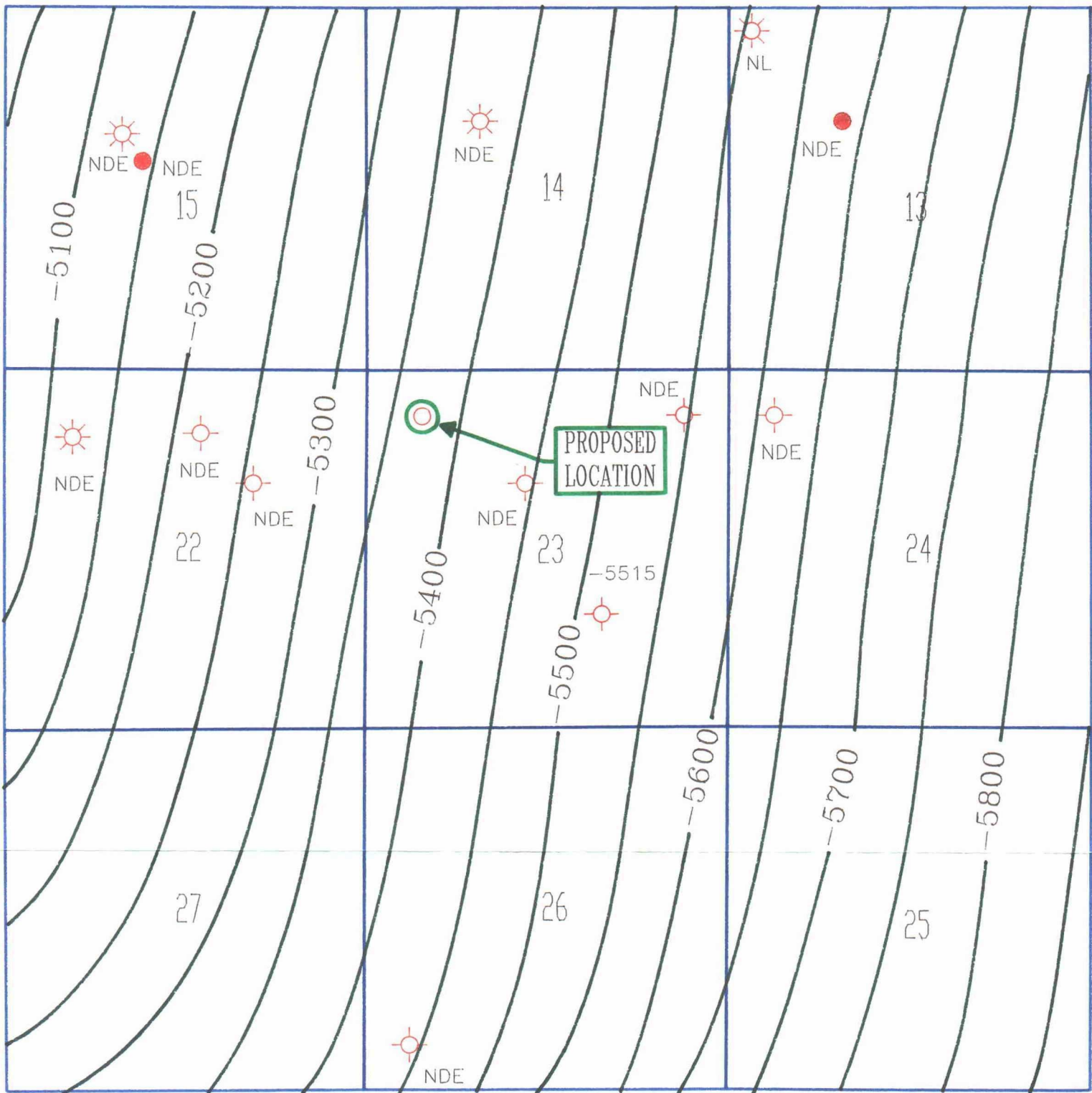
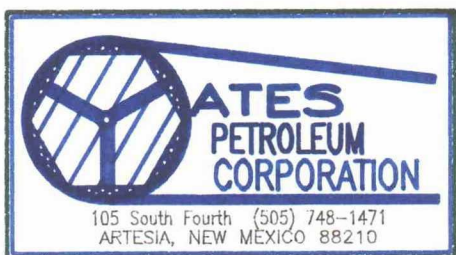


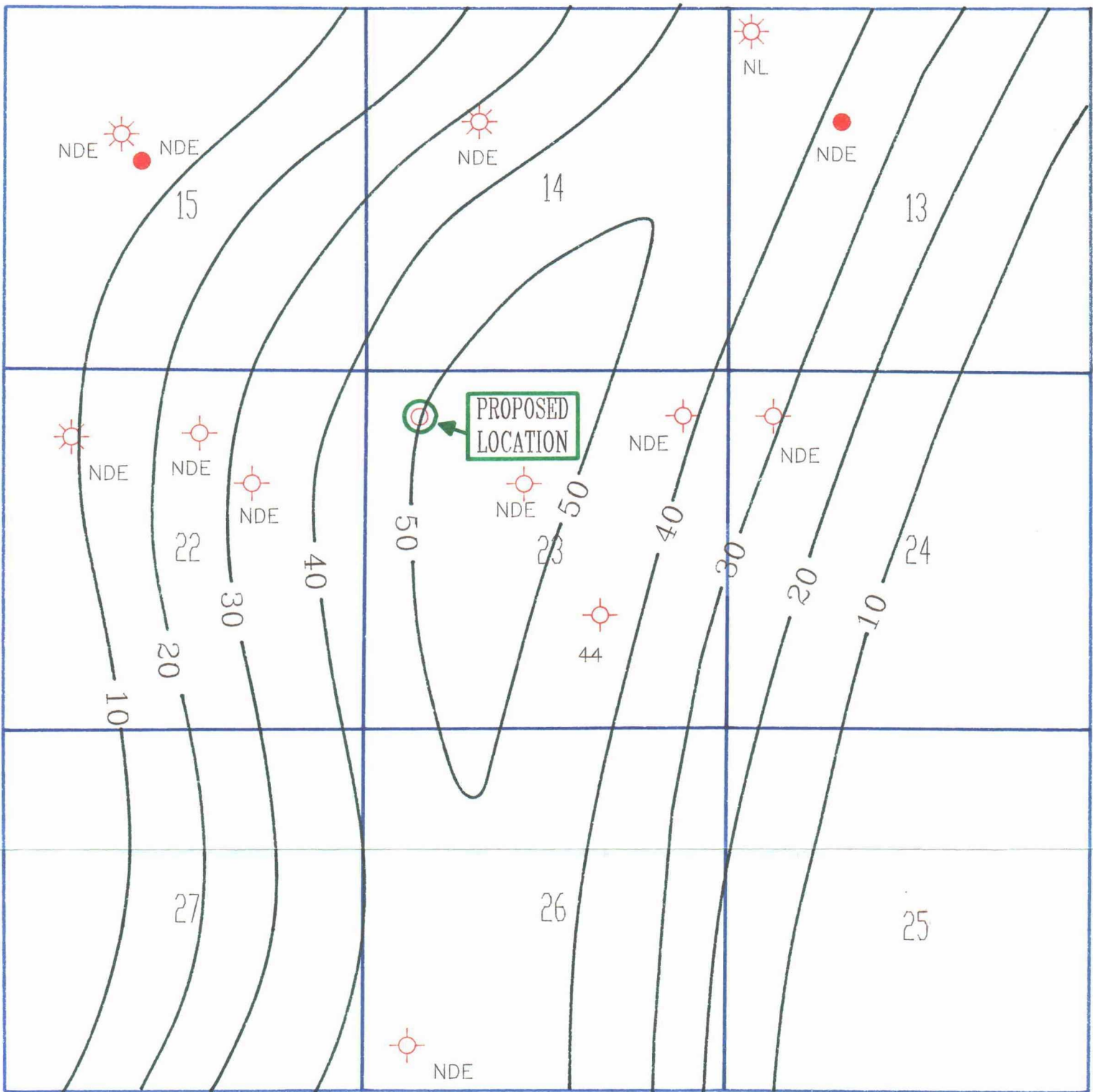


T22S / R23E



C.I.=50'
SCALE: 1"=2000'
Geology: Brent May
Map #92054C
9/8/92 If

INDIAN BASIN AREA
STRUCTURE MAP
TOP OF LOWER MORROW
Eddy County, New Mexico

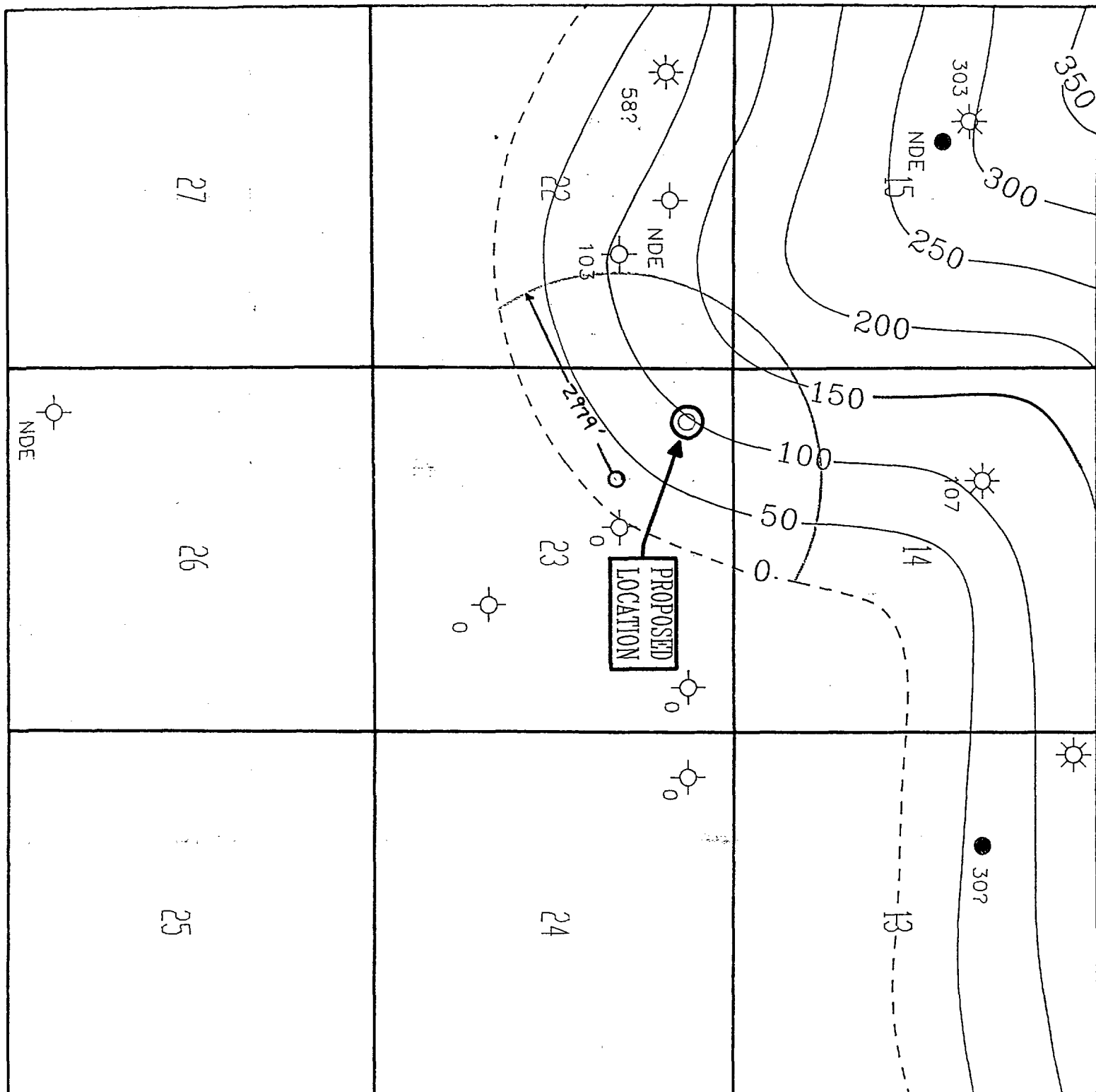


T22S / R23E



C.I.=10'
SCALE: 1"=2000'
Geology: Brent May
Map #92054F
9/8/92 lf

INDIAN BASIN AREA
ISOLITH MAP
MORROW SANDS
GR $\leq$ 50 API
Eddy County, New Mexico



YATES DIANE #1
D 23-22S-23E
INDIAN BASIN UPPER PENN

HERE, $\langle Sg \rangle = 0.75$
T = 146 deg F = 606 R
 $\langle \phi \rangle = 0.06$
BHP = 2921 psi originally

GAS IN PLACE - DISCOVERY

$$G = (43560) * A * h * \phi * Sg * Bg \text{ where } Bg = 35.35 * P / zT$$

$$Bg = 35.35 * 2921 / (0.851 * 606)$$
$$Bg = 200 \text{ Scf/cf}$$

$$G = (43560) * A * h * (0.06) * (0.75) * (200)$$

$$G = 392040 * A * h$$

SECTION 23
=====

$A * h = 8329$ Acre-feet

and $G = 392040 * 8329 = 3.3 \text{ Bcf}$ — 16 - remains today

DRAINAGE AREA around ORTHODOX LOCATION
=====

$A * h = 24352$ Acre-feet

and $G = 392040 * 24352 = 9.5 \text{ Bcf}$

4.7 BCF - currently

INDIAN BASIN
PLANIMETER VOLUME of GAS PAY in SECTION 23
USE ISOPACH MAP PREPARED by BRENT MAY

SECTION 23

AREA	MEASURED AREA	AREA (ACRE)	RATIO of AREAS	INTERVAL (FEET)	EQ	DELTA VOLUME (AC-FT)
A(0)	145	145.0				
A(50)	80	80.0	0.55	50.00	PYR	5545.1
A(100)	24	24.0	0.30	50.00	PYR	2463.6
A(140)	0	0.0	0.00	40.00	PYR	320.0
						8328.7

STANDARD DRAINAGE around ORTHODOX LOCATION

AREA	MEASURED AREA	AREA (ACRE)	RATIO of AREAS	INTERVAL (FEET)	EQ	DELTA VOLUME (AC-FT)
A(0)	326	326.0				
A(50)	212	212.0	0.65	50.00	PYR	13348.2
A(100)	102	102.0	0.48	50.00	PYR	7684.2
A(150)	16	16.0	0.16	50.00	PYR	2640.0
A(170)	0	0.0	0.00	20.00	PYR	680.0
						24352.3

GAS DEVIATION FACTOR

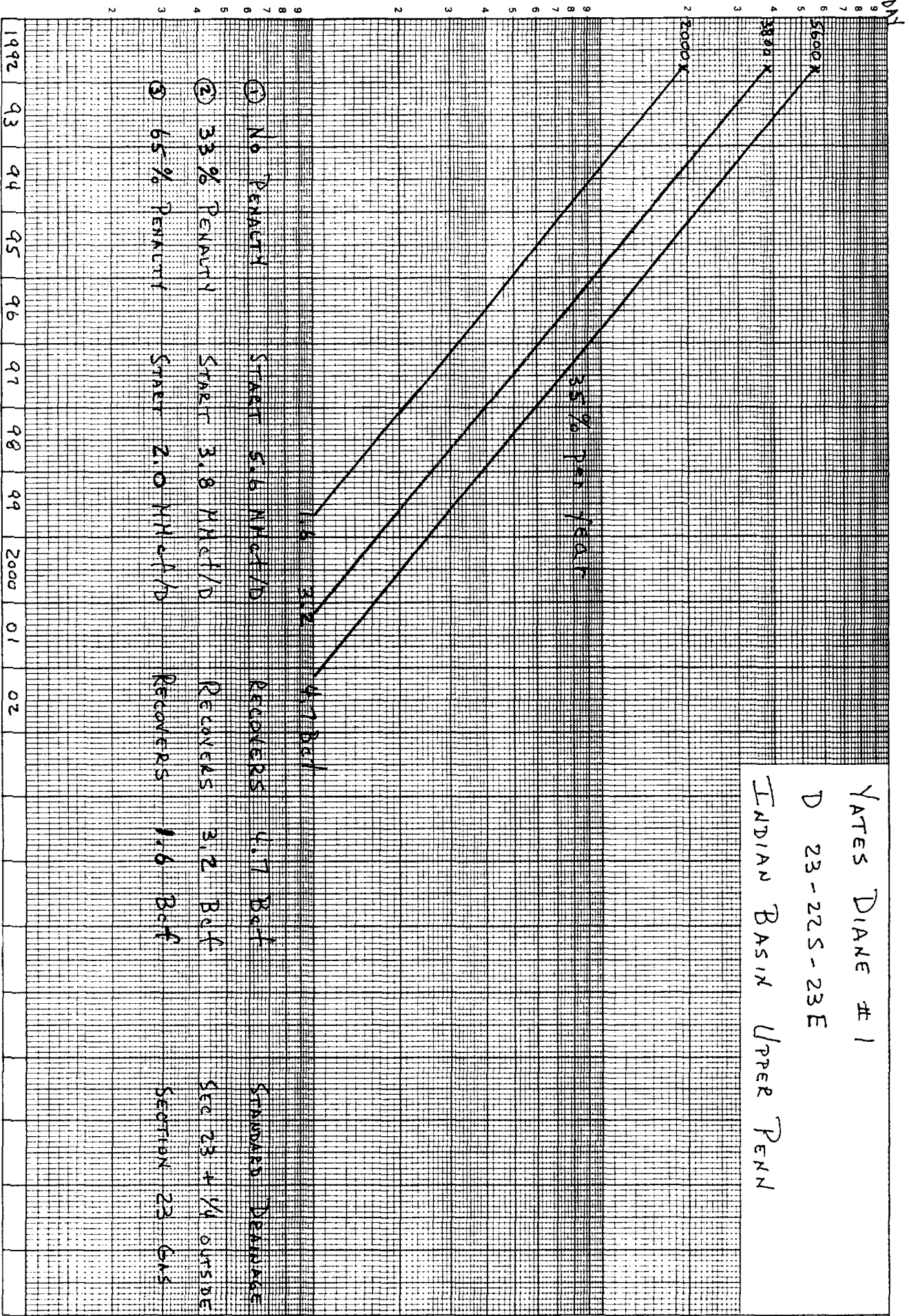
WELL : INDIAN BASIN UPPER PENN
 DATE : SEPTEMBER 1, 1966
 SAMPLE : HUGH N. FRENZEL

RESERVOIR TEMP = 146 F
 RESERVOIR PRESSURE = 2921 psia

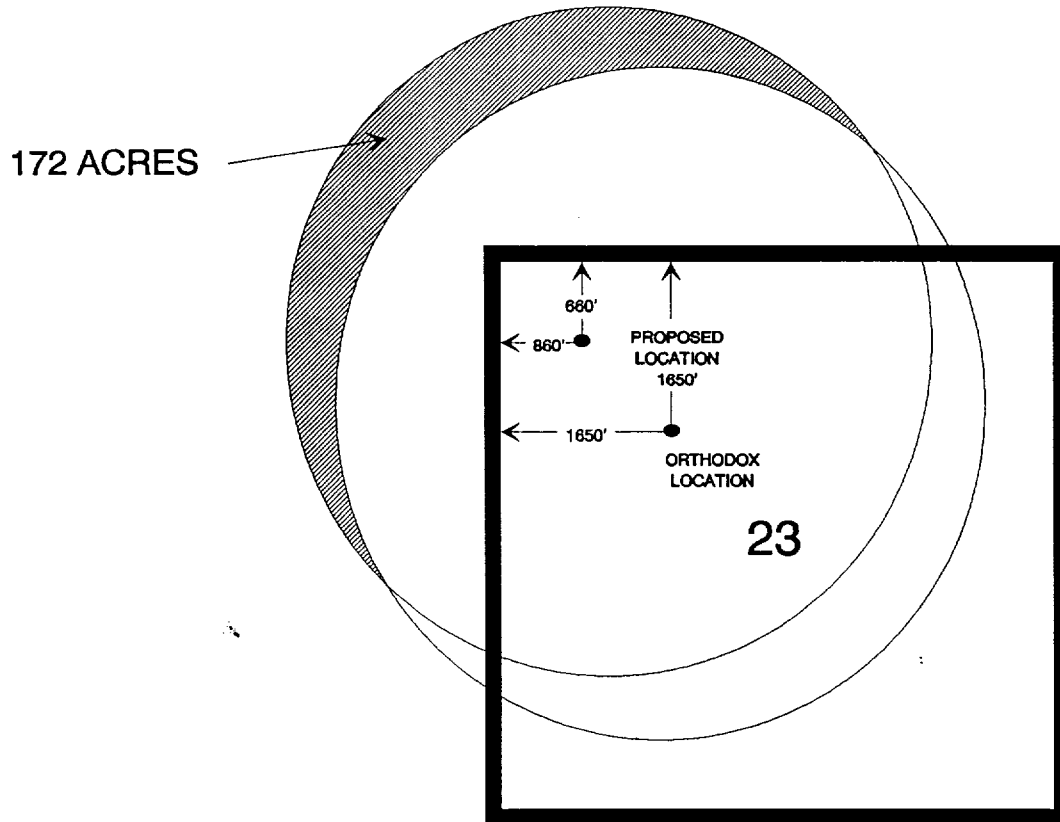
	MOLE PERCENT	MOLECULAR WEIGHT	CRITICAL PRESSURE psia	CRITICAL TEMP deg R	SAMPLE MOLECULAR WEIGHT	SAMPLE CRITICAL PRESSURE psia	SAMPLE CRITICAL TEMP deg R
CARBON DIOXIDE	0.650	44.01	1070.2	547.5	0.29	6.96	3.56
NITROGEN	0.780	28.02	492.2	227.0	0.22	3.84	1.77
HYDROGEN SULFIDE	0.380	34.08	1306.5	672.4	0.13	4.96	2.56
METHANE	88.480	16.04	673.1	343.2	14.19	595.56	303.66
ETHANE	4.940	30.07	708.3	549.9	1.49	34.99	27.17
PROpane	1.770	44.09	617.4	666.0	0.78	10.93	11.79
ISO-BUTANE	0.860	58.12	529.1	734.6	0.50	4.55	6.32
N-BUTANE	0.450	58.12	550.1	765.7	0.26	2.48	3.45
ISO-PENTANE	0.490	72.15	483.5	829.6	0.35	2.37	4.07
N-PENTANE	0.490	72.15	489.8	846.2	0.35	2.40	4.15
HEXANE	0.420	86.17	440.1	914.2	0.36	1.85	3.84
HEPTANE	0.290	100.20	395.9	972.4	0.29	1.15	2.82
	100.000				19.21	672.03	375.14

SPECIFIC GRAVITY = 0.663
 PSEUDOREDUCED PRESSURE = 4.347
 PSEUDOREDUCED TEMP = 1.615
 GAS DEVIATION FACTOR (Z) = 0.851

Yates Diane #1
D 23-22S-23E
INDIAN BASIN Upper Penn



THREE - PART PENALTY FORMULA



- 1) EW Factor $P_1 = \frac{\text{Orthodox EW} - \text{Actual EW}}{\text{Orthodox EW}} = \frac{1650-860}{1650} = 0.48$
- 2) NS Factor $P_2 = \frac{\text{Orthodox NS} - \text{Actual NS}}{\text{Orthodox NS}} = \frac{1650-660}{1650} = 0.60$
- 3) Excess Area $P_3 = \text{Excess Area/Spacing Unit} = 172/640 = 0.27$

$$\text{Then, Penalty} = 1/3 (P_1 + P_2 + P_3) = 1/3 (0.48 + 0.60 + 0.27) = 0.45$$

45% PENALTY

Yates Petroleum Corporation's

Application for an Unorthodox Location

Diane "ALQ" Federal No. 1

Proposed Acreage Factor based on distance from lease lines:

AF

660' location	=	$1 - (1650' - 660') / 1650'$	=	0.40
860' location	=	$1 - (1650' - 860') / 1650'$	=	0.52

Proposed Acreage Factor based on acreage:

AF

Diane "ALQ" acreage/640 acre unit	=	$(163.6 / 640) =$	0.26
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Average of Proposed Acreage Factors from Distances & Acreage:

AF

660' location	=	$1 - (1650' - 660') / 1650'$	=	0.40
860' location	=	$1 - (1650' - 860') / 1650'$	=	0.52
Average			=	0.46

Diane "ALQ" acreage/640 acre unit			=(163.6/640) =	0.26
660' location	=	1-(1650'-660')/1650'	=	0.40
Average			=	0.33

Diane "ALQ" acreage/640 acre unit			=(163.6/640) =	0.26
860' location	=	1-(1650'-860')/1650'	=	0.52
Average			=	0.39

CHEVRON'S RECOMMENDED ACREAGE FACTOR:

Diane "ALQ" acreage/640 acre unit			=	(163.6/640) =	0.26
660' location	=	1-(1650'-660')/1650'	=		0.40
860' location	=	1-(1650'-860')/1650'	=		0.52
Average			=		0.39

BEFORE EXAMINER CATANACH

OIL CONSERVATION DIVISION

CHEVRON EXHIBIT NO. 4

CASE NO. 10544