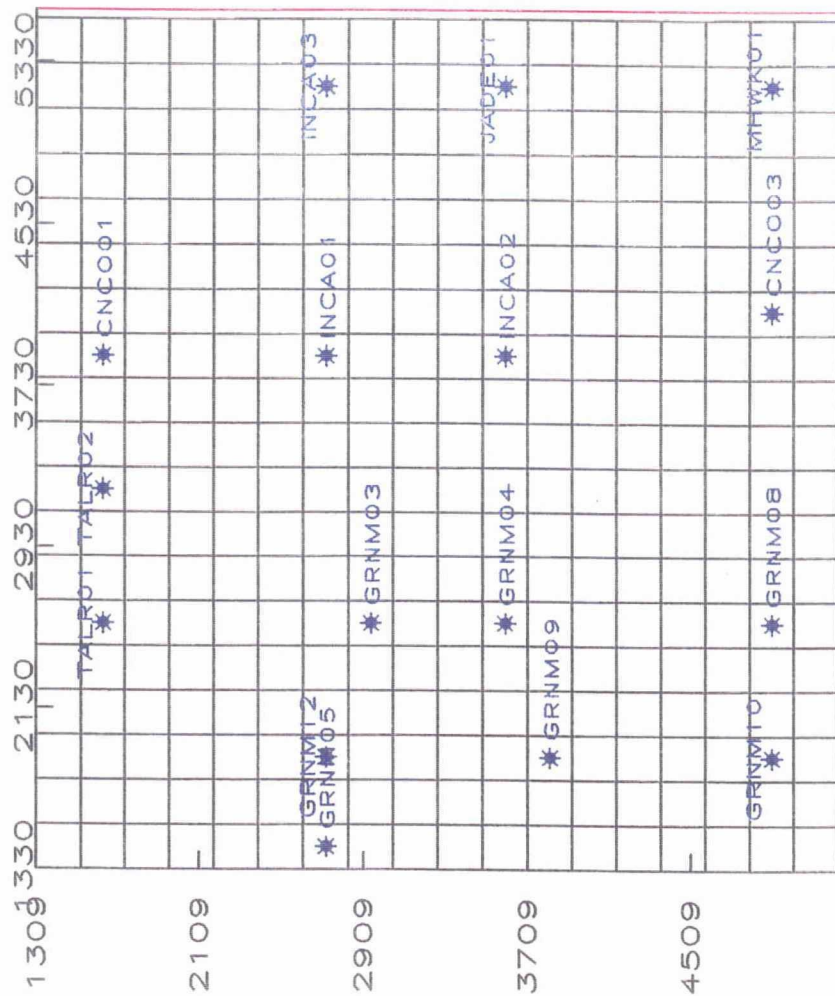
NEW MEXICO
OIL CONSERVATION DIVISION

EXHIBIT 30

CASE NO. _____

WELLS at step 83 4474 DAYS

Producer Injector
 Shut in well



NEW MEXICO
OIL CONSERVATION DIVISION

CASE NO. _____

EXHIBIT 32

GRID MAP
EAST SHUGART (DELAWARE) FIELD
EDDY & LEA COUNTIES, NEW MEXICO

EXHIBIT

33

CASE NO. _____

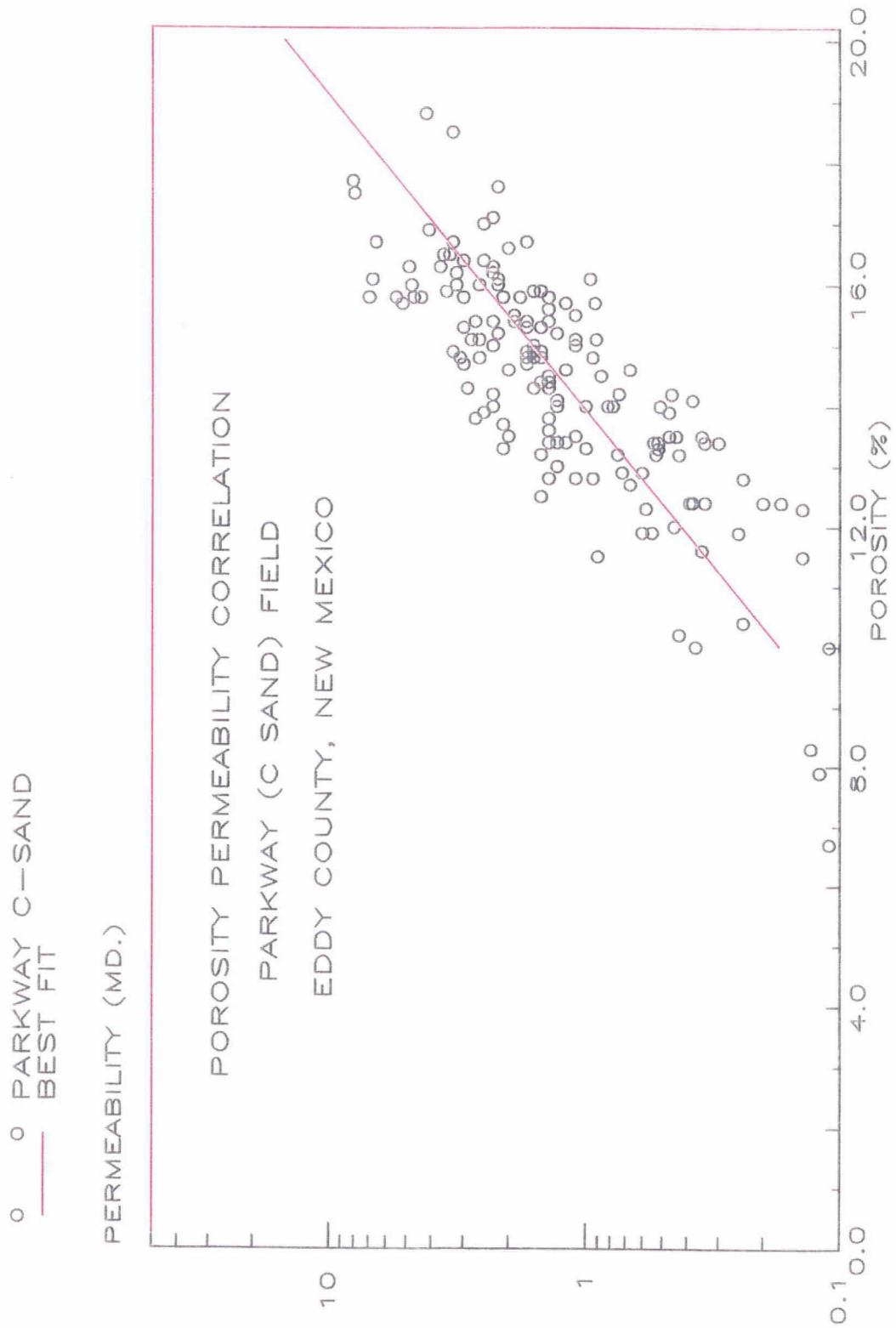


FIGURE 5

**RESERVOIR SIMULATION STUDY
EAST SHUGART (Delaware) FIELD
Eddy & Lea Counties, New Mexico**

HISTORY MATCH RESULTS

Cum Prod thru' 9/31/97	Model	Historical	% Error
Oil	2240	2172	3.1
Gas	4906	4747	3.3
Water	1081	1788	39.5

**The above match was obtained with very little changes
in Log Derived reservoir data**

**Net pay derived from logs were reduced by 20% for
GERONIMO LEASE**

RESERVOIR SIMULATION DIVISION
EXHIBIT 34
CASE NO. _____

EXHIBIT 35

CASE NO. _____

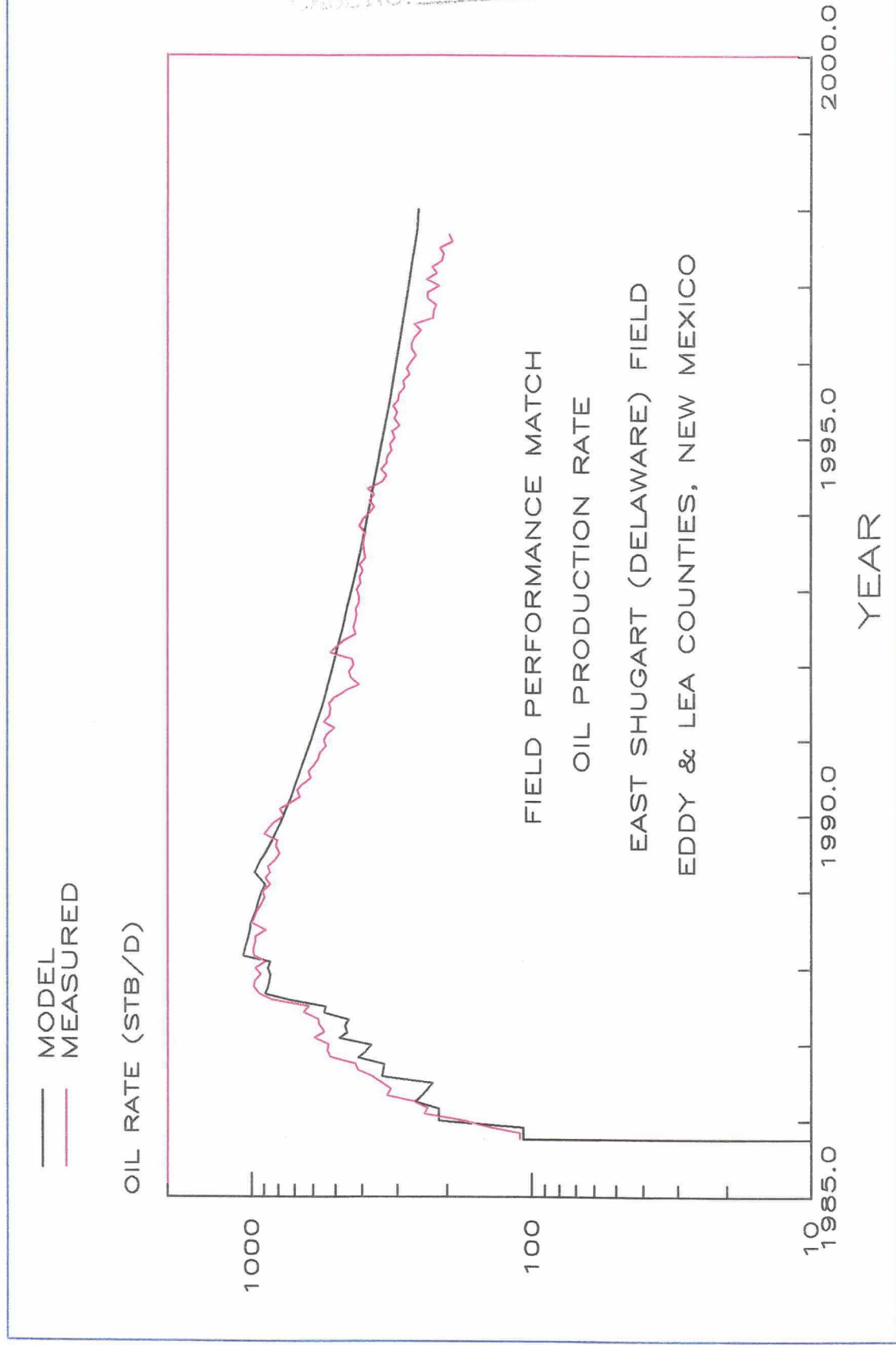


FIGURE 10

shugbu

EAST SHUGART DELAWARE

BUILD-UP DATA

WELL NAME	DATE OF TEST	FRACTURE LENGTH	ORIGINAL COMPLETION	COMP DATE
Inca #1	May-97	0'	Acidize w/ 2000 gal. Frac w/ 75,000 gal & 133,800 # sand	May-87
Inca #2	May-97	0'	Acidize w/ 1000 gal. Frac w/ 23,000 gal & 46,000 # sand	Jun-87
Jade #1	May-97	0'	Acidize w/ 2000 gal. Frac w/ 73,000 gal & 111,300 # sand	Jun-87
Geronimo #4	Jul-94 Oct-97	126' to 77' 0'	Acidize w/ 1000 gal. Frac w/ 32,000 gal & 62,000 # sand	Dec-85

DATE NO.

36

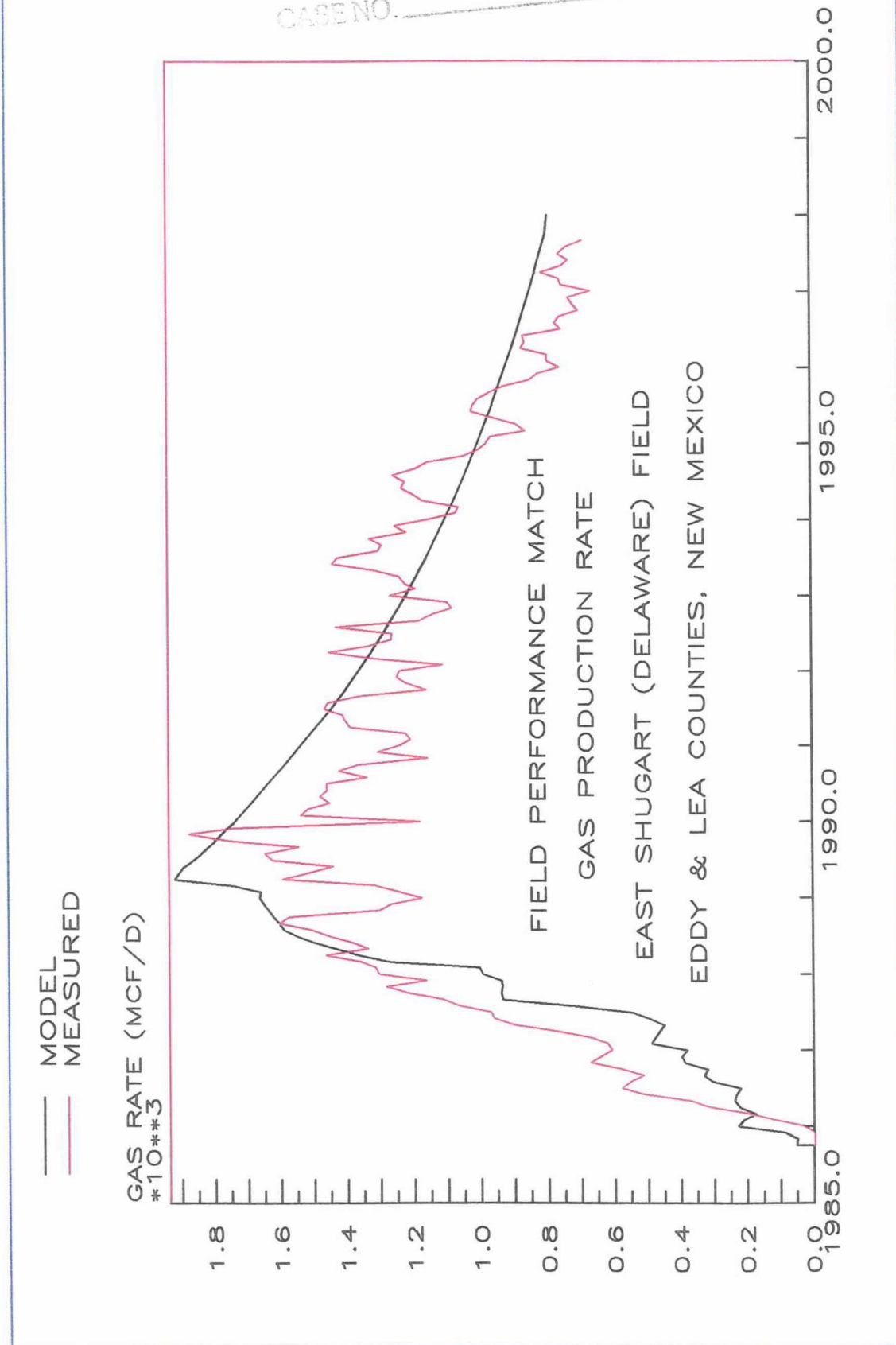


FIGURE 12

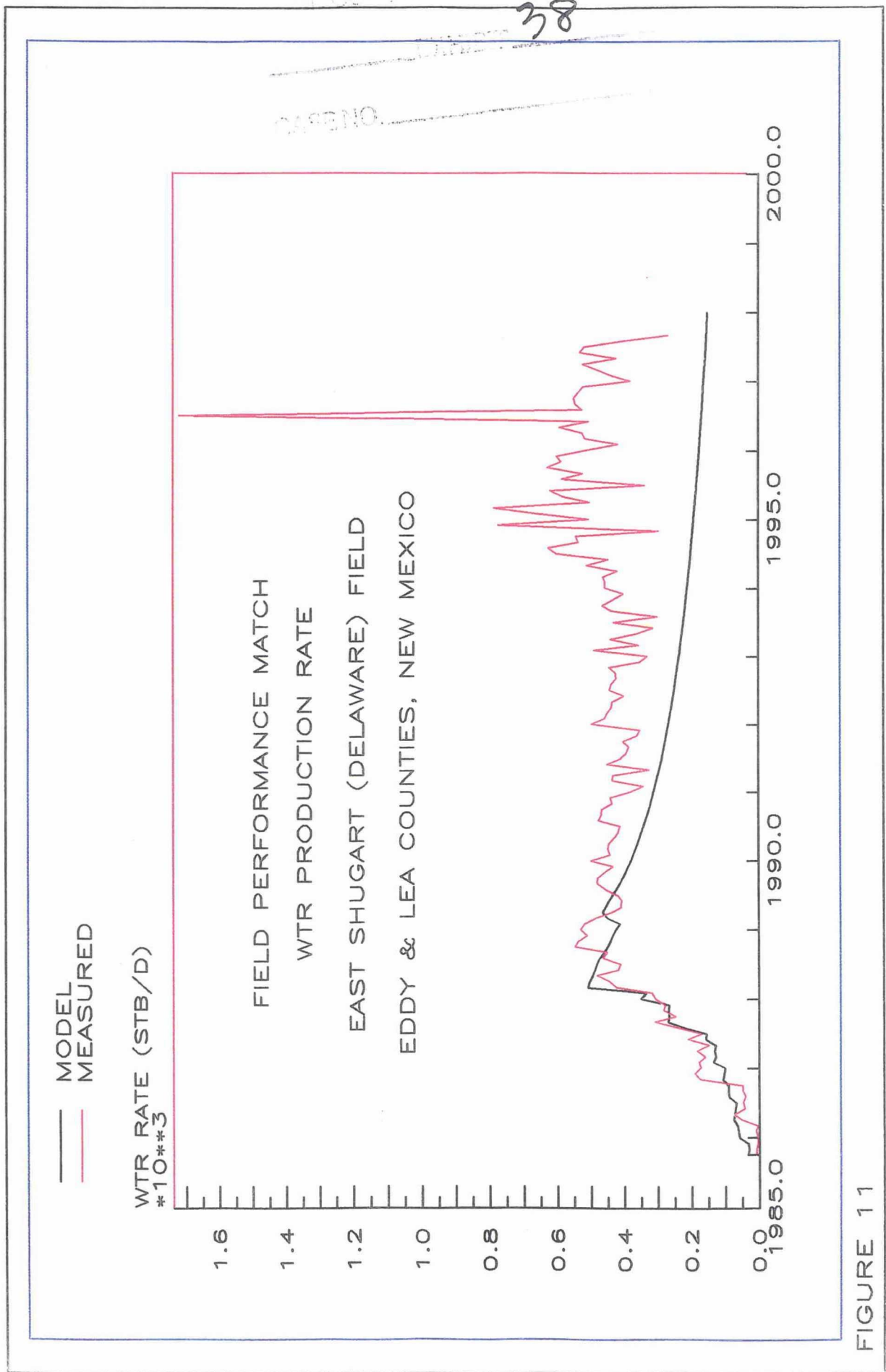
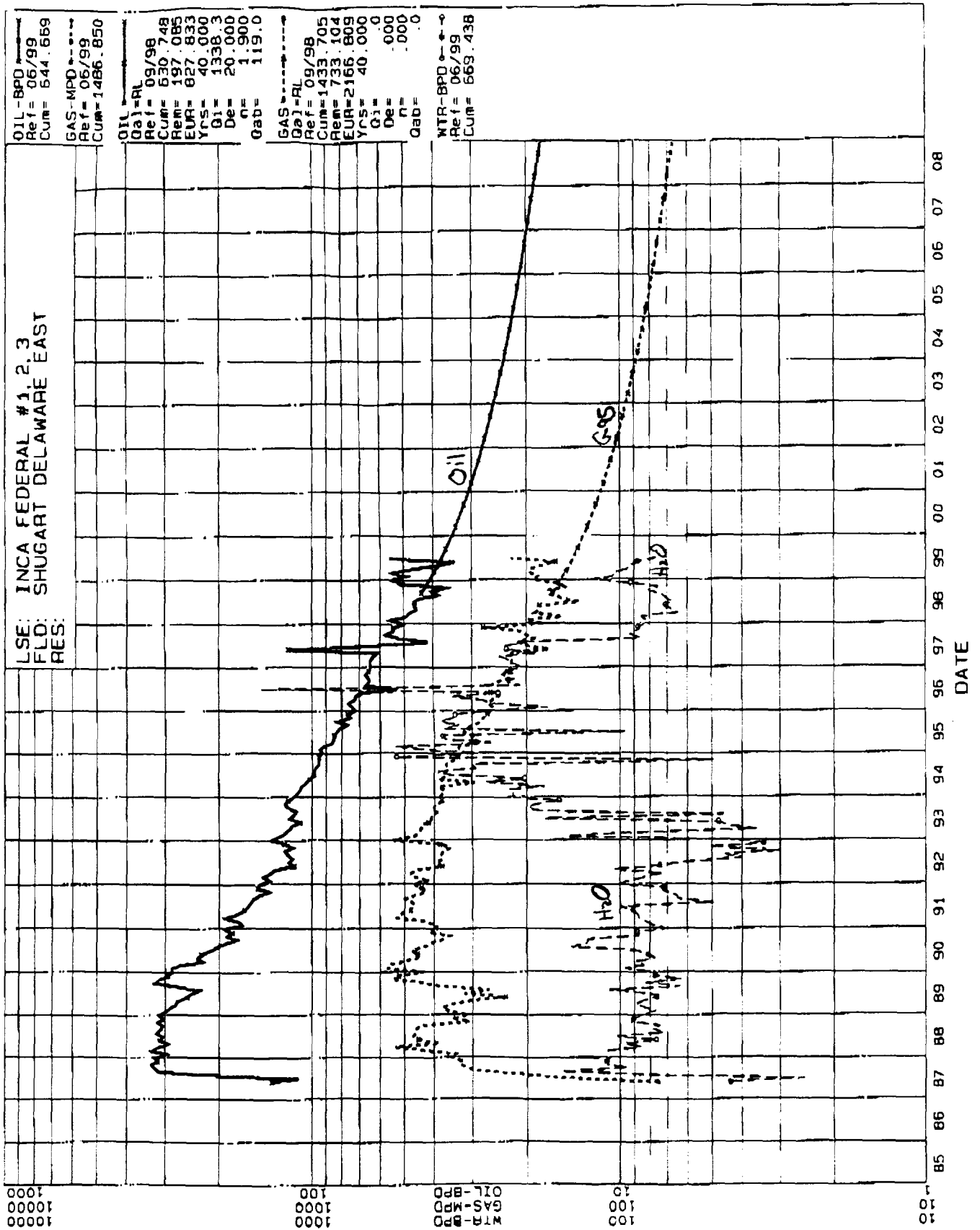


FIGURE 11



CASE NO.

PRESSURE MATCH
EAST SHUGART (DELAWARE) FIELD
EDDY & LEA COUNTIES, NEW MEXICO

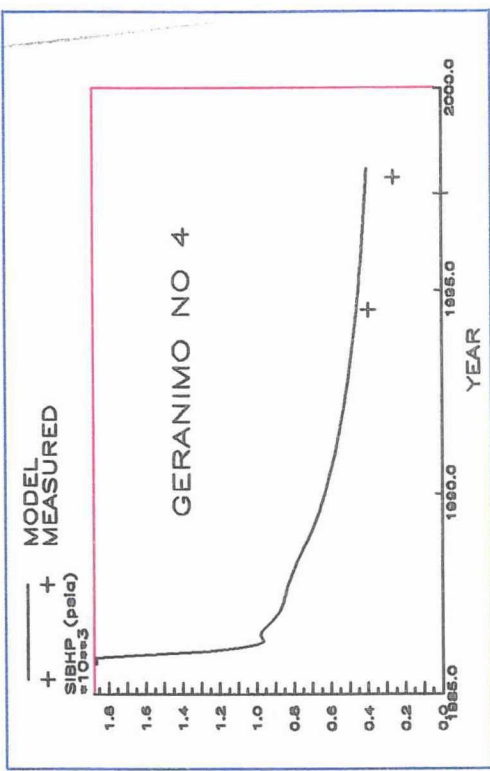
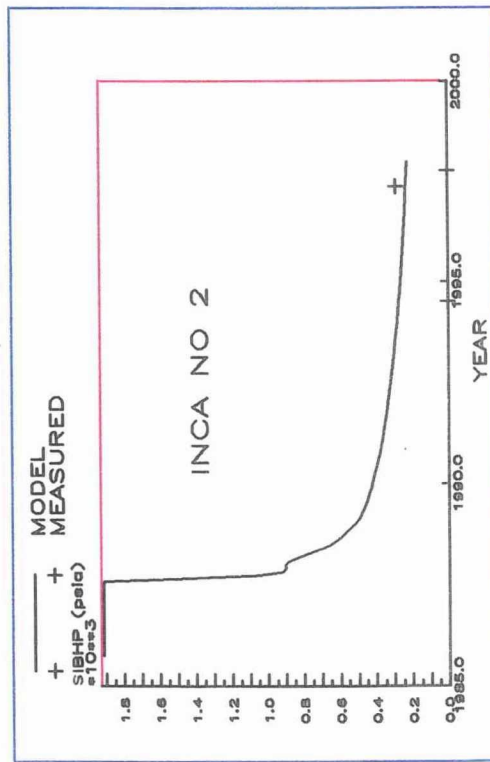
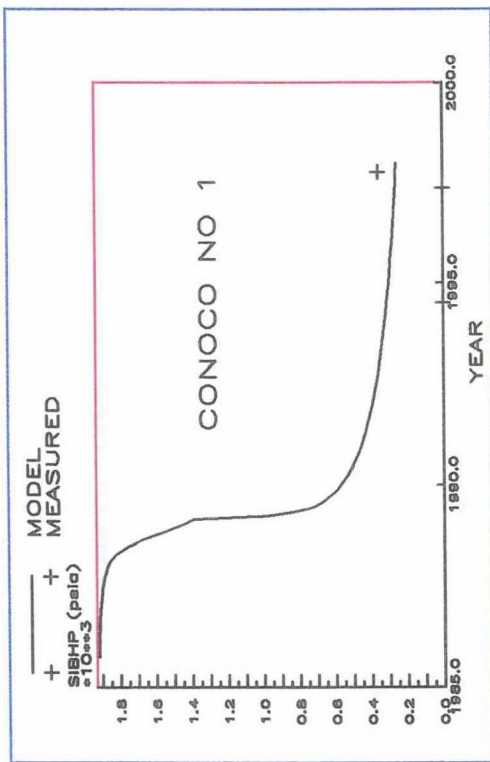


FIGURE 15

**RESERVOIR SIMULATION STUDY
EAST SHUGART (Delaware) FIELD
Eddy & Lea Counties, New Mexico**

PERFORMANCE PREDICTIONS

Four prediction cases were run. These are:

- ★ **Primary depletion with existing perforations.**
- ★ **Primary depletion with existing plus added perforations.**
- ★ **Secondary depletion (Waterflood) using existing perforations and drilling nine (9) injection wells and converting Taylor 3 to injector.**
- ★ **Secondary depletion using existing plus added perforations and drilling nine (9) injection wells and converting Taylor 3 to injector.**

APPROVED BY: _____
DATE: 40
CASE NO. _____

EXHIBIT

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— BASE
--- ADD-PRF
... WTRFLD
-.- MEASURED
OIL RATE (STB/D)

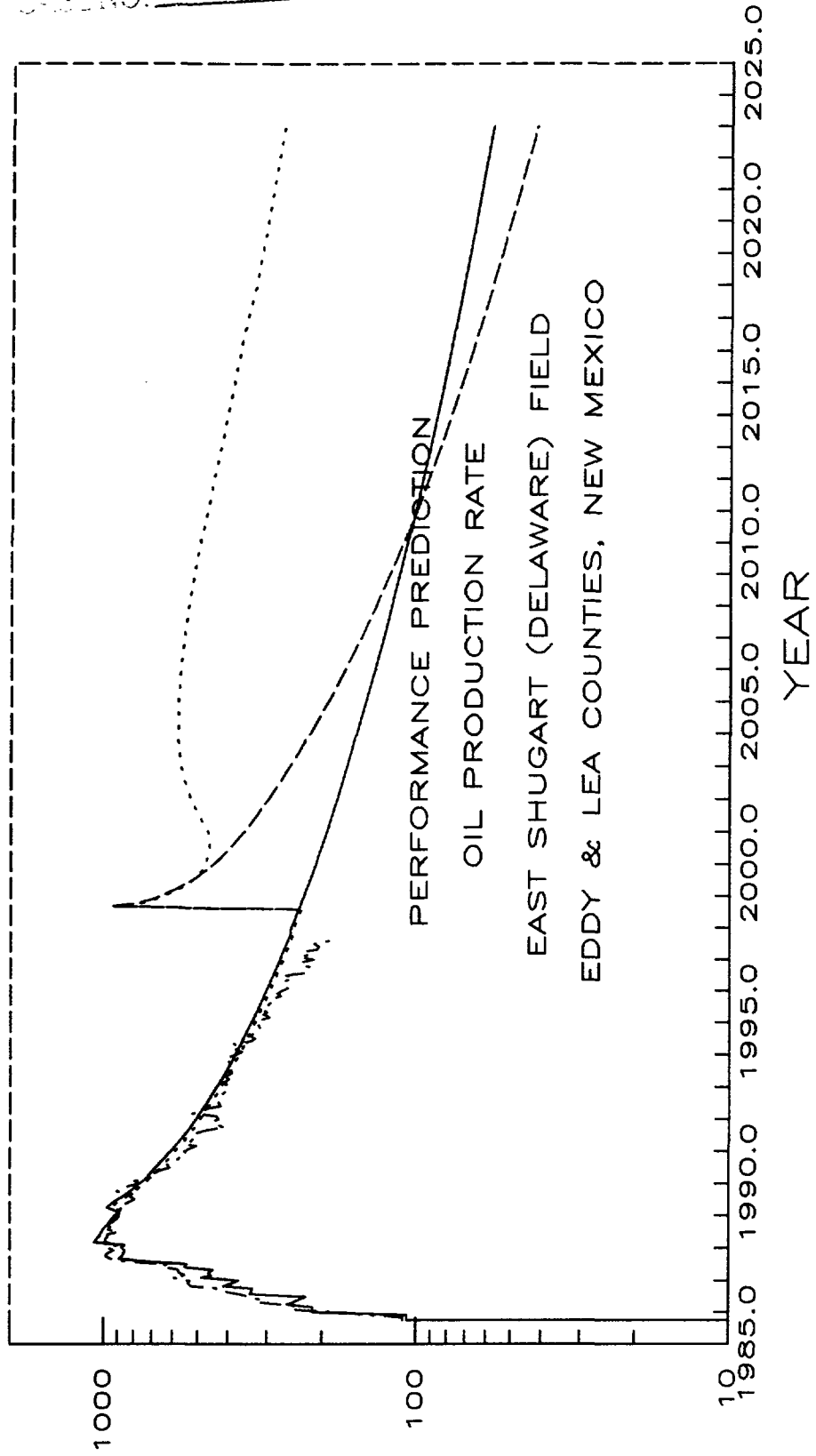


FIGURE 16

Geological Division
CALCULATED BY DIVISION
A2
EXHIBIT

CASE NO.

**RESERVOIR SIMULATION STUDY
EAST SHUGART (Delaware) FIELD
Eddy & Lea Counties, New Mexico**

CONCLUSIONS

- ★ **It is feasible to waterflood the Delaware zone of East Shugart Field.**
- ★ **Primary reserves for the existing perforations are calculated to be 1015.9 MSTB.**
- ★ **Primary reserves for the behind pipe zones within the Delaware formation are calculated to be 361.2 MSTB.**
- ★ **Secondary reserves using existing perforations are calculated to be 1305.3 MSTB.**
- ★ **Secondary reserves for the behind pipe zones are calculated to be 1282.5 MSTB.**
- ★ **Total reserves including primary (Existing perfs + behind pipe) and secondary (existing perfs + behind pipe) are 3964.9 MSTB.**

Note: These reserves are estimated as of 8/1/98 and are calculated for production through year 2022

Tract Participation

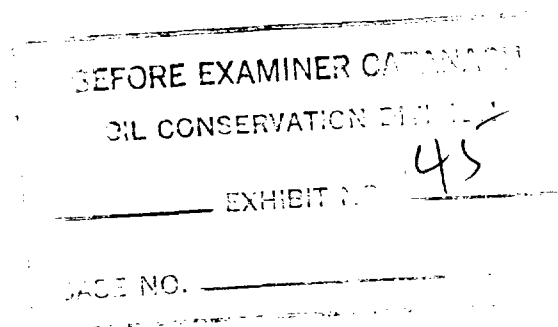
East Shugart Delaware Unit											
Tract Participation Factors											
Tract No.	Tract Name	% of Acres	% of Cum Oil	% of Oil Rate	% of OOIP	% of Rem. Prim	Unit Participation	OWNER	STM FORMULA	INTOL FORMULA	GWI
1A	S. Taylor 2	6.62%	8.99%	8.83%	6.24%	8.03%	7.5875%	ST. MARY LAND & EXPLORATION CO.	0.565306	0.55971813	-0.005588
1B	S. Taylor 3	6.62%	0.00%	0.00%	3.32%	0.00%	1.6590%	RIVERHILL ENERGY CORP.	0.062812	0.06219084	-0.000621
2	Inca Fed	20.21%	28.95%	28.07%	26.62%	24.54%	26.6995%	NORMAN BARKER	0.032106	0.0313886	-0.000717
3A	Corroco 1	6.79%	10.77%	11.10%	5.09%	11.76%	8.5300%	INTOL, INC.	0.045453	0.053195	0.007743
3B	Corroco 3	6.80%	2.86%	5.18%	6.75%	7.35%	5.8665%	NORTEX CORP.	0.023116	0.0220975	-0.001019
4	Mohawk 1	6.62%	1.40%	2.25%	3.32%	2.35%	2.7840%	HARVEY E. YATES CO.	0.038938	0.03722207	-0.001716
5A	Gerónimo 3	6.62%	15.95%	12.37%	11.15%	13.94%	12.3670%	SPIRAL, INC.	0.005145	0.0049178	-0.000227
5B	Gerónimo 4	6.62%	9.92%	6.02%	10.92%	6.62%	8.6850%	EXPLORENS PETROLEUM CORP.	0.005145	0.0049178	-0.000227
5C	Gerónimo 5	3.31%	2.93%	1.75%	3.06%	0.18%	2.2935%	HEYCO EMPLOYEES LTD.	0.001758	0.00168051	-0.000077
5D	Gerónimo 8	6.62%	2.09%	2.59%	4.26%	1.28%	3.1880%	YATES ENERGY CORP.	0.012434	0.01188605	-0.000548
5E	Gerónimo 9	6.62%	5.47%	6.65%	6.69%	8.22%	6.7230%	JALAPENO CORP.	0.005930	0.00566827	-0.000261
5F	Gerónimo 10	6.62%	1.42%	2.39%	2.23%	2.08%	2.3455%	DR. MICHAEL NORTON	0.021244	0.02022849	-0.001016
5G	Gerónimo 12	3.31%	1.83%	1.75%	3.06%	0.53%	2.1810%	GWENDOLYN MANNING WILLIAMS	0.012040	0.01177073	-0.000289
6	Jade 1	6.62%	7.42%	11.05%	7.29%	13.12%	9.0905%	GENE SHUMATE	0.000324	0.00030083	-0.000024
		100.00%	100.00%	100.00%	100.00%	100.00%	100.0000%	NM&T RESOURCES, LLC.	0.011356	0.0118101	-0.000175
STM Participation Formula: (5% X Acres) + (15% X Cum Oil) + (25% X Oil Rate) + (40% X OOIP) + (15% X Rem. Prim)											
INTOL Participation Formula: (5% X Acres) + (20% X Cum Oil) + (35% X Oil Rate) + (5% X OOIP) + (35% X Rem. Prim)											

BEFORE EXAMINER CATANACH
OIL CONSERVATION DIVISION
EXHIBIT NO. 44
CASE NO. _____

shugintoil

**EAST SHUGART DELAWARE UNIT
COMPARING UNIT vs. JADE #1
INTOIL INTEREST**

	TOTAL UNIT Primary + W/O + <u>Waterflood</u>	<u>JADE #1</u>
W. I.	4.54%	50.00%
R. I.	3.98%	43.75%
 Intoil Net Reserves	 172 MBO 138 MMCF	 38 MBO 106 MMCF
 Current Production at March 1999		
BOPD	174(G) 7(N)	16(G) 7(N)
MCFPD	550(G) 22(N)	48(G) 21(N)
 Undisc. Net Cash Flow	 2966 M\$	 574 M\$



OIL-BPD
Ref= 06/99
Cum= 166.225

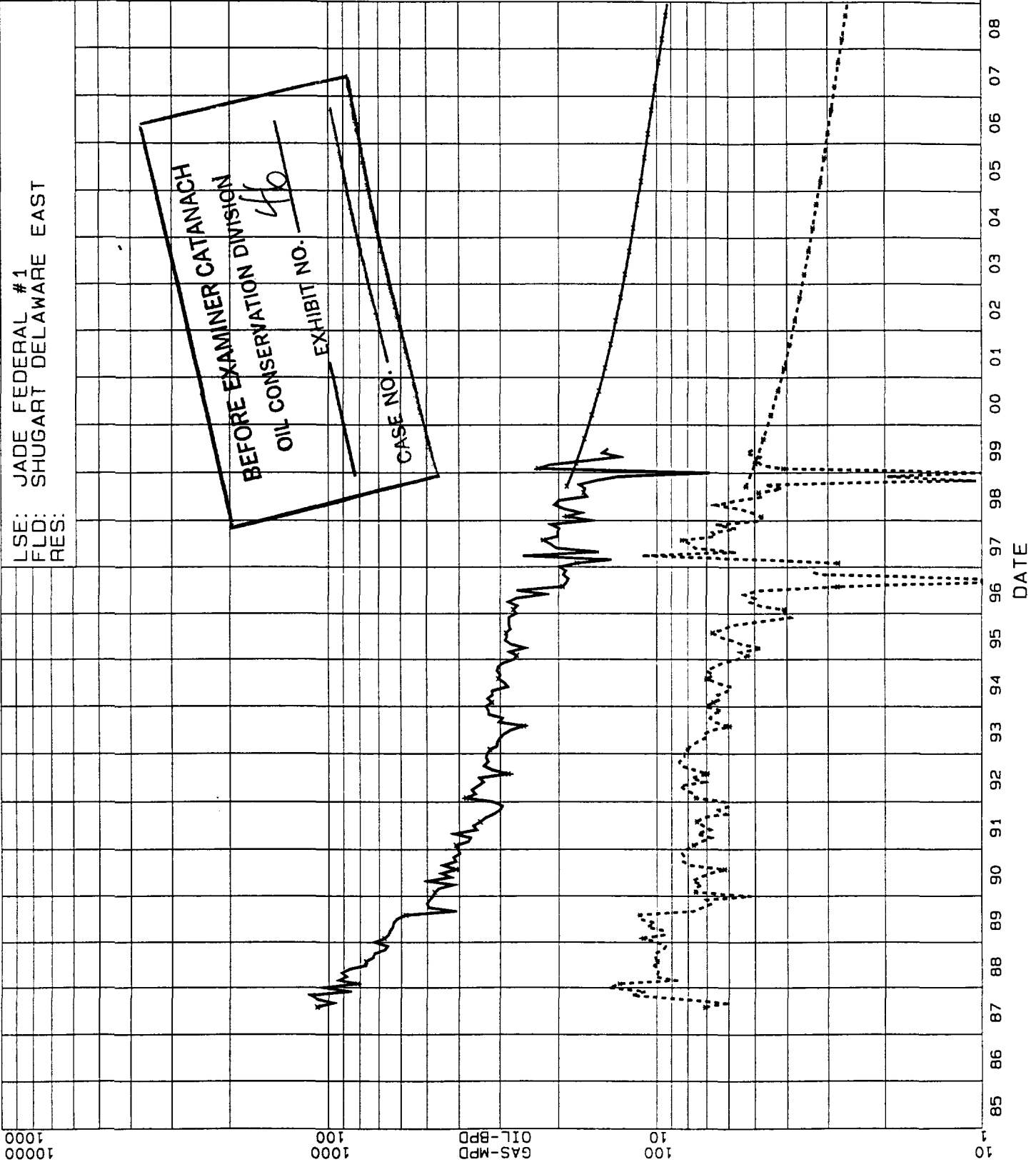
GAS-MPD
Ref= 06/99
Cum= 297.799

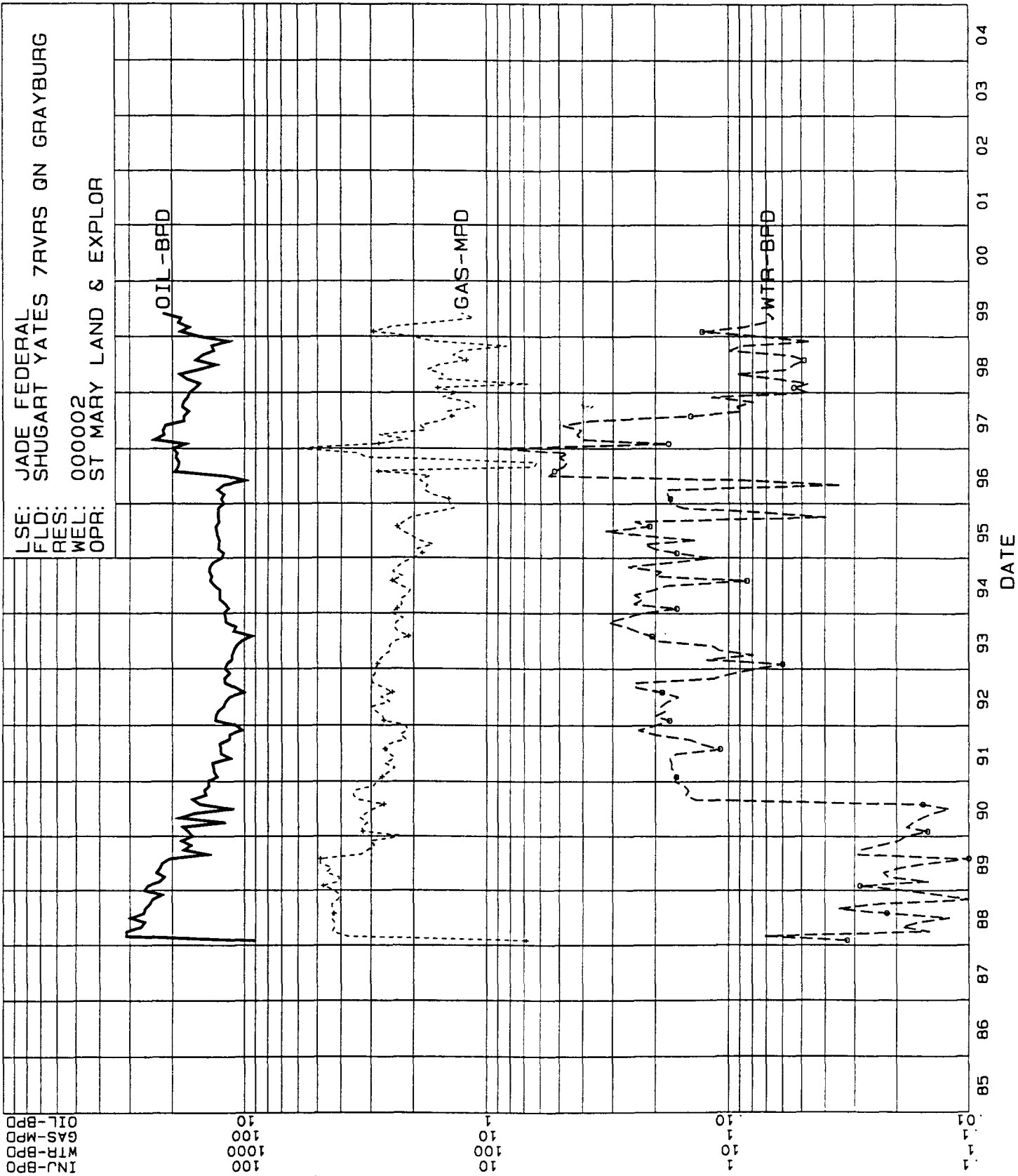
OIL-RL
Ref= 09/98
Cum= 161.676
Rem= 99.092
EUR= 250.758
Yrs= 40.000
Qi= 577.9
De= 13.000
Qab= 1.900
n= 61.2

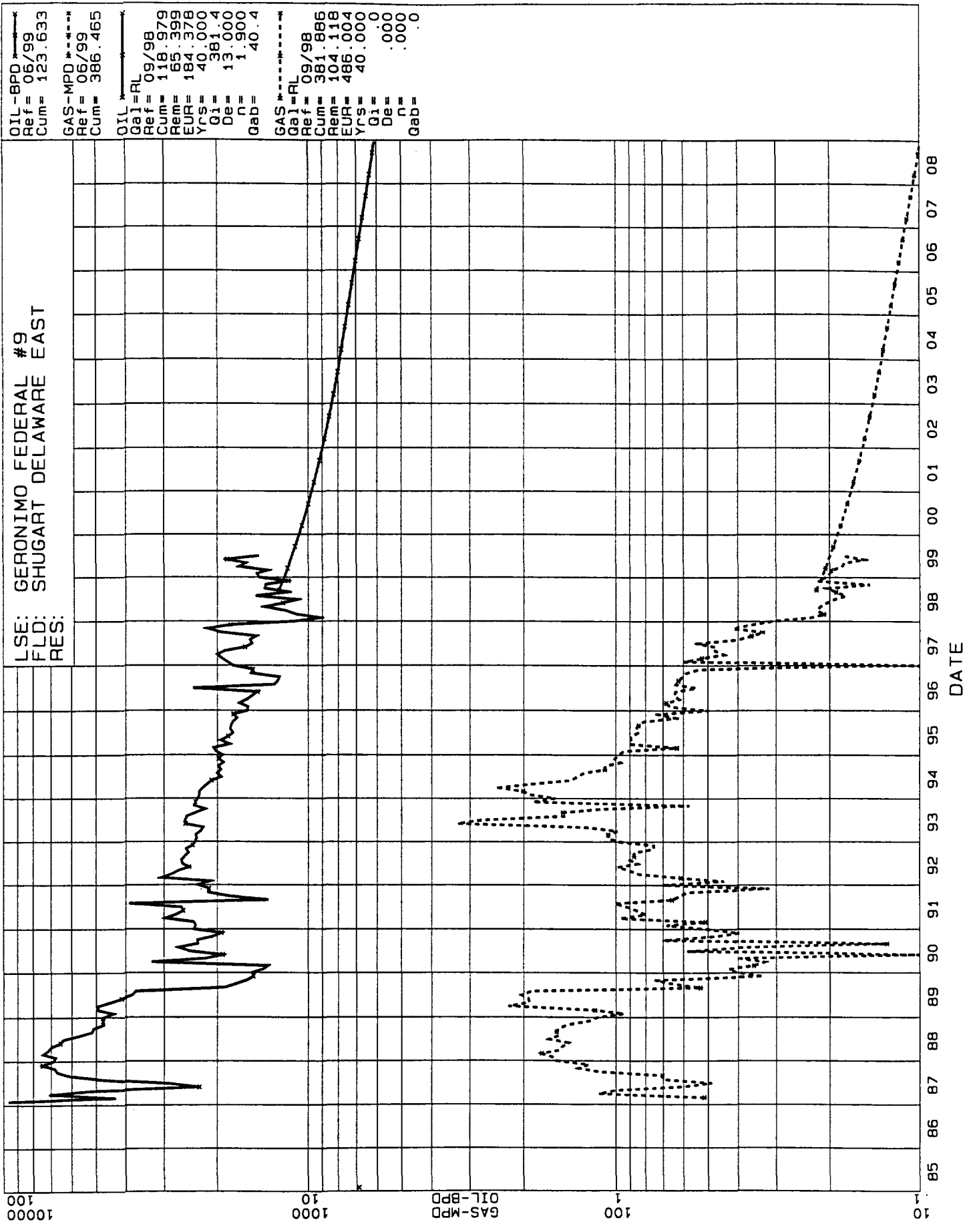
GAS-RL
Ref= 09/98
Cum= 287.048
Rem= 279.198
EUR= 555.245
Yrs= 40.000
Qi= .000
De= .000
Qab= .0

LSE: JADE FEDERAL #1
FLD: SHUGART DELAWARE EAST
RES:

BEFORE EXAMINER CATANACH
OIL CONSERVATION DIVISION
EXHIBIT NO. 46
CASE NO.







SHUGART WATERFLOOD WATERFLOOD PARAMETERS

SHUGART

WELL NAME	ACRES	% OF ACRES	ACRES % OF UNIT	OOIP MBO	% OF OOIP	OOIP % OF UNIT	CUM OIL	% OF CUM OIL	CUM OIL % OF UNIT	REM RES PRIM.	% OF REM RES PRIM.	REM RES % OF UNIT	RATE 1 to 5/98	% OF RATE	RATE % OF UNIT	TRACT UNIT %
Conoco #1	41.01	0.0679	0.0034	1581	0.051	0.0204	232.327	0.1077	0.0162	83.6	0.1176	0.0176	2912	0.111	0.0277	0.0853
Conoco #3	41.04	0.0679	0.0034	2096	0.068	0.0270	61.687	0.0286	0.0043	52.3	0.0736	0.0110	1359	0.052	0.0129	0.0587
Geronimo #3	40	0.0662	0.0033	3461	0.111	0.0446	344.146	0.1595	0.0239	99.1	0.1394	0.0209	3245	0.124	0.0309	0.1237
Geronimo #4	40	0.0662	0.0033	3392	0.109	0.0437	214.007	0.0992	0.0149	47	0.0661	0.0099	1581	0.060	0.0151	0.0869
Geronimo #5	20	0.0331	0.0017	950	0.031	0.0122	63.232	0.0293	0.0044	1.3	0.0018	0.0003	460	0.018	0.0044	0.0229
Geronimo #8	40	0.0662	0.0033	1323	0.043	0.0170	45.005	0.0209	0.0031	9.1	0.0128	0.0019	680	0.026	0.0065	0.0319
Geronimo #9	40	0.0662	0.0033	2076	0.067	0.0267	117.993	0.0547	0.0082	58.4	0.0821	0.0123	1745	0.067	0.0166	0.0672
Geronimo #10	40	0.0662	0.0033	692	0.022	0.0089	30.654	0.0142	0.0021	14.8	0.0208	0.0031	626	0.024	0.0060	0.0234
Geronimo #12	20	0.0331	0.0017	950	0.031	0.0122	39.609	0.0184	0.0028	3.8	0.0053	0.0008	460	0.018	0.0044	0.0218
Inca #1	40.69	0.0674	0.0034	2652	0.085	0.0342	259.954	0.1205	0.0181	58.2	0.0818	0.0123	2698	0.103	0.0257	0.0936
Inca #2	40.69	0.0674	0.0034	3832	0.123	0.0494	221.764	0.1028	0.0154	58.2	0.0818	0.0123	2898	0.110	0.0276	0.1080
Inca #3	40.69	0.0674	0.0034	1782	0.057	0.0230	142.78	0.0662	0.0099	58.2	0.0818	0.0123	1770	0.067	0.0169	0.0654
Jade #1	40	0.0662	0.0033	2263	0.073	0.0292	159.99	0.0742	0.0111	93.3	0.1312	0.0197	2899	0.110	0.0276	0.0909
Mohawk #1	40	0.0662	0.0033	1031	0.033	0.0133	30.251	0.0140	0.0021	16.7	0.0235	0.0035	591	0.023	0.0056	0.0279
South Taylor #2	40	0.0662	0.0033	1938	0.062	0.0250	193.865	0.0899	0.0135	57.1	0.0803	0.0120	2316	0.088	0.0221	0.0759
South Taylor #3	40	0.0662	0.0033	1030	0.033	0.0133	0	0.0000	0.0000	0	0.0000	0.0000	0	0.000	0.0000	0.0166
TOTAL FIELD	604.12	1.000	0.050	31049	1.000	0.400	2157.264	1.000	0.150	711	1.000	0.150	26240	1.000	0.250	1.000
PARAMETER %			0.05			0.4			0.15			0.15			0.25	

BEFORE EXAMINER CATANACH
OIL CONSERVATION DIVISION
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