



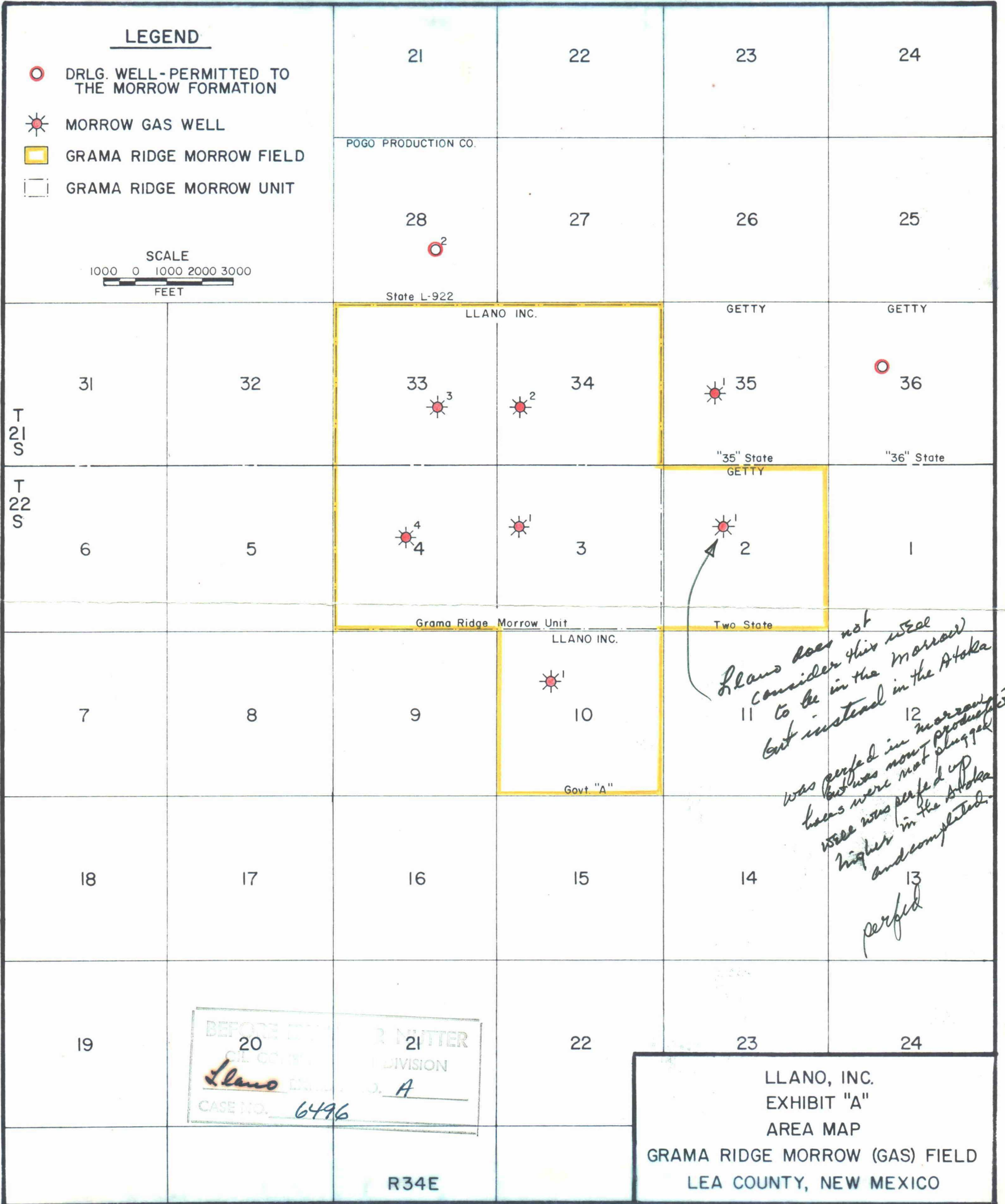


**LEGEND**

-  DRLG. WELL - PERMITTED TO THE MORROW FORMATION
-  MORROW GAS WELL
-  GRAMA RIDGE MORROW FIELD
-  GRAMA RIDGE MORROW UNIT

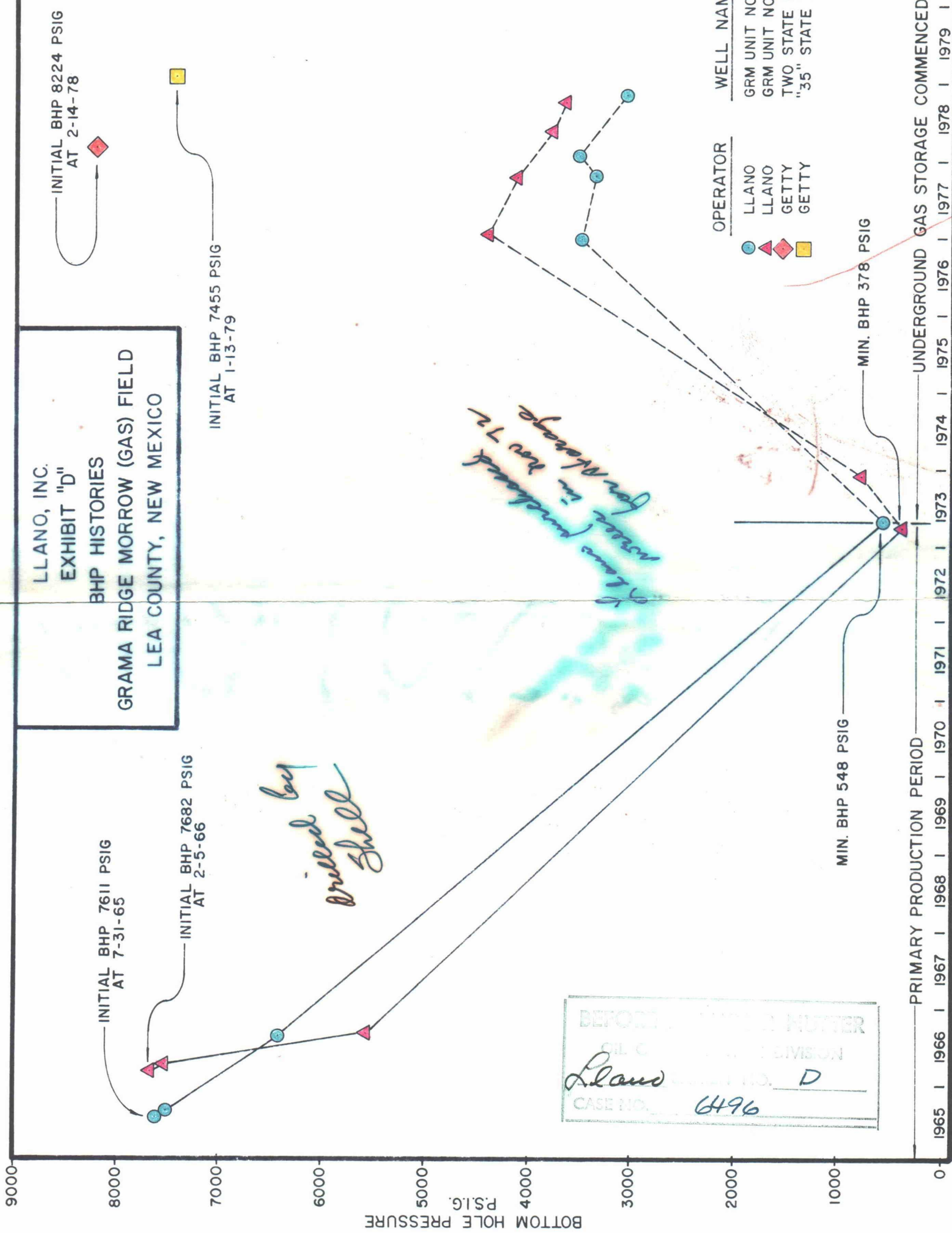


*LLANO does not consider this well to be in the Morrow but instead in the Atoka was perf'd in Morrow but was not plugged because were not plugged higher in the Atoka and completed. perf'd*

BEFORE EXHIBIT 21 INTER  
OIL COMPANY DIVISION  
*Llano* INC. J. A.  
CASE NO. *6496*

LLANO, INC.  
EXHIBIT "A"  
AREA MAP  
GRAMA RIDGE MORROW (GAS) FIELD  
LEA COUNTY, NEW MEXICO

LLANO, INC.  
 EXHIBIT "D"  
 BHP HISTORIES  
 GRAMA RIDGE MORROW (GAS) FIELD  
 LEA COUNTY, NEW MEXICO



BEFORE THE PUBLIC UTILITY  
 COMMISSION  
 LLANO COMPANY NO. D  
 CASE NO. 6496

*Drilled by Shell*

*Flow purchased in Nov 72*

1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980

PRIMARY PRODUCTION PERIOD

UNDERGROUND GAS STORAGE COMMENCED 4-73

OPERATOR

- LLANO
- ▲ LLANO
- ◆ GETTY
- GETTY

WELL NAME

- GRM UNIT NO. 1
- ▲ GRM UNIT NO. 2
- ◆ TWO STATE NO. 1
- "35" STATE NO. 1

MIN. BHP 548 PSIG

MIN. BHP 378 PSIG

$$\text{Drainage Area} = \frac{43,560 \text{ SQ.FT.} \times \phi \times (1.0 - S_w) \times \frac{R_p}{15.025} \times \frac{520}{R_t} \times \frac{1}{Z} \times h \times .001}{\text{AC.}}$$

Well Data	Operator: Well Name: Well No.:	Llano GRMU No. 1	Llano GRMU No. 2	Llano GRMU No. 3	Llano GRMU No. 4	Llano Gov't A No. 1	Getty 35 State No. 1	Average Well
Primary Gas Production - MCF		6,997,911	5,897,450	1,856,851	2,641,051	1,500,000	5,000,000	3,982,210
Primary Oil Production - EQ. MCF (1)		71,729	82,922	25,655	65,748	35,000	70,000	58,509
Remaining Primary Reserves - MCF (2)		21,742	21,742	318,519	-0-	-0-	-0-	60,334
Ultimate Producidble Reserves - MCF		7,091,382	6,002,114	2,201,025	2,706,799	1,535,000	5,070,000	4,101,053
Recovery Efficiency - %		.80	.80	.80	.80	.80	.80	.80
Original Gas In Place - MCF		8,864,228	7,502,642	2,751,281	3,383,499	1,918,750	6,337,500	5,126,317
Thickness of Net Productive Sands - h (ft.)		24	20	15	16	6	23	17.3
Average Porosity - $\phi$ (%)		10.0	8.8	10.5	7.1	7.0	10.3	9.3
Average Formation Water Saturation - $S_w$ (%)		30	30	30	30	30	30	30
Initial Reservoir Pressure - $R_p$ (psia)		7614.2	7695.2	5230.2	7671.2	7017.2	7468.2	7116.0
Reservoir Temperature - $R_t$ (°R)		644	637	632	638	644	636	638
Specific Gravity of Gas - G		.590	.596	.628	.595	.610	.595	.602
Supercompressibility Factor - Z		1.210	1.217	1.238	1.215	1.160	1.215	1.209
Calculated Drainage Area - (acres)		<u>358</u>	<u>407</u>	<u>248</u>	<u>285</u>	<u>461</u>	<u>262</u>	<u>327</u>

- (1) Condensate production has been converted to equivalent MCF at the rate of 3.5 MCF/STBO.
- (2) Remaining Primary Reserves agreed to by Llano and State of New Mexico prior to commencement of gas storage operations. The volumes were calculated from extrapolations of BHP/Z vs. Cumulative Production plots.

The foregoing table has been compiled solely for those Grama Ridge Morrow (Gas) Field wells which are or have been producing only from the Morrow Sand interval located below the Morrow Clastics Zone.

358  
407  
248  
285  

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1298 acres

LLANO, INC.  
EXHIBIT "E"  
CALCULATED DRAINAGE AREA OF FIELD WELLS  
GRAMA RIDGE MORROW (GAS) FIELD  
LEA COUNTY, NEW MEXICO

RECEIVED	DATE
FILED	BY
Llano	E
CASE NO.	6496