STRATA PRODUCTION COMPANY

NASH DRAW - BRUSHY CANYON POOL
EDDY COUNTY, NEW MEXICO

SPECIAL POOL RULES
GAS-OIL RATIO LIMITATION
CASE No. 10935
ORDER No. R-10096

BEFORE THE OIL CONSERVATION DIVISION
NEW MEXICO DEPARTMENT OF ENERGY, MINERALS, AND NATURAL RESOURCES

NOVEMBER 16, 1995

EXHIBIT No. 1 to 15

PECOS PETROLEUM ENGINEERING, INC.
ROSWELL, NEW MEXICO

STRATA PRODUCTION COMPANY
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The Nash Draw - Brushy Canyon Pool initially was subject to standard 40 acre proration units, standard depth bracket allowable of 142 BOPD (6,000' to 6,999') and a standard 2,000 to 1 GOR limit. The standard GOR limit results in a casinghead gas allowable of 284 MCFD (8520 MCF per month). At a hearing on March 17, 1994 application was made and evidence given in support for Special Rules increasing the GOR limit. The Division Director issued Order No. R-10096 on April 11, 1994 increasing the GOR limit to 8000 cubic feet of gas per barrel of oil produced. This results in a casing head gas allowable of 1,136 MCFD per 40 acre proration unit. The Oil Conservation Division, on its own motion, requested a review of these temporary rules on or about November 1, 1995.

As further evidence will show, the Brushy Canyon pool is a solution gas drive reservoir, which through normal depletion has an increasing GOR. An increase in the GOR limit will allow continued production and will not result in waste.

The Nash Draw - Brushy Canyon Pool is located in Sections 12, 13, 14 and 24, T23S-R29E and Section 18, T23S-R30E as shown on the Pool Map, Exhibit I-A highlighted with yellow. The pool is located approximately 9 miles East of the town of Loving in Eddy County, New Mexico. As indicated on the Area Map, Exhibit I-B the analogous Delaware production is in the East Loving Brushy Canyon Pool in T23S-R28E, approximately 6 miles West of the Nash Draw field. The East Loving Brushy Canyon Pool produces from the same interval as the Nash Draw Brushy Canyon Pool and has similar production characteristics. Production curves are provided in Exhibit I-C.

Exhibit II is a listing of the wells that have produced from the Delaware interval (Bell canyon, Cherry Canyon and Brushy Canyon) showing the location of each well, from which Pools the well has produced, the perforated intervals and any pertinent comments about the wells. The Nash Draw #1 and #4 wells indicate production from the Cherry Canyon Pool. The #4 has been abandoned in the Cherry Canyon and converted to SWD and the #1 has squeezed off the Cherry Canyon perfs and has been completed in the Brushy Canyon. The Nash Draw #1, 5, 6, 9, 10, 11, 13, 14, 15, 19 20, 23 and 24 have been completed in the Brushy Draw Pool. B.K. Exploration has tested two wells in section 24, T23S-R29E in the Brushy Canyon, with limited success. The Nash Draw #1, 9 and 10 were the first wells to be completed in the Brushy Canyon Pool in the last part of 1992.

Land

The majority of the lands covered by the Nash Draw Brushy Canyon Pool are located in the Nash Unit operated by Strata Production Company. Thirteen of the fifteen producing wells are inside this unit. The two wells outside the Unit are located in the E/2 of section 24, T23S-R29E and are operated by B.K. Exploration.

The Nash Unit is a federal exploratory unit covering sections 1, 11, 12, 13 and 14, T23S-R29E and sections 6, 7 and 18, T23S-R30E. Working interests in the Unit are on an undivided basis and royalties and overriding royalties are based on participating areas.

The B.K. Exploration wells are on a state lease located in section 24, T23S-R29E, just south of the Nash Unit. These wells were completed in the last quarter of 1994.

Geology

The main pay intervals in the Nash Draw Brushy Canyon Pool are the Basal Brushy Canyon zones designated the "K" and "L". These zones are shown on the type log presented in Exhibit III. The top of the Brushy Canyon is at 5230 ft. (-2229 ft. subsea) and the "L" zone lies on top of the Bone Springs zone at 6840' (-3839 ft.).

The Structure Map on top of the "K" zone, Exhibit IV-A, and the Structure Map on top of the "L" zone, Exhibit IV-B, indicate regional dip of approximately 130 feet per mile to the east. Analysis of the net pay and the calculation of oil-feet in each well, Exhibit V-A and V-B, shows parallel northeast-southwest channel sands. The productive limit to the southeast in the "K" sand is defined by an oil-water contact. No oil-water contact has been seen in the "L" zone.

Other potential pay zones in the Brushy Canyon have been tested as outlined in Exhibit II. These other zones have made minor contributions and are not as prolific as the "K" and "L" zones.

Reservoir Characterization

Through analysis of the production from the Nash Draw Brushy Canyon Pool, a reservoir characterization can be formulated. As shown in Exhibit VI, the start of production with the completion of the Nash Draw #1, 9 & 10 in October 1992 and the subsequent development of the field, now with a total of 15 wells. Oil production peaked in October 1994 at 17,595 BOPM, and gas production peaked in November 1994 at 99,424 MCFGM.

Examination of Exhibit VI indicates the Gas-Oil Ratio for this pool was initially 1500 to 1, but, after additional production and the drilling of additional wells the average GOR is now approximately 6300 to 1. Individual wells have GOR's as high as 16,000 to 1 as shown in Exhibit VII.

Exhibit VII indicates the initial GOR and present GOR for each well in the pool. As can be seen on this exhibit the GOR's are not a function of structure, as the lower wells have the higher GOR's. The GOR's are a function of production and well density. The newer wells on the western side of the pool, have lower GOR's. From this we can conclude there is no active gas cap and because the Delaware in this pool has low permeability, .2 to 6 md., the formation of a secondary gas cap is unlikely.

Exhibit VIII indicates the percent water cut for the Nash Draw Brushy Canyon Pool. The water cuts typically declined at a slightly lower rate than the oil. This can be attributed to the water wet nature of the reservoir and the relative permeability to water remaining constant while the relative permeability to oil decreases. No active water drive has been observed in this reservoir.

Exhibits IX are individual well production-GOR curves and the associated data. The data indicates the wells produce with an initial GOR of approximately 1000 to 1 and after a few months the GOR increases to as high as 16,000 to 1 in the #1, 6 and 14 wells.

The decreasing water rates coupled with the increasing GOR indicates the Nash Draw Brushy Canyon Pool is a typical solution gas drive reservoir. There is no indication of a water drive, because water rates are decreasing and the GOR is increasing indicating no water influx and a corresponding decline in reservoir pressure. The GOR is behaving as expected in a classic solution gas drive reservoir, with initial GOR's low and increasing as cumulative production increases. Comparing the Nash Draw Brushy Canyon production with a typical solution-gas drive reservoir (Exhibit X) as depicted in H.C. Slider's "Practical Petroleum Reservoir Engineering Methods"[1] shows that this is a solution-gas drive reservoir. The graph shows that in a solution-gas drive reservoir, the GOR remains constant until the bubble point pressure is reached then the GOR may decline slightly until the critical gas saturation is reached and the permeability to gas increases. After that point the GOR increases rapidly due to the increasing relative permeability to gas. In late time the GOR levels off and may decrease due to change in formation volume factors.

A recombined sample was taken for PVT analysis and a BHP buildup performed on the Nash Draw #19, located in unit J, Section 12-T23S-R29E. The analysis by Core Laboratories shows the "Bubble Point" pressure is 2677 psig and the "Bottom Hole Pressure Build-Up" indicates the reservoir pressure to be 2963 psig. This data is presented in Exhibit XI. The relative closeness of the reservoir pressure to the bubble point pressure shows that with a small amount of withdrawal from the reservoir, the pressure would be reduced and bubble point reached early in the life of the wells in this pool. This was demonstrated in Exhibit IX, individual well GOR data. The bubble point pressure in the Loving Brushy Canyon Pool is 2850 psi.

The SPE Petroleum Engineers Handbook[2] discusses in detail solution gas drive reservoirs and simulation studies by Mr. R.L Ridings[3], and his conclusions concerning solution gas drive reservoirs. Mr. Ridings concluded:

1) "Ultimate recovery is essentially independent of rate and spacing, and agrees closely with recovery predicted by the conventional Muskat method."

2) "GOR depends somewhat on rate and spacing. For high rates or close spacing, GOR's initially are higher, but later become lower than a Muskat prediction would indicate. At low rates or wide spacing, GOR behavior approaches a Muskat prediction."

3) Computed depletion time agreed closely with conventional analysis (productivity index method) at low pressure drawdown, but differed more for high drawdowns. This is in qualitative agreement with results obtained by Vogel.

4) "Intermittent operation greatly affects instantaneous GOR behavior, but the cumulative GOR is not affected significantly. Also, oil recovery is not affected." This refers to the cumulative oil recovery, not the amount of oil recovered in a given time period.

These conclusions are substantiated by analysis of the material balance equation Exhibit XII and XII-B. All of the variables except the produced gas-oil ratios are a function of pressure and the properties of the reservoir fluids. Since the nature of the reservoir fluids are fixed, the recovery is fixed by the PVT properties of the reservoir fluid and produced gas-oil ratio. The cumulative GOR is not significantly affected by rate, the ultimate recovery will not be significantly affected by the production rate.

Field application of these conclusions involves generating typical decline curves to model the producing history of a typical Delaware well. Typical Delaware wells completed from 1987 (Exhibit XIII) indicate an initial decline of 50% for the first year, a 25% decline for the next two years and a 12% decline for the remaining life of the well. The model was then applied to Loving Brushy Canyon fields, Exhibit XIV, with a good match. This confirms that recovery from high GOR Delaware fields is not affected by rate or GOR, but are controlled by the reservoir fluid properties. Therefore, recovery will not be affected by a higher GOR limit.

A match was made with the Nash Draw Brushy Canyon Pool wells (Exhibit XI) to demonstrate the expected decline. The Nash Draw Brushy Canyon Pool wells exhibit a good match except in the area surrounding the Nash Draw #1. This area has shown rapidly increasing GOR and steeper declines in oil production. This is a function of close well spacing and more rapid declines in reservoir pressures.

Economics

Without an increase in the GOR limit, oil production will have to be curtailed on the Nash Draw Unit #11, 14, 15, 19, 23 and 24 wells to maintain the statutory casinghead gas allowable of 284 MCFGD. This will have the effect of extending the life of the well and increasing the time to payout the cost of drilling. This will result in higher costs to the operator, due to increased operating costs for the additional years the well is produced and the loss of value due to the time value of money.

For example, the Nash Draw Unit #19 well produced 13,024 MCFG in August 1995, without the higher gas allowable, gas production would have been curtailed 32% to maintain the 2000 to 1

GOR limit.

Using the Nash draw #19 as an example, Exhibit XV-A, the net cash flow is reduced by $357,000 and the revenue discounted at 10% is reduced by $509,000, if the well is produced with a maximum GOR of 2000 to 1. This is based on the same recoveries but in the first case the GOR is limited to 2000 to 1 and the second case the GOR is allowed to increase throughout the life of the well. The higher GOR limit reduces the producing life of the well, thus reducing operating costs, while recovering the same amount of reserves.

As more wells are drilled to develop this field, the reservoir pressure will continue to decline. This will allow more gas to come out of solution, resulting in higher GOR's. For future development of this field it is important to have a higher GOR limit to provide for efficient production of these reserves and full development of this resource.

Conclusion

The Brushy Canyon formation is a solution gas drive reservoir and is not rate sensitive as far as gas production and GOR are concerned. The ultimate recovery is governed by reservoir fluid properties and not production rates. To prevent waste of the operator's resources and reserves, an increase in the GOR limit to 8,000 to 1 should be granted. Granting, the higher GOR limit will not affect correlative rights.

1 Slider, H.C.: Practical Petroleum Reservoir Engineering Methods, Petroleum Publishing Company, Tulsa, Oklahoma (1976), p. 342.

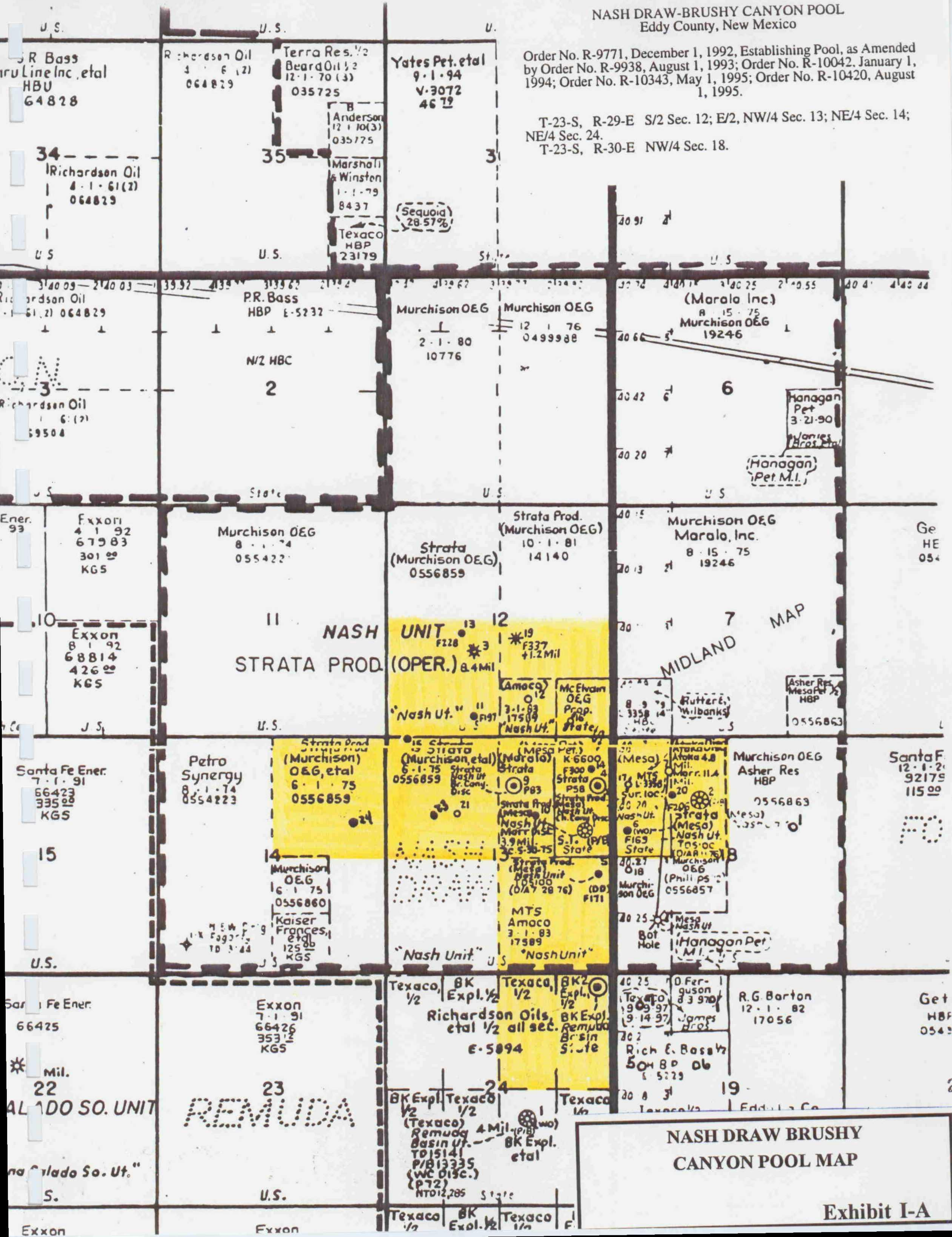
2 Bradley, Harold B.: Petroleum Engineers Handbook, Society of Petroleum Engineers, Richardson, Texas (1987), p. 37-21.

3 Riding, R.L. et al.: "Experimental and Calculated Behavior of Dissolved-Gas-Drive Systems," Society of Petroleum Engineers Journal (March 1963), 41-48: Transactions, AIME, p. 228.

NASH DRAW-BRUSHY CANYON POOL
Eddy County, New Mexico

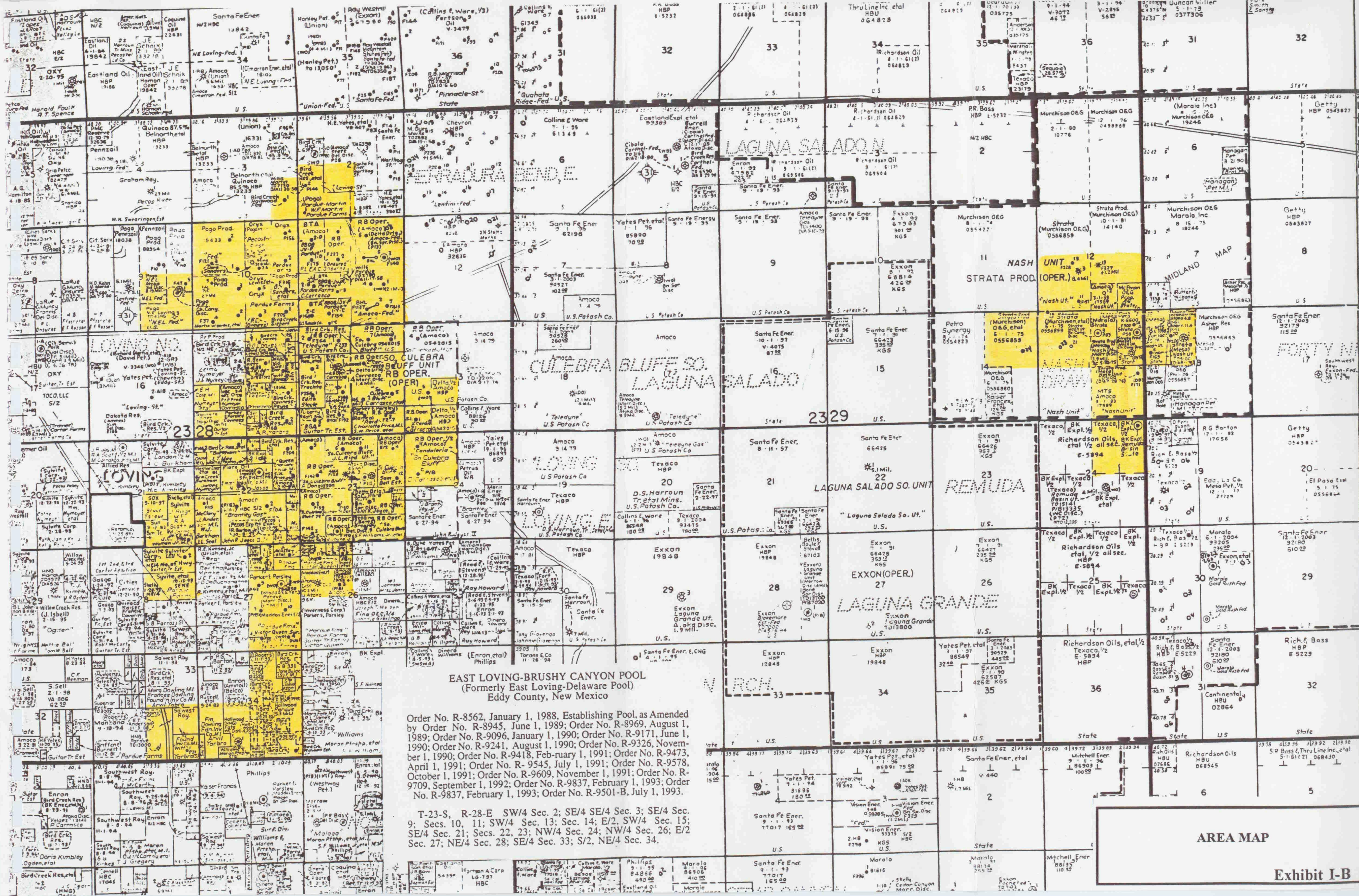
Order No. R-9771, December 1, 1992, Establishing Pool, as Amended by Order No. R-9938, August 1, 1993; Order No. R-10042, January 1, 1994; Order No. R-10343, May 1, 1995; Order No. R-10420, August 1, 1995.

T-23-S, R-29-E S/2 Sec. 12; E/2, NW/4 Sec. 13; NE/4 Sec. 14; NE/4 Sec. 24.
T-23-S, R-30-E NW/4 Sec. 18.



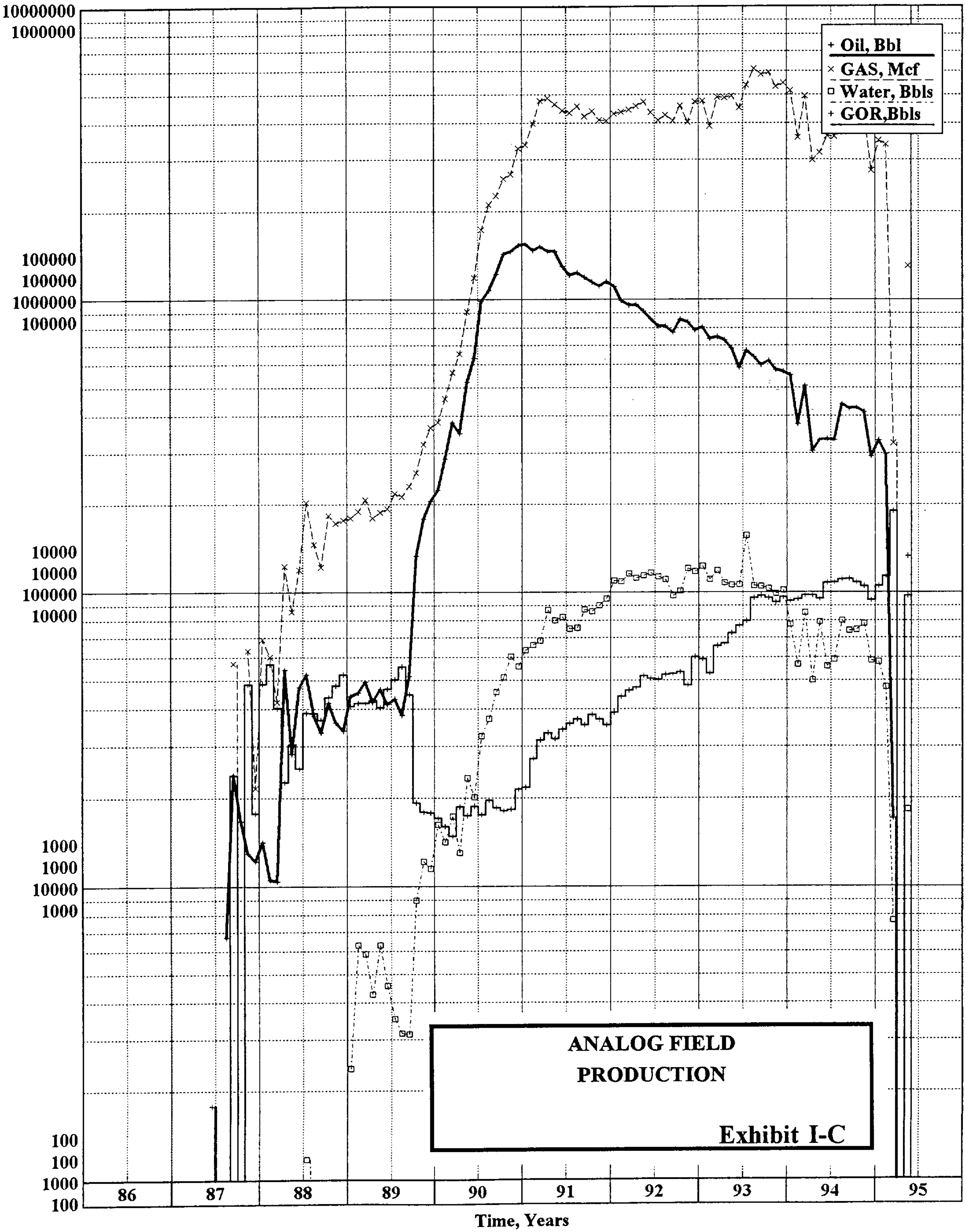
NASH DRAW BRUSHY CANYON POOL MAP

Exhibit I-A



EAST LOVING-BRUSHY CANYON POOL
(Formerly East Loving-Delaware Pool)
Eddy County, New Mexico
Order No. R-8562, January 1, 1988, Establishing Pool, as Amended by Order No. R-8945, June 1, 1989; Order No. R-8969, August 1, 1989; Order No. R-9096, January 1, 1990; Order No. R-9171, June 1, 1990; Order No. R-9241, August 1, 1990; Order No. R-9326, November 1, 1990; Order No. R-9418, Feb-ruary 1, 1991; Order No. R-9473, April 1, 1991; Order No. R- 9545, July 1, 1991; Order No. R-9578, October 1, 1991; Order No. R-9609, November 1, 1991; Order No. R-9709, September 1, 1992; Order No. R-9837, February 1, 1993; Order No. R-9837, February 1, 1993; Order No. R-9501-B, July 1, 1993.
T-23-S, R-28-E SW/4 Sec. 2; SE/4 SE/4 Sec. 3; SE/4 Sec. 9; Secs. 10, 11; SW/4 Sec. 13; Sec. 14; E/2, SW/4 Sec. 15; SE/4 Sec. 21; Secs. 22, 23; NW/4 Sec. 24; NW/4 Sec. 26; E/2 Sec. 27; NE/4 Sec. 28; SE/4 Sec. 33; S/2, NE/4 Sec. 34.
AREA MAP
Exhibit I-B
LAGUNA SALADO N.
HERRADURA BEND E.
LOVING NO.
CULEBRA BLUFF SO.
LAGUNA SALADO
CULEBRA BLUFF UNIT
RB OPER.
SO. CULEBRA
LOVING
LOVING E.
NASH UNIT
STRATA PROD. (OPER.)
NASH DRAW
MIDLAND MAP
FORTY NINE
REMUDA
LAGUNA SALADO SO. UNIT
LAGUNA GRANDE
EXXON (OPER.)
2329
2328

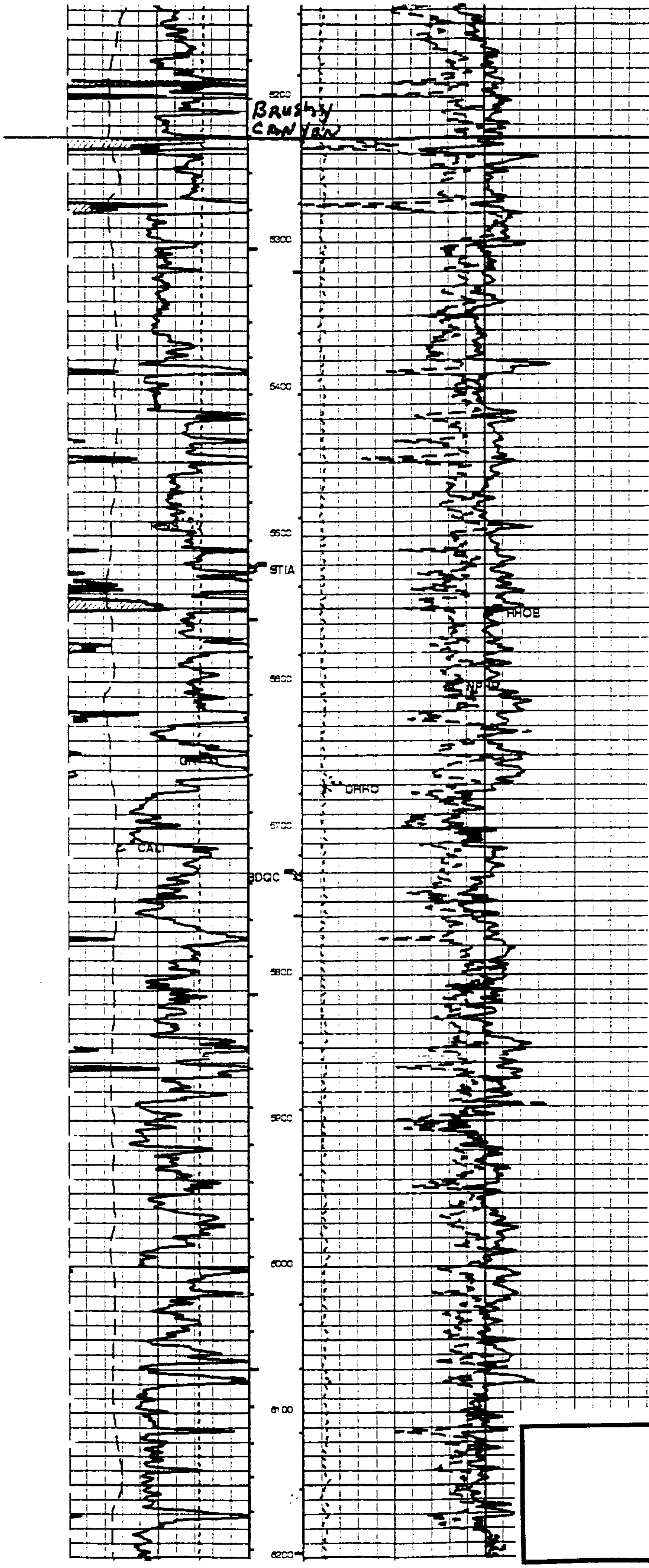
LOVING & E. LOVING B.C.
EDDY COUNTY, NM
FIELD SUMMARY



NASH DRAW DELAWARE WELLS

WELL NAME	LOCATION	UPPER PERF.	LOWER PERF.	FORMATION	COMMENTS
NASH DRAW #1	H SEC. 13-T23S-R29	4780	4784	CHERRY CANYON	SQUEEZED 9/28/92
		4936	4932	CHERRY CANYON	SQUEEZED 9/28/92
		6772	6899	BRUSHY CANYON	266 BO, 176 MCFG, 22 BW
		6385	6400	BRUSHY CANYON	TESTED 10 BWPD
NASH DRAW #4	A SEC. 13-T23S-R29	4785	4788	CHERRY CANYON	SET CIBP @4738'
		4930	4936	CHERRY CANYON	CONVERT TO DISPOSAL
		4952	4956	CHERRY CANYON	7-30-93
		3240	3734		SWD
NASH DRAW #5	I SEC. 13-T23S-R29E	6902	6933	BRUSHY CANYON	171 BO, 137MCFG, 265 BW
NASH DRAW #6	E SEC. 18-T23S-R30	6906	6933	BRUSHY CANYON	169 BO, 131 MCFG, 77 BW
NASH DRAW #9	B SEC. 13-T23S-R29	5432	5440	BRUSHY CANYON	2-19-93
		5838	5843	BRUSHY CANYON	COMPLETE ADDITIONAL PAY
		6318	6373	BRUSHY CANYON	
		6713	6749	BRUSHY CANYON	83 BO, 53 MCFG, 147 BW
		6831	6880	BRUSHY CANYON	7-20-92
NASH DRAW #10	G SEC. 13-T23S-R29	5858	5864	BRUSHY CANYON	4-10-93
		6319	6329	BRUSHY CANYON	COMPLETE ADDITIONAL PAY
		6767	6779	BRUSHY CANYON	
		6846	6864	BRUSHY CANYON	173 BO, 123 MCFG, 52 BW
NASH DRAW #11	N SEC. 12-T23S-R29	6795	6821	BRUSHY CANYON	197 BO, 139 MCFG, 277 BW
		6679	6700	BRUSHY CANYON	COMPLETED IN 1995, 18 B0PD
		6280	6303	BRUSHY CANYON	"
		5897	5905	BRUSHY CANYON	"
		5863	5809	BRUSHY CANYON	"
		5405	5416	BRUSHY CANYON	"
		5022	5079	BRUSHY CANYON	"
NASH DRAW #13	K SEC. 12-T23S-R29	6791	6836	BRUSHY CANYON	228 BO, 123 MCFG, 144 BW
		6879	7007	BRUSHY CANYON	
NASH DRAW #14	A SEC. 13-T23S-R29	6870	6889	BRUSHY CANYON	300 BO, 143 MCFG, 197 BW
NASH DRAW #19	J SEC. 12-T23S-R29E	6721	6734	BRUSHY CANYON	337 BO, 1200 MCFG, 1 BWPD
		6812	6830	BRUSHY CANYON	
WELLS COMPLETED SINCE MARCH 17, 1994 HEARING					
NASH DRAW #15	D SEC. 13-T23S-R29	6686	6818	BRUSHY CANYON	263 BO, 430 MCFG, 215 BWPD
NASH DRAW #20	C SEC. 18-T23S-R30	6932	6956	BRUSHY CANYON	206 BO, 260 MCFG, 73 BWPD
NASH DRAW #23	E SEC. 13-T23S-R29	6643	6801	BRUSHY CANYON	196 BO, 375 MCFG, 500 BWPD
NASH DRAW #24	H SEC. 24-T23S-R29	6650	6794	BRUSHY CANYON	213 BO, 130 MCFG, 406 BWPD
REMUDA BASIN UNIT #1	J SEC. 24-T23S-R29E			BRUSHY CANYON	35 BO, 70 MCGFD
REMUDA BASIN "24" STATE #2	A SEC. 24-T23S-R29	6919	6928	BRUSHY CANYON	IPP 38 BO, 12 MCFG, 274 BWPD

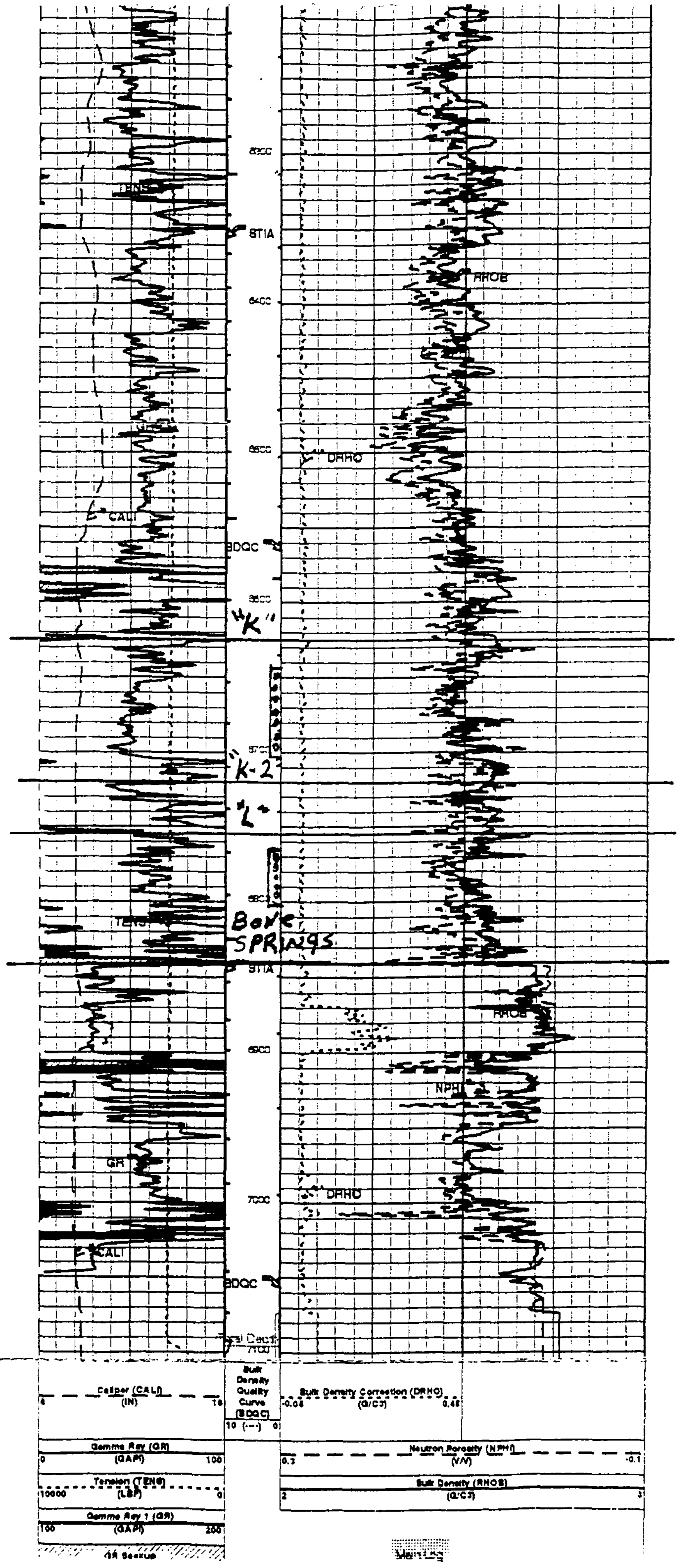
Exhibit II



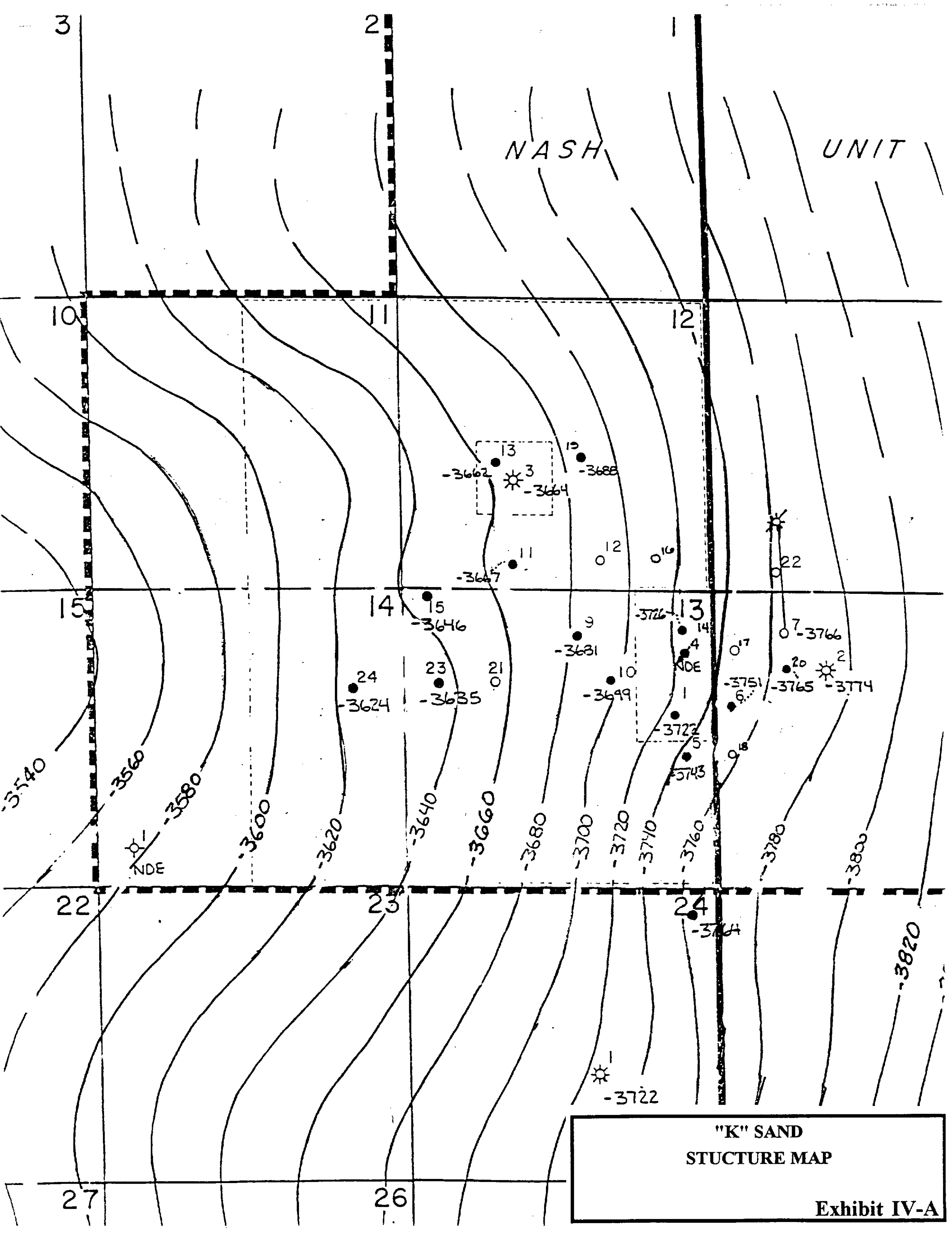
TYPE LOG

NASH DRAW #23

Exhibit III



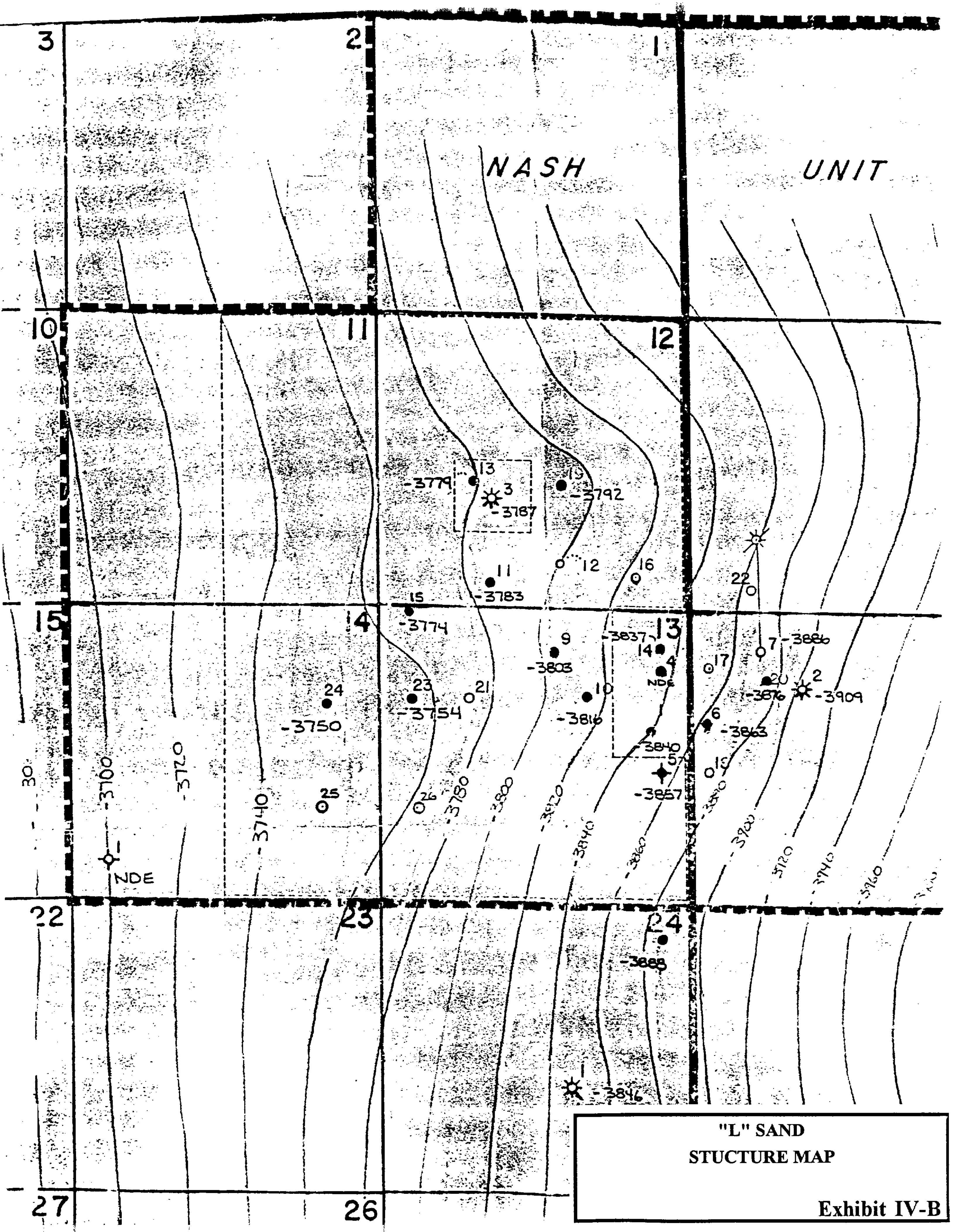
6300
TENS
STIA
RHOB
6400
6500
DRHO
CALI
BDQC
6600
"K"
6700
"K-2"
"L"
6800
TENS
Bone SPRings
STIA
RHOB
6900
NPHI
GR
7000
DRHO
CALI
BDQC
Total Depth
7100
Caliper (CALI)
(IN)
4
16
Bulk Density Quality Curve (BDQC)
10 (---) 0
Bulk Density Correction (DRHO)
(G/C3)
-0.05
0.45
Gamma Ray (GR)
(GAPI)
0
100
Neutron Porosity (NPHI)
(V/V)
0.3
-0.1
Tension (TENS)
(LBF)
10000
0
Bulk Density (RHOB)
(G/C3)
2
3
Gamma Ray 1 (GR)
(GAPI)
100
200
GR Backup
Main Log



"K" SAND

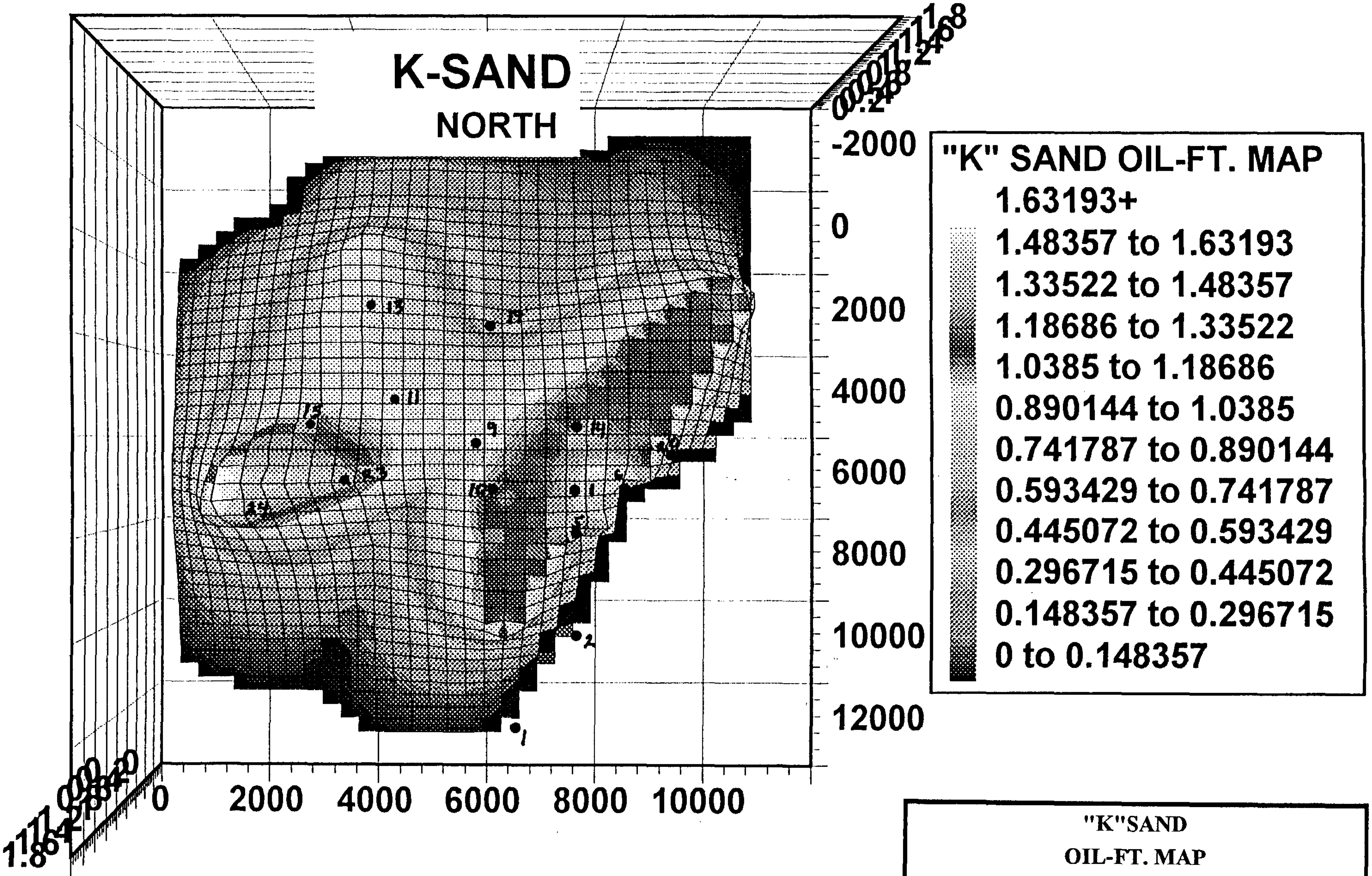
STUCTURE MAP

Exhibit IV-A



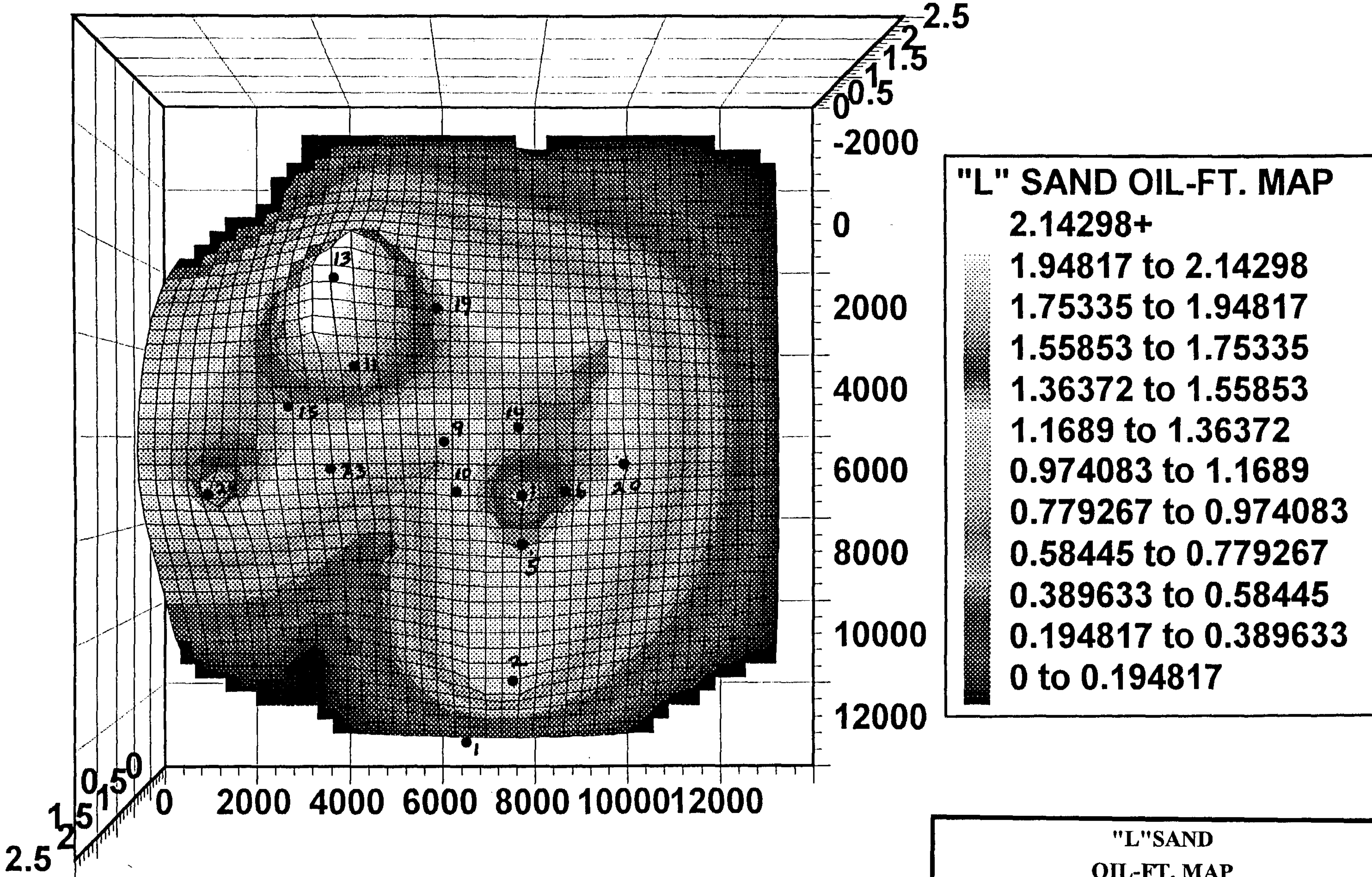
"L" SAND
STUCTURE MAP

Exhibit IV-B



"K"SAND
OIL-FT. MAP

Exhibit V-A



"L"SAND
OIL-FT. MAP

Exhibit V-B

SUMMARY
NASH DRAW (BRUSHY CANYON) FIELD
EDDY COUNTY, NM

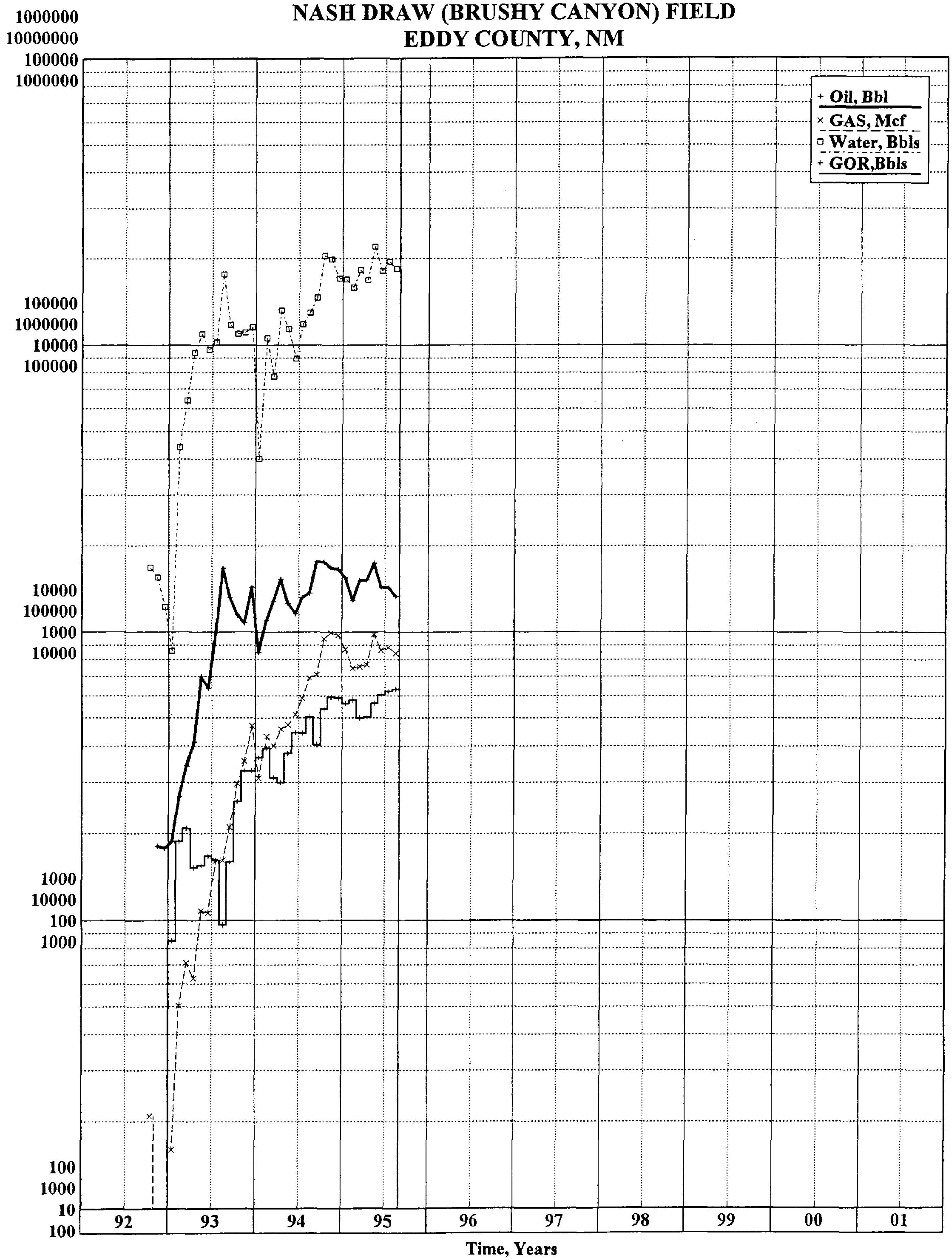
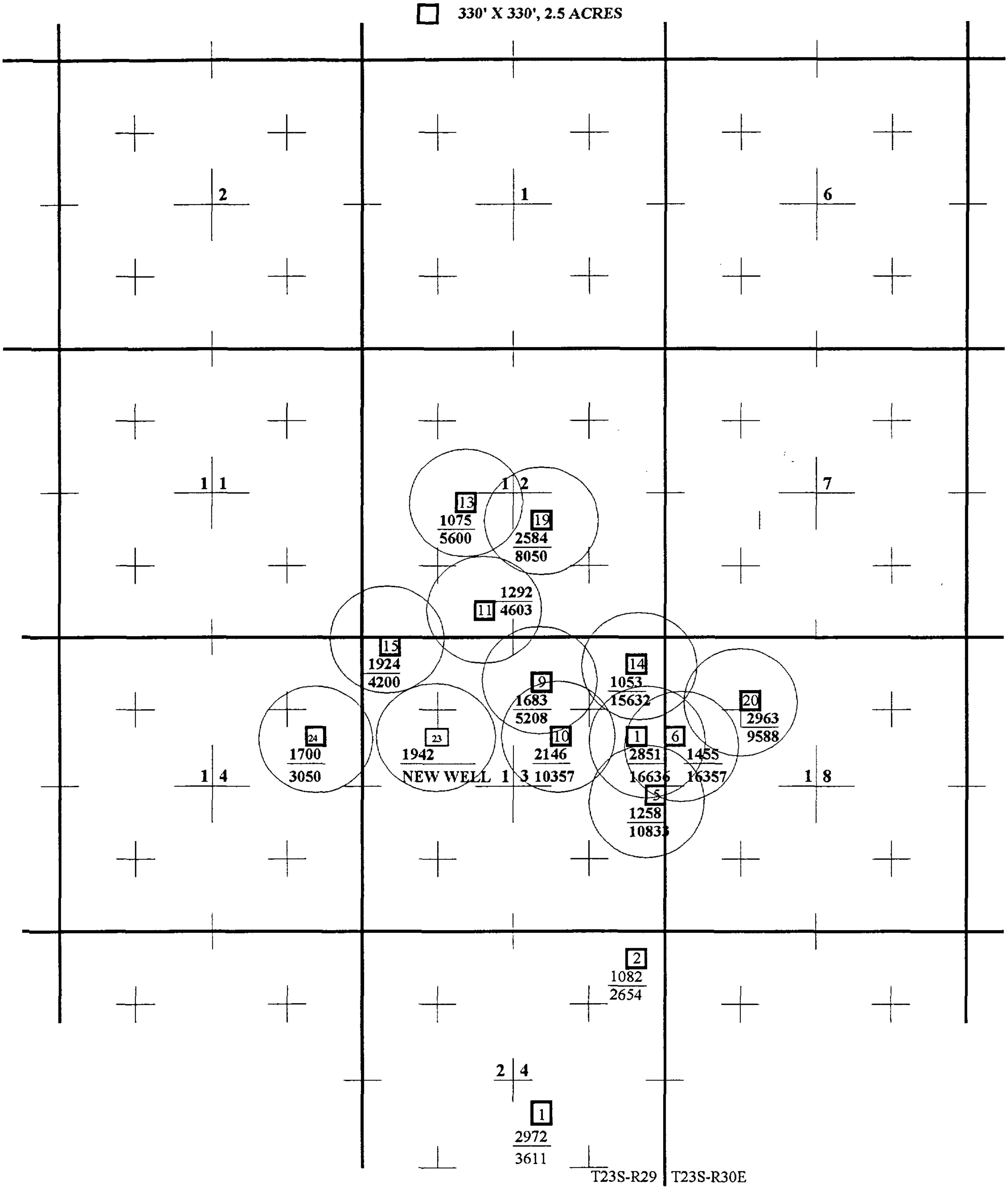


Exhibit VI

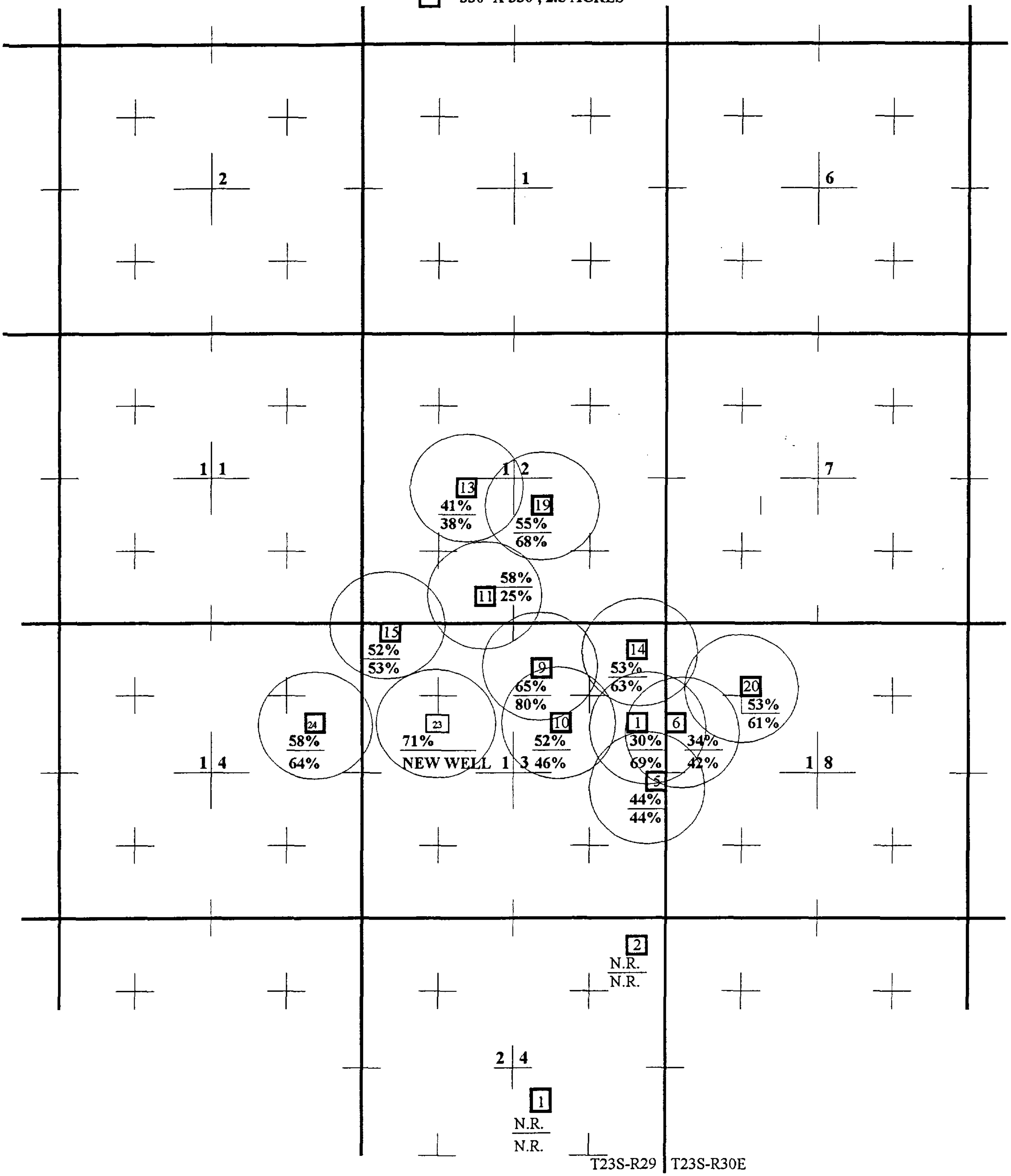


NASH DRAW BRUSHY CANYON POOOL
GAS-OIL RATIO

INITIAL GOR
PRESENT GOR

Exhibit VII

330' X 330', 2.5 ACRES



NASH DRAW BRUSHY CANYON POOOL
% WATER CUT

INITIAL %
PRESENT %

N.R. - NOT REPORTED

Exhibit VIII

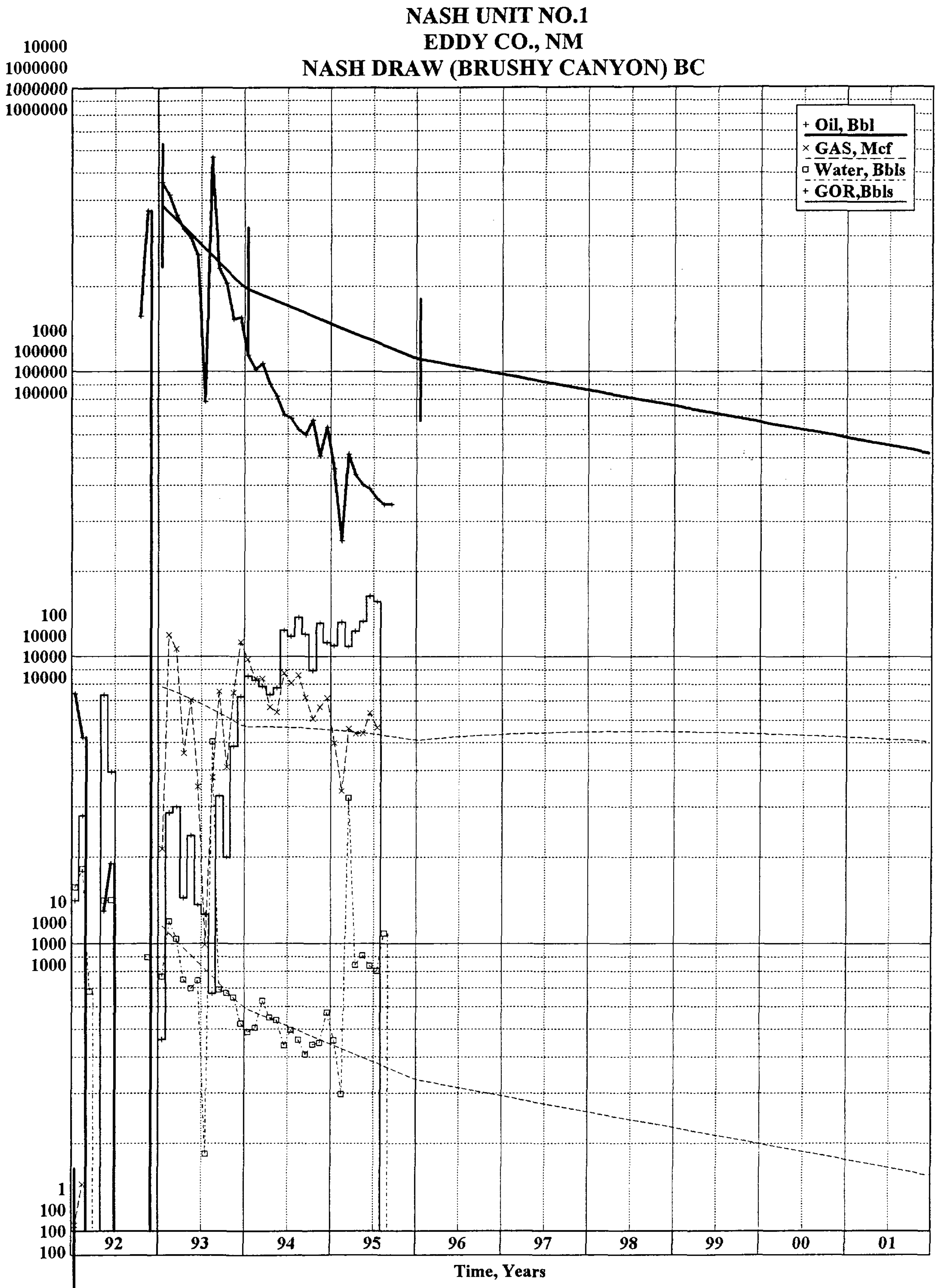

NASH UNIT NO.1
EDDY CO., NM
NASH DRAW (BRUSHY CANYON) BC
10000
1000000
1000000
1000000
1000
100000
100000
100000
100
10000
10000
10000
10
1000
1000
1000
1
100
100
100
Oil, Bbl
GAS, Mcf
Water, Bbls
GOR,Bbls
92
93
94
95
96
97
98
99
00
01
Time, Years

Exhibit IX-A

NASH DRAW UNIT NO.5
EDDY CO., NM
NASH DRAW BRUSHY CANYON

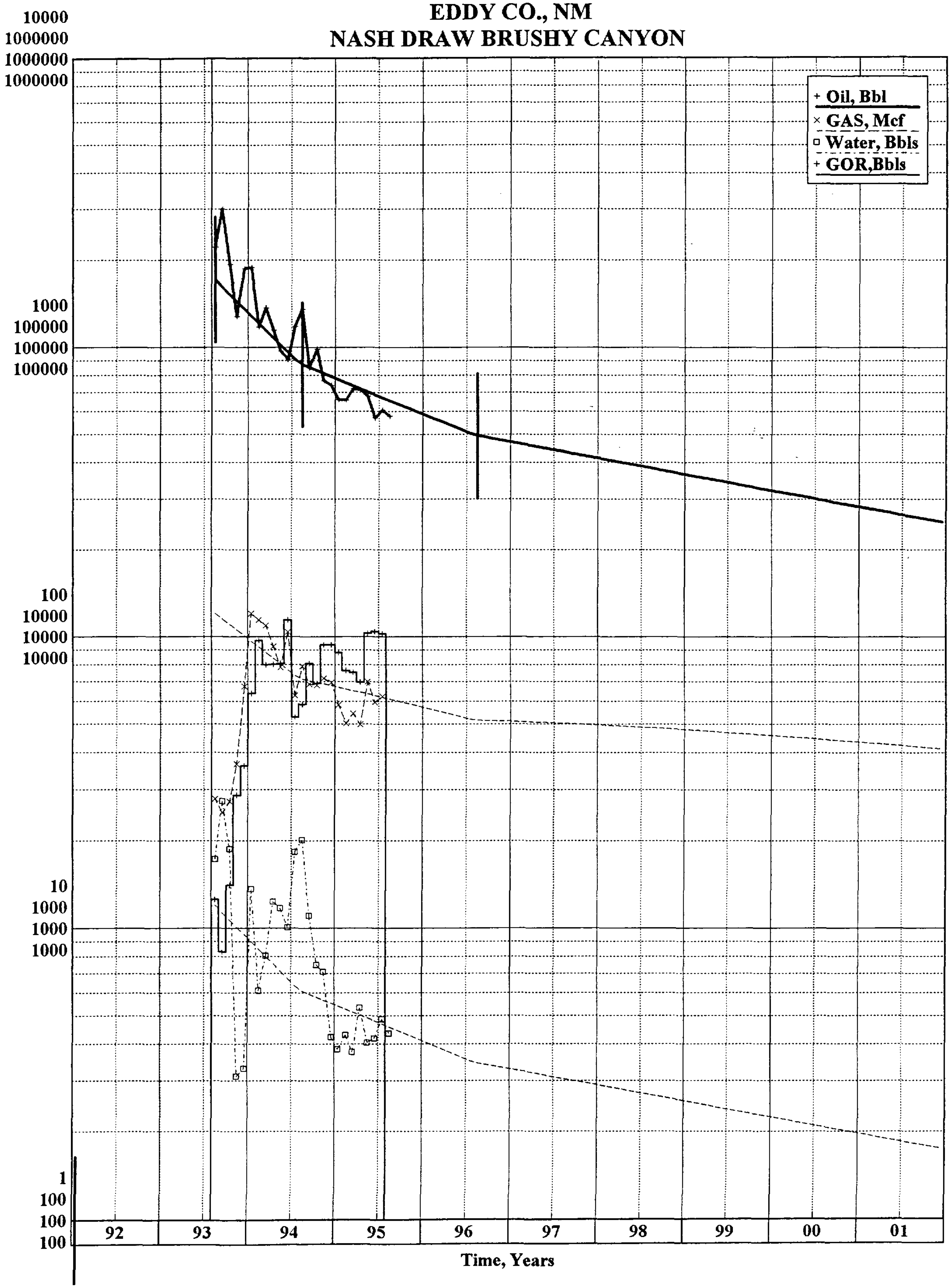


Exhibit IX-B

NASH DRAW UNIT NO.6
EDDY CO., NM
NASH DRAW BRUSHY CANYON

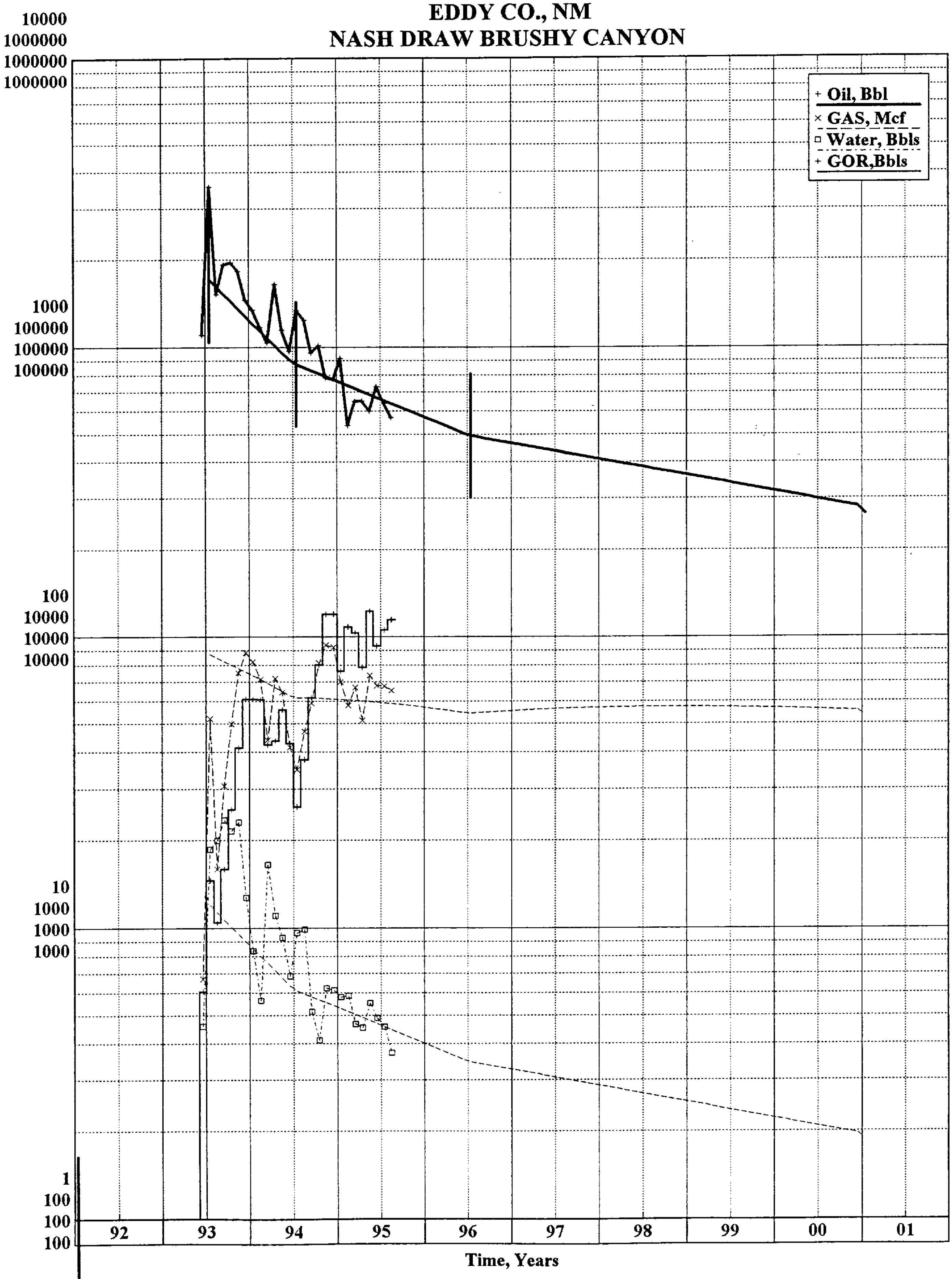


Exhibit IX-C

NASH DRAW UNIT NO.9
EDDY CO., NM
NASH DRAW BRUSHY CANYON

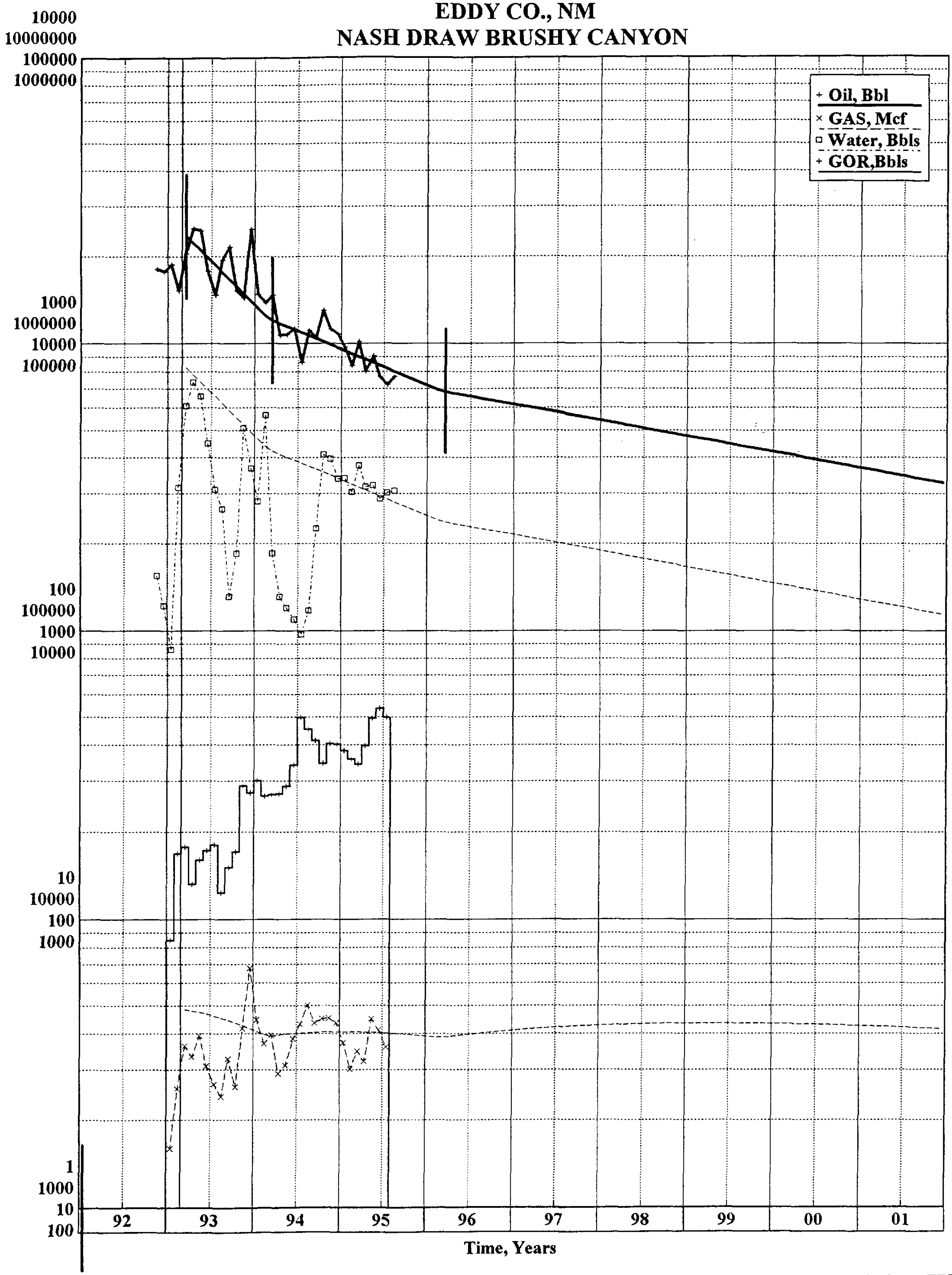


Exhibit IX-D

NASH DRAW UNIT NO.10
EDDY CO., NM
NASH DRAW BRUSHY CANYON

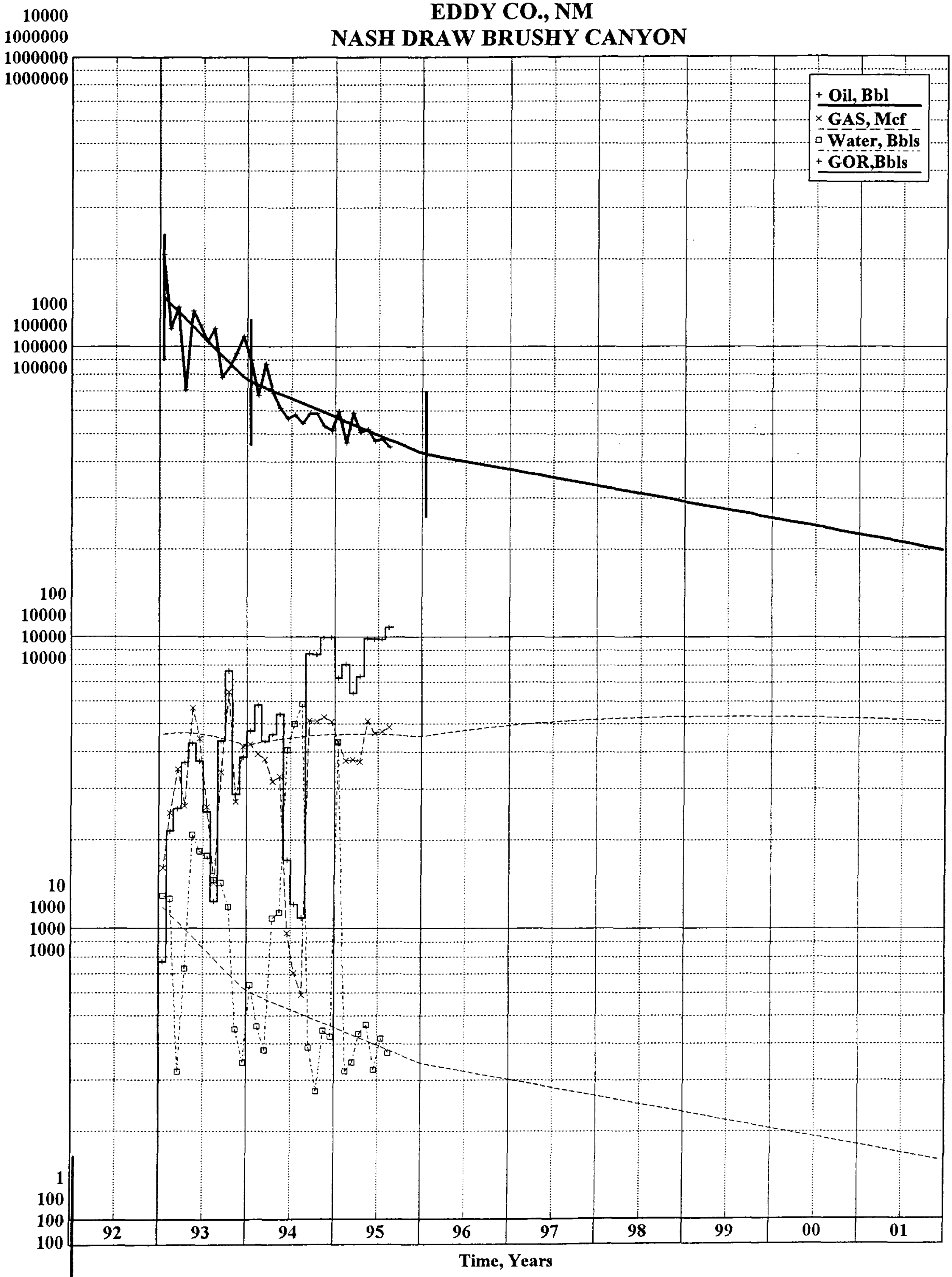


Exhibit IX-E

NASH DRAW UNIT NO.11
EDDY CO., NM
NASH DRAW BRUSHY CANYON

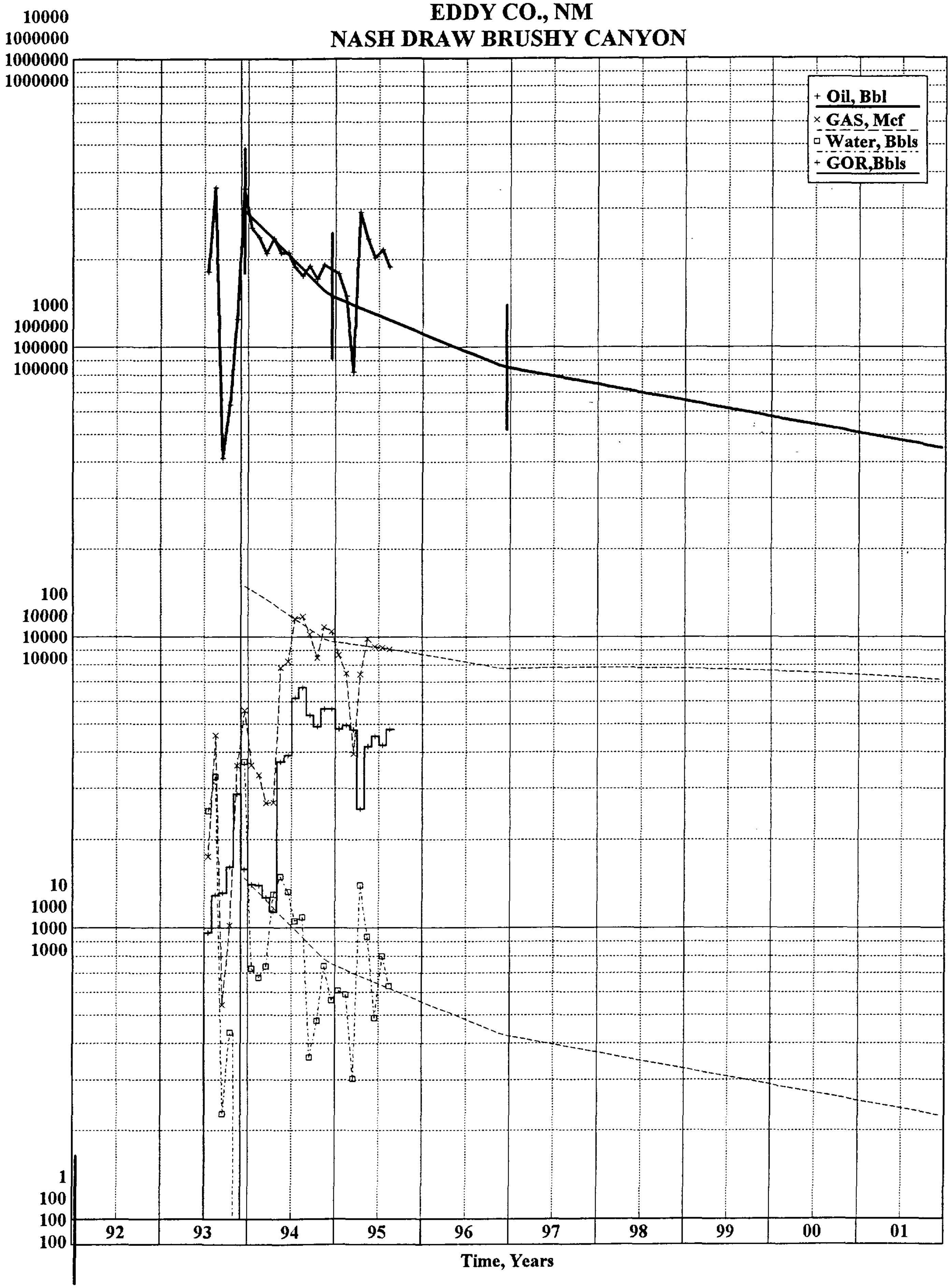


Exhibit IX-F

NASH DRAW UNIT NO.13
EDDY CO., NM
NASH DRAW BRUSHY CANYON

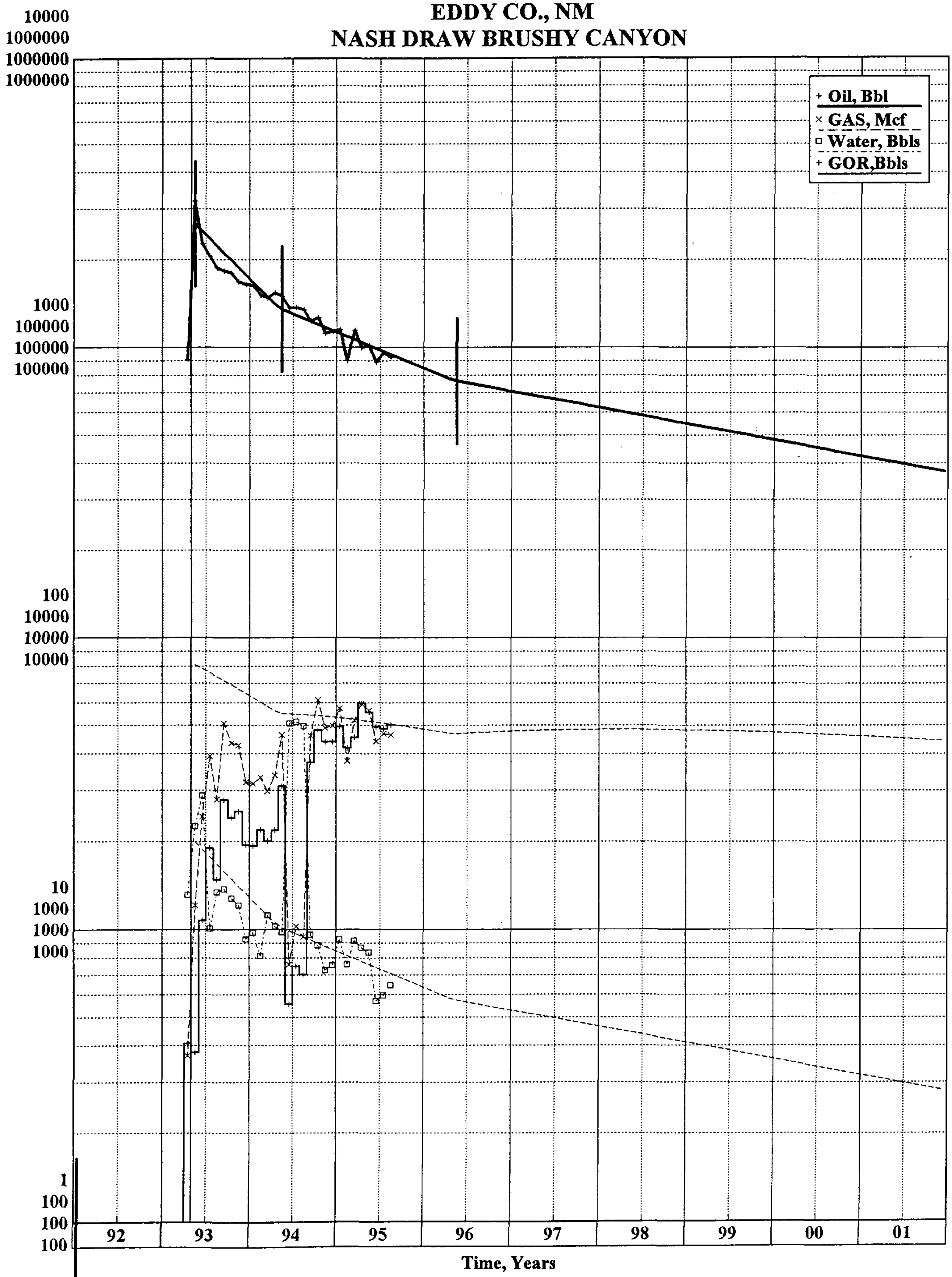


Exhibit IX-G

NASH DRAW UNIT NO.14
EDDY CO., NM
NASH DRAW BRUSHY CANYON

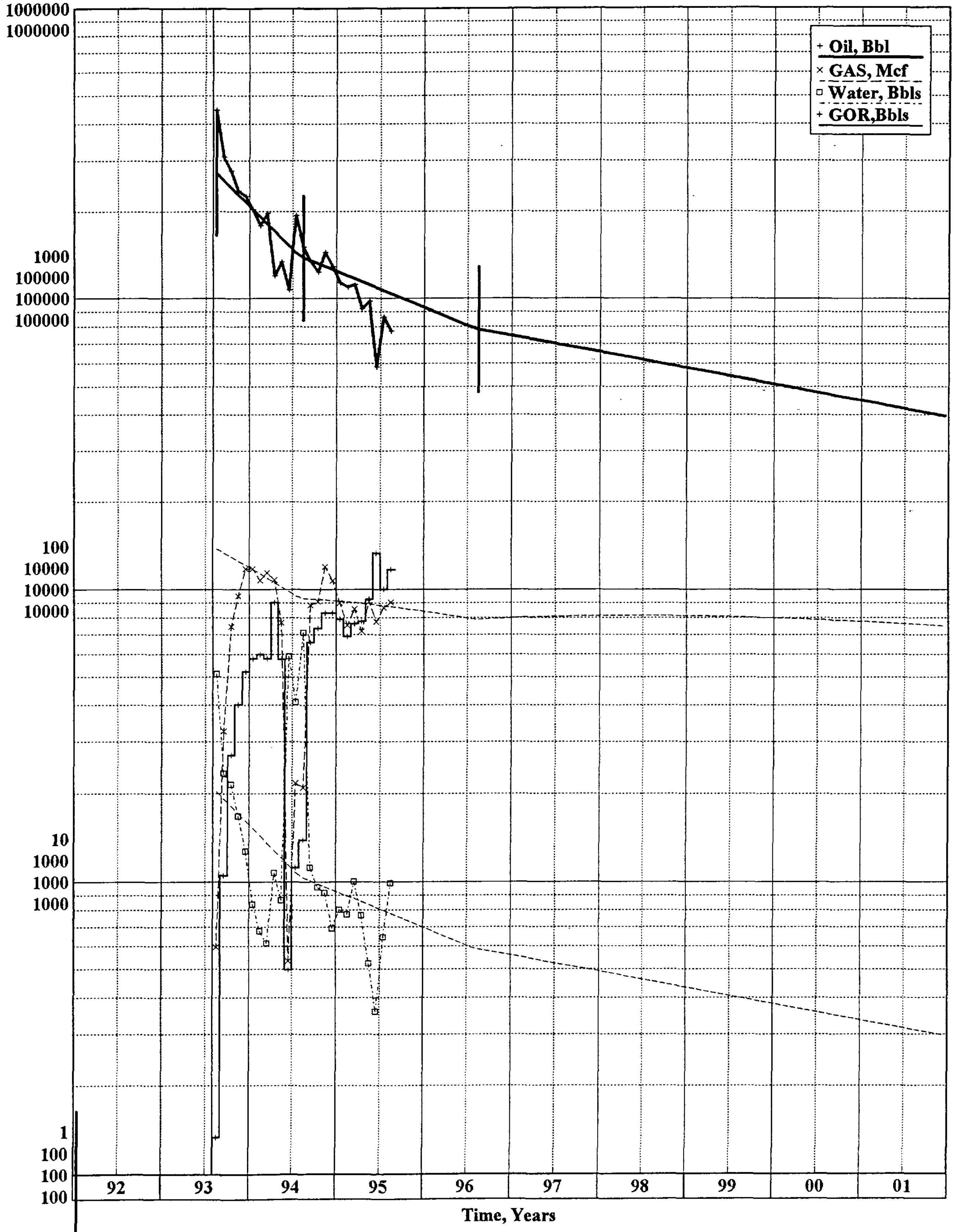
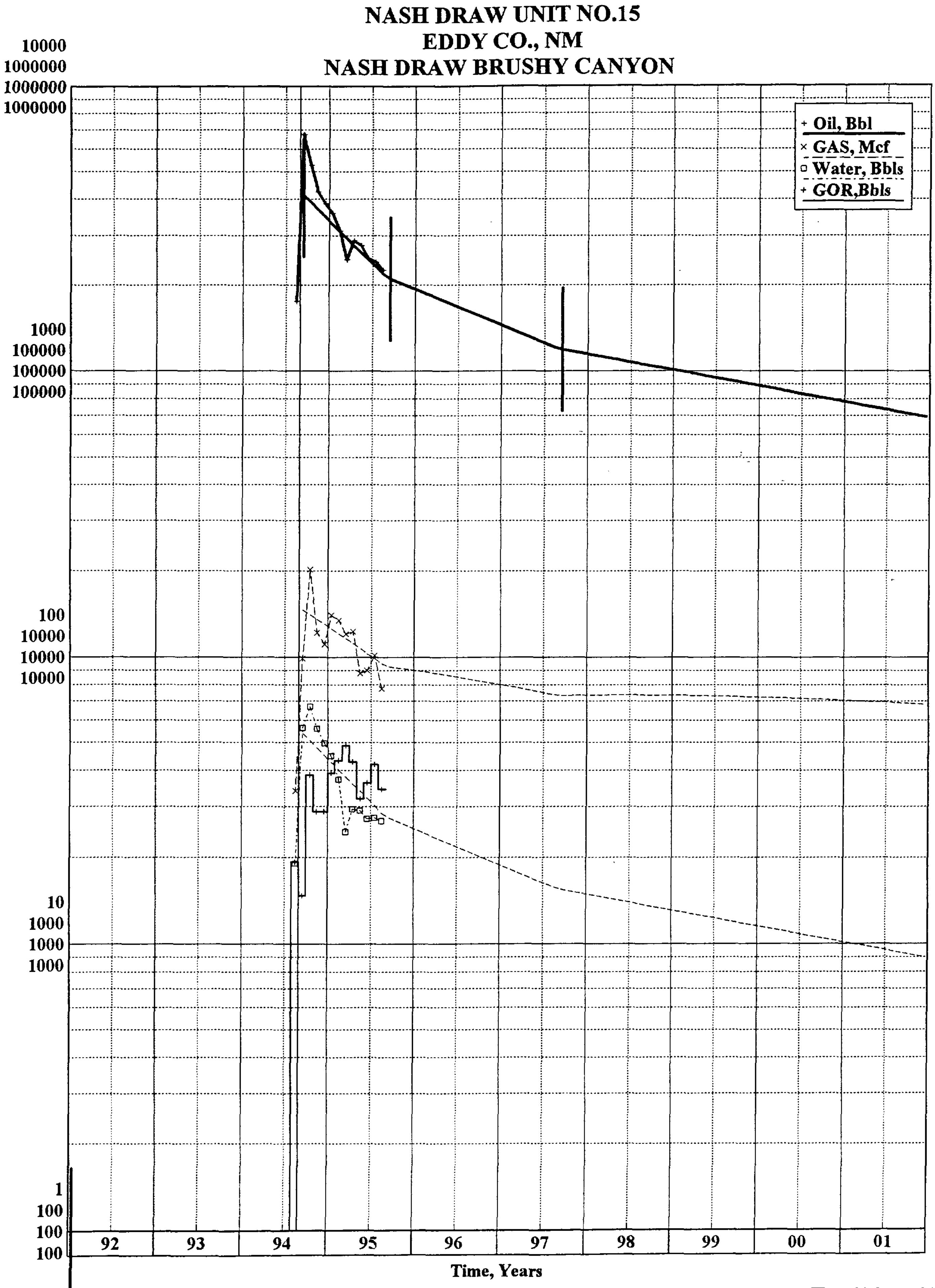


Exhibit IX-H



NASH DRAW UNIT NO.15
EDDY CO., NM
NASH DRAW BRUSHY CANYON
10000
1000000
1000000
1000000
1000
100000
100000
100000
100
10000
10000
10000
10
1000
1000
1000
1
100
100
100
Oil, Bbl
GAS, Mcf
Water, Bbls
GOR,Bbls
92
93
94
95
96
97
98
99
00
01
Time, Years

Exhibit IX-I

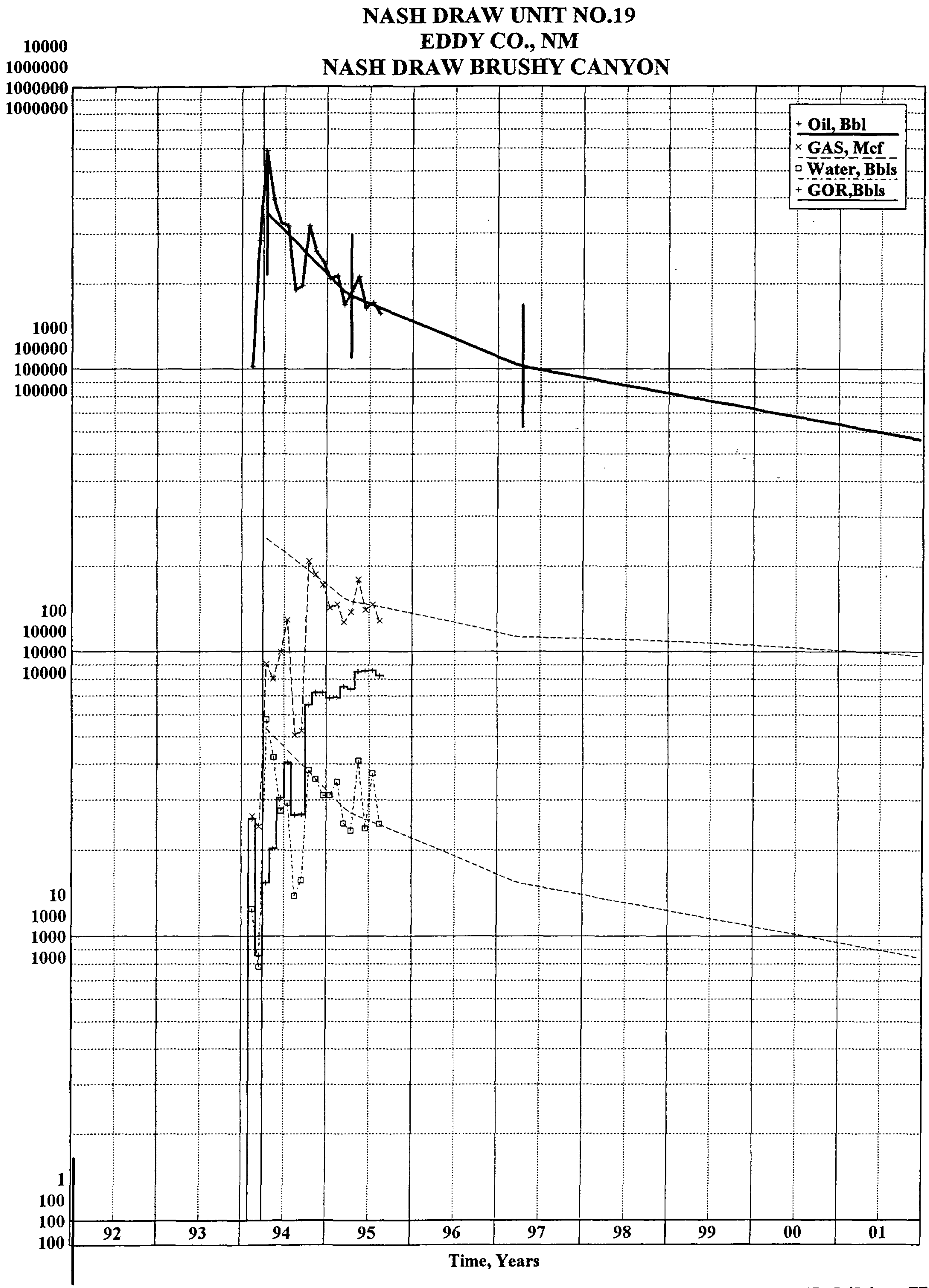

NASH DRAW UNIT NO.19
EDDY CO., NM
NASH DRAW BRUSHY CANYON
10000
1000000
1000000
1000000
1000
100000
100000
100000
100
10000
10000
10000
10
1000
1000
1000
1
100
100
100
Oil, Bbl
GAS, Mcf
Water, Bbls
GOR,Bbls
92
93
94
95
96
97
98
99
00
01
Time, Years

Exhibit IX-J

NASH DRAW UNIT NO.20
EDDY CO., NM
NASH DRAW BRUSHY CANYON

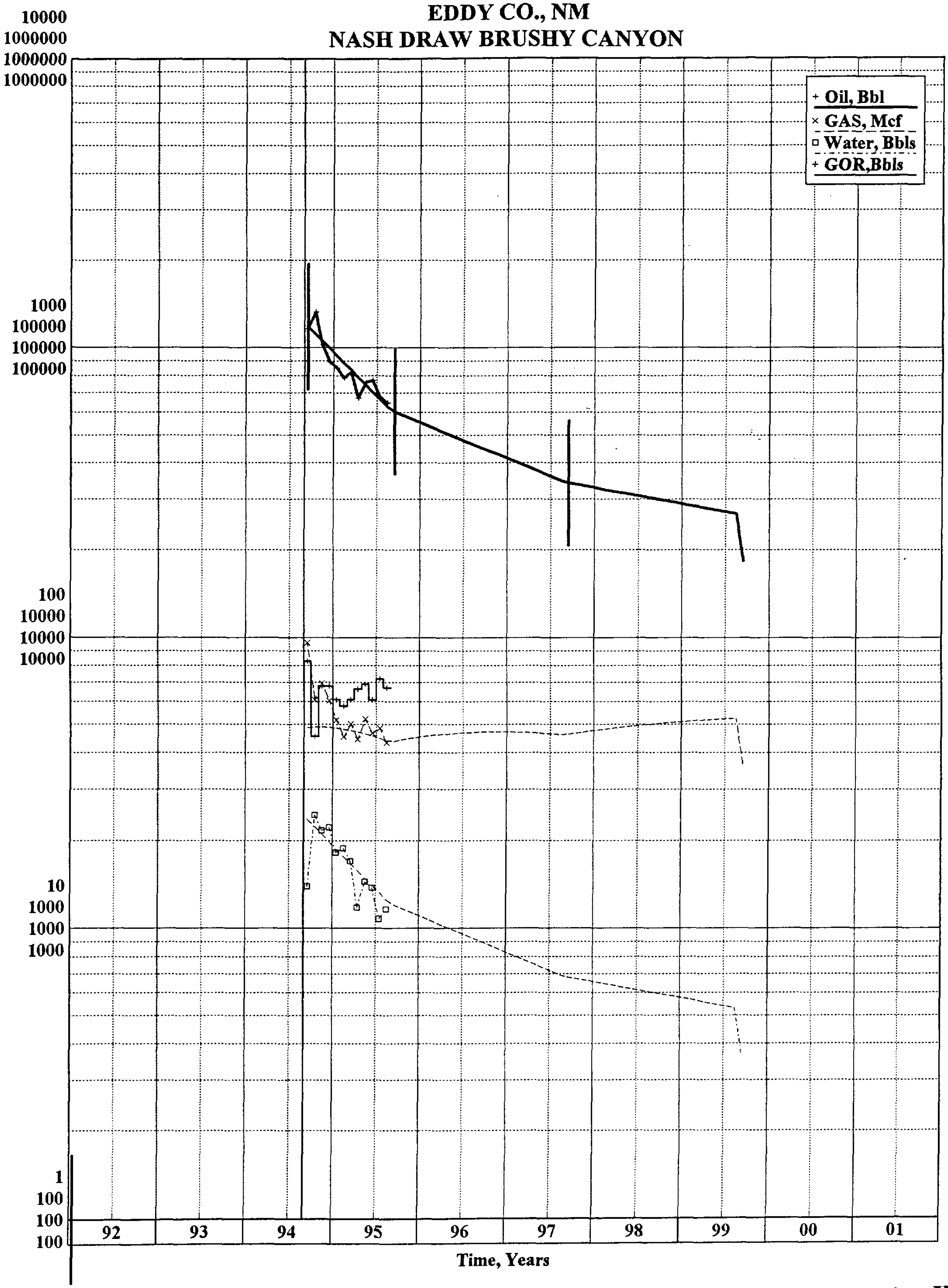


Exhibit IX-K

NASH DRAW UNIT NO.23
EDDY CO., NM
NASH DRAW BRUSHY CANYON

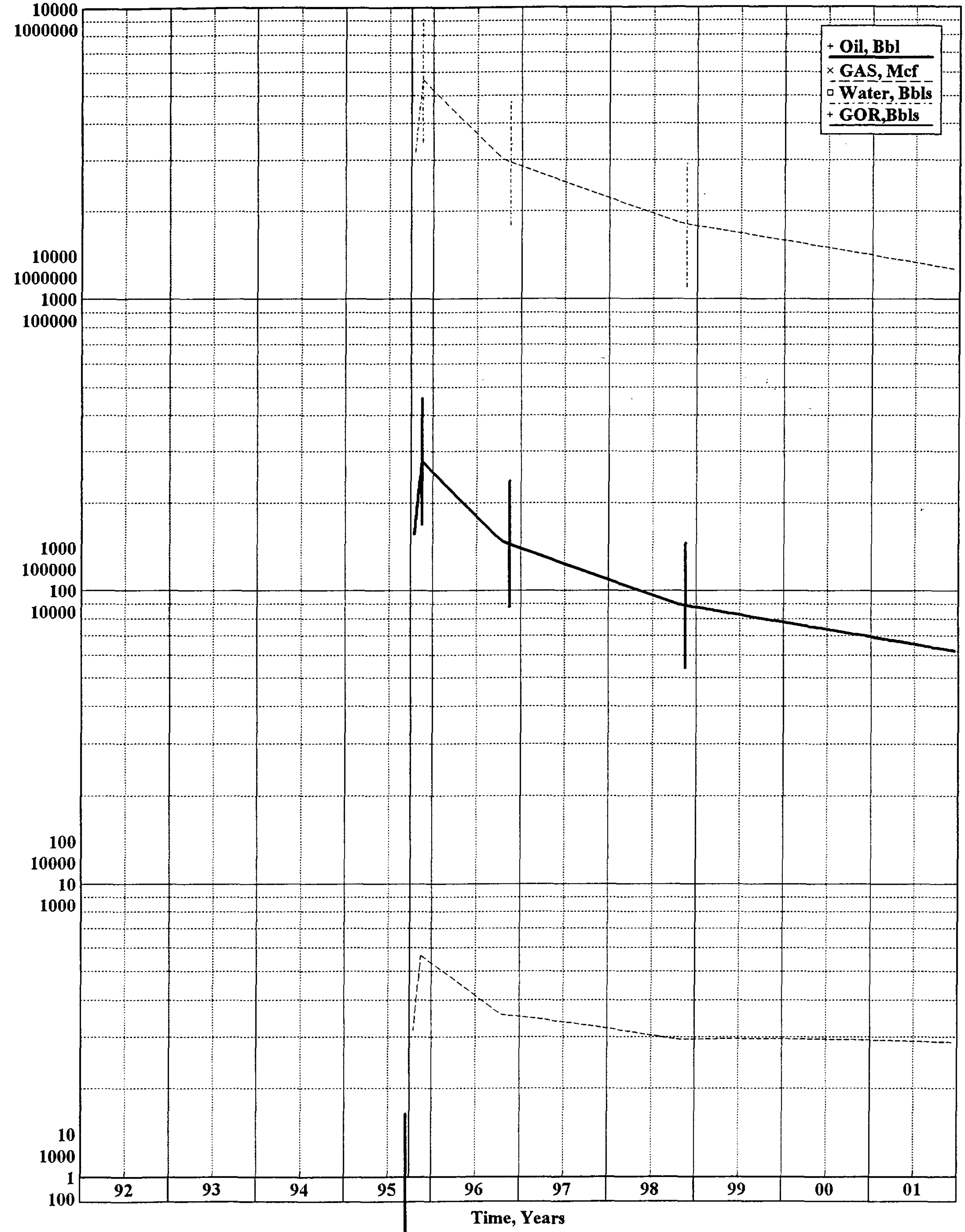


Exhibit IX-L

NASH DRAW UNIT NO. 24
EDDY CO., NM
NASH DRAW BRUSHY CANYON

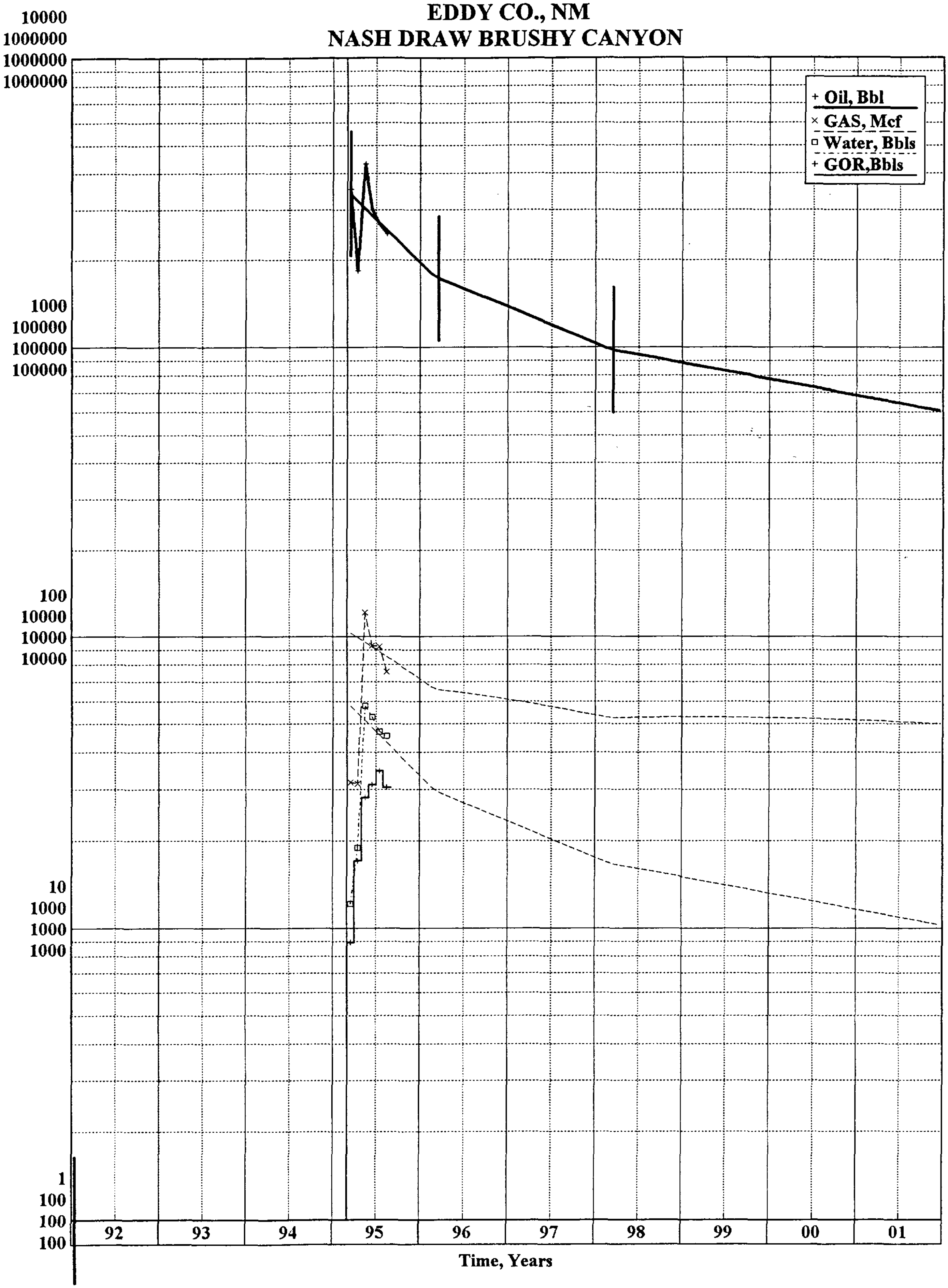


Exhibit IX-M

REMUDA BASIN UNIT 001
EDDY COUNTY, NM
NASH DRAW (BRUSHY CANYON) FIELD

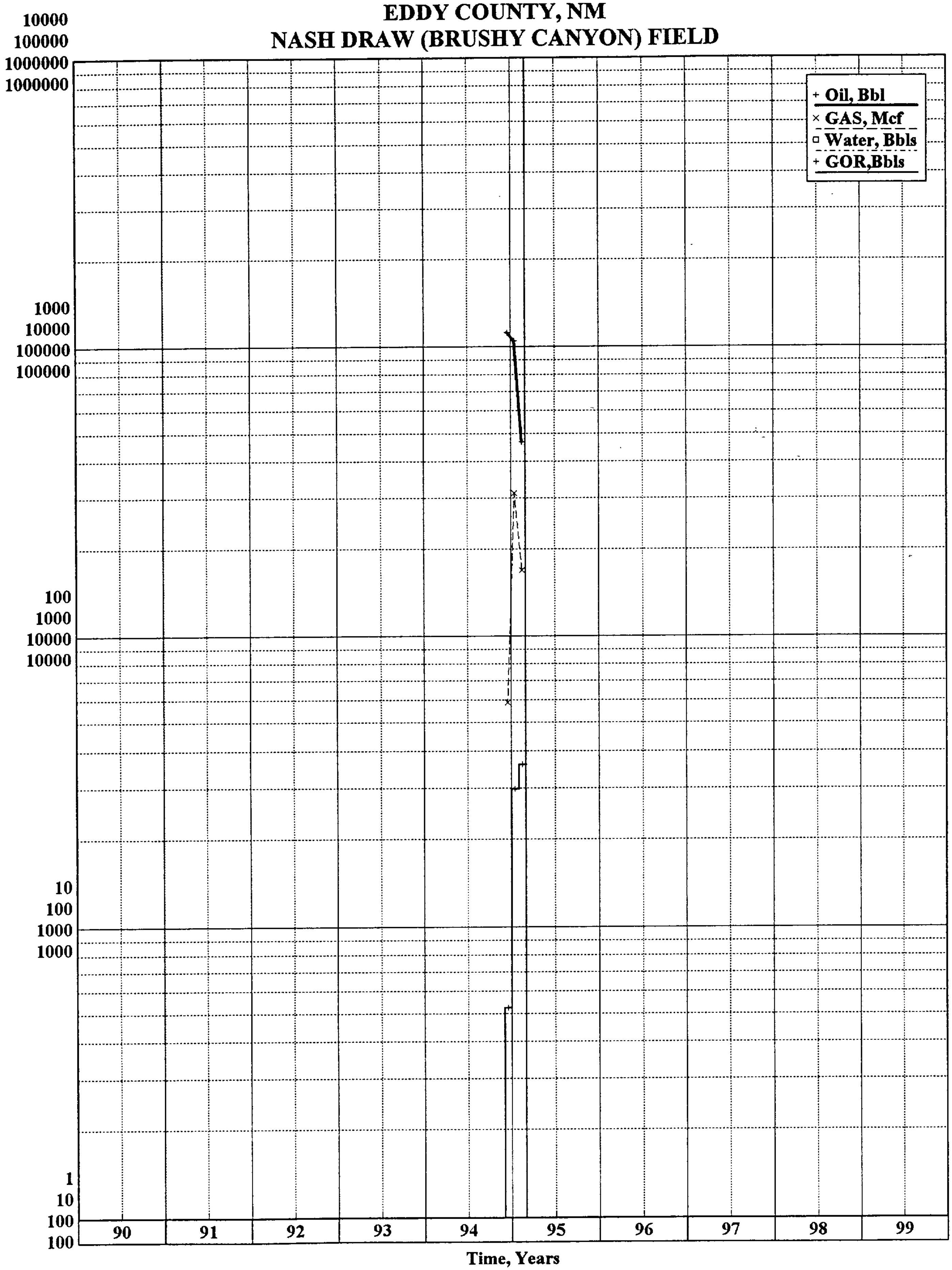


Exhibit IX-N

REMUDA BASIN 24 STATE #2
EDDY COUNTY, NM
NASH DRAW (BRUSHY CANYON) FIELD

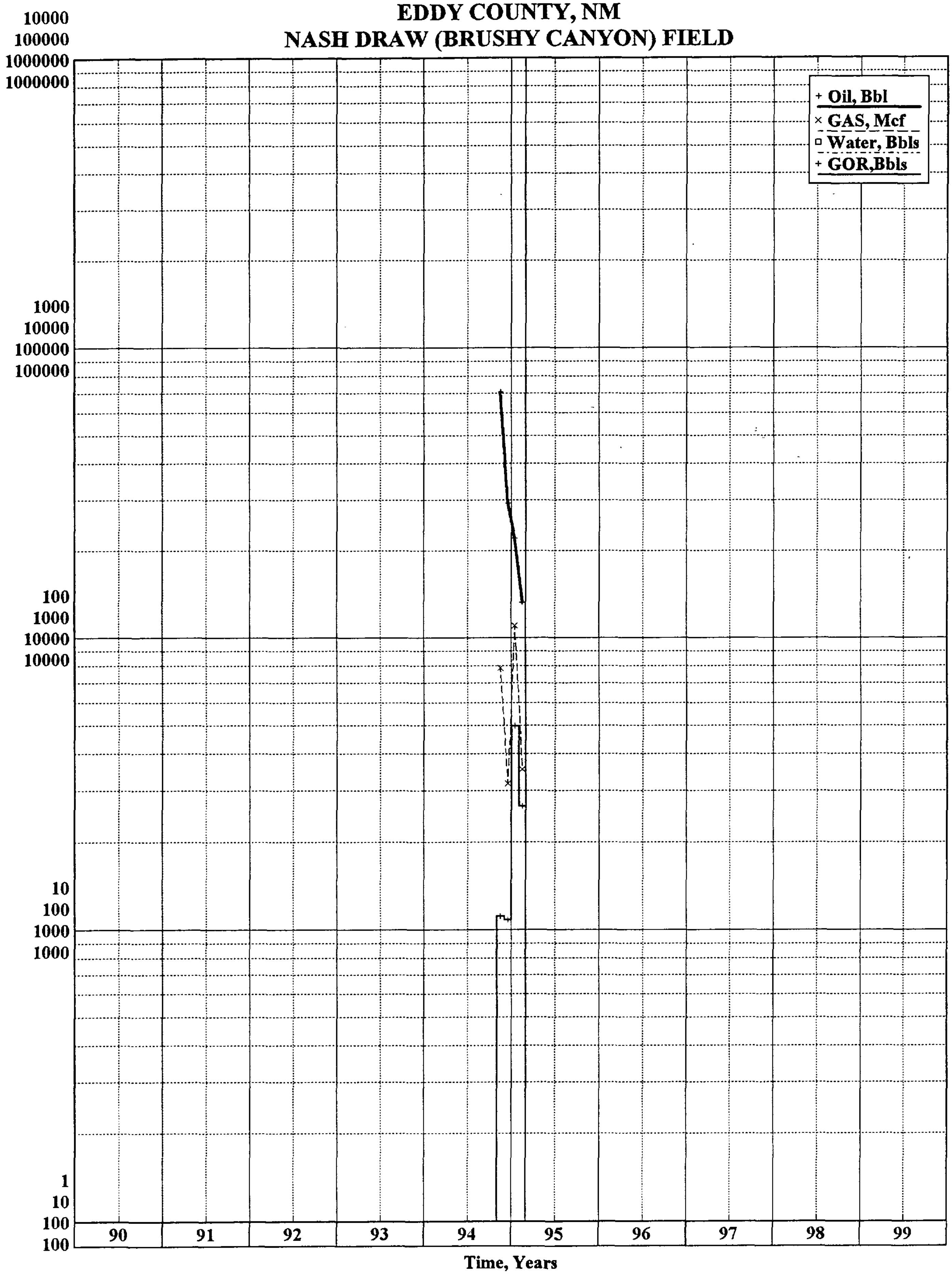


Exhibit IX-O

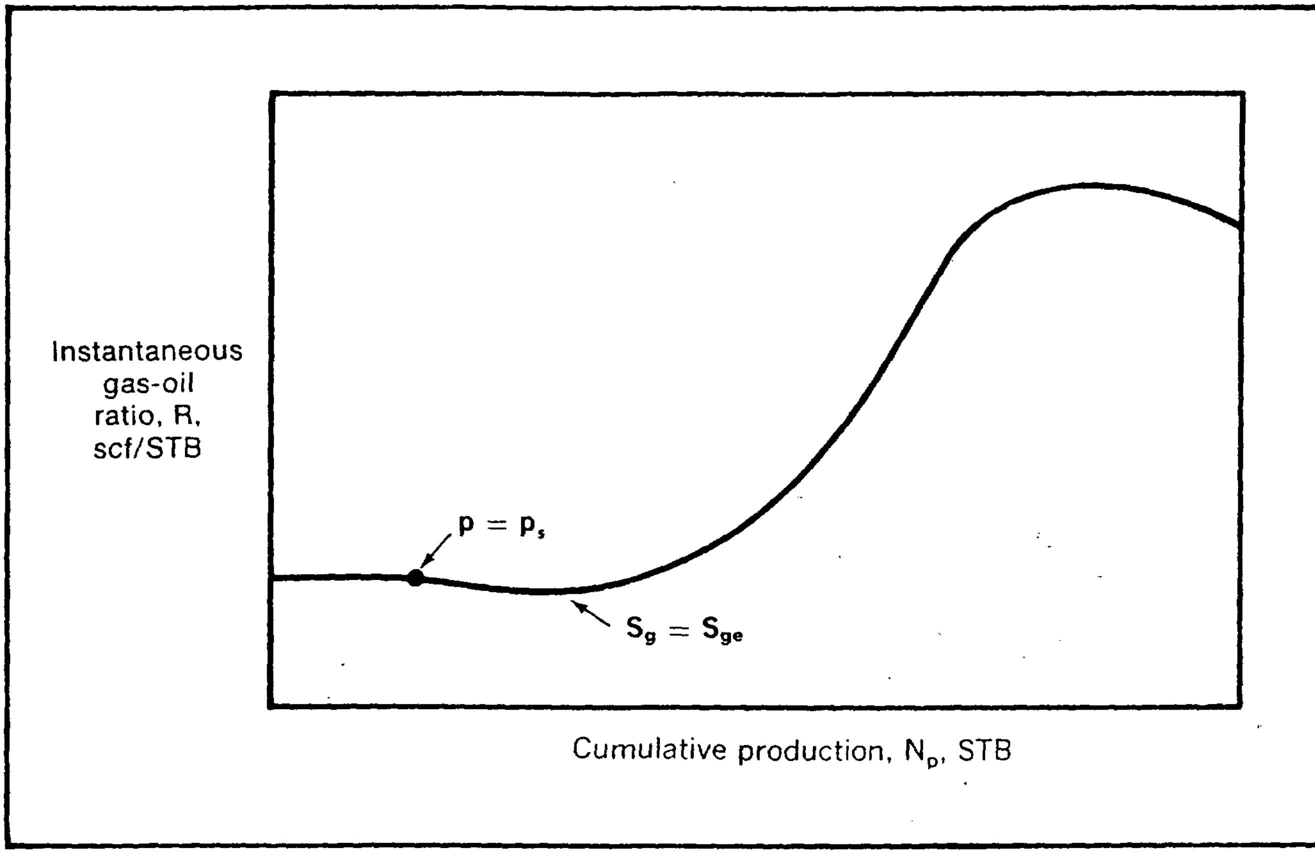


FIG. 6.8 Gas-oil ratio history for a solution-gas-drive reservoir.

TYPICAL GAS–OIL RATIO HISTORY FOR A SOLUTION–GAS–DRIVE RESERVOIR

SLIDER, H.C.; PRACTICAL PETROLEUM RESERVOIR ENGINEERING METHODS; PETROLEUM PUBLISHING COMPANY, TULSA, OKLAHOMA (1976, P. 342.

Exhibit X

STRATA PRODUCTION
Nash Unit No.19
RFLM 94007

SUMMARY OF PVT DATA

Reported Reservoir Conditions

Average Reservoir Pressure	2963	psig
Average Reservoir Temperature	117	°F

Pressure-Volume Relations

Saturation Pressure	2677	psig
Avg Single-Phase Compressibility	13.28	E-6 v/v/psi (5000 to 2677 psig)
Thermal Exp @ 5000 psig	1.03217	V at 117 °F / V at 68 °F

Differential Vaporization Data
(at 2677 psig and 117 °F)

Solution Gas/Oil Ratio	1,109	scf / bbl of residual oil at 60 °F
Relative Oil Volume	1.568	bbl / bbl of residual oil at 60 °F
Density of Reservoir Fluid	0.6627	gm/cc

Reservoir Fluid Viscosity

0.372 cp at 2677 psig and 117 °F

Separator Test Results

Separator Conditions		Formation Volume Factor (A)	Total Solution Gas/Oil Ratio (B)	Tank Oil Gravity (°API at 60 °F)
psig	°F			
30	69	1.542	1,064	42.7

(A) Barrels of saturated oil per barrel of stock tank oil at 60 °F.
(B) Total standard cubic feet of gas per barrel of stock tank oil at 60 °F.

CORE LABORATORIES

Exhibit XI-A

STRATA PRODUCTION
Nash Unit No.19
RFLM 94007

DIFFERENTIAL VAPORIZATION
(at 117 °F)

Pressure psig	Solution Gas/Oil Ratio Rsd (A)	Relative Oil Volume Bod (B)	Relative Total Volume Btd (C)	Oil Density gm/cc	Deviation Factor Z	Gas Formation Volume Factor (D)	Incremental Gas Gravity (Air=1.000)
b»2677	1,109	1.568	1.568	0.6627			
2450	1,020	1.528	1.609	0.6702	0.755	0.00511	0.746
2200	926	1.486	1.674	0.6783	0.764	0.00575	0.733
1950	834	1.446	1.769	0.6864	0.776	0.00658	0.722
1700	746	1.408	1.905	0.6945	0.789	0.00767	0.713
1450	659	1.372	2.106	0.7027	0.805	0.00916	0.708
1200	575	1.337	2.412	0.7109	0.823	0.01130	0.711
950	492	1.302	2.908	0.7193	0.844	0.01459	0.724
700	407	1.267	3.801	0.7281	0.869	0.02026	0.756
450	319	1.229	5.764	0.7377	0.898	0.03221	0.822
201	217	1.179	12.665	0.7494	0.936	0.07224	0.972
100	162	1.147	24.558	0.7562	0.957	0.13867	1.097
0	0	1.031		0.7887			1.524
	@ 60 °F	= 1.000					

Gravity of Residual Oil = 42.4 °API at 60 °F
Density of Residual Oil = 0.8128 gm/cc at 60 °F

(A) Cubic Feet of gas at 15.025 psia and 60 °F per Barrel of residual oil at 60 °F.
(B) Barrel of oil at indicated pressure and temperature per Barrel of residual oil at 60 °F.
(C) Barrels of oil plus liberated gas at indicated pressure and temperature per Barrel of residual oil at 60 °F.
(D) Cubic Feet of gas at indicated pressure and temperature per Cubic Feet at 15.025 psia and 60 °F.

Exhibit XI-B

PANSYSTEM V1.6 (C) EPDS 1989.

NASH UNIT #19 - HORNER PLOT

File....................:	STRATA.OIL	Field..................:	WILDCAT	Slope........:	-130.555
Analyst name............:	KENT WILLIAMS-TEFTELLER, INC.	Formation..............:	DELAWARE	Intercept....:	2963.492
Company.................:	STRATA PRODUCTION COMPANY	Date...................:	MARCH 10-14, 1994	Permeability.:	
Well....................:	NASH UNIT #19	Test...................:	90.5 HOUR BHPBU	Skin.........:	

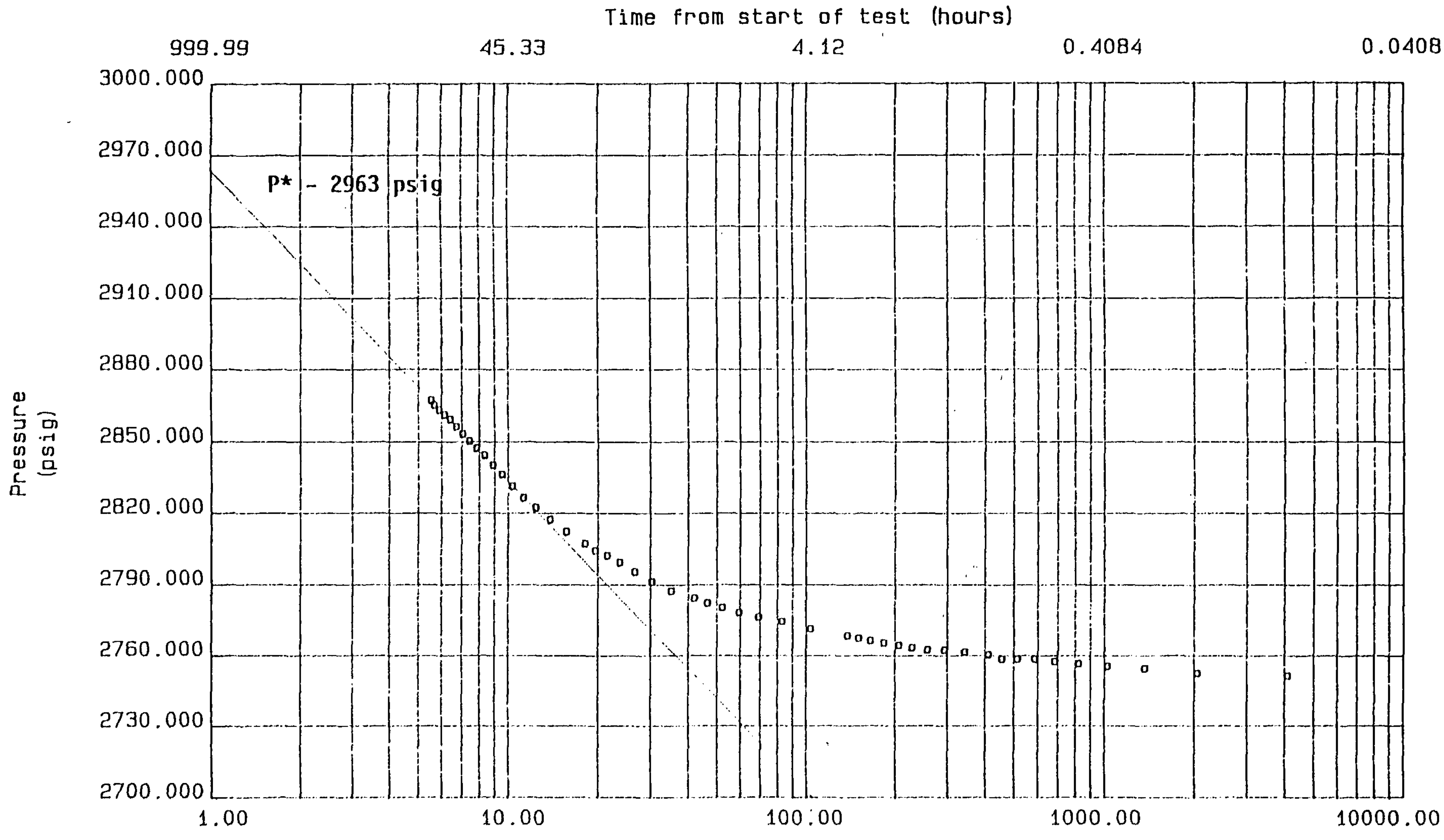


Exhibit XI-C

THE GENERAL MATERIAL BALANCE EQUATION

$$N = \frac{N_p B_o + (G_p - N_p R_s) B_g + (W_p - W_i - W_e) B_w - G_i B_g}{(B_o - B_{oi}) + (R_{si} - R_s) B_g + m B_{oi} \left[\frac{B_g - B_{gi}}{B_{gi}} \right] + \frac{B_{oi}}{1 - S_w} (1+m)(S_w c_w + c_f)(p_{ir} - p_r)}$$

B_g	GAS FORMATION VOLUME FACTOR
B_{gi}	INITIAL GAS FORMATION VOLUME FACTOR
B_o	OIL FORMATION VOLUME FACTOR
B_{oi}	INITIAL OIL FORMATION VOLUME FACTOR
B_w	WATER FORMATION VOLUME FACTOR
c_f	FORMATION COMPRESSIBILITY
c_w	WATER COMPRESSIBILITY
G_i	CUMMULATIVE GAS INJECTION
G_p	CUMMULATIVE GAS PRODUCED
m	PV OF GAS CAP/PV OF OIL ZONE
N	INITIAL OIL IN PLACE
N_p	CUMMULATIVE OIL PRODUCTION
p_{ir}	INITIAL RESERVOIR PRESSURE
p_r	RESERVOIR PRESSURE
R_s	SOLUTION GOR
R_{si}	INITIAL SOLUTION GOR
S_w	WATER SATURATION
W_e	CUMMULATIVE WATER INJECTION
W_i	CUMMULATIVE WATER INFLUX
W_p	CUMMULATIVE WATER PRODUCED

Exhibit XII-A

Bradley, H.B., Petroleum Engineering Handbook, Society of Petroleum Engineers, Richardson, Texas, (1987), P.37-5.

Since there is no injection, water drive, gas cap and the effects of compressibility are negligible the equation reduces to:

$$N = \frac{N_p B_o + (G_p - N_p R_s) B_g}{(B_o - B_{oi}) + (R_{si} - R_s) B_g}$$

Rewriting this equation to arrive at r, fractional recovery of oil in place, yields:
(substitute $R_p \times N_p$ for G_p, R_p cummulative produced gas–oil ratio)

$$r = \frac{N_p}{N} = \frac{(B_o - B_{oi}) + (R_{si} - R_s) B_g}{B_o - (R_p - R_s) B_g}$$

Analysis of this equation indicates that all the terms except the produced gas–oil ratio, R_p, are a function of pressure only, and are the properties of the reservoir fluids. As the nature of the fluid is fixed, it follows that the recovery, r, is fixed by the PVT properties of the reservoir fluid and produced gas–oil ratio.

Exhibit XII-B

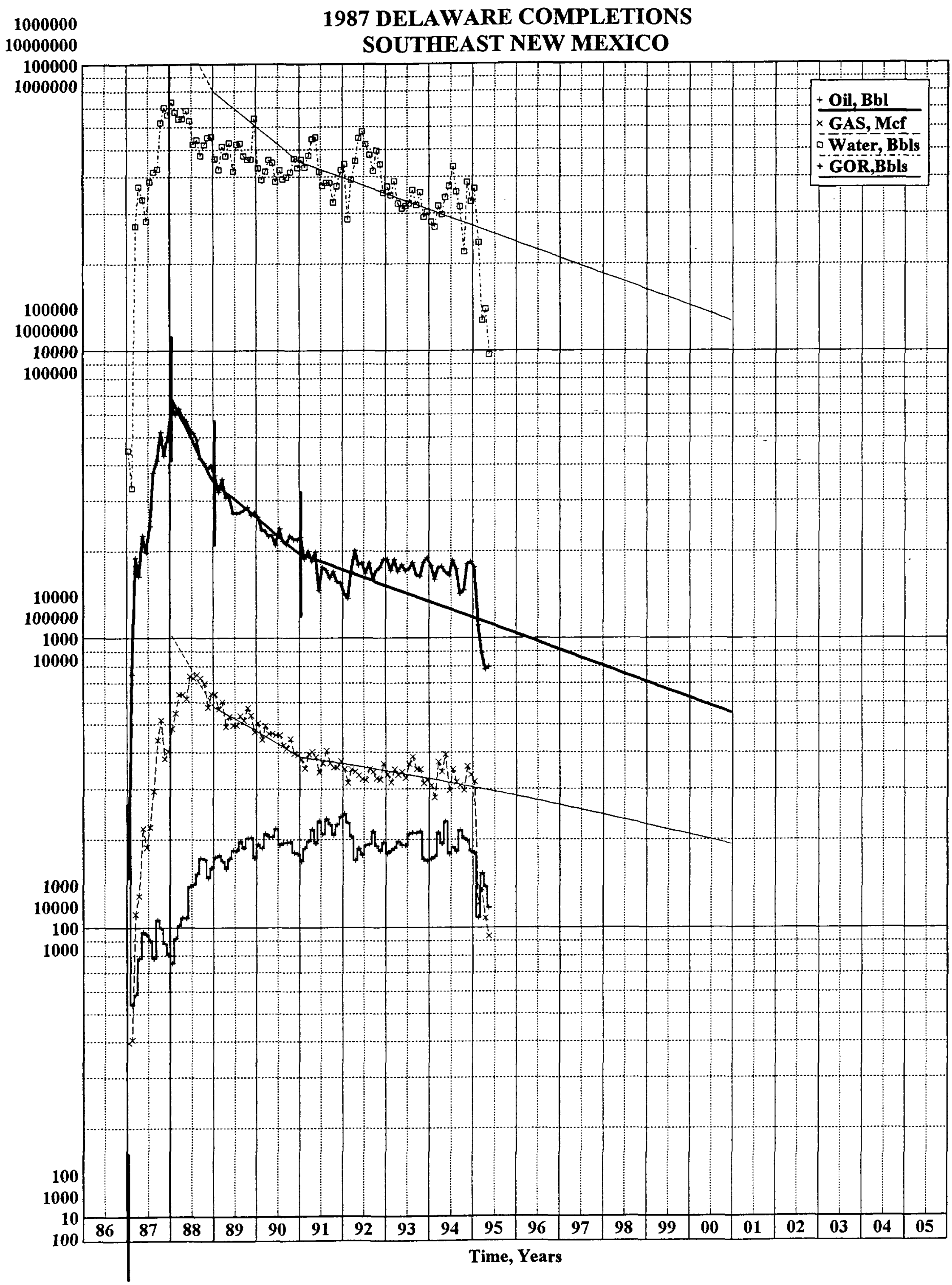


Exhibit XIII

1990 BRUSHY CANYON COMPLETIONS
EDDY COUNTY, NM
55 WELLS

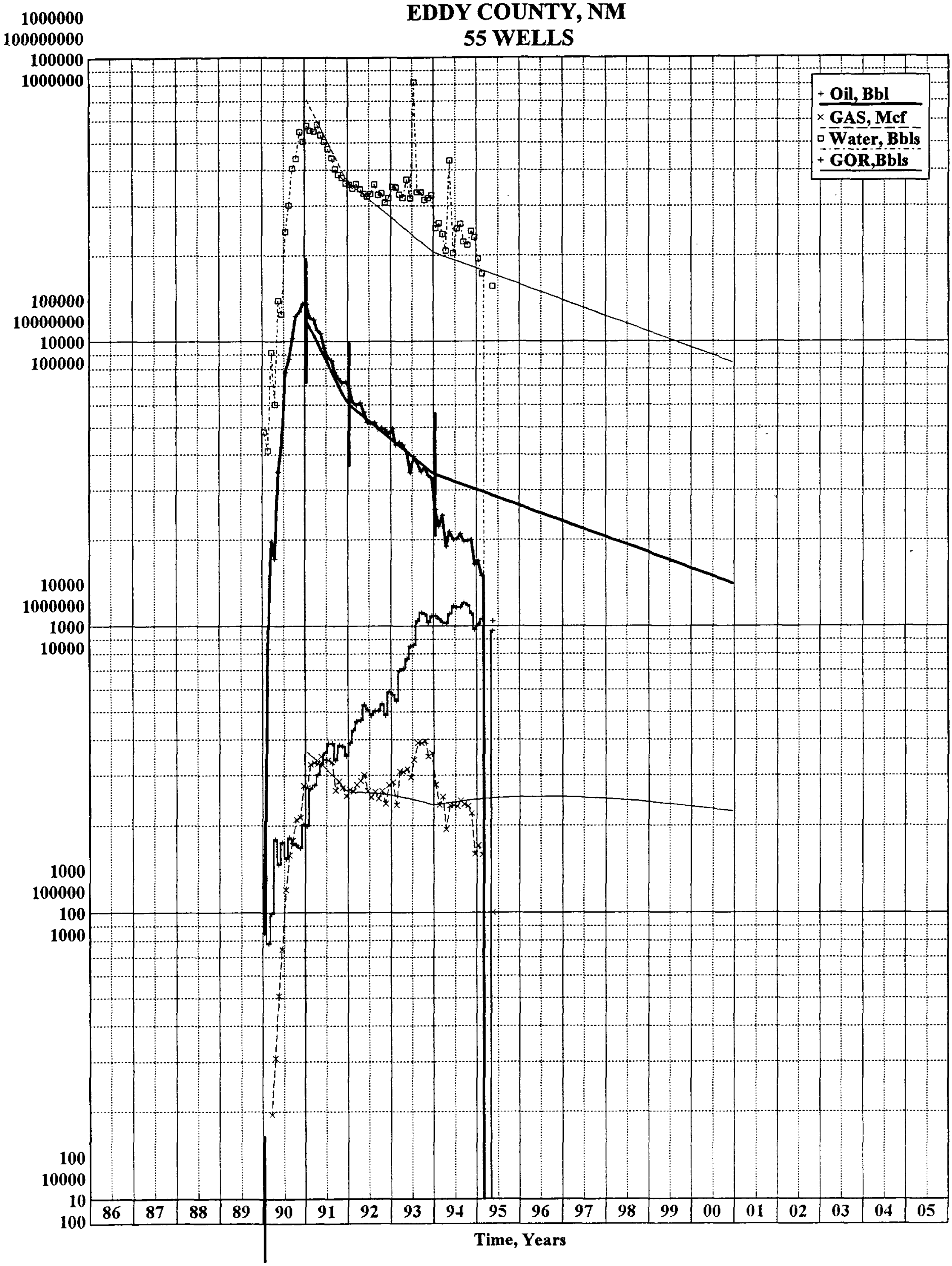


Exhibit XIV

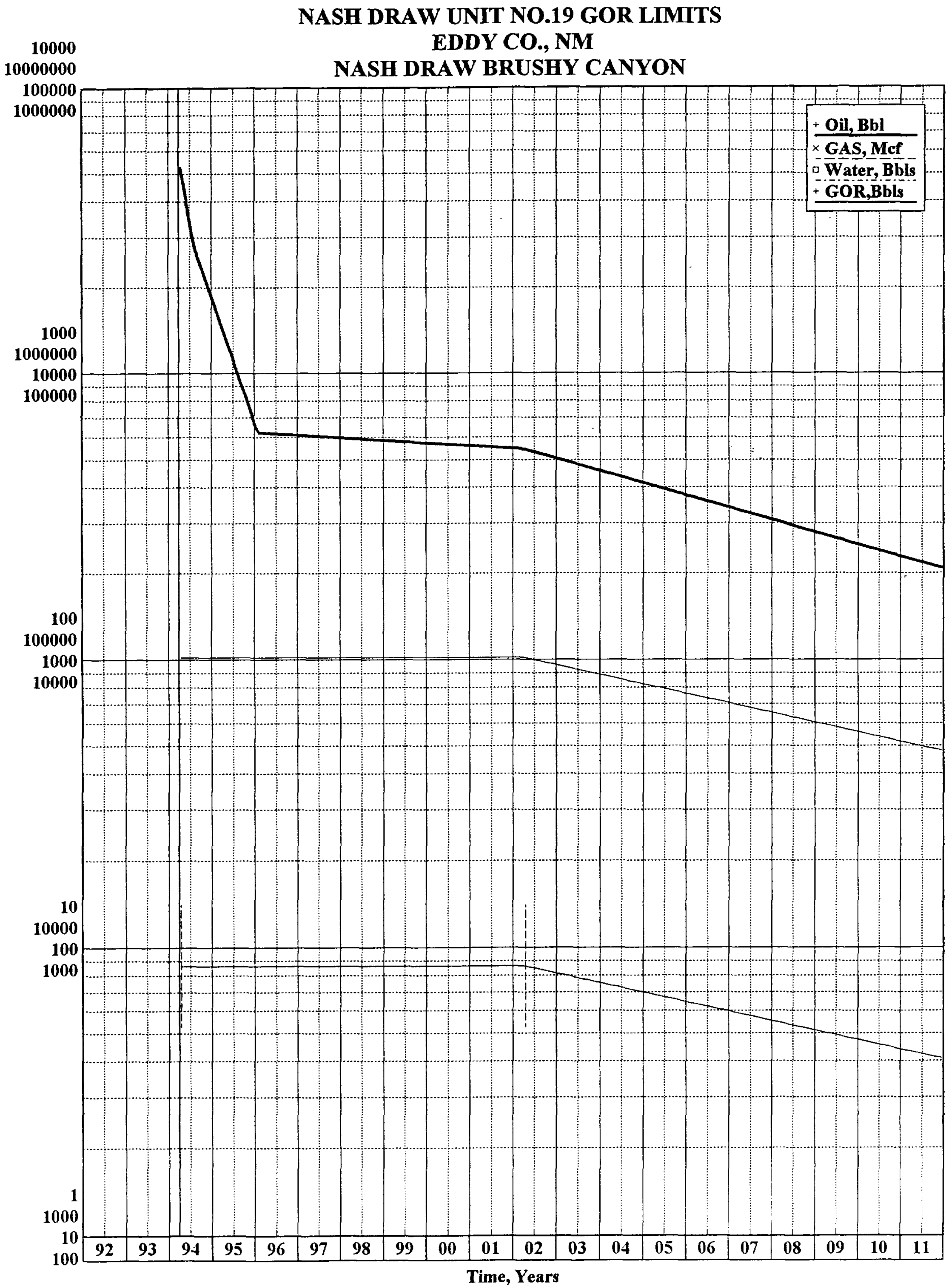

NASH DRAW UNIT NO.19 GOR LIMITS
EDDY CO., NM
NASH DRAW BRUSHY CANYON
Oil, Bbl
GAS, Mcf
Water, Bbls
GOR,Bbls
10000
10000000
100000
1000000
1000
1000000
10000
100000
100
100000
1000
10000
10
10000
100
1000
1
1000
10
100
92
93
94
95
96
97
98
99
00
01
02
03
04
05
06
07
08
09
10
11
Time, Years

Exhibit XV-A

OGRE(R) V1.40 BTAX
FILE NAME: ND19 (4)
CASE NAME: NASH19CURTAILED
CMD NAME: STDG1330(300)

DATA REPORT

DATE: 11/13/95
TIME: 16:13:36

101 NASH DRAW UNIT NO.19 GOR LIMITS
102 EDDY CO., NM
103 NASH DRAW BRUSHY CANYON
104 STRATA PRODUCTION CO

117 CASE $STRALCOM
* 120 4 94 12 4 1 94 10 2

	W.I. FRACTION	OP. COST ($/W/MO)	OP. COST ($/MO.)	ADV. TAX (PCT)	MAJOR PH. NAME	PROD DATE (MO/DY/YR)
210	1.00000000	3310.00	.00	.939	GAS	4/ 1/94

	PHASE NAME	CUM PROD (MUNITS)	REV. INT FRACTION	PRICE ($/UNIT)	SEV. TAX (PCT)	NO. OF WELLS	RATIO TO MAJOR PH
221	OIL	.000	.80000000	17.540	8.958	1.0	
222	GAS	.000	.80000000	1.661	8.958	.0	
223	WATER	.000	1.00000000	-.170	.000	.0	.118

	PH. NAME	CURVE TP		DECLINE%	QI RATE	QT RATE	CUM. LIMIT		(M OR Y)	CALC VALUE	
410	GAS	FLAT		.000	284.000	X	8.000	YRS	D		
CALC	GAS	FLAT	END=	.000	284.000	284.000	8.000	YRS	D	829.280	MMCF
411	GAS	EXP		7.433	LAST	EL	X	X	D		
CALC	GAS	EXP	END=	7.433	284.000	92.333	22.547	YRS	D	1735.039	MMCF

	PH. NAME	RATIO PH	GRAPH TP	INIT U/U	END U/U	CUM. LIMIT		DIVISOR
460	OIL	GAS	LOG	.660	.330	4.000	MOS	
461	OIL	GAS	LOG	.330	.072	1.500	IYRS	
462	OIL	GAS	LOG	.072	.046	TO	LIFE	

	INV NAME	INV. POINT		(G OR N)	TANG-M$	INTANG-M$	LSEHLD-M$	RISK FRAC	OVHD FLAG
802	INVEST	-1.000	MOS	G	.000	600.000	.000		

FOOTNOTES:

905 TOTAL GAS = 227717 AS OF 958
906 TOTAL OIL = 47089 AS OF 958
907 TOTAL WATER = 55228 AS OF 958

NASH DRAW UNIT NO.19 GOR LIMITS
EDDY CO., NM
NASH DRAW BRUSHY CANYON
STRATA PRODUCTION CO

DATE: 11/13/95
TIME: 16:13:36
FILE: ND19
GET#: 4

RESERVES AND ECONOMICS

AS OF APRIL 1, 1994

-END- MO-YR	GROSS PRODUCTION OIL, MBBL	GROSS PRODUCTION GAS, MMCF	NET PRODUCTION OIL, MBBL	NET PRODUCTION GAS, MMCF	PRICES OIL $/B	PRICES GAS $/M	OPERATIONS, M$ NET OPER REVENUES	OPERATIONS, M$ SEV+ADV TAXES	OPERATIONS, M$ NET OPER EXPENSES	CAPITAL COSTS, M$	CASH FLOW BTAX, M$	10.00 PCT CUM. DISC BTAX, M$
12-94	28.073	77.745	22.458	62.196	17.54	1.66	495.665	48.774	29.790	600.000	-182.899	-197.543
12-95	14.079	103.660	11.263	82.928	17.54	1.66	333.221	32.880	39.720	.000	260.621	33.806
12-96	7.423	103.660	5.938	82.928	17.54	1.66	239.821	23.716	39.720	.000	176.385	176.146
12-97	7.238	103.660	5.790	82.928	17.54	1.66	237.225	23.461	39.720	.000	174.044	303.829
12-98	7.084	103.660	5.667	82.928	17.54	1.66	235.067	23.249	39.720	.000	172.098	418.607
12-99	6.932	103.660	5.546	82.928	17.54	1.66	232.945	23.041	39.720	.000	170.184	521.790
12- 0	6.784	103.660	5.427	82.928	17.54	1.66	230.858	22.836	39.720	.000	168.302	614.555
12- 1	6.638	103.660	5.310	82.928	17.54	1.66	228.805	22.635	39.720	.000	166.450	697.959
12- 2	6.358	101.451	5.086	81.161	17.54	1.66	221.985	21.963	39.720	.000	160.302	770.980
12- 3	5.774	94.143	4.619	75.314	17.54	1.66	204.230	20.207	39.720	.000	144.303	830.738
12- 4	5.230	87.146	4.184	69.717	17.54	1.66	187.442	18.548	39.720	.000	129.174	879.368
12- 5	4.738	80.668	3.790	64.534	17.54	1.66	172.053	17.026	39.720	.000	115.307	918.831
12- 6	4.292	74.672	3.434	59.738	17.54	1.66	157.962	15.632	39.720	.000	102.610	950.756
12- 7	3.888	69.122	3.110	55.298	17.54	1.66	145.015	14.352	39.720	.000	90.943	976.479
12- 8	3.522	63.984	2.818	51.187	17.54	1.66	133.169	13.181	39.720	.000	80.268	997.118
12- 9	3.190	59.228	2.552	47.382	17.54	1.66	122.278	12.104	39.720	.000	70.454	1013.587
12-10	2.890	54.825	2.312	43.860	17.54	1.66	112.305	11.117	39.720	.000	61.468	1026.649
12-11	2.618	50.750	2.094	40.600	17.54	1.66	103.150	10.212	39.720	.000	53.218	1036.930
12-12	2.372	46.978	1.898	37.582	17.54	1.66	94.775	9.383	39.720	.000	45.672	1044.951
12-13	2.148	43.487	1.718	34.790	17.54	1.66	87.050	8.618	39.720	.000	38.712	1051.132
12-14	1.946	40.253	1.557	32.202	17.54	1.66	79.992	7.920	39.720	.000	32.352	1055.828
12-15	1.763	37.262	1.410	29.810	17.54	1.66	73.499	7.278	39.720	.000	26.501	1059.325
12-16	1.285	27.705	1.028	22.164	17.54	1.66	54.290	5.377	31.658	.000	17.255	1061.415
S TOT	136.265	1735.039	109.009	1388.031	17.54	1.66	4182.802	413.510	895.568	600.000	2273.724	1061.415
REM.	.000	.000	.000	.000	.00	.00	.000	.000	.000	.000	.000	1061.415
TOTAL	136.265	1735.039	109.009	1388.031	17.54	1.66	4182.802	413.510	895.568	600.000	2273.724	1061.415
CUM.	.000	.000										
ULT.	136.265	1735.039										

NET OIL REVENUES (M$)	1912.017
NET GAS REVENUES (M$)	2305.518
TOTAL REVENUES (M$)	4182.802

BTAX RATE OF RETURN (PCT)	70.76	PROJECT LIFE (YEARS)	22.547
BTAX PAYOUT YEARS	1.45	DISCOUNT RATE (PCT)	10.000
BTAX PAYOUT YEARS (DISC)	1.60	GROSS OIL WELLS	1.000
BTAX NET INCOME/INVEST	4.79	GROSS GAS WELLS	.000
BTAX NET INCOME/INVEST (DISC)	2.77	GROSS WELLS	1.000
INITIAL W.I. FRACTION	1.000000	INITIAL NET OIL FRACTION	.800000
FINAL W.I. FRACTION	1.000000	FINAL NET OIL FRACTION	.800000
PRODUCTION START DATE	4- 1-94	INITIAL NET GAS FRACTION	.800000
MONTHS IN FIRST LINE	9.00	FINAL NET GAS FRACTION	.800000
WATER GROSS PROD. (MU)	204.301	WATER NET PRODUCTION (MU)	204.301

PRESENT WORTH PROFILE

DISC RATE	PW OF NET BTAX, M$	DISC RATE	PW OF NET BTAX, M$
.0	2273.724	30.0	353.019
2.0	1912.570	35.0	274.918
5.0	1507.397	40.0	212.748
8.0	1214.003	45.0	162.041
10.0	1061.415	50.0	119.818
12.0	934.287	60.0	53.320
15.0	779.812	70.0	3.028
18.0	657.627	80.0	-36.592
20.0	589.673	90.0	-68.805
25.0	454.084	100.0	-95.644

WATER NET REVENUES (M$) -34.733

NASH DRAW UNIT NO.19
EDDY CO., NM
NASH DRAW BRUSHY CANYON

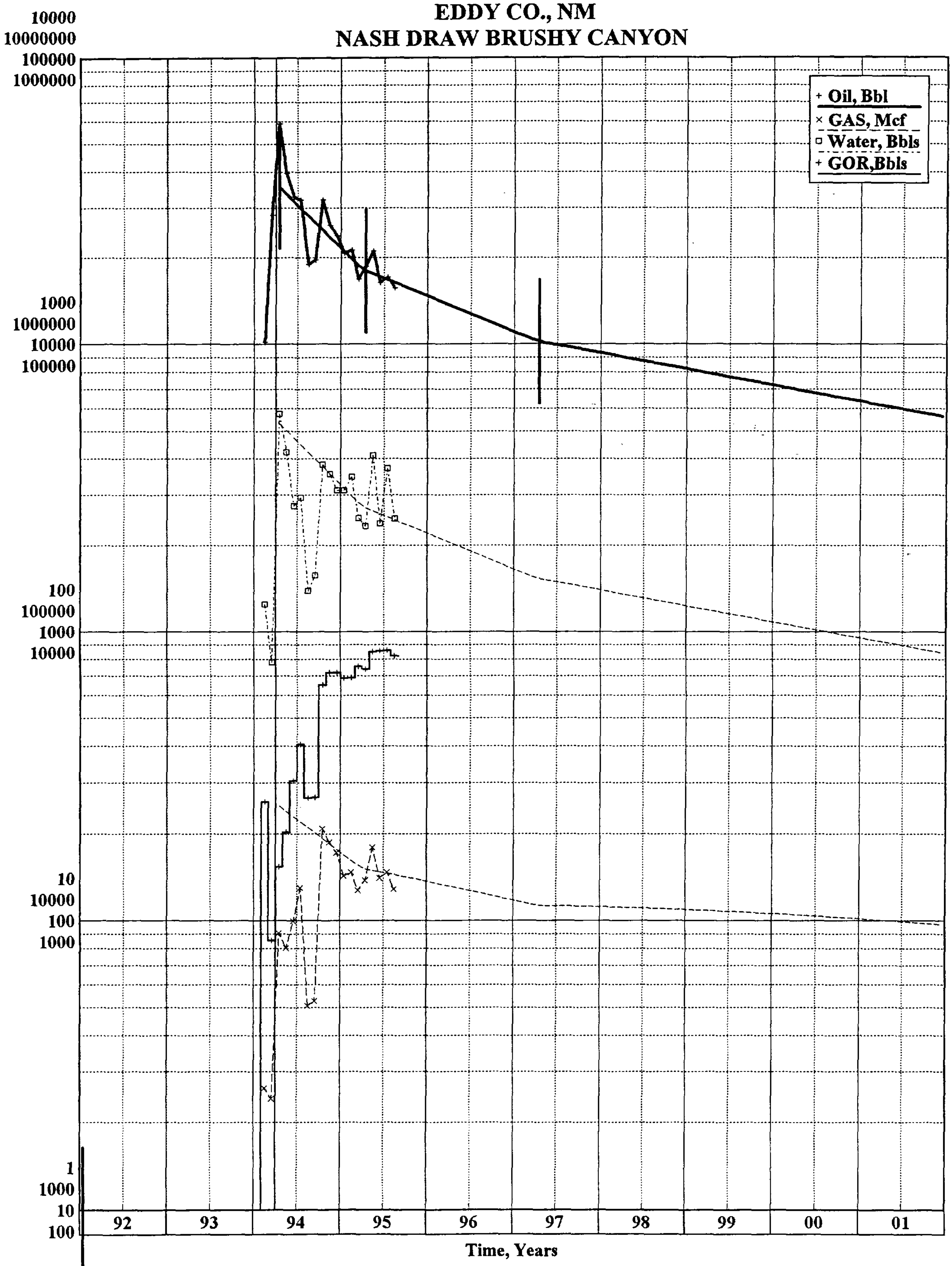


Exhibit XV-B

OGRE(R) V1.40 BTAX
FILE NAME: ND19 (1)
CASE NAME: NASH19
CMD NAME: STDC4732(300)

DATA REPORT

DATE: 11/13/95
TIME: 15:47:35

101 NASH DRAW UNIT NO.19
102 EDDY CO., NM
103 NASH DRAW BRUSHY CANYON
104 STRATA PRODUCTION CO

117 CASE $STRALCOM
* 120 4 94 12 4 1 94 10 2

	W.I. FRACTION	OP. COST ($/W/MO)	OP. COST ($/MO.)	ADV. TAX (PCT)	MAJOR PH. NAME	PROD DATE (MO/DY/YR)
210	1.00000000	3310.00	.00	.939	OIL	4/ 1/94

	PHASE NAME	CUM PROD (MUNITS)	REV. INT FRACTION	PRICE ($/UNIT)	SEV. TAX (PCT)	NO. OF WELLS	RATIO TO MAJOR PH
221	OIL	.000	.80000000	17.540	8.958	1.0	
222	GAS	.000	.80000000	1.661	8.958	.0	
223	WATER	.000	1.00000000	-.170	.000	.0	1.500

	PH. NAME	CURVE TP		DECLINE%	QI RATE	QT RATE	CUM. LIMIT		(M OR Y)	CALC VALUE	
410	OIL	EXP		50.000	120.000	X	12.000	MOS	D		
CALC	OIL	EXP	END=	50.000	120.000	60.000	1.000	YRS	D	31.595	MBBL
411	OIL	EXP		25.000	LAST	X	24.000	IMOS	D		
CALC	OIL	EXP	END=	25.000	60.000	33.750	3.000	YRS	D	64.900	MBBL
412	OIL	EXP		12.000	LAST	EL	X	X	D		
CALC	OIL	EXP	END=	12.000	33.750	8.774	13.538	YRS	D	136.213	MBBL

	PH. NAME	RATIO PH	GRAPH TP	INIT U/U	END U/U	CUM. LIMIT		DIVISOR
460	GAS	OIL	LIN	7.000	25.000	TO	LIFE	

	INV NAME	INV. POINT		(G OR N)	TANG-M$	INTANG-M$	LSEHLD-M$	RISK FRAC	OVHD FLAG
802	INVEST	-1.000	MOS	G	.000	600.000	.000		

FOOTNOTES:

905 TOTAL GAS = 227717 AS OF 958
906 TOTAL OIL = 47089 AS OF 958
907 TOTAL WATER = 55228 AS OF 958

NASH DRAW UNIT NO.19
EDDY CO., NM
NASH DRAW BRUSHY CANYON
STRATA PRODUCTION CO

DATE: 11/13/95
TIME: 15:47:35
FILE: ND19
GET#: 1

R E S E R V E S   A N D   E C O N O M I C S

AS OF APRIL 1, 1994

-END- MO-YR	GROSS PRODUCTION OIL, MBBL	GROSS PRODUCTION GAS, MMCF	NET PRODUCTION OIL, MBBL	NET PRODUCTION GAS, MMCF	PRICES OIL $/B	PRICES GAS $/M	OPERATIONS, M$ NET OPER REVENUES	OPERATIONS, M$ SEV+ADV TAXES	OPERATIONS, M$ NET OPER EXPENSES	CAPITAL COSTS, M$	CASH FLOW BTAX, M$	10.00 PCT CUM. DISC BTAX, M$
12-94	25.617	192.091	20.494	153.673	17.54	1.66	608.184	60.256	29.790	600.000	-81.862	-100.054
12-95	20.752	179.752	16.602	143.802	17.54	1.66	524.762	51.961	39.720	.000	433.081	284.386
12-96	15.338	153.249	12.270	122.599	17.54	1.66	414.942	41.062	39.720	.000	334.160	554.049
12-97	12.003	135.887	9.602	108.710	17.54	1.66	345.925	34.214	39.720	.000	271.991	753.588
12-98	10.507	132.916	8.406	106.333	17.54	1.66	321.381	31.773	39.720	.000	249.888	920.246
12-99	9.246	129.258	7.397	103.406	17.54	1.66	299.142	29.562	39.720	.000	229.860	1059.610
12- 0	8.136	124.565	6.509	99.652	17.54	1.66	277.615	27.425	39.720	.000	210.470	1175.617
12- 1	7.160	119.137	5.728	95.310	17.54	1.66	256.953	25.376	39.720	.000	191.857	1271.752
12- 2	6.301	113.218	5.041	90.574	17.54	1.66	237.255	23.422	39.720	.000	174.113	1351.064
12- 3	5.544	107.003	4.435	85.602	17.54	1.66	218.561	21.571	39.720	.000	157.270	1416.191
12- 4	4.880	100.650	3.904	80.520	17.54	1.66	200.976	19.831	39.720	.000	141.425	1469.433
12- 5	4.294	94.282	3.435	75.426	17.54	1.66	184.438	18.194	39.720	.000	126.524	1512.735
12- 6	3.778	87.991	3.022	70.393	17.54	1.66	168.966	16.664	39.720	.000	112.582	1547.762
12- 7	2.657	65.027	2.126	52.022	17.54	1.66	123.021	12.131	31.318	.000	79.572	1570.496
S TOT	136.213	1735.026	108.971	1388.022	17.54	1.66	4182.121	413.442	537.748	600.000	2630.931	1570.496
REM.	.000	.000	.000	.000	.00	.00	.000	.000	.000	.000	.000	1570.496
TOTAL	136.213	1735.026	108.971	1388.022	17.54	1.66	4182.121	413.442	537.748	600.000	2630.931	1570.496

CUM.	.000	.000
ULT.	136.213	1735.026

NET OIL REVENUES (M$)	1911.351
NET GAS REVENUES (M$)	2305.505
TOTAL REVENUES (M$)	4182.121

BTAX RATE OF RETURN (PCT)	100.00
BTAX PAYOUT YEARS	.94
BTAX PAYOUT YEARS (DISC)	1.01
BTAX NET INCOME/INVEST	5.38
BTAX NET INCOME/INVEST (DISC)	3.62
INITIAL W.I. FRACTION	1.000000
FINAL W.I. FRACTION	1.000000
PRODUCTION START DATE	4- 1-94
MONTHS IN FIRST LINE	9.00
WATER GROSS PROD. (MU)	204.320

PROJECT LIFE (YEARS)	13.538
DISCOUNT RATE (PCT)	10.000
GROSS OIL WELLS	1.000
GROSS GAS WELLS	.000
GROSS WELLS	1.000
INITIAL NET OIL FRACTION	.800000
FINAL NET OIL FRACTION	.800000
INITIAL NET GAS FRACTION	.800000
FINAL NET GAS FRACTION	.800000
WATER NET PRODUCTION (MU)	204.320

PRESENT WORTH PROFILE

DISC RATE	PW OF NET BTAX, M$	DISC RATE	PW OF NET BTAX, M$
.0	2630.931	30.0	749.231
2.0	2345.665	35.0	644.324
5.0	1997.834	40.0	558.476
8.0	1722.867	45.0	486.914
10.0	1570.496	50.0	426.301
12.0	1437.903	60.0	329.028
15.0	1269.029	70.0	254.134
18.0	1128.749	80.0	194.447
20.0	1047.936	90.0	145.576
25.0	880.222	100.0	104.693

WATER NET REVENUES (M$) -34.735