Ex "4"

# KELT OIL & GAS, INC.

Case 9738

## WATERFLOOD FEASIBILITY

## AND UNITIZATION STUDY

## PROPOSED

## CATO SAN ANDRES UNIT

CHAVES COUNTY, NEW MEXICO

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## WATERFLOOD FEASIBILITY AND UNITIZATION STUDY

## PROPOSED CATO SAN ANDRES UNIT, CHAVES CO., NEW MEXICO

### PURPOSE

The purpose of this report is to determine the feasibility of waterflooding the P1, P2 and P3 dolomites of the San Andres Formation in the Cato field, Chaves County, New Mexico and to present a proposed waterflood and unitization plan for secondary recovery.

### CONCLUSIONS

1. Based on a pilot flood in the northern part of Cato field, a VIP reservoir simulation study and an analogous field study; the P1, P2 and P3 dolomites of the San Andres Formation in the Cato field can be successfully water flooded.

2. Remaining primary oil recovery is estimated at 730,000 barrels of oil for proved developed and undeveloped reserves (446 MBO and 284 MBO respectively). This would give Cato an ultimate recovery of 10 % without flooding.

3. Estimated proven undeveloped secondary reserves are 11.687 MMBO which is an increase in recovery of 7 % over primary and gives a secondary to primary recovery ratio of 0.8. This ratio is within the proven range of secondary to primary ratios known for the San Andres Formation, 0.6 to 1.4.

4. Total estimated initial investment for the waterflood project is $13.6 million. Ultimate capitol expenditures could approach $20.0 million. This includes drilling of new wells, conversion of wells, re-perforating and squeezing, surface facilities installation/renovation and power plant installation.

5. Present net worth for secondary proved undeveloped reserves, discounted at 10 % is $26.9 million as compared to a 10 % discounted present net worth of developed producing reserves of only $0.96 million.

6. The most efficient way to economically recover both remaining primary and secondary reserves is to unitize the Cato field.

## 1.0 FIELD HISTORY

### 1.1 Location

The Cato Field, Chaves County, New Mexico, is located approximately fifty miles east, north-east of the city of Roswell, on the Northwestern Shelf of the Permian Basin in T8S and T9S, R30E. The field lies near the western edge of the east-west San Andres fairway that begins with the giant Slaughter-Leveland field 60 miles east in Texas. The fairway includes Bluitt, Milenesand, Chaveroo, Tom Tom, Tomahawk, Siete, Cato and Twin Lakes San Andres fields (Figure 1).

### 1.2 Producing Zones

Cato's productive reservoirs are in three lower San Andres Formation anhydritic fractured dolomites locally named P1, P2, and P3 (increasing depth). The zones occur at a depth of 3100 to 3700 feet with gross thicknesses ranging from 10 to 60 feet per zone. The P1 is the primary productive zone being completed in all wells except for those on the extreme northwest edge of the field where the P3 zone was the primary target and initial completion interval.

There are three Devonian wells offsetting Cato to the northwest by 1/2 mile in sections 6, 7 and 8 of T8S-R30E. These constitute the Lightcap field and are not considered either part of the Cato San Andres field or part of the proposed unit.

### 1.3 Discovery and Development

Cato Baskett #1, located in the NW/4 SW/4 Sec11 T8S-R30E drilled by Pan American Petroleum Corporation, discovered the Cato field in June 1966. Amoco, Shell, Mobil and Union Texas all played an integral part in the development of the Cato and the field was developed over the next four years on 40-acre spacing with 250 wells covering 10,500 productive acres. A typical 3,400 foot San Andres well potentialed for 60 barrels of oil per day (BOPD), 30,000 cubic feet of gas per day (MCFPD) and no water. The average field water cut increased to about 50 percent in the early 1970's yet total fluid rates fell dramatically indicating field wide pressure depletion. In January, 1968 primary oil production peaked at 10,000 BOPD from 205 wells. In 1970 maximum gas production was reached at 14.3 MMCFPD (Figure 6). As of January 1, 1988 production from the 130 active wells was 300 BOPD, 1.14 MMCFPD, and approximately 2,000 BWPD. Cumulative field production as of the same date was 15.3 MMBO, 29.8 BCFG, and 23.5 MMBW.

Fourteen step-out and 40 acre in-fill locations and one 20 acre in-fill location were drilled after 1970 bringing the total producer count to 265. The proposed unit contains 259 or 98% of the total produced San Andres wells drilled in the field. A total of 268 wells (producers plus dry holes) were drilled in defining the field limits. Of these, 261 wells were drilled within the proposed unit boundary. Thirteen wells within the proposed unit were converted into injectors in two pilot floods. Two wells outside of the unit were used as disposal wells. The chart below summarizes the current well status.

| WELLS | PROD | IDLE | INJ | P&A | D&A |
|---|---|---|---|---|---|
| IN UNIT | 123 | 71 | 13 | 54 | 12 |
| OUT OF UNIT | 2 | 4 | 2 | 0 | 7 |

The 20 acre in-fill location, New Mexico State H #17, was drilled and completed in the center of the NE/4 of section 16 T8S-R30E during June, 1979. It had an initial production of 5 BOPD, 6 MCF, and 12 BWPD from 38 feet of perforations in the P1 interval. Production rates from this well confirmed that the reservoir had suffered pressure depletion and had been adequately drained on primary. Furthermore this well verified lateral reservoir continuity.

At present much of Cato is at or below its economic limit. Low production rates per well and persistently low product prices in conjunction with increasing operating expenses necessitate the unitization of Cato for the economic recovery of remaining primary and undeveloped secondary reserves.

## 1.4 Log and Core Data

Over 50% of the wells were logged with either compensated density porosity, sidewall neutron porosity or bore hole compensated sonic logs. The remainder of the wells were logged with cased hole gamma ray neutron logs or simply gamma ray logs for perforating. Laterlogs or guard logs were also run on the wells with open hole porosity logs.

Thirty-one wells were cored and of this total seventeen had a routine complete core analysis performed. The open hole logs were calibrated to the routine core analysis for water saturation and petrophysical analysis.

Nine of the cores were examined by Kelt to determine lithology, heterogeneity, fracture orientation and density, solution porosity distribution and intercrystalline porosity distribution. Core plugs from one core were submitted for thin section petrographic analysis.

## 1.5 Completions

Typically, 4 1/2" production casing was set through the P1 and P2 pay zones and cemented with 300 sacks. The wells were acid stimulated through perforations with 1000 to 5000 gallons of 15-28% HCL. The majority of the original wells were completed flowing and field pressure and hence rates declined, the wells were converted to artificial lift. The P3 was found to be productive only in the northwest corner of the field.

## 2.0 GEOLOGY

### 2.1 Stratigraphy

Cato oil reservoirs are divided into three zones separated by two major interzones. The reservoirs are three lower San Andres fractured anhydritic dolomites locally termed, from highest to lowest stratigraphically, P1, P2 and P3. The two interzones are termed P1-P2 interzone and P2-P3 interzone. The P1-P2 is a dense blue-grey anhydrite with thin interbedded dolomite layers. The P2-P3 is a dense non-porous, non-permeable tan to brown limestone. The P1 is capped by a slightly dolomitic anhydrite (Figure 2).

The general stratigraphic column from the upper most P3 dolomite to the cap rock anhydrite above the P1 is as follows: P3 anhydritic dolomite overlain by a dense and impermeable P2-P3 limestone grading upward into a limey dolomite to P2 anyhdritic dolomite overlain by the blue-grey P1-P2 anhydrite overlain by P1 anhydritic dolomite capped by anhydrite. This cyclical depositional pattern is common for the lower San Andres. It is the result of deposition in a prograding sabkha environment that was interrupted by periodic transgressions.

Reservoir continuity is illustrated by the three restored cross sections (Plats 1,2,3). Consistent log correlations in the northern part of the field (north of section 27, T8S-R30E) indicate good lateral continuity in the P1 and P2. To the south a lateral facies change results in the thinning of the P1-P2 anhydrite and the resultant thickening of the P1 dolomite. The P1 porosity breaks in the southern part of the field are separated by thin beds of increased anhydrite volume. These porosity breaks can be correlated from well to well again implying reservoir continuity. The P2 is also mappable yet thinner in the southern portion.

### 2.2 Productive Zone Porosity Evaluation

Porosity values for the three productive zones were determined primarily from routine core analysis calibrated to the various porosity logs. The core porosity values were taken as given (no correction has been made for overburden) but log derived values were calculated by standardizing each log to consistent lithologic units; i.e. the anhydrite cap and P1-P2 interzone. A reasonable correlation between core porosity versus log porosity was achieved with this technique (Figure 3). On the average log porosity was found to be 1-2% higher than core porosity.

The sidewall neutron porosity (SNP) logs corrected for lithology were found to have the best agreement with the core. Similarly the compensated density porosity (FDC) logs matched the core, but to a lesser degree. Matrix density values of 2.83 gm/cc for P1 and P3 and 2.76 gm/cc for P2 were selected as representative. The sonic logs lacked sensitivity and were used only when a SNP or FDC was not available. Based on a weighted average (by thickness) distribution of porosity a log calculated porosity cutoff of 4% was selected as reasonable. That is, 80% of the rock showing log porosity had a porosity greater than 4%. This criterion was used in all isopach mapping of porous rock.

From the 17 routine core analysis the average porosity of all zones is about 6% and average permeability is 20 millidarcy (md) for all rock greater than 2% porosity and/or greater than 1 md (Table 1). This is the criterion used for determining net porous and permeable rock from the core data. It is, within the accuracy of the correlation between log and core porosity, identical to the log porosity cutoff used.

Thin section analysis using the Swift Automatic Point Counter for volume percentages on 18 slides covering the P1 through P3 from the Crosby 7 well, SW SW sec. 9, T8S-R30E, yielded an average porosity of 8.6%.

## 2.3 Porosity versus Permeability

Porosity versus permeability cross plots were prepared for each zone (P1, P2, P3) and for each rock type - dolomite, fractured dolomite, vuggy dolomite, limestone and fractured limestone. With the exception of the vuggy dolomite (Figure 4) the plots showed no correlation between porosity and permeability.

Examination of 9 cores by Kelt revealed three types of porosity; solution, intercrystalline, and fracture. The vuggy (solution) dolomite has a minimum of 3% porosity with the vug diameter ranging from 0.09 mm to .65 mm. The vuggy intervals occur in 6 inch to 1 foot thick intervals. It is present in all three zones but due to limited core data it is not mappable. The average porosity is 9% and the average permeability is about 10 md.

The vugs are dissolved from a dolomite matrix with intercrystalline porosity. The matrix permeability (intercrystalline as opposed to solution) is 1-2 md. Individual crystals range in size from very fine to medium grained.

The fractures are predominantly vertical with occasional horizontal and 10-20 degrees to vertical fractures intersecting them. The 20 md average permeability measured in the cores is due to fracture permeability yet fracture porosity is roughly only 1% of the total porous volume. Fractures within several feet of the over and underlying anhydrite beds are usually filled with anhydrite but most of those within the porous section are naturally open.

Core measured permeabilites exhibited a wide distribution (.1 to over 100 md) which reflects the triple porosity model and hence the heterogeneity of the reservoirs. Diverse permeability distributions are common in many San Andres dolomite reserviors and are seldom used to influence waterflood performance predictions.

## 2.4 Water Saturation Analysis

Water saturations (Sw) were calculated with Archie's equation:

$$Sw = \{a * Rw/PHI^m * Rt\}^{1/n}$$

Petrophysical parameters n=2.0 and a=1.0 were used since no special core analysis were available for determination of the saturation exponent or the porosity intercept. Data supporting a cementation factor (m) are not available either, therefore a series of Sw sensitivity calculations and Picket plots with m varying from 2.0 to 2.4 were done. Results indicated that m = 2.1 yielded the most reasonable results. For m > 2.2 Sw was often larger than 100% which is never true. The generally low core porosities and Picket plots both suggest that m is greater than 2.0 which is the norm for "typical" porous carbonates.

An Rw = 0.032 ohm-m was used in all Sw calculations. It is based on water analysis reports of the P1 and P2 zones from three wells over a period of 12 years. The ionic concentrations were converted to equivalent NaCl concentrations by the Variable Dunlap Multiplier Method. The Rw values were then selected from standard temperature versus salinity charts as per a bottom hole temperature of 95 to 103 degrees F.

True resistivity (Rt) values used are direct focused resistivity log readings (Ra) - either laterlogs or guard logs. Focused resistivities approach Rt where the borehole contains a salt water mud (Rmf < 3Rw) and the zone of interest is greater than the measure electrode spacing. Mud filtrate resistivities (Rmf) on Cato wells were near 0.033 ohm-m at 100 degrees F which is less than 3Rw and the zones of interest (10 to 60 feet) exceed measured electrode spacing which is usually 32 inches. This assumption (Ra approaching Rt) was substantiated by Sw calculations accounting for borehole diameter, mud resistivity, shoulder effect and invaded zone corrections. This indicates that focused log resistivities are acceptable as Rt values for Cato wells.

Initial water saturation calculations were made from digitized log values in 45 wells for the P1, P2 and P3. The average connate water saturation is about 32 %. Structural elevation versus water saturation plots were used to determine original oil water contacts (OWC) (Figure 5). These plots give an OWC of about 625 feet amsl for the P1, P2 and P3 and are substantiated by production data.

The merging of the P1 and P2 water saturation versus structural elevation curves suggest that the two reservoirs have a common down dip aquifer. This is in agreement with the lateral facies change noted in the P1-P2 interzone - anhydrite wedging out to the south of the field. With consideration given to geologic time and the regional concept of a prograding sabka system it is reasonable for the P1 and P2 dolomites to be hydraulically connected. However, the two zones must be considered as separate reservoirs for the successful implementation of a secondary development program. This is particularly true for the northern portion of the field.

## 2.5 Definition of Net Pay

Based on the extensive core and log evaluations and their comparison to actual primary production response net pay was defined for primary and secondary reserves as P1, P2 and P3 dolomite greater than 2% core porosity (4% log porosity) and/or greater than 1 md permeability and above the oil/water contact of 625 feet amsl.

## 2.6 Description of Reservoirs

The P1 can be divided into a upper and a lower member. The upper member is a dense, grey, very anhydritic and sightly argilliaceous dolomite with poor porosity and permeability development. It has an occasional porosity break (log porosity > 4%) that was perforated by the original operators but these breaks are not correlative on a field wide basis. Most of the fractures in the upper P1 are sealed by anhydrite.

The lower P1 is a grey anhydritic dolomite with vertical fractures, solution and intercrystalline porosity. Based on perforation frequency it is the major producing reservoir accounting for an estimated 75% of primary production. This zone is correlative through out the northern part of the field as a single reservoir. Field wide pressure depletion and the formation of a P1 secondary gas cap confirm its continuity. The P1-P2 interzone lateral facies change to the south results in the subsequent thickening of the P1. Although the P1 log signature is quite different in the southern part of the field its individual porosity lenses are still correlative. The P1 is the most frequently fractured reservoir, 75% of the P1 core feet examined by Kelt exhibited natural vertical fractures. This would explain its steep water saturation profile with respect to structural elevation.

The P1 average porosity is 5% (9% when vugs are present), its average permeability is 25 md with an average net thickness of 25 feet.

The P2 is a tan-grey anhydritic dolomite that grades downward into a dolomitic, impermeable limestone. P2 dolomite development is found at the base of the P1-P2 interzone in the northern part of the field. The contribution of vugs to total porosity is greater in the P2 than in the P1 but the P2 is less fractured. Thus the P2 has a higher average porosity but a lower average permeability. This gives the P2 a flatter water saturation profile. Log correlations and an original gas-oil-water segregated reservoir indicate its lateral continuity. In the southern and eastern portions of the field much of the P2 is below the original OWC and was not considered as net pay. Sixty-three percent of the P2 core examined was naturally fractured. It has an average porosity of 10 % and average permeability of 10 md with an average net thickness of 15 feet.

The P3 is only productive in the northwest corner of the field. It is a grey, slightly anhydritic and argillaceous dolomite. Its downdip limits are defined by two "wet" production tests. The UT Winkler-Fed 1 (SE NE 9-T8S-R30E) and the State H-5 (NE NW 16-T8S-R30E) both recovered only water in the P3. It has an average porosity of 8 % and a 10 foot average net thickness.

Isopachs of the P1, P2, P3 and total reservoir thickness for log porosity greater than 4% are enclosed as Plats 4, 5, 6 and 7.

## 2.7 Structure

The geologic structure (Plat 8) is a gently southeast dipping monocline. The map is drawn on top of the P1 with a mean sea level datum.

The strike is north-northeast to south-southeast. Dip averages 1 degree across the field giving a vertical relief of 380 feet. The dip angle increases up structure to 3 degrees at about the 760 foot contour interval. Two minor structural features are present. One is the east-west trending low near the northern edge of the field. The second is a south to southeast plunging structural nose in section 8, T8S-R30E. Both are low amplitude folds not associated with faulting.

The extreme southern tip of the field (section 7, T9S-R30E) is separated by a strong structural low perpendicular to regional strike. This area is 50 to 75 feet low on structure yet had initial rates indicative of virgin pressures. The Yates 2-Y (SE SW 7-T9S-R30E) had an initial IP of 125 BOPD in 1985, 15 years after the rest of the field had already suffered pressure depletion. This area is undoubtedly tapping a separate pool and is therefore not recommended for inclusion in the unit.

## 2.8 Field Limits

The north and west field limits are set by an updip porosity / permeability barrier likely caused by anhydrite plugging the pore throats and fractures in the dolomite reservoirs. These limits are best illustrated by the cumulative production isopach (Plat 9) which shows decreasing productivity to the north and west. Nine wells reported as dry holes were drilled around the west and north perimeter of the field. In most cases however the north and west limits were set when early development drilling ceased as pay quality deteriorated around the periphery of the current field development.

From a log evaluation point of view, the west and north limits are less clear. There is no true zero porosity line mappable; however the net reservoir thickness does decrease to the north and west. The poor relationship between core porosity and permeability contributes to the difficulty of establishing a field limit based on log porosity. This problem is compounded by the lack of wells actually penetrating the updip trapping mechanism.

A primary gas cap in the P2 and a secondary gas cap forming in the P1 were also used in defining field limits. The P2 is the only zone which exhibited an original gas cap from the production data. This cap was confined to the northwest corner of the field and is considered the updip limit for the P2. There was no gas cap in the P1 since the crude oil was slightly undersaturated at initial reservoir pressure. However, increasing P1 GOR's are evidence for a secondary gas cap forming in the northwest corner of the field - implying both reservoir continuity and an updip field limit.

In summary, the current north and west field limits are primarily a function of 1968 economics and are suggested, yet not completely defined, by current data. To this end and to protect the north and west boundaries the proposed unit outline was selected one 40 acre location both north and west of areas not limited by an offsetting dry hole.

The southeast and east field limits are established by an oil/water contact defined by production testing and open hole log water saturation analysis. The structural elevation of the OWC is at about 625 feet amsl for all three reservoirs. The southern limit is defined by a structural low separating section 7, T9S-R30E from the rest of the field as stated above in section 2.4.

## 3.0 ENGINEERING

### 3.1 Determination of Primary Reserves

Production histories on a well by well basis were generated from previous operators records, state documents and reports and commercial reporting companies (PI). Although the data from the various sources was not 100 % consistent, reliable production histories on a per well basis could be generated. Individual well performances were plotted on similog paper and remaining primary reserves were calculated using classic decline curve analysis. Such calculations were performed for each well within the proposed unit boundary. Remaining primary reserves were summed on a lease/tract basis and subsequently on a field wide basis.

A combination of hyperbolic and exponential declines were used to forecast remaining primary reserves. Decline rates (and hence type, either hyperbolic or exponential) were chosen on a well by well basis. Field wide decline rates were not force fit onto individual wells (this practice tends to penalize "good" wells and benefit "poor" wells). An economic limit of 1 BOPD per well was assumed as a measure of ultimate remaining primary production. Although the actual current economic limit is slightly higher than 1 BOPD, this figure was chosen to provide as fair an estimate as possible. Figure 9 is an example calculation for the Crosby 4 tract.

### 3.2 Determination of Secondary Reserves

In order to determine the secondary reserves per tract when waterflooding is initiated, a fairly extensive reservoir engineering study was carried out using reservoir simulation. The following steps were performed:

- Determine oil/water contact and water saturation at depth related to every lease/tract. This calculation was repeated for every lease.

- Determine gas saturation from production tests for each lease and each zone (P1, P2 and P3).

- Determine average porosity for each lease and each zone.

- Construct and perform a one quarter five-spot reservoir simulation using the VIP three phase, three dimensional, EPIS reservoir simulation model. The model included Cato fluid properties, relative permeabilities from a nearby field, core permeability and represented a 40 acre pattern.

Separate simulation runs were conducted for each of the three main zones. The model/simulation was initialized using porosity, water and gas saturation for each individual lease. Primary production prior to water injection was history matched to actual rates by adjusting well parameters. The simulations were run under water injection until economic limits and secondary reserves were obtained by subtraction of cumulative produced oil and calculated primary production. Figure 10 is a plot of oil production, water/oil ratio, gas/oil ratio and average pressure if initial water saturation is 20% and gas saturation is 3%.

Estimated secondary reserve results from the stimulation study were compared to actual field responses from the pilot injection program on the North part of the Cato and analogous field results. Waterflood response rates and recoviers were reviewed and limited, subjective engineering analysis was applied to smooth the data and provide a most likely response to field wide waterflooding.

## 3.3 Original Oil In Place and Remaining Primary

Cumulative oil, gas, and water production maps are enclosed as Plats 9, 10 and 11. These maps and Figure 6 (Full Field Historical Production) illustrate the primary performance of the Cato field.

A total of 159 million barrels of developed original oil in place is contained in the P1, P2 and P3. With primary recovery at 15.3 MMBO gives Cato a 9.6 % recovery factor. Unperforated intervals in existing wells contain 42 million barrels of oil in place. Remaining primary proved developed producing and non-producing reserves are 284,000 and 446,000 BO, respectively. This represents only a 0.3 % increase in ultimate recovery under primary conditions.

The oil in place values above were calculated using all of the available geologic and engineering data for the field. A gross thickness map was constructed for each of the three San Andres pay zones. Open hole porosity logs were calibrated to core data resulting in net to gross pay thickness ratios, average porosity and average water saturation values assigned to each productive zone at each well location. The resultant bulk volume oil map yielded initial oil in place.

There is one fluid analysis available in the field from a bottom hole sample taken in January 1968, and should accurately represent the Cato crude. The analysis of this sample indicated an original reservoir pressure of 1138 psig, a bubble point pressure of 1014 psig, a 1.18 formation volume factor (res. bbl/stock tank bbl), a solution gas-oil ratio of 370 scf/bbl, and stock tank oil gravity of 25 degree API.

## 3.4 Secondary Recovery

Secondary reserves from field wide water injection are based on the results of a small pilot flood in the northern part of the field and on a reservoir simulation study performed using the VIP package. Proved undeveloped secondary reserves for the proposed unit area resulting from field wide water injection are 11,687,000 barrels of oil. Probable and possible undeveloped secondary reserves are 14,062,000 and 2,735,000 barrels of oil, respectively. If all secondary reserve classifications hold true an additional 18 % of the original oil in place will be recovered under field wide water flooding. This would give Cato an ultimate recovery (primary plus secondary) of 44 MMBO or 27 % of the original oil in place.

Based on the stratigraphic nature of the field, the production history and fluid analysis, it is obvious that the primary San Andres producing mechanism is solution gas drive. Field operators recognized the potential of waterflooding Cato field and in the early 1970's installed two pilot floods in two parts of the field; one in the southern part in section 33, T9S-R30E for which there is little documentation. The other was in the northern part of the field, sections 11 and 14, T8S-R30E, its results are fairly well documented (Plat 12).

This northern project involved injecting limited amounts of water into seven wells on a rough incomplete 80 acre 5 spot pattern. Only about 2 % of a pore volume of water was injected yet measurable response in the offset producers was noted (Figure 7 and Table 2). The injection of roughly 2 million barrels of water resulted in the incremental recovery due to waterflood of 350,000 barrels of oil from a portion of the reservoir containing 54 million barrels of original oil in place for a secondary recovery factor of 0.65 % of original oil in place. Based on this pilot project and also on the reservoir simulation study described below, roughly 50 percent of the secondary reserves predicted to be recovered as a result of a field water injection project have been classified as proven.

## 3.5 Reservoir Simulation

To establish the magnitude of secondary oil recovery from waterflooding Cato field, a reservoir simulation study was performed using the VIP package. A typical San Andres pay section with proper porosity and permeability profiles was employed. A quarter of an 80 acre 5 spot pattern was utilized, as well as relative permeability curves representative of the mixed-wettability San Andres in this area were used for all runs. The variables in the various cases were initial water and gas saturation at the start of injection. Water saturation varied from 20 to 48 percent of pore volume and gas saturation varied from 3 to 8 percent of pore volume. The results of these runs indicate a secondary recovery of zero to 40 percent of the oil in place. The average recovery at about 30 percent water saturation was 20-25 percent of oil in place. The array of recovery factors thus generated were then applied to each zone in each 40 acre tract in the field based on its current estimated water and gas saturation, and its current oil in place to calculate recoverable secondary oil. Results of the simulation are shown on Figure 8.

This analysis indicates total remaining recoverable oil from waterflooding Cato field is 26.0 million barrels. Of this total 0.7 million barrels would have been recovered by currently producing wells under primary drive over the next 12 years. As previously mentioned, about 12 million barrels of undeveloped secondary reserves have been classified as proven. This results in an estimated secondary to primary ratio of 0.8 which is well within the 0.6 to 1.4 range observed for nearby San Andres waterfloods. This indicates a primary plus secondary recovery factor of 15 percent of oil in place for proven developed and undeveloped reserves. The remaining waterflood reserve has been classified as probable and represents an additional 7 percent recovery.

### 3.6 Flood Pattern

An additional 56 wells will be drilled on undeveloped acreage to complete a 5-spot flood pattern (Plat 13). These wells will develope an estimated 25 million barrels of oil in place which is directly offset by productive San Andres wells. An additional contiguous area containing 12.2 million barrels of oil in place is also included in the proposed unit. This area requires drilling an additional 54 wells. The unit outline was drawn around 40-acre locations with a producer, around recommended and probable undrilled locations and around the open undrilled spots deemed reasonable by geology and to protect the unit.

### 3.7 Estimated Project Costs

Secondary recovery cash flow projections (Section 5.0) are started 1/1/89 (investments) with water injection commencing immediately thereafter in selected portions of the field. The total project installation will be completed in 1990. Partial oil production response should occur in late 1989 with peak response in 1994.

Total initial investment for the Cato waterflood project is estimated to be $13.6 million as shown in the cashflow projections and Tables 3 and 4. Compared to incremental proven secondary recovery project reserves of 12.0 million barrels, the cost per barrel is $1.13.

Waterflooding operating cost has been projected based on historical lifting cost and water handling cost per barrell. A sample of operating cost items is shown in the attachments for year 1990. The waterflood project will include installation of an electrical power generating unit to be run with field gas. This unit is cheaper to purchase and operate than to purchase electrical power from outside sources. The $1.7 million power unit cost pays out in the second year of the project.

3.8 Unitization Parameters

Fifty nine individual tracts have been created to form the proposed Cato Unit. The proposed Cato Unit Boundaries are outlined on Plat 14 as well as Exhibit A in the Cato Unit Agreement and Cato Unit Operating Agreement. Several various parameters have been considered in the calculations to define individual tract participation in the proposed unit. The tract participation formula and participation parameters are defined below:

Phase I Tract Participation =
5% A/B + 18% C/D + 5% E/F + 2% G/H + 5% I/J + 15% K/L + 50% M/N

Phase II Tract Participation =
5% A/B + 10% C/D + 5% {(G+I)/(H+J)} + 10% K/L + 20% M/N + 45% O/P

A = The tract gross acreage.

B = The unit total gross acreage.

C = The tract current (as of 6-1-88) active producing well count.

D = The unit total active producing well count.

E = The tract current temporarily shut in producing well count.

F = The unit total temporarily shut in producing well count.

G = The tract current temporarily abandoned producing well count.

H = The unit total current temporarily abandoned producing well count.

I = The tract current active injection well count.

J = The unit total active injection well count.

K = The tract cumulative oil production from the unitized formation from 1960 through 6-1-88.

L = The total unit cumulative oil production from the unitize formation from 1960 through 6-1-88.

M = The remaining primary oil reserves from the unitized formation for the tract as of 6-1-88.

N = The remaining primary oil reserves from the unitized formation for all unit tracts as of 6-1-88.

O = The remaining secondary oil reserves from the unitized formation for the tract as of 6-1-88.

P = The remaining secondary oil reserves from the unitized formation for all tracts as of 6-1-88.

The tract participation calculations have been separated into two distinct phases or time periods. Phase I and Phase II are designed to more accurately distribute the ownership of the unit based upon the quantity and producibility of the recoverable hydrocarbons as a function of the timing of the development. Phase I calculations are designed to reflect the relative values of the individual tracts early in the life of the unit while the project is producing remaining primary reserves. Phase II calculation are intended to reflect the value of the respective tracts after extensive renovation and capitol expenditures enable the exploitation of additional secondary reserves.

Phase I Tract Participation shall apply from the Effective Date until the earlier of (a) 447,000 barrels of oil have been produced from the Unit, or (b) 3,000,000 barrels of incremental (makeup) water have been injected into wells in the Unit, at which time Phase II Tract Participation shall apply.

Phase I participation figures are heavily weighted by the parameter: remaining primary reserves. Fifty percent of the weighting to determine Phase I tract participation has been assigned to this parameter. Although all available data has been carefully examined, the primary reserves per tract remains a scientific and engineering estimate of the amount of primary oil remaining under the individual tract. The estimate of remaining primary reserves does not reflect the tracts ability to exploit these reserves; thus, remaining primary reserves should not be used as the sole criterium. Thirty percent of the weighting used to calculate Phase I tract participation has been assigned to the mechanical ability of the individual tract to physically exploit these remaining reserves. The remaining twenty percent weighting has been assigned to parameters for which actual / precise values can be determined. Gross acreage has been assigned a weighting factor of five percent and the cumulative production, (the cumulative of the tracts production from Jan '60 to Jun '88) has been assigned a weighting of fifteen percent. These two parameters provide an accurate balancing / averaging to the previous parameter weightings. The previous cum production per tract is a historical value, which can be determined precisely, which provides an excellent correlation to reservoir quality and its ability to produce, and hence tract value. Gross acreage is a weighting factor which provides an estimation of value to leases / tract which provide speculative additional stepout drilling, infill drilling. Gross acreage also provides value to tracts which lie on the edge of the know reservoir and were included in the unit because of geologic unknown and uncertainty to protect the units boundaries / borders.

Phase II tract participation figures are more heavily weighted by engineering and scientific approximations. Sixty five percent of the weighting of the Phase II calculations is assigned to estimates of future production. Twenty and fortyfive percent to remaining primary and estimated secondary respectively. Fifteen percent weighting factor has been assigned to the "known quantity" parameters of previous tract cumulative production (ten percent) and gross acreage (five percent). Parameters representing the mechanical ability of the individual tracts ability to produce has been weighted by fifteen percent.

ROBIN B. LeBLEU
PETROLEUM ENGINEER

March 15, 1988

Kelt Energy
3878 Carson Street - Suite B 200
Torrance, California 90503

Attention: Mr. John Crick

Gentlemen:

At your request, an estimate has been made of the reserves and future cash flow as of January 1, 1988, attributable to the leasehold interests of certain properties located in the Cato Field, Chaves County, New Mexico. A discussion of the details of this study immediately follow this letter and are illustrated by the figures and tables which follow the discussion. In this report, M stands for thousands of units, MM stands for millions of units, and B stands for billions of units. The summarized results of this study are as follows:

| | Proved | | | |
|---|---|---|---|---|
| | Developed | | Undeveloped | Total |
| | Producing | Non-Producing | | |
| Gross Oil, MBBL | 284 | 446 | 11,687 | 12,418 |
| Gross Gas, MMCF | 1,137 | 1,785 | (2,456) | 466 |
| Net Oil, MBBL | 242 | 379 | 9,934 | 10,555 |
| Net Gas, MMCF | 966 | 1,517 | (2,087) | 396 |
| Net Revenue, M$ | 4,412 | 6,927 | 143,902 | 155,241 |
| Net Expense, M$ | 3,317 | 3,320 | 52,680 | 59,319 |
| Net Income, M$ | 1,094 | 3,607 | 91,222 | 95,922 |
| Net Investment, M$ | -0- | 47 | 18,461 | 18,508 |
| Net Oper. Income, M$ | 1,094 | 3,559 | 72,759 | 77,414 |
| Present Worth, 10%, M$ | 910 | 2,470 | 26,931 | 30,312 |



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| | Probable Undeveloped | Possible Undeveloped |
|---|---|---|
| Gross Oil, MBBL | 14,062 | 2,735 |
| Gross Gas, MMCF | -0- | -0- |
| Net Oil, MBBL | 11,953 | 2,324 |
| Net Gas, MMCF | -0- | -0- |
| Net Revenue, M$ | 175,392 | 34,109 |
| Net Expense, M$ | 50,814 | 12,042 |
| Net Income, M$ | 124,577 | 22,067 |
| Net Investment, M$ | -0- | 8,510 |
| Net Oper. Income, M$ | 124,577 | 13,557 |
| Present Worth,10%,M$ | 51,935 | 2,351 |

Liquid hydrocarbons are expressed in standard U.S. 42 gallon barrels. Gas volumes are expressed in cubic feet at standard conditions of 60°F and 15.025 psig. All monetary amounts are expressed in $U.S.

The above reserve and cash flow projections are estimates made according to accepted petroleum engineering practices and should not be construed to be the fair market value of these properties. The proved developed producing projection is based on production from Kelt owned leases at an assumed working (expense) interest of 100 percent and a net revenue interest of 85 percent. The undeveloped secondary projections include all Cato Field leases required to efficiently waterflood the San Andres reservoir, whether currently owned by Kelt or not. These latter projections assume 100 percent Kelt working interest and 85 percent net revenue interest. The actual interests Kelt will have depends on the results of unitization negotiations prior to waterflood if all outstanding field interests are not purchased by Kelt.

Reserve Definitions

Proven reserves are estimated quantities of crude oil and natural gas, calculated using engineering and geological data, which with reasonable certainty can be recovered from known reservoirs under existing economic and operating conditions. These proven reserves are, in general, supported by actual production or test volumes, but may be based in some instances on well log or core analysis which indicate the reservoir in question is similar to known productive reservoirs in the same field. The area of a proven reservoir includes that portion delineated by drilling and also includes those areas immediately adjoining the developed area which can reasonably be judged economically productive based on available geologic and engineering data.

Proven reserves can be further subdivided as follows:

Developed Reserves are those reserves expected to be recovered from existing wellbores.

Producing reserves are expected to be recovered from completed intervals producing at the time of the reserve report.

Non-Producing reserves are to be recovered from intervals not yet on production, but which can be converted to producing status with an expenditure which is small compared to the drilling and completion cost of a well drilled to the interval in question. These productive, but non-producing intervals can be awaiting completion, awaiting a market, awaiting repairs, or be behind pipe in a wellbore in which another interval is now producing.

Undeveloped reserves require a capital outlay which is significant when compared to the reserve value to be recovered.

Primary Recovery reserves require a large expenditure to rework an existing well, or require a new wellbore in order to be recovered.

Secondary Recovery reserves are based on application of an established improved recovery method (waterflood) when successful testing by a pilot project in the subject reservoir, or in one in the immediate area with similar rock and fluid properties, provides support for the engineering analysis on which the project is based; and; it is reasonably certain the project will proceed. New wellbores may be required to efficiently effect the project. Such new wellbores must meet the requirements for proven reserves as outlined above.

Probable reserves are based on engineering and geologic data similar to those used in estimates of proved reserves, but these data lack the certainty and definitiveness required to classify the reserves as proved.

Possible reserves appear commercially recoverable from known accumulations but are based on engineering and geologic data which are less complete and less conclusive than the data used in estimates of probable reserves.

Proven, probable, and possible reserves are shown separately in this report. No attempt has been made to assess the probability of occurrence or risk of each category in order for them to be compared.

Future producing rates were projected from past history for proven producing reserves. For non-producing and undeveloped reserves, future producing rates were derived by analogy to similar producing intervals in the same wellbore, or in immediately adjoining wellbores. Secondary revovery rates were predicted by a reservoir simulation study based on the rock and fluid characteristics of the reservoir in question.

Hydrocarbon Prices ($U.S.)

The initial product prices used in this report are $15.92 per barrel of oil and $1.06 per MCF of gas. These values are the volume weighted average of prices actually received at Cato Field for the last half of 1987. No price escalation was used in the cash flow projections.

Taxes

State of New Mexico and local taxes included in this report include (1) oil severance tax of 4.5 percent of oil value (2) gas severance tax of $0.163 per MCF (3) school tax of 3.15 percent of oil value (4) conservation tax of 0.19 percent of oil value and (5) ad valorem tax of 0.144 percent of total oil plus gas value. No U.S. Federal or State Income Tax was applied to the cash flow runs included herein.

Operating Costs

Operating cost, used in this report, is based on data supplied by Kelt. It should be noted that the waterflood project includes the installation of an on-site electrical generating unit that will supplant electrical power now purchased from outside sources. Field gas will be used to power this unit, hence, the gas will not be sold except in the early years of the project. This results in a negative gas reserve for the waterflood project when compared to the proven producing (primary) and proven non-producing cases.

The reserve estimates contained in this report are based upon a detailed study of the properties owned by Kelt using engineering and geological data supplied by Kelt. A field examination of the properties was not made. The ownership, interests, prices, and other factual data furnished by Kelt regarding these properties were accepted without verification.

The reserves included in this report are estimates only and should not be construed as being exact quantities. The actual reserves recovered, the related revenue received and the actual costs incurred may be more or less than predicted and are a function to some extent of future operations.

Neither Robin B. LeBleu or any of his associates has any interest in the subject properties and neither the employment to make this study nor the compensation is contingent on the estimates of reserves or future income from the subject properties.

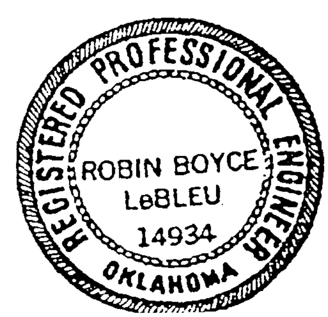
The work papers used in the preparation of this report are available for examination in the office of Robin B. LeBleu.

Very truly yours,

Robin B. LeBleu

Robin B. LeBleu, P.E.

RBL:sp
Enclosures



ROBIN B. LEBLEU - PETROLEUM ENGINEER

RUN DATE: 3/15/88

SUMMARY FORECAST OF INCOME, PRODUCTION, AND NET REVENUE, AS OF JANUARY 1, 1988

KELT ENERGY
CATO FIELD (SEC)

ALL PROVED RESERVES

DISCOUNTED AT 10.00%

| YR | GROSS PRODUCTION MBBLS | GROSS PRODUCTION MMCF | NET PRODUCTION MBBLS | NET PRODUCTION MMCF | OIL INCOME M$ | GAS INCOME M$ | W-P-T M$ | SEVER-ANCE TAX M$ | OPER-ATING INCOME M$ | OPER-ATING EXP M$ | FUTURE EXP M$ | NET REV M$ | CUM NET REV M$ | DISC REV M$ | CUM DISC REV M$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 88 | 92.424 | 369.708 | 78.561 | 314.252 | 1250 | 333.107 | .000 | 149.152 | 1434.646 | 553.805 | 47.000 | 833.841 | 833.841 | 795.035 | 795.035 |
| 89 | 352.532 | 95.998 | 299.652 | 81.598 | 4770 | 86.494 | .000 | 386.828 | 4470.126 | 4757 | 11992 | 12279- | 11446- | 10843- | 9848.904- |
| 90 | 718.190 | .000 | 610.462 | .001 | 9718 | .001 | .000 | 760.962 | 8957.594 | 2557 | 1569.200 | 4831.314 | 6614.706- | 3807.027 | 6041.877- |
| 91 | 772.476 | .000 | 656.605 | .000 | 10453 | .000 | .000 | 818.483 | 9634.669 | 2414 | .000 | 7219.753 | 605.047 | 5171.870 | 870.007- |
| 92 | 781.846 | .000 | 664.570 | .000 | 10579 | .001 | .000 | 828.410 | 9751.546 | 2428 | .000 | 7323.485 | 7928.532 | 4769.274 | 3899.267 |
| 93 | 781.854 | .000 | 664.577 | .000 | 10580 | .000 | .000 | 828.419 | 9751.647 | 2447 | .000 | 7304.587 | 15233 | 4324.534 | 8223.801 |
| 94 | 781.870 | .000 | 664.590 | .000 | 10580 | .000 | .000 | 828.435 | 9751.838 | 2471 | .000 | 7280.777 | 22513 | 3918.515 | 12142 |
| 95 | 769.052 | .000 | 653.694 | .000 | 10406 | .000 | .000 | 814.853 | 9591.955 | 2495 | 700.000 | 6396.092 | 28909 | 3129.480 | 15271 |
| 96 | 756.304 | .000 | 642.858 | .000 | 10234 | .000 | .000 | 801.346 | 9432.953 | 2522 | .000 | 6910.285 | 35820 | 3073.695 | 18345 |
| 97 | 716.842 | .000 | 609.316 | .000 | 9700 | .000 | .000 | 759.534 | 8940.777 | 2547 | 700.000 | 5693.719 | 41513 | 2302.312 | 20647 |
| SUB | 6523.390 | 465.706 | 5544 | 395.851 | 88274 | 419.603 | .000 | 6976 | 81717 | 25195 | 15008 | 41513 | 41513 | 20647 | 20647 |
| 98 | 670.680 | .000 | 570.078 | .000 | 9075 | .000 | .000 | 710.623 | 8365.018 | 2573 | .000 | 5791.672 | 47305 | 2129.019 | 22776 |
| 99 | 629.626 | .000 | 535.183 | .000 | 8520 | .000 | .000 | 667.125 | 7852.988 | 2600 | 700.000 | 4552.275 | 51857 | 1521.279 | 24298 |
| 00 | 600.425 | .000 | 510.361 | .000 | 8124 | .000 | .000 | 636.183 | 7488.764 | 2628 | .000 | 4860.502 | 56718 | 1476.621 | 25774 |
| 01 | 582.175 | .000 | 494.849 | .000 | 7877 | .000 | .000 | 616.847 | 7261.149 | 2656 | 700.000 | 3904.168 | 60622 | 1078.253 | 26852 |
| 02 | 542.750 | .000 | 461.338 | .000 | 7344 | .000 | .000 | 575.074 | 6769.427 | 2688 | .000 | 4081.054 | 64703 | 1024.671 | 27877 |
| SUB | 9549.046 | 465.706 | 8116 | 395.851 | 129217 | 419.603 | .000 | 10182 | 119455 | 38342 | 16408 | 64703 | 64703 | 27877 | 27877 |
| REM | 2869.255 | .000 | 2438 | .000 | 38826 | .000 | .000 | 3040 | 35786 | 20976 | 2100.000 | 12710 | 77414 | 2434.998 | 30312 |
| TOT | 12418 | 465.706 | 10555 | 395.851 | 168044 | 419.603 | .000 | 13222 | 155241 | 59319 | 18508 | 77414 | 77414 | 30312 | 30312 |

| | |
|---|---|
| TOTAL NET REVENUE | 77414.044 |
| DISCOUNTED AT 5.00% | 47292.386 |
| DISCOUNTED AT 10.00% | 30312.644 |
| DISCOUNTED AT 15.00% | 20097.632 |
| DISCOUNTED AT 20.00% | 13613.456 |
| DISCOUNTED AT 30.00% | 6361.424 |
| DISCOUNTED AT 40.00% | 2766.629 |

ROBIN B. LEBLEU - PETROLEUM ENGINEER
FORECAST OF INCOME, PRODUCTION, AND NET REVENUE, AS OF JANUARY 1, 1988

RUN DATE: 3/15/88

KELT ENERGY
CATO FIELD (SEC)

CATO FIELD
T8S R30E; T9S R30E
NEW MEXICO
CHAVES

PROVED DEVELOPED PRODUCING RESERVES

DISCOUNTED AT 10.00 PERCENT

| YR | GROSS PRODUCTION MBBLS | GROSS PRODUCTION MMCF | NET PRODUCTION MBBLS | NET PRODUCTION MMCF | GROSS PRICES OIL $/BBL | GROSS PRICES GAS $/MCF | OIL INCOME M$ | GAS INCOME M$ | W-P-T M$ | SEVER-ANCE TAX M$ | OPER-ATING INCOME M$ | OPER-ATING EXP M$ | FUTURE EXP M$ | NET REV M$ | CUM REV M$ | DISC REV M$ | CUM DISC REV M$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 88 | 57.768 | 231.072 | 49.103 | 196.411 | 15.92 | 1.060 | 781.720 | 208.196 | .000 | 93.224 | 896.692 | 553 | .000 | 343 | 343 | 327 | 327 |
| 89 | 53.148 | 212.580 | 45.176 | 180.693 | 15.92 | 1.060 | 719.202 | 191.535 | .000 | 85.767 | 824.970 | 553 | .000 | 271 | 615 | 235 | 563 |
| 90 | 48.900 | 195.576 | 41.565 | 166.240 | 15.92 | 1.060 | 661.715 | 176.214 | .000 | 78.909 | 759.020 | 552 | .000 | 206 | 821 | 162 | 725 |
| 91 | 44.988 | 179.928 | 38.240 | 152.939 | 15.92 | 1.060 | 608.781 | 162.115 | .000 | 72.597 | 698.299 | 552 | .000 | 145 | 966 | 104 | 829 |
| 92 | 41.388 | 165.540 | 35.180 | 140.709 | 15.92 | 1.060 | 560.066 | 149.152 | .000 | 66.789 | 642.429 | 552 | .000 | 89.621 | 1056 | 58.364 | 888 |
| 93 | 38.076 | 152.292 | 32.365 | 129.448 | 15.92 | 1.060 | 515.251 | 137.215 | .000 | 61.444 | 591.022 | 552 | .000 | 38.279 | 1094 | 22.662 | 910 |
| TOT | 284.268 | 1136.988 | 241.629 | 966.440 | 15.92 | 1.060 | 3846 | 1024 | .000 | 458 | 4412 | 3317 | .000 | 1094 | 1094 | 910 | 910 |

15322 29840 CUMULATIVE
15606 30976 ULTIMATE

107 KELT WELLS ACTIVE
AVERAGE NET OIL PRICE: 14.655 $/BBL
AVERAGE NET GAS PRICE: .896 $/MCF
EQUIVALENT BBL FACTOR: 16.356 MCF/BBL

| INTEREST: TYPE | AMOUNT | WORKING | OIL | GAS |
|---|---|---|---|---|
| INITIAL | | 1.0000000 | .8500000 | .8500000 |

| | OIL | GAS |
|---|---|---|
| SEVERANCE TAX: | 7.830 % $ | .163 |
| DIRECT COST: | .114 % | .114 % |

TIER: 1 WPT RATE: 0
GAS CODE: 1 OPEX BASIS: 0
NGPA: 001 DEPTH: 3,400
OPERATOR: KELT OIL & GAS
PRODUCING ZONE: SAN ANDRES
DATE FIRST PROD: JANUARY 1966

OPER COST ESCALATION @ .00%
RESERVE LIFE, YEARS 6
IDENT: 30 00001 A

TOTAL NET REVENUE 1094.881

DISCOUNTED AT 5.00% 994.246
DISCOUNTED AT 10.00% 910.855
DISCOUNTED AT 15.00% 840.865
DISCOUNTED AT 20.00% 781.448
DISCOUNTED AT 30.00% 686.346
DISCOUNTED AT 40.00% 613.899

ROBIN B. LEBLEU - PETROLEUM ENGINEER
FORECAST OF INCOME, PRODUCTION, AND NET REVENUE, AS OF JANUARY 1, 1988



KELT ENERGY
CATO FIELD (SEC)

CATO FIELD
T8S R30E; T9S R30E
NEW MEXICO
CHAVES

PROVED DEVELOPED NON-PRODUCING RESERVES

| YR | GROSS PRODUCTION MBBLS | GROSS PRODUCTION MMCF | NET PRODUCTION MBBLS | NET PRODUCTION MMCF | GROSS PRICES OIL $/BBL | GROSS PRICES GAS $/MCF | OIL INCOME M$ | GAS INCOME M$ | W-P-T M$ | SEVER-ANCE TAX M$ | OPER-ATING INCOME M$ | OPER-ATING EXP M$ | FUTURE EXP M$ | DISCOUNTED AT 10.00 PERCENT NET REV M$ | CUM REV M$ | DISC REV M$ | CUM DISC REV M$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 88 | 34.656 | 138.636 | 29.458 | 117.841 | 15.92 | 1.060 | 468.971 | 124.911 | .000 | 55.928 | 537.954 | .677 | 47.000 | 490 | 490 | 467 | 467 |
| 89 | 31.884 | 127.548 | 27.101 | 108.416 | 15.92 | 1.060 | 431.448 | 114.921 | .000 | 51.454 | 494.915 | .623 | .000 | 494 | 984 | 428 | 895 |
| 90 | 29.340 | 117.348 | 24.939 | 99.746 | 15.92 | 1.060 | 397.029 | 105.731 | .000 | 47.346 | 455.414 | .574 | .000 | 454 | 1439 | 358 | 1254 |
| 91 | 26.988 | 107.964 | 22.940 | 91.769 | 15.92 | 1.060 | 365.205 | 97.275 | .000 | 43.554 | 418.926 | .527 | .000 | 418 | 1857 | 299 | 1554 |
| 92 | 24.828 | 99.324 | 21.104 | 84.425 | 15.92 | 1.060 | 335.976 | 89.491 | .000 | 40.068 | 385.399 | .485 | .000 | 384 | 2242 | 250 | 1804 |
| 93 | 22.848 | 91.380 | 19.421 | 77.673 | 15.92 | 1.060 | 309.182 | 82.333 | .000 | 36.870 | 354.645 | .446 | .000 | 354 | 2596 | 209 | 2014 |
| 94 | 56.040 | 224.136 | 47.634 | 190.516 | 15.92 | 1.060 | 758.333 | 201.947 | .000 | 90.431 | 869.849 | 553 | .000 | 316 | 2913 | 170 | 2184 |
| 95 | 51.552 | 206.208 | 43.819 | 175.277 | 15.92 | 1.060 | 697.598 | 185.794 | .000 | 83.192 | 800.200 | 553 | .000 | 247 | 3160 | 120 | 2305 |
| 96 | 47.424 | 189.708 | 40.310 | 161.252 | 15.92 | 1.060 | 641.735 | 170.927 | .000 | 76.532 | 736.130 | 552 | .000 | 183 | 3344 | 81.489 | 2387 |
| 97 | 43.632 | 174.528 | 37.087 | 148.349 | 15.92 | 1.060 | 590.425 | 157.250 | .000 | 70.411 | 677.264 | 552 | .000 | 124 | 3468 | 50.307 | 2437 |
| SUB | 369.192 | 1476.780 | 313.813 | 1255 | 15.92 | 1.060 | 4995 | 1330 | .000 | 595 | 5730 | 2215 | 47.000 | 3468 | 3468 | 2437 | 2437 |
| 98 | 40.140 | 160.572 | 34.119 | 136.486 | 15.92 | 1.060 | 543.174 | 144.675 | .000 | 64.778 | 623.071 | 552 | .000 | 70.287 | 3538 | 25.838 | 2463 |
| 99 | 36.936 | 147.720 | 31.396 | 125.562 | 15.92 | 1.060 | 499.824 | 133.096 | .000 | 59.603 | 573.317 | 552 | .000 | 20.595 | 3559 | 6.882 | 2470 |
| TOT | 446.268 | 1785.072 | 379.328 | 1517 | 15.92 | 1.060 | 6038 | 1608 | .000 | 720 | 6927 | 3320 | 47.000 | 3559 | 3559 | 2470 | 2470 |
| | 446.268 | 1785.072 | ULTIMATE | | | | | | | | | | | | | | |

REPAIR OF PRODUCING WELLS REQUIRED

| INTEREST: TYPE | AMOUNT | WORKING | OIL | GAS |
|---|---|---|---|---|
| INITIAL | | 1.0000000 | .8500000 | .8500000 |

AVERAGE NET OIL PRICE: 14.655 $/BBL
AVERAGE NET GAS PRICE: .896 $/MCF
EQUIVALENT BBL FACTOR: 16.356 MCF/BBL

| | OIL | GAS |
|---|---|---|
| SEVERANCE TAX: | 7.830 % $ | .163 |
| DIRECT COST: | .114 % | .114 % |

TIER: 1 WPT RATE: 0
GAS CODE: 1 OPEX BASIS: 0
NGPA: 001 DEPTH: 3,400
OPERATOR: KELT OIL & GAS
PRODUCING ZONE: SAN ANDRES

OPER COST ESCALATION ● .00%
RESERVE LIFE, YEARS 12
IDENT: 30 00002 B

| | |
|---|---|
| TOTAL NET REVENUE | 3559.366 |
| DISCOUNTED AT 5.00% | 2928.323 |
| DISCOUNTED AT 10.00% | 2470.336 |
| DISCOUNTED AT 15.00% | 2128.186 |
| DISCOUNTED AT 20.00% | 1865.959 |
| DISCOUNTED AT 30.00% | 1496.002 |
| DISCOUNTED AT 40.00% | 1251.528 |

KELT ENERGY
CATO FIELD (SEC)

CATO FIELD
T8S R30E; T9S R30E
NEW MEXICO
CHAVES

PROVED UNDEVELOPED SECONDARY RESERVES

| YR | GROSS PRODUCTION MBBLS | GROSS PRODUCTION MMCF | NET PRODUCTION MBBLS | NET PRODUCTION MMCF | GROSS PRICES OIL $/BBL | GROSS PRICES GAS $/MCF | OIL INCOME M$ | GAS INCOME M$ | W-P-T M$ | SEVERANCE TAX M$ | OPERATING INCOME M$ | OPERATING EXP M$ | FUTURE EXP M$ | NET REV M$ | CUM REV M$ | DISC REV M$ | CUM DISC REV M$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | DISCOUNTED AT 10.00 PERCENT | | | | |
| 88 | .000 | .000 | .000 | .000 | 15.92 | 1.060 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 89 | 267.500 | 244.130- | 227.375 | 207.511- | 15.92 | 1.060 | 3619 | 219.962- | .000 | 249 | 3150 | 4203 | 11992 | 13046- | 13046- | 11308- | 11308- |
| 90 | 639.950 | 312.924- | 543.958 | 265.985- | 15.92 | 1.060 | 8659 | 281.944- | .000 | 634 | 7743 | 2003 | 1569 | 4170 | 8875- | 3286 | 8021- |
| 91 | 700.500 | 287.892- | 595.425 | 244.708- | 15.92 | 1.060 | 9479 | 259.390- | .000 | 702 | 8517 | 1861 | .000 | 6655 | 2219- | 4767 | 3253- |
| 92 | 715.630 | 264.864- | 608.286 | 225.134- | 15.92 | 1.060 | 9683 | 238.642- | .000 | 721 | 8723 | 1874 | .000 | 6848 | 4629 | 4460 | 1206 |
| 93 | 720.930 | 243.672- | 612.791 | 207.121- | 15.92 | 1.060 | 9755 | 219.548- | .000 | 730 | 8805 | 1893 | .000 | 6912 | 11541 | 4092 | 5298 |
| 94 | 725.830 | 224.136- | 616.956 | 190.516- | 15.92 | 1.060 | 9821 | 201.947- | .000 | 738 | 8881 | 1917 | .000 | 6964 | 18505 | 3748 | 9046 |
| 95 | 717.500 | 206.208- | 609.875 | 175.277- | 15.92 | 1.060 | 9709 | 185.794- | .000 | 731 | 8791 | 1942 | 700 | 6148 | 24654 | 3008 | 12055 |
| 96 | 708.880 | 189.708- | 602.548 | 161.252- | 15.92 | 1.060 | 9592 | 170.927- | .000 | 724 | 8696 | 1969 | .000 | 6727 | 31381 | 2992 | 15047 |
| 97 | 673.210 | 174.528- | 572.229 | 148.349- | 15.92 | 1.060 | 9109 | 157.250- | .000 | 689 | 8263 | 1994 | 700 | 5569 | 36950 | 2252 | 17299 |
| SUB | 5869.930 | 2148.062- | 4989 | 1825- | 15.92 | 1.060 | 79431 | 1935- | .000 | 5921 | 71574 | 19662 | 14961 | 36950 | 36950 | 17299 | 17299 |
| 98 | 630.540 | 160.572- | 535.959 | 136.486- | 15.92 | 1.060 | 8532 | 144.675- | .000 | 645 | 7741 | 2020 | .000 | 5721 | 42672 | 2103 | 19402 |
| 99 | 592.690 | 147.720- | 503.787 | 125.562- | 15.92 | 1.060 | 8020 | 133.096- | .000 | 607 | 7279 | 2047 | 700 | 4531 | 47203 | 1514 | 20916 |
| 00 | 600.425 | .000 | 510.361 | .000 | 15.92 | 1.060 | 8124 | .000 | .000 | 636 | 7488 | 2628 | .000 | 4860 | 52064 | 1476 | 22393 |
| 01 | 582.175 | .000 | 494.849 | .000 | 15.92 | 1.060 | 7877 | .000 | .000 | 616 | 7261 | 2656 | 700 | 3904 | 55968 | 1078 | 23471 |
| 02 | 542.750 | .000 | 461.338 | .000 | 15.92 | 1.060 | 7344 | .000 | .000 | 575 | 6769 | 2688 | .000 | 4081 | 60049 | 1024 | 24496 |
| SUB | 8818.510 | 2456.354- | 7495 | 2087- | 15.92 | 1.060 | 119332 | 2213- | .000 | 9003 | 108115 | 31704 | 16361 | 60049 | 60049 | 24496 | 24496 |
| REM | 2869.255 | .000 | 2438 | .000 | 15.92 | .000 | 38826 | .000 | .000 | 3040 | 35786 | 20976 | 2100 | 12710 | 72759 | 2434 | 26931 |
| TOT | 11687 | 2456.354- | 9934 | 2087- | 15.92 | 1.060 | 158158 | 2213- | .000 | 12043 | 143902 | 52680 | 18461 | 72759 | 72759 | 26931 | 26931 |
| | 11687 | 2456.354- | ULTIMATE | | | | | | | | | | | | | | |

REQUIRES 55 NEW WELLS, 110 CONVERSIONS
AVERAGE NET OIL PRICE: 14.655 $/BBL
AVERAGE NET GAS PRICE: .896 $/MCF
EQUIVALENT BBL FACTOR: 16.356 MCF/BBL

| INTEREST: TYPE | AMOUNT | WORKING | OIL | GAS |
|---|---|---|---|---|
| INITIAL | | 1.0000000 | .8500000 | .8500000 |

| | OIL | GAS |
|---|---|---|
| SEVERANCE TAX: | 7.830 % | $ .163 |

TIER: 1 WPT RATE: 0
GAS CODE: 1 OPEX BASIS: 0
NGPA: 001 DEPTH: 3,400
OPERATOR: KELT OIL & GAS
PRODUCING ZONE: SAN ANDRES

OPER COST ESCALATION @ .00%
RESERVE LIFE, YEARS 21
IDENT: 30 00003 D

| | |
|---|---|
| TOTAL NET REVENUE | 72759.797 |
| DISCOUNTED AT 5.00% | 43369.817 |
| DISCOUNTED AT 10.00% | 26931.453 |
| DISCOUNTED AT 15.00% | 17128.581 |
| DISCOUNTED AT 20.00% | 10966.049 |
| DISCOUNTED AT 30.00% | 4179.076 |
| DISCOUNTED AT 40.00% | 901.202 |

ROBIN B. LEBLEU - PETROLEUM ENGINEER
FORECAST OF INCOME, PRODUCTION, AND NET REVENUE, AS OF JANUARY 1, 1988

KELT ENERGY
CATO FIELD (SEC)

CATO FIELD
T8S R30E; T9S R30E
NEW MEXICO
CHAVES

PROBABLE UNDEVELOPED SECONDARY RESERVES

DISCOUNTED AT 10.00 PERCENT

| YR | GROSS PRODUCTION MBBLS | GROSS PRODUCTION MMCF | NET PRODUCTION MBBLS | NET PRODUCTION MMCF | GROSS PRICES OIL $/BBL | GROSS PRICES GAS $/MCF | OIL INCOME M$ | GAS INCOME M$ | W-P-T M$ | SEVERANCE TAX M$ | OPERATING INCOME M$ | OPERATING EXP M$ | FUTURE EXP M$ | NET REV M$ | CUM REV M$ | DISC REV M$ | CUM DISC REV M$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 88 | .000 | .000 | .000 | .000 | 15.92 | 1.060 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 89 | 352.590 | .000 | 299.702 | .000 | 15.92 | 1.060 | 4771 | .000 | .000 | 373 | 4397 | 405 | .000 | 3992 | 3992 | 3460 | 3460 |
| 90 | 717.955 | .000 | 610.262 | .000 | 15.92 | 1.060 | 9715 | .000 | .000 | 760 | 8954 | 2061 | .000 | 6893 | 10885 | 5432 | 8892 |
| 91 | 772.705 | .000 | 656.799 | .000 | 15.92 | 1.060 | 10456 | .000 | .000 | 818 | 9637 | 1915 | .000 | 7721 | 18607 | 5531 | 14423 |
| 92 | 781.830 | .000 | 664.556 | .000 | 15.92 | 1.060 | 10579 | .000 | .000 | 828 | 9751 | 1929 | .000 | 7822 | 26429 | 5094 | 19517 |
| 93 | 781.830 | .000 | 664.556 | .000 | 15.92 | 1.060 | 10579 | .000 | .000 | 828 | 9751 | 1947 | .000 | 7804 | 34233 | 4620 | 24138 |
| 94 | 781.830 | .000 | 664.556 | .000 | 15.92 | 1.060 | 10579 | .000 | .000 | 828 | 9751 | 1972 | .000 | 7779 | 42013 | 4186 | 28325 |
| 95 | 769.055 | .000 | 653.697 | .000 | 15.92 | 1.060 | 10406 | .000 | .000 | 814 | 9591 | 1995 | .000 | 7596 | 49609 | 3716 | 32041 |
| 96 | 756.280 | .000 | 642.838 | .000 | 15.92 | 1.060 | 10233 | .000 | .000 | 801 | 9432 | 2024 | .000 | 7407 | 57017 | 3295 | 35336 |
| 97 | 716.860 | .000 | 609.331 | .000 | 15.92 | 1.060 | 9700 | .000 | .000 | 759 | 8940 | 2049 | .000 | 6891 | 63909 | 2786 | 38123 |
| SUB | 6430.935 | .000 | 5466 | .000 | 15.92 | .000 | 87023 | .000 | .000 | 6813 | 80209 | 16300 | .000 | 63909 | 63909 | 38123 | 38123 |
| 98 | 670.688 | .000 | 570.085 | .000 | 15.92 | 1.060 | 9075 | .000 | .000 | 710 | 8365 | 2073 | .000 | 6291 | 70201 | 2312 | 40436 |
| 99 | 629.625 | .000 | 535.181 | .000 | 15.92 | 1.060 | 8520 | .000 | .000 | 667 | 7852 | 2101 | .000 | 5751 | 75952 | 1921 | 42358 |
| 00 | 600.425 | .000 | 510.361 | .000 | 15.92 | 1.060 | 8124 | .000 | .000 | 636 | 7488 | 2128 | .000 | 5360 | 81312 | 1628 | 43986 |
| 01 | 582.175 | .000 | 494.849 | .000 | 15.92 | 1.060 | 7877 | .000 | .000 | 616 | 7261 | 2158 | .000 | 5102 | 86414 | 1409 | 45396 |
| 02 | 542.755 | .000 | 461.342 | .000 | 15.92 | 1.060 | 7344 | .000 | .000 | 575 | 6769 | 2188 | .000 | 4581 | 90996 | 1150 | 46546 |
| SUB | 9456.603 | .000 | 8038 | .000 | 15.92 | .000 | 127966 | .000 | .000 | 10019 | 117946 | 26950 | .000 | 90996 | 90996 | 46546 | 46546 |
| REM | 4605.804 | .000 | 3914 | .000 | 15.92 | .000 | 62325 | .000 | .000 | 4880 | 57445 | 23864 | .000 | 33581 | 124577 | 5389 | 51935 |
| TOT | 14062 | .000 | 11953 | .000 | 15.92 | .000 | 190292 | .000 | .000 | 14899 | 175392 | 50814 | .000 | 124577 | 124577 | 51935 | 51935 |
| | 14062 | | ULTIMATE | | | | | | | | | | | | | | |

INCREASED WATERFLOOD RESPONSE
AVERAGE NET OIL PRICE: 14.655 $/BBL

| INTEREST: TYPE | AMOUNT | WORKING | OIL | GAS |
|---|---|---|---|---|
| INITIAL | | 1.0000000 | .8500000 | .8500000 |

TIER: 1
GAS CODE: 1
NGPA: 001
OPERATOR:
PRODUCING ZONE: SAN ANDRES

WPT RATE: 0
OPEX BASIS: 0
DEPTH: 3,400
KELT OIL & GAS

| | OIL | GAS |
|---|---|---|
| SEVERANCE TAX: | 7.830 % $ | .163 |

OPER COST ESCALATION @ .00%
RESERVE LIFE, YEARS 24
IDENT: 30 00004 H

TOTAL NET REVENUE 124577.703

DISCOUNTED AT 5.00% 76670.929
DISCOUNTED AT 10.00% 51935.451
DISCOUNTED AT 15.00% 37757.959
DISCOUNTED AT 20.00% 28905.631
DISCOUNTED AT, 30.00% 18822.722
DISCOUNTED AT 40.00% 13436.218



ATO FIELD
8S R30E; T9S R30E
EW MEXICO
HAVES

| YR | GROSS PRODUCTI MBBLS | MMC |
|---|---|---|
| 88 | .000 | |
| 89 | .000 | |
| 90 | 165.600 | |
| 91 | 165.600 | |
| 92 | 165.600 | |
| 93 | 165.600 | |
| 94 | 165.600 | |
| 95 | 165.600 | |
| 96 | 165.600 | |
| 97 | 165.600 | |
| SUB | 1324.800 | |
| 98 | 158.967 | |
| 99 | 145.295 | |
| 00 | 132.800 | |
| 01 | 121.379 | |
| 02 | 110.941 | |
| SUB | 1994.182 | |
| REM | 740.589 | |
| TOT | 2734.771 | |
| | 2734.771 | |

INTEREST:
TYPE AN
INITIAL

ROBIN B. LEBLEU - PETROLEUM ENGINEER

RUN DATE: 3/15/88

FORECAST OF INCOME, PRODUCTION, AND NET REVENUE, AS OF JANUARY 1, 1988

KELT ENERGY
CATO FIELD (SEC)

CATO FIELD
T8S R30E; T9S R30E
NEW MEXICO
CHAVES

POSSIBLE UNDEVELOPED SECONDARY RESERVES

DISCOUNTED AT 10.00 PERCENT

| YR | GROSS PRODUCTION MBBLS | GROSS PRODUCTION MMCF | NET PRODUCTION MBBLS | NET PRODUCTION MMCF | GROSS PRICES OIL $/BBL | GROSS PRICES GAS $/MCF | OIL INCOME M$ | GAS INCOME M$ | W-P-T M$ | SEVERANCE TAX M$ | OPERATING INCOME M$ | OPERATING EXP M$ | FUTURE EXP M$ | NET REV M$ | CUM REV M$ | DISC REV M$ | CUM DISC REV M$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 88 | .000 | .000 | .000 | .000 | 15.92 | 1.060 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 89 | .000 | .000 | .000 | .000 | 15.92 | 1.060 | .000 | .000 | .000 | .000 | .000 | .000 | 8510 | 8510- | 8510- | 7376- | 7376- |
| 90 | 165.600 | .000 | 140.760 | .000 | 15.92 | 1.060 | 2240 | .000 | .000 | 175 | 2065 | 502 | .000 | 1562 | 6947- | 1231 | 6144- |
| 91 | 165.600 | .000 | 140.760 | .000 | 15.92 | 1.060 | 2240 | .000 | .000 | 175 | 2065 | 502 | .000 | 1562 | 5384- | 1119 | 5025- |
| 92 | 165.600 | .000 | 140.760 | .000 | 15.92 | 1.060 | 2240 | .000 | .000 | 175 | 2065 | 502 | .000 | 1562 | 3821- | 1017 | 4007- |
| 93 | 165.600 | .000 | 140.760 | .000 | 15.92 | 1.060 | 2240 | .000 | .000 | 175 | 2065 | 502 | .000 | 1562 | 2258- | 925 | 3082- |
| 94 | 165.600 | .000 | 140.760 | .000 | 15.92 | 1.060 | 2240 | .000 | .000 | 175 | 2065 | 502 | .000 | 1562 | 695- | 841 | 2240- |
| 95 | 165.600 | .000 | 140.760 | .000 | 15.92 | 1.060 | 2240 | .000 | .000 | 175 | 2065 | 502 | .000 | 1562 | 867 | 764 | 1476- |
| 96 | 165.600 | .000 | 140.760 | .000 | 15.92 | 1.060 | 2240 | .000 | .000 | 175 | 2065 | 502 | .000 | 1562 | 2430 | 695 | 781- |
| 97 | 165.600 | .000 | 140.760 | .000 | 15.92 | 1.060 | 2240 | .000 | .000 | 175 | 2065 | 502 | .000 | 1562 | 3993 | 631 | 149- |
| SUB | 1324.800 | .000 | 1126 | .000 | 15.92 | .000 | 17927 | .000 | .000 | 1403 | 16523 | 4020 | 8510 | 3993 | 3993 | 149- | 149- |
| 98 | 158.967 | .000 | 135.122 | .000 | 15.92 | 1.060 | 2151 | .000 | .000 | 168 | 1982 | 502 | .000 | 1480 | 5473 | 544 | 394 |
| 99 | 145.295 | .000 | 123.501 | .000 | 15.92 | 1.060 | 1966 | .000 | .000 | 153 | 1812 | 502 | .000 | 1309 | 6783 | 437 | 832 |
| 00 | 132.800 | .000 | 112.880 | .000 | 15.92 | 1.060 | 1797 | .000 | .000 | 140 | 1656 | 502 | .000 | 1154 | 7937 | 350 | 1183 |
| 01 | 121.379 | .000 | 103.172 | .000 | 15.92 | 1.060 | 1642 | .000 | .000 | 128 | 1513 | 501 | .000 | 1012 | 8949 | 279 | 1462 |
| 02 | 110.941 | .000 | 94.300 | .000 | 15.92 | 1.060 | 1501 | .000 | .000 | 117 | 1383 | 501 | .000 | 881 | 9831 | 221 | 1684 |
| SUB | 1994.182 | .000 | 1695 | .000 | 15.92 | .000 | 26985 | .000 | .000 | 2112 | 24872 | 6530 | 8510 | 9831 | 9831 | 1684 | 1684 |
| REM | 740.589 | .000 | 629.499 | .000 | 15.92 | .000 | 10021 | .000 | .000 | 784 | 9236 | 5511 | .000 | 3725 | 13557 | 667 | 2351 |
| TOT | 2734.771 | .000 | 2324 | .000 | 15.92 | .000 | 37006 | .000 | .000 | 2897 | 34109 | 12042 | 8510 | 13557 | 13557 | 2351 | 2351 |

2734.771 ULTIMATE

REQUIRES 54 ADDITIONAL WELLS
AVERAGE NET OIL PRICE: 14.655 $/BBL

| INTEREST: TYPE | AMOUNT | WORKING | OIL | GAS |
|---|---|---|---|---|
| INITIAL | | 1.0000000 | .8500000 | .8500000 |

SEVERANCE TAX: OIL 7.830 % $ GAS .163

TIER: 1 WPT RATE: 0
GAS CODE: 1 OPEX BASIS: 0
NGPA: 001 DEPTH: 3,400
OPERATOR: KELT OIL & GAS
PRODUCING ZONE: SAN ANDRES

OPER COST ESCALATION ● .00%
RESERVE LIFE, YEARS 24
IDENT: 30 00005 M

TOTAL NET REVENUE 13557.074

DISCOUNTED AT 5.00% 6234.387
DISCOUNTED AT 10.00% 2351.820
DISCOUNTED AT 15.00% 164.969
DISCOUNTED AT 20.00% 1120.847-
DISCOUNTED AT 30.00% 2370.471-
DISCOUNTED AT 40.00% 2822.817-

CATO FIELD
SAN ANDRES CORE ANALYSIS
16 WELLS
(Permeability greater than or equal to 0.1 md.)

| Porosity #Cores | Avg ,% |
|---|---|
| 80 | 1.0 |
| 82 | 2.5 |
| 69 | 3.5 |
| 61 | 4.5 |
| 73 | 5.5 |
| 51 | 6.5 |
| 50 | 7.5 |
| 48 | 8.5 |
| 38 | 9.5 |
| 24 | 10.5 |
| 20 | 11.5 |
| 17 | 12.5 |
| 20 | 13.5 |
| 9 | 14.5 |
| 8 | 15.5 |
| 3 | 16.5 |
| 653 | 6.04 |

| *Permeability #Cores | Avg , md |
|---|---|
| 101 | 0.1 |
| 151 | 0.3 |
| 81 | 0.75 |
| 174 | 3.0 |
| 28 | 7.5 |
| 71 | 30.0 |
| 21 | 75.0 |
| 17 | 300.0 |
| 6 | 750.0 |
| 650 | 21.7 |

* Eliminated 3 samples 1000 md. from average

TABLE 1

Subject: Cato Waterflood Response

Northern Waterflood
Sections 11 & 14 Injection

| Sect's with Known Response | Incemental Prod. due to WF (Barrels) | Original PV (Barrels) | Original Oil in Place (Barrels) | Incr. Prod. as Percent of OOIP |
|---|---|---|---|---|
| 02 | 10 081 | 3 342 348 | 2 203 132 | 0.5 % |
| 03 | 17 900 | 7 932 909 | 5 445 097 | 0.3 % |
| 10 | 35 300 | 16 901 880 | 10 952 752 | 0.3 % |
| 11 | 76 500 | 7 345 951 | 4 807 258 | 1.6 % |
| 13 | 34 100 | 181 388 | 89 205 | 38.2 % |
| 14 | 62 700 | 9 605 037 | 6 289 499 | 10.0 % |
| 15 | 45 800 | 17 633 605 | 11 250 057 | 0.4% |
| 22 | 26 800 | 16 108 919 | 10 524 397 | 0.3% |
| 23 | 44 100 | 4 125 850 | 2 632 714 | 1.7% |
| Total Incre. | 353,281 | 83 177 807 | 54 194 111 | 0.65% |

Net Pore Volume Injected = 1,935,669 / 83,117,807 = 2.3 %

SECTION 11 & 14 CALCULATIONS
Net Pore Volume Injected = 1,935,669 / 83,117,807 = 2.3 %
Total PV sections = 16,950,000 Bbls
Total OOIP = 11,096,000 STB
Total Increm. oil = 139,200 STB
Percent incremental oil = 1.25 %
Percent PV's injected = 17.7 %

TABLE 2

CATO WATERFLOOD INVESTMENT
($ 1000's)

| ITEM | 1989 | | 1990 | | TOTAL | |
|---|---|---|---|---|---|---|
| • Drill (24) Injection Wells @ $140 M each | (23) | 3220 | (1) | 140 | (24) | 3360 |
| • Drill (31) Producing Wells @ 150 M each | (27) | 4050 | (4) | 600 | (31) | 4650 |
| • Convert (110) producers to injectors @ $4.3 M each | (60) | 258 | (50) | 215 | (110) | 473 |
| • Re-perforate (148) wells @ $8.3 M each | (74) | 614 | (74) | 614 | (148) | 1228 |
| • Squeeze (29) wells @ $8.3 M each | (29) | 241 | | | (29) | 241 |
| • Modify Tank Batteries | | 73 | | | | 73 |
| • Upgrade Injection Facilities | | 90 | | | | 90 |
| • Install Production Pipelines | | 463 | | | | 463 |
| • Install Injection Pipelines | | 1284 | | | | 1284 |
| • Install Power Plant | | 1700 | | | | 1700 |
| TOTAL | | 11993 | | 1569 | | 13562 |

TABLE 3

CATO FIELD
SECONDARY RECOVERY PROJECT
OPERATING COSTS
EXAMPLE YEAR - 1991

| | $ 1,000's Per Year |
|---|---|
| (143 producing wells, 143 injection wells active during year) | |
| Consumables - 32¢/BBL fluid lifted (oil & water) from producing wells | 7,396 |
| Surface services $788/well/year (all wells) | 225 |
| Downhole services $340/well/year (producing wells only) | 49 |
| Operator Fees | 175 |
| Other expenses - $179/well/year (all wells) | 51 |
| Water injection cost - 3¢/BBL injected | 708 |
| Make-up water cost - 16¢/BBL | 326 |
| Sub Total | 8,930 |
| Outside electrical power cost savings | (4,623) |
| Sub Total | 4,659 |
| Less 1991 proven producing expenses | ( 553) |
| 1991 Grand Total Incremental Expenses | (1) 4,106 |

(1) NOTE: These costs split roughly 50% to proven reserves and 50% to probable reserves.

TABLE 4

CATO DATA SHEET TABLE 5

CATO CUMULATIVE PROD
1967 THRU JUNE 1988

origin =
SW corner
of T8S-R30E

H > 4% LOG PHI
FEET

| | X ft | Y ft | CPS SYM | WELL No | of sec. FWL | FSL | LOCATION 1/4 | 1/4 | sec | twn | rng | MBO | MMCF | MBW | MBW INJ | KB ELEV | TOP P1 | STR P1 | P1 | P2 | P3 | P1+P2 +P3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 660 | 36300 | 12 | 1 | 660 | 4620 | NW | NW | 31 | 7 | 30 | 0 | 0 | 0 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 2 | 16500 | 36300 | 12 | 1 | 660 | 4620 | NW | NW | 34 | 7 | 30 | 0 | 0 | 0 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 3 | 25740 | 32340 | 12 | 1 | 4620 | 660 | SE | SE | 35 | 7 | 30 | 0 | 0 | 0 | 0 | | 9999 | 9999 | 0 | 0 | 0 | 0 |
| 4 | 28380 | 33660 | 16 | 2 | 1980 | 1980 | NE | SW | 36 | 7 | 30 | 9999 | 9999 | 9999 | 9999 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 5 | 27060 | 36300 | 18 | 1 | 660 | 4620 | NW | NW | 36 | 7 | 30 | 0 | 0 | 0 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 6 | 27060 | 32340 | 16 | 1 | 660 | 660 | SW | SW | 36 | 7 | 30 | 9999 | 9999 | 9999 | 9999 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 7 | 28380 | 34980 | 16 | 3 | 1980 | 3300 | SE | NW | 36 | 7 | 30 | 9999 | 9999 | 9999 | 9999 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 8 | 31020 | 36300 | 12 | 1 | 4620 | 4620 | NE | NE | 36 | 7 | 30 | 0 | 0 | 0 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 9 | 27060 | 27060 | 12 | B-1 | 660 | 660 | SW | SW | 1 | 8 | 30 | 0 | 0 | 0 | 0 | 4191 | 3482 | 709 | 2 | 20 | 0 | 22 |
| 10 | 31020 | 29700 | 16 | 2 | 4620 | 3300 | SE | NE | 1 | 8 | 30 | 3 | 8 | 10 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 11 | 29700 | 29700 | 16 | 1 | 3300 | 3300 | SW | NE | 1 | 8 | 30 | 5 | 10 | 17 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 12 | 24420 | 27060 | 13 | 5 | 3300 | 660 | SW | SE | 2 | 8 | 30 | 5 | 2 | 3 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 13 | 21780 | 27060 | 16 | 1 | 660 | 660 | SW | SW | 2 | 8 | 30 | 35 | 41 | 57 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 14 | 23100 | 27060 | 16 | 2 | 1980 | 660 | SE | SW | 2 | 8 | 30 | 20 | 27 | 36 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 15 | 21450 | 28050 | 16 | 4 | 330 | 1650 | NW | SW | 2 | 8 | 30 | 13 | 25 | 44 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 16 | 20460 | 27060 | 16 | 2 | 4620 | 660 | SE | SE | 3 | 8 | 30 | 52 | 66 | 44 | 0 | 4059 | 3307 | 752 | 28 | 14 | 9999 | 42 |
| 17 | 19140 | 27060 | 16 | 1 | 3300 | 660 | SW | SE | 3 | 8 | 30 | 22 | 20 | 77 | 0 | 4093 | 3268 | 825 | 8 | 13 | 5 | 26 |
| 18 | 16500 | 29700 | 12 | C-1 | 660 | 3300 | SW | NW | 3 | 8 | 30 | 0 | 0 | 0 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 19 | 16500 | 27060 | 35 | 1 | 660 | 660 | SW | SW | 3 | 8 | 30 | 0 | 0 | 0 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 20 | 20460 | 28380 | 16 | B1 | 4620 | 1980 | NE | SE | 3 | 8 | 30 | 74 | 78 | 41 | 0 | 4104 | 3305 | 799 | 17 | 12 | 2 | 31 |
| 21 | 19140 | 29700 | 13 | 1 | 3300 | 3300 | SW | NE | 3 | 8 | 30 | 0 | 0 | 0 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 22 | 20460 | 29700 | 16 | 2 | 4620 | 3300 | SE | NE | 3 | 8 | 30 | 47 | 25 | 409 | 0 | 4066 | 3294 | 772 | 17 | 13 | 3 | 33 |
| 23 | 11220 | 29700 | 16 | 4 | 660 | 3300 | SW | NW | 4 | 8 | 30 | 6 | 0 | 4 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 24 | 13860 | 28380 | 18 | 2 | 3300 | 1980 | NW | SE | 4 | 8 | 30 | 0 | 0 | 0 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 25 | 11220 | 27060 | 18 | 1 | 660 | 660 | SW | SW | 4 | 8 | 30 | 25 | 541 | 36 | 0 | 4049 | 3087 | 962 | 19 | 8 | 10 | 37 |
| 26 | 9900 | 27060 | 12 | 1 | 4620 | 660 | SE | SE | 5 | 8 | 30 | 0 | 0 | 0 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 27 | 5940 | 27060 | 35 | 1 | 660 | 660 | SW | SW | 5 | 8 | 30 | 0 | 0 | 0 | 0 | | 9999 | 9999 | 0 | 0 | 0 | 0 |
| 28 | 8580 | 28380 | 13 | 1 | 3300 | 1980 | NW | SE | 5 | 8 | 30 | 0 | 46 | 0 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 29 | 4620 | 27060 | 16 | 1 DEV | 4620 | 660 | SE | SE | 6 | 8 | 30 | 33 | 160 | 14 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 30 | 4620 | 25740 | 16 | 1 DEV | 4620 | 4620 | NE | NE | 7 | 8 | 30 | 9999 | 9999 | 9999 | 9999 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 31 | 4620 | 24420 | 35 | 2 DEV | 4620 | 3300 | SE | NE | 7 | 8 | 30 | 0 | 0 | 0 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 32 | 8580 | 24420 | 16 | 6 | 3300 | 3300 | SW | NE | 8 | 8 | 30 | 21 | 648 | 37 | 0 | 4081 | 3053 | 1028 | 7 | 17 | 12 | 36 |
| 33 | 9900 | 25740 | 16 | 1 | 4620 | 4620 | NE | NE | 8 | 8 | 30 | 51 | 918 | 0 | 0 | 4036 | 3045 | 991 | 11 | 20 | 16 | 47 |
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| 35 | 5940 | 24420 | 20 | 1 DEV | 660 | 3300 | SW | NW | 8 | 8 | 30 | 94 | 265 | 25 | 0 | | 9999 | 9999 | 0 | 0 | 0 | 0 |
| 36 | 9900 | 21780 | 16 | 1 | 4620 | 660 | SE | SE | 8 | 8 | 30 | 24 | 464 | 6 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 37 | 7260 | 21780 | 12 | 1 | 1980 | 660 | SE | SW | 8 | 8 | 30 | 0 | 0 | 0 | 0 | | 9999 | 9999 | 0 | 0 | 0 | 0 |
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| 41 | 8580 | 21780 | 18 | 2 | 3300 | 660 | SW | SE | 8 | 8 | 30 | 77 | 360 | 16 | 0 | 4065 | 3138 | 927 | 18 | 10 | 5 | 33 |
| 42 | 13860 | 24420 | 16 | 1 | 3300 | 3300 | SW | NE | 9 | 8 | 30 | 56 | 93 | 52 | 0 | 4057 | 3195 | 862 | 11 | 16 | 14 | 41 |
| 43 | 12540 | 24420 | 16 | 8 | 1980 | 3300 | SE | NW | 9 | 8 | 30 | 120 | 1212 | 28 | 0 | 4050 | 3145 | 905 | 20 | 15 | 10 | 45 |
| 44 | 11220 | 23100 | 16 | 9 | 660 | 1980 | NW | SW | 9 | 8 | 30 | 94 | 733 | 15 | 0 | 4044 | 3114 | 930 | 14 | 9 | 11 | 34 |
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| 46 | 11220 | 25740 | 16 | 2 | 660 | 4620 | NW | NW | 9 | 8 | 30 | 49 | 453 | 12 | 0 | 4050 | 3094 | 956 | 30 | 10 | 12 | 52 |
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| 49 | 12540 | 25740 | 16 | 10 | 1980 | 4620 | NE | NW | 9 | 8 | 30 | 87 | 622 | 72 | 0 | 4051 | 3156 | 895 | 19 | 14 | 12 | 45 |
| 50 | 13860 | 21780 | 16 | 1 | 3300 | 660 | SW | SE | 9 | 8 | 30 | 172 | 120 | 527 | 0 | 4071 | 3220 | 851 | 18 | 13 | 2 | 33 |
| 51 | 12540 | 21780 | 16 | 1 | 1980 | 660 | SE | SW | 9 | 8 | 30 | 93 | 346 | 16 | 0 | 4058 | 3169 | 889 | 30 | 22 | 10 | 62 |
| 52 | 11220 | 21780 | 16 | 7 | 660 | 660 | SW | SW | 9 | 8 | 30 | 71 | 624 | 10 | 0 | 4066 | 3158 | 908 | 20 | 16 | 10 | 46 |
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| 63 | 17820 | 25740 | 16 | 1 | 1980 | 4620 | NE | NW | 10 | 8 | 30 | 47 | 47 | 39 | 0 | 4077 | 3247 | 830 | 19 | 12 | 9999 | 31 |
| 64 | 20460 | 25740 | 16 | 3 | 4620 | 4620 | NE | NE | 10 | 8 | 30 | 42 | 44 | 10 | 0 | 4104 | 3303 | 801 | 14 | 7 | 6 | 27 |
| 65 | 19140 | 21780 | 18 | 1 | 3300 | 660 | SW | SE | 10 | 8 | 30 | 63 | 74 | 14 | 0 | 4110 | 3389 | 721 | 15 | 10 | 9999 | 25 |
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| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
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| 77 | 21780 | 23100 | 16 | 1 | 660 | 1980 | NW | SW | 11 | 8 | 30 | 78 | 149 | 20 | 0 | 4143 | 3413 | 730 | 16 | 10 | 9999 | 26 |
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| 79 | 25740 | 23100 | 3 | 4 | 4620 | 1980 | NE | SE | 11 | 8 | 30 | 51 | 27 | 3 | 472 | 4168 | 3505 | 663 | 14 | 14 | 9999 | 28 |
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| 85 | 25410 | 24750 | 16 | 8 | 4290 | 3630 | SE | NE | 11 | 8 | 30 | 66 | 74 | 161 | 0 | 4179 | 3485 | 694 | 20 | 8 | 9999 | 28 |
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| 90 | 27060 | 24420 | 18 | 2 | 660 | 3300 | SW | NW | 12 | 8 | 30 | 3 | 5 | 10 | 0 | 4194 | 3543 | 651 | 13 | 2 | 9999 | 15 |
| 91 | 31020 | 23100 | 12 | 1 | 4620 | 1980 | NE | SE | 12 | 8 | 30 | 0 | 0 | 0 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 92 | 27060 | 19140 | 16 | 2 | 660 | 3300 | SW | NW | 13 | 8 | 30 | 111 | 168 | 203 | 0 | 4171 | 3531 | 640 | 20 | 9999 | 9999 | 20 |
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| 94 | 26730 | 17820 | 13 | 1 | 330 | 1980 | NW | SW | 13 | 8 | 30 | 18 | 8 | 44 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 95 | 26730 | 20790 | 16 | 1 | 330 | 4950 | NW | NW | 13 | 8 | 30 | 29 | 1 | 39 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
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| 97 | 21780 | 17820 | 18 | 1 | 660 | 1980 | NW | SW | 14 | 8 | 30 | 75 | 146 | 31 | 0 | 4127 | 3429 | 698 | 20 | 14 | 9999 | 34 |
| 98 | 23100 | 20460 | 3 | 6 | 1980 | 4620 | NE | NW | 14 | 8 | 30 | 84 | 181 | 13 | 555 | 4124 | 3440 | 684 | 16 | 18 | 9999 | 34 |
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| 101 | 25740 | 19140 | 18 | 8 | 4620 | 3300 | SE | NE | 14 | 8 | 30 | 72 | 147 | 17 | 0 | 4154 | 3513 | 641 | 25 | 22 | 9999 | 47 |
| 102 | 24420 | 20460 | 18 | 7 | 3300 | 4620 | NW | NE | 14 | 8 | 30 | 77 | 95 | 56 | 0 | 4154 | 3485 | 669 | 26 | 20 | 9999 | 46 |
| 103 | 23100 | 16500 | 16 | 2 | 1980 | 660 | SE | SW | 14 | 8 | 30 | 88 | 229 | 19 | 0 | 4167 | 3494 | 673 | 24 | 6 | 9999 | 30 |
| 104 | 21780 | 16500 | 18 | 4 | 660 | 660 | SW | SW | 14 | 8 | 30 | 83 | 202 | 29 | 0 | 4169 | 3485 | 684 | 30 | 19 | 9999 | 49 |
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| 107 | 24420 | 19140 | 18 | 5 | 3300 | 3300 | SW | NE | 14 | 8 | 30 | 92 | 160 | 48 | 0 | 4136 | 3467 | 669 | 27 | 0 | 9999 | 27 |
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| 110 | 21780 | 20460 | 18 | 4 | 660 | 4620 | NW | NW | 14 | 8 | 30 | 90 | 79 | 35 | 0 | 4115 | 3424 | 691 | 19 | 12 | 9999 | 31 |
| 111 | 25740 | 20460 | 3 | 9 | 4620 | 4620 | NE | NE | 14 | 8 | 30 | 75 | 70 | 8 | 714 | 4165 | 3518 | 647 | 32 | 17 | 9999 | 49 |
| 112 | 24420 | 17820 | 18 | 1 | 3300 | 1980 | NW | SE | 14 | 8 | 30 | 81 | 202 | 29 | 0 | 4158 | 3496 | 662 | 33 | 10 | 9999 | 43 |
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| 115 | 19140 | 19140 | 16 | 3 | 3300 | 3300 | SW | NE | 15 | 8 | 30 | 62 | 95 | 28 | 0 | 4098 | 3374 | 724 | 26 | 14 | 9999 | 40 |
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| 117 | 19140 | 16500 | 16 | 8 | 3300 | 660 | SW | SE | 15 | 8 | 30 | 60 | 125 | 25 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 118 | 20460 | 17820 | 16 | 1 | 4620 | 1980 | NE | SE | 15 | 8 | 30 | 67 | 136 | 27 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
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| 120 | 17820 | 19140 | 16 | 2 | 1980 | 3300 | SE | NW | 15 | 8 | 30 | 55 | 53 | 14 | 0 | 4090 | 3361 | 729 | 25 | 16 | 9999 | 41 |
| 121 | 19140 | 20460 | 16 | 4 | 3300 | 4620 | NW | NE | 15 | 8 | 30 | 89 | 88 | 48 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 122 | 16500 | 19140 | 18 | 4 | 660 | 3300 | SW | NW | 15 | 8 | 30 | 58 | 47 | 18 | 0 | 4096 | 3333 | 763 | 33 | 20 | 4 | 57 |
| 123 | 20460 | 16500 | 16 | 3 | 4620 | 660 | SE | SE | 15 | 8 | 30 | 75 | 171 | 22 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 124 | 17820 | 17820 | 16 | 1 | 1980 | 1980 | NE | SW | 15 | 8 | 30 | 56 | 93 | 58 | 0 | 4113 | 3382 | 731 | 23 | 13 | 9999 | 36 |
| 125 | 20460 | 20460 | 16 | 1 | 4620 | 4620 | NE | NE | 15 | 8 | 30 | 69 | 71 | 41 | 0 | 4118 | 3405 | 713 | 28 | 16 | 9999 | 44 |
| 126 | 17820 | 16500 | 16 | 3 | 1980 | 660 | SE | SW | 15 | 8 | 30 | 32 | 50 | 27 | 0 | 4150 | 3427 | 723 | 19 | 14 | 9999 | 33 |
| 127 | 17820 | 20460 | 16 | 1 | 1980 | 4620 | NE | NW | 15 | 8 | 30 | 74 | 85 | 24 | 0 | 4100 | 3364 | 736 | 28 | 14 | 9999 | 42 |
| 128 | 12540 | 16500 | 16 | 15 | 1980 | 660 | SE | SW | 16 | 8 | 30 | 45 | 59 | 42 | 0 | 4123 | 3324 | 799 | 31 | 22 | 9999 | 53 |
| 129 | 12540 | 19140 | 16 | 8 | 1980 | 3300 | SE | NW | 16 | 8 | 30 | 39 | 54 | 36 | 0 | 4131 | 3313 | 818 | 9999 | 9999 | 9999 | 9999 |
| 130 | 11220 | 17820 | 16 | 9 | 660 | 1980 | NW | SW | 16 | 8 | 30 | 74 | 109 | 20 | 0 | 4124 | 3276 | 848 | 35 | 30 | 12 | 77 |
| 131 | 15180 | 20460 | 16 | 2 | 4620 | 4620 | NE | NE | 16 | 8 | 30 | 131 | 339 | 44 | 0 | 4082 | 3283 | 799 | 41 | 20 | 9999 | 61 |
| 132 | 13860 | 20460 | 16 | 6 | 3300 | 4620 | NW | NE | 16 | 8 | 30 | 73 | 147 | 51 | 0 | 4089 | 3244 | 845 | 46 | 35 | 9999 | 81 |
| 133 | 15180 | 16500 | 3 | 13 | 4620 | 660 | SE | SE | 16 | 8 | 30 | 5 | 1 | 9 | 0 | 4153 | 3391 | 762 | 18 | 13 | 4 | 35 |
| 134 | 12540 | 17820 | 16 | 10 | 1980 | 1980 | NE | SW | 16 | 8 | 30 | 47 | 57 | 18 | 0 | 4128 | 3300 | 828 | 31 | 27 | 7 | 65 |
| 135 | 12540 | 20460 | 16 | 5 | 1980 | 4620 | NE | NW | 16 | 8 | 30 | 106 | 231 | 28 | 0 | 4109 | 3241 | 868 | 36 | 26 | 4 | 66 |
| 136 | 11220 | 20460 | 16 | 4 | 660 | 4620 | NW | NW | 16 | 8 | 30 | 51 | 91 | 34 | 0 | 4114 | 3232 | 882 | 34 | 24 | 14 | 72 |
| 137 | 13860 | 19140 | 16 | 3 | 3300 | 3300 | SW | NE | 16 | 8 | 30 | 38 | 61 | 15 | 0 | 4123 | 3303 | 820 | 31 | 26 | 4 | 61 |
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| 139 | 14520 | 19800 | 16 | 17 | 3960 | 3960 | CR | NE | 16 | 8 | 30 | 1 | 5 | 6 | 0 | 4091 | 3282 | 809 | 27 | 18 | 9 | 54 |
| 140 | 15180 | 17820 | 16 | 12 | 4620 | 1980 | NE | SE | 16 | 8 | 30 | 54 | 100 | 53 | 0 | 4141 | 3372 | 769 | 36 | 20 | 10 | 66 |
| 141 | 11220 | 16500 | 16 | 16 | 660 | 660 | SW | SW | 16 | 8 | 30 | 60 | 104 | 37 | 0 | 4118 | 3288 | 830 | 42 | 21 | 11 | 74 |
| 142 | 13860 | 16500 | 16 | 14 | 3300 | 660 | SW | SE | 16 | 8 | 30 | 19 | 13 | 11 | 0 | 4133 | 3356 | 777 | 35 | 27 | 4 | 66 |
| 143 | 15180 | 19140 | 16 | 3 | 4620 | 3300 | SE | NE | 16 | 8 | 30 | 56 | 100 | 57 | 0 | 4099 | 3310 | 789 | 34 | 24 | 9999 | 58 |
| 144 | 13860 | 17820 | 16 | 11 | 3300 | 1980 | NW | SE | 16 | 8 | 30 | 55 | 83 | 48 | 0 | 4132 | 3333 | 799 | 28 | 36 | 9999 | 64 |
| 145 | 9900 | 17820 | 16 | F-1 | 4620 | 1980 | NE | SE | 17 | 8 | 30 | 23 | 40 | 47 | 0 | 4120 | 3255 | 865 | 9 | 4 | 7 | 20 |
| 146 | 9900 | 20460 | 18 | 17-3 | 4620 | 4620 | NE | NE | 17 | 8 | 30 | 75 | 40 | 61 | 0 | 4139 | 3207 | 932 | 14 | 14 | 10 | 38 |
| 147 | 9900 | 19140 | 16 | 17-1 | 4620 | 3300 | SE | NE | 17 | 8 | 30 | 135 | 96 | 136 | 0 | 4127 | 3252 | 875 | 12 | 12 | 10 | 34 |
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| 149 | 8910 | 20460 | 16 | 1 | 3630 | 4620 | NW | NE | 17 | 8 | 30 | 84 | 37 | 43 | 0 | 4097 | 3177 | 920 | 14 | 10 | 10 | 34 |
| 150 | 8580 | 17820 | 18 | 17-2 | 3300 | 1980 | NW | SE | 17 | 8 | 30 | 25 | 9 | 15 | 0 | 4121 | 3250 | 871 | 15 | 9 | 9999 | 24 |
| 151 | 10230 | 16830 | 18 | 1 | 4950 | 990 | SE | SE | 17 | 8 | 30 | 2 | 3 | 5 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
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| 153 | 5940 | 20460 | 18 | 2 | 660 | 4620 | NW | NW | 17 | 8 | 30 | 0 | 0 | 0 | 0 | 4097 | 3177 | 920 | 9999 | 9999 | 9999 | 9999 |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 154 | 7260 | 19140 | 16 | 1 | 1980 | 3300 | SE | NW | 17 | 8 | 30 | 26 | 224 | 48 | 0 | 4116 | 3210 | 906 | 7 | 5 | 4 | 16 |
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| 156 | 3300 | 13860 | 18 | 1 | 3300 | 3300 | SW | NE | 19 | 8 | 30 | 0 | 1 | 0 | 0 | 4065 | 3196 | 869 | 9999 | 9999 | 9999 | 9999 |
| 157 | 9900 | 15180 | 16 | 1 | 4620 | 4620 | NE | NE | 20 | 8 | 30 | 1 | 0 | 4 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 158 | 7260 | 15180 | 12 | 1 | 1980 | 4620 | NE | NW | 20 | 8 | 30 | 0 | 0 | 0 | 0 | | 9999 | 9999 | 0 | 0 | 0 | 0 |
| 159 | 15180 | 11220 | 18 | 1 | 4620 | 660 | SE | SE | 21 | 8 | 30 | 2 | 2 | 10 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 160 | 12540 | 15180 | 35 | 11 | 1980 | 4620 | NE | NW | 21 | 8 | 30 | 0 | 0 | 0 | 0 | 4125 | 3351 | 774 | 16 | 9999 | 9999 | 16 |
| 161 | 11220 | 15180 | 35 | 12 | 660 | 4620 | NW | NW | 21 | 8 | 30 | 0 | 0 | 0 | 0 | 4121 | 3325 | 796 | 14 | 3 | 9999 | 17 |
| 162 | 15180 | 12540 | 18 | 1 | 4620 | 1980 | NE | SE | 21 | 8 | 30 | 0 | 0 | 3 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 163 | 20460 | 12540 | 13 | 3 | 4620 | 1980 | NE | SE | 22 | 8 | 30 | 97 | 161 | 64 | 0 | 4170 | 3472 | 698 | 24 | 9 | 9999 | 33 |
| 164 | 20460 | 13860 | 16 | 5 | 4620 | 3300 | SE | NE | 22 | 8 | 30 | 74 | 192 | 28 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 165 | 20460 | 15180 | 16 | 2 | 4620 | 4620 | NE | NE | 22 | 8 | 30 | 67 | 114 | 27 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
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| 167 | 20460 | 11220 | 13 | 1 | 4620 | 660 | SE | SE | 22 | 8 | 30 | 30 | 72 | 57 | 0 | 4169 | 3478 | 691 | 12 | 10 | 6 | 28 |
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| 175 | 21780 | 12540 | 16 | 1 | 660 | 1980 | NW | SW | 23 | 8 | 30 | 152 | 126 | 169 | 0 | 4191 | 3508 | 683 | 9999 | 9999 | 9999 | 9999 |
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| 179 | 21780 | 15180 | 16 | 3 | 660 | 4620 | NW | NW | 23 | 8 | 30 | 90 | 247 | 26 | 0 | 4179 | 3500 | 679 | 16 | 6 | 9999 | 22 |
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| 181 | 21780 | 13860 | 16 | 5 | 660 | 3300 | SW | NW | 23 | 8 | 30 | 75 | 135 | 22 | 0 | 4192 | 3514 | 678 | 10 | 8 | 9999 | 18 |
| 182 | 25410 | 14190 | 16 | 4 | 4290 | 3630 | SE | NE | 23 | 8 | 30 | 9999 | 9999 | 9999 | 9999 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
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| 184 | 23100 | 15180 | 16 | 7 | 1980 | 4620 | NE | NW | 23 | 8 | 30 | 80 | 241 | 35 | 0 | 4191 | 3524 | 667 | 17 | 8 | 9999 | 25 |
| 185 | 24090 | 12870 | 16 | 1 | 2970 | 2310 | NW | SE | 23 | 8 | 30 | 38 | 50 | 155 | 0 | 4214 | 3572 | 642 | 11 | 9999 | 9999 | 11 |
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| 190 | 17820 | 7260 | 16 | 3 | 1980 | 1980 | NE | SW | 27 | 8 | 30 | 103 | 121 | 408 | 0 | 4170 | 3476 | 694 | 9999 | 9999 | 9999 | 9999 |
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| 192 | 19140 | 9900 | 12 | 1 | 3300 | 4620 | NW | NE | 27 | 8 | 30 | 9999 | 9999 | 9999 | 9999 | 4165 | 3459 | 706 | 8 | 11 | 9999 | 19 |
| 193 | 19140 | 6270 | 35 | 3 | 3300 | 990 | SW | SE | 27 | 8 | 30 | 0 | 0 | 0 | 0 | 4174 | 3505 | 669 | 6 | 9999 | 9999 | 6 |
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| 199 | 20130 | 10230 | 16 | 2 | 4290 | 4950 | NE | NE | 27 | 8 | 30 | 26 | 39 | 36 | 0 | 4171 | 3493 | 678 | 14 | 9999 | 9999 | 14 |
| 200 | 16500 | 8580 | 13 | 4 | 660 | 3300 | SW | NW | 27 | 8 | 30 | 73 | 56 | 62 | 0 | 4162 | 3456 | 706 | 11 | 7 | 9999 | 18 |
| 201 | 15180 | 5940 | 13 | 1 | 4620 | 660 | SE | SE | 28 | 8 | 30 | 58 | 47 | 44 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 202 | 11220 | 8580 | 16 | 2 | 660 | 3300 | SW | NW | 28 | 8 | 30 | 43 | 47 | 33 | 0 | 4149 | 3360 | 789 | 21 | 4 | 2 | 27 |
| 203 | 12540 | 5940 | 16 | 3 | 1980 | 660 | SE | SW | 28 | 8 | 30 | 86 | 109 | 21 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 204 | 12540 | 9900 | 16 | 7 | 1980 | 4620 | NE | NW | 28 | 8 | 30 | 10 | 24 | 47 | 0 | 4144 | 3380 | 764 | 9999 | 9999 | 9999 | 9999 |
| 205 | 13860 | 7260 | 16 | 5 | 3300 | 1980 | NW | SE | 28 | 8 | 30 | 70 | 86 | 39 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 206 | 12540 | 8580 | 16 | 1 | 1980 | 3300 | SE | NW | 28 | 8 | 30 | 25 | 42 | 39 | 0 | 4154 | 3390 | 764 | 21 | 4 | 0 | 25 |
| 207 | 14190 | 9570 | 16 | 4 | 3630 | 4290 | NW | NE | 28 | 8 | 30 | 59 | 104 | 8 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 208 | 13860 | 5940 | 16 | 2 | 3300 | 660 | SW | SE | 28 | 8 | 30 | 99 | 121 | 30 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 209 | 15180 | 9900 | 16 | 3 | 4620 | 4620 | NE | NE | 28 | 8 | 30 | 49 | 60 | 60 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
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| 211 | 15180 | 7260 | 13 | 1 | 4620 | 1980 | NE | SE | 28 | 8 | 30 | 30 | 23 | 33 | 0 | 4168 | 3464 | 704 | 11 | 4 | 9999 | 15 |
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| 213 | 15180 | 8580 | 16 | 1 | 4620 | 3300 | SE | NE | 28 | 8 | 30 | 58 | 56 | 15 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 214 | 13860 | 8580 | 16 | 2 | 3300 | 3300 | SW | NE | 28 | 8 | 30 | 48 | 35 | 15 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 215 | 11220 | 7260 | 16 | 6 | 660 | 1980 | NW | SW | 28 | 8 | 30 | 65 | 75 | 33 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
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| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
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| 247 | 13860 | 660 | 3 | 6 | 3300 | 660 | SW | SE | 33 | 8 | 30 | 99 | 90 | 179 | 3638 | 4138 | 3407 | 731 | 20 | 11 | 9999 | 31 |
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| 256 | 16500 | 4620 | 16 | 1 | 660 | 4620 | NW | NW | 34 | 8 | 30 | 86 | 77 | 349 | 0 | 4177 | 3492 | 685 | 17 | 3 | 9999 | 20 |
| 257 | 17820 | 4620 | 13 | 2 | 1980 | 4620 | NE | NW | 34 | 8 | 30 | 40 | 62 | 68 | 0 | 4179 | 3504 | 675 | 9999 | 9999 | 9999 | 9999 |
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| 260 | 25740 | 4620 | 8 | WD-1 | 4620 | 4620 | NE | NE | 35 | 8 | 30 | 0 | 0 | 0 | 0 | 4185 | 3581 | 604 | 17 | 10 | 9999 | 27 |
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| 263 | 20460 | -660 | 12 | 1 | 4620 | 4620 | NE | NE | 3 | 9 | 30 | 0 | 0 | 0 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
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| 272 | 12540 | -3300 | 35 | 1-A | 1980 | 1980 | NE | SW | 4 | 9 | 30 | 0 | 0 | 0 | 0 | 4071 | 3374 | 697 | 16 | 6 | 9999 | 22 |
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| 286 | 7260 | -3300 | 16 | 1 | 1980 | 1980 | NE | SW | 5 | 9 | 30 | 69 | 51 | 97 | 0 | 4066 | 3282 | 784 | 7 | 9999 | 9999 | 7 |
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| 288 | 3300 | -1980 | 13 | 2 | 3300 | 3300 | SW | NE | 6 | 9 | 30 | 5 | 6 | 0 | 0 | 4115 | 3279 | 836 | 21 | 9999 | 9999 | 21 |
| 289 | 2970 | -4950 | 12 | 1 | 2970 | 330 | SW | SE | 6 | 9 | 30 | 0 | 0 | 0 | 0 | 4056 | 3238 | 818 | 4 | 9999 | 9999 | 4 |
| 290 | 4950 | -4290 | 16 | 2 | 4950 | 990 | SE | SE | 6 | 9 | 30 | 3 | 9 | 18 | 0 | | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 291 | 4950 | -2970 | 16 | 1 | 4950 | 2310 | NE | SE | 6 | 9 | 30 | 60 | 132 | 170 | 0 | 4099 | 9999 | 9999 | 9999 | 9999 | 9999 | 9999 |
| 292 | 3300 | -3300 | 16 | 1 | 3300 | 1980 | NW | SE | 6 | 9 | 30 | 33 | 15 | 43 | 0 | 4089 | 3262 | 827 | 14 | 9999 | 9999 | 14 |
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| 294 | 4620 | -7260 | 16 | 1 | 4620 | 3300 | SE | NE | 7 | 9 | 30 | 12 | 0 | 63 | 0 | 4042 | 3222 | 820 | 40 | 6 | 0 | 46 |
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| 303 | 9900 | -5940 | 16 | 1 | 4620 | 4620 | NE | NE | 8 | 9 | 30 | 13 | 17 | 697 | 0 | 4045 | 3313 | 732 | 25 | 2 | 9999 | 27 |
| 304 | 9900 | -12540 | 8 | SWD1 | 4620 | 3300 | SE | NE | 17 | 9 | 30 | 0 | 0 | 0 | 0 | 4035 | 3368 | 667 | 57 | 0 | 9999 | 57 |
| 305 | 1980 | -11220 | 12 | 1 | 1980 | 4620 | NE | NW | 18 | 9 | 30 | 0 | 0 | 0 | 0 | 4028 | 3236 | 792 | 46 | 6 | 9999 | 52 |
| 306 | 4620 | -12540 | 12 | 1 | 4620 | 3300 | SE | NE | 18 | 9 | 30 | 0 | 0 | 0 | 0 | 4001 | 3266 | 735 | 24 | 4 | 0 | 28 |

DOCUMENT LEDGER FOR ROBIN LEBLEU

| PROJECT | LEASE | DOC. ID# | PAGES | DOCUMENT DESCRIPTION |
|---|---|---|---|---|
| CATO | | NC-87-1 | 1 | X-SECTION A-A' |
| CATO | | NC-87-2 | 1 | X-SECTION B-B' |
| CATO | | NC-87-3 | 1 | X-SECTION C-C' |
| CATO | | NC-87-4 | 1 | X-SECTION D-D' |
| CATO | | NC-87-5 | 1 | X-SECTION E-E' |
| CATO | | NC-87-6 | 1 | X-SECTION F-F' |
| CATO | | NC-87-7 | 1 | X-SECTION G-G' |
| CATO | | NC-87-8 | 1 | X-SECTION H-H' |
| CATO | | NC-87-9 | 1 | X-SECTION I-I' |
| CATO | | NC-87-10 | 1 | X-SECTION J-J' |
| CATO | | NC-87-11 | 1 | ISOPACH MAP P1T AND P1 |
| CATO | | NC-87-12 | 1 | ISOPACH MAP P2 DOLOMITE |
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| CATO | | NC-87-16 | 1 | CATO BASE MAP LARGE |
| CATO | | NC-87-17 | 1 | STRUCTURE MAP TOP P1 |
| CATO | | NC-87-18 | 1 | CATO BASE MAP SMALL |
| CATO | | NC-87-19 | 1 | KELT ACREAGE MAP |
| CATO | | NC-87-20 | 1 | CATO GEOLOGIC EVALUATION AREA |
| CATO | | NC/OL/1 | 1 | T CROSBY B1,MLL |
| CATO | | NC/OL/2 | 1 | T CROSBY B1,LL |
| CATO | | NC/OL/3 | 1 | CROSBY 3 1,FDC |
| CATO | | NC/OL/4 | 1 | CROSBY 3 1,LL |
| CATO | | NC/OL/5 | 1 | CROSBY 3 1,MLL |
| CATO | | NC/OL/6 | 1 | BAXTER FED 2,DENSITY |
| CATO | | NC/OL/7 | 1 | BAXTER FED 2,GUARD |
| CATO | | NC/OL/8 | 1 | BAXTER FED 2,FORXO |
| CATO | | NC/OL/9 | 1 | BAXTER FED 5,DENSITY |
| CATO | | NC/OL/10 | 1 | BAXTER FED 5,GUARD |
| CATO | | NC/OL/11 | 1 | BAXTER FED 5,FORXO |
| CATO | | NC/OL/12 | 1 | CROSBY B FED 1,FDC |
| CATO | | NC/OL/13 | 1 | CROSBY A 1,FL |
| CATO | | NC/OL/14 | 1 | CROSBY A 1,MFL |
| CATO | | NC/OL/15 | 1 | CROSBY A 1,MOP |
| CATO | | NC/OL/16 | 1 | CROSBY A 1,DENSILOG |
| CATO | | NC/OL/17 | 1 | WINKLER FED 2,GUARD |
| CATO | | NC/OL/18 | 1 | WINKLER FED 2,DENSITY |
| CATO | | NC/OL/19 | 1 | WINKLER FED 2,FORXO |
| CATO | | NC/OL/20 | 1 | GRIMM FED 1,FDC |
| CATO | | NC/OL/21 | 1 | GRIMM FED 1,LL |
| CATO | | NC/OL/22 | 1 | GRIMM FED 1,MLL |
| CATO | | NC/OL/23 | 1 | GRIMM FED 1,COMPUTED POR. |
| CATO | | NC/OL/24 | 1 | CROSBY 1, FDC |
| CATO | | NC/OL/25 | 1 | CROSBY 1, MLL |
| CATO | | NC/OL/26 | 1 | QUEEN 2, DENSILOG |
| CATO | | NC/OL/27 | 1 | QUEEN 2, FL |
| CATO | | NC/OL/28 | 1 | QUEEN 2, MFL |
| CATO | | NC/OL/29 | 1 | QUEEN 2, MOVABLE OIL PLOT |
| CATO | | NC/OL/30 | 1 | CATO 2, FDC |
| CATO | | NC/OL/31 | 1 | CATO 2, SNP |
| CATO | | NC/OL/32 | 1 | CATO 2, BSGR |
| CATO | | NC/OL/33 | 1 | CATO 2, ILL |
| CATO | | NC/OL/34 | 1 | CATO 2, LL |
| CATO | | NC/OL/35 | 1 | CATO 2, MLL |
| CATO | | NC/OL/36 | 1 | CATO 2, MOVABLE OIL PLOT |
| CATO | | NC/OL/37 | 1 | ABKO FED 1, FDC |
| CATO | | NC/OL/38 | 1 | ABKO FED 1, LL |
| CATO | | NC/OL/39 | 1 | ABKO FED 1, MLL |
| CATO | | NC/OL/40 | 1 | ABKO FED 2, FDC |
| CATO | | NC/OL/41 | 1 | ABKO FED 2, SNP |
| CATO | | NC/OL/42 | 1 | ABKO FED 2, BSGR |
| CATO | | NC/OL/43 | 1 | ABKO FED 2, LL |
| CATO | | NC/OL/44 | 1 | ABKO FED 2, MLL |
| CATO | | NC/OL/45 | 1 | ABKO FED 2, MOVABLE OIL PLOT |
| CATO | | NC/OL/46 | 1 | ABKO FED 3, FDC |
| CATO | | NC/OL/47 | 1 | ABKO FED 3, LL |
| CATO | | NC/OL/48 | 1 | ABKO FED 3, MLL |
| CATO | | NC/OL/49 | 1 | BASKETT C 2, FDC |
| CATO | | NC/OL/50 | 1 | BASKETT C 2, LL |
| CATO | | NC/OL/51 | 1 | BASKETT C 2,MLL |
| CATO | | NC/OL/52 | 1 | CROSBY E 1, FDC |
| CATO | | NC/OL/53 | 1 | CROSBY E 1, LL |
| CATO | | NC/OL/54 | 1 | CROSBY E 1, MLL |
| CATO | | NC/OL/55 | 1 | DAPHNE CATO BASKETT 1,FDC |
| CATO | | NC/OL/56 | 1 | DAPHNE CATO BASKETT 1,LL |

TABLE 6

| | | | |
|---|---|---|---|
| CATO | NC/OL/57 | 1 | DAPHNE CATO BASKETT 1,MLL |
| CATO | NC/OL/58 | 1 | BASKETT 2, FDC |
| CATO | NC/OL/59 | 1 | BASKETT 2, IL |
| CATO | NC/OL/60 | 1 | BASKETT D 3, DENSILOG |
| CATO | NC/OL/61 | 1 | BASKETT D 3, FL |
| CATO | NC/OL/62 | 1 | BASKETT D 3, MFL |
| CATO | NC/OL/63 | 1 | BASKETT D 3, MOVABLE OIL PLOT |
| CATO | NC/OL/64 | 1 | BASKETT D 5, FDC |
| CATO | NC/OL/65 | 1 | BASKETT D 5, LL |
| CATO | NC/OL/66 | 1 | BASKETT D 5, MLL |
| CATO | NC/OL/67 | 1 | FISCHER FED 1, FDC |
| CATO | NC/OL/68 | 1 | FISCHER FED 1, LL |
| CATO | NC/OL/69 | 1 | FISCHER FED 1, MLL |
| CATO | NC/OL/70 | 1 | FISCHER FED 2, FDC |
| CATO | NC/OL/71 | 1 | FISCHER FED 2, LL |
| CATO | NC/OL/72 | 1 | FISCHER FED 2, MLL |
| CATO | NC/OL/73 | 1 | CATO FED B 1, FDC |
| CATO | NC/OL/74 | 1 | CATO FED B 1, LL |
| CATO | NC/OL/75 | 1 | CATO FED B 1, MLL |
| CATO | NC/OL/76 | 1 | CATO FED B 2, FDC |
| CATO | NC/OL/77 | 1 | CATO C 1, FDC |
| CATO | NC/OL/78 | 1 | CATO C 1, LL |
| CATO | NC/OL/79 | 1 | CATO C 1, MLL |
| CATO | NC/OL/80 | 1 | CATO C FED 4, DENSILOG |
| CATO | NC/OL/81 | 1 | CATO C FED 4, BHC ACOUSTILOG |
| CATO | NC/OL/82 | 1 | CATO C FED 4, LL |
| CATO | NC/OL/83 | 1 | CATO C FED 4, MLL |
| CATO | NC/OL/84 | 1 | BASKETT PMP 6,FDC |
| CATO | NC/OL/85 | 1 | BASKETT PMP 6, LL |
| CATO | NC/OL/86 | 1 | BASKETT PMP 6, MLL |
| CATO | NC/OL/87 | 1 | WASLEY 2, FDC |
| CATO | NC/OL/88 | 1 | WASLEY 2, LL |
| CATO | NC/OL/89 | 1 | WASLEY 2, MLL |
| CATO | NC/OL/90 | 1 | CATO BASKETT PMP 7, DENSILOG |
| CATO | NC/OL/91 | 1 | CATO BASKETT PMP 7, FL |
| CATO | NC/OL/92 | 1 | CATO BASKETT PMP 7, MFL |
| CATO | NC/OL/93 | 1 | CATO BASKETT PMP 7, MOV OIL PLOT |
| CATO | NC/OL/94 | 1 | WASLEY 5, FDC |
| CATO | NC/OL/95 | 1 | CROSBY D 1, FDC |
| CATO | NC/OL/96 | 1 | CROSBY D 1, SNP |
| CATO | NC/OL/97 | 1 | CROSBY D 1, BSGR |
| CATO | NC/OL/98 | 1 | CROSBY D 1, LL |
| CATO | NC/OL/99 | 1 | CROSBY D 1, IL |
| CATO | NC/OL/100 | 1 | CROSBY D 1,MLL |
| CATO | NC/OL/101 | 1 | CATO A FED 1, FDC |
| CATO | NC/OL/101A | 1 | CATO A FED 1, LL |
| CATO | NC/OL/102 | 1 | CATO A FED 1, MLL |
| CATO | NC/OL/103 | 1 | CATO A FED 2, DENSILOG |
| CATO | NC/OL/104 | 1 | CATO A FED 2, FL |
| CATO | NC/OL/105 | 1 | CATO A FED 2, MFL |
| CATO | NC/OL/106 | 1 | CATO A FED 2, MOV OIL PLOT |
| CATO | NC/OL/107 | 1 | CATO 3, DENSITY |
| CATO | NC/OL/108 | 1 | CATO 3, GUARD |
| CATO | NC/OL/109 | 1 | CATO 3, FoRxo |
| CATO | NC/OL/110 | 1 | CROSBY 4, FDC |
| CATO | NC/OL/111 | 1 | CROSBY 4, LL |
| CATO | NC/OL/112 | 1 | CROSBY 4, MLL |
| CATO | NC/OL/113 | 1 | STATE H 1, DENSILOG |
| CATO | NC/OL/114 | 1 | STATE H 1, FL |
| CATO | NC/OL/115 | 1 | STATE H 1, MFL |
| CATO | NC/OL/116 | 1 | STATE H 1, MOV OIL PLOT |
| CATO | NC/OL/117 | 1 | STATE H 2, DENSILOG |
| CATO | NC/OL/118 | 1 | STATE H 2, ACOUSTILOG |
| CATO | NC/OL/119 | 1 | STATE H 2, FL |
| CATO | NC/OL/120 | 1 | STATE H 4, DENSILOG |
| CATO | NC/OL/121 | 1 | STATE H 4, FL |
| CATO | NC/OL/122 | 1 | STATE H 5, DENSILOG |
| CATO | NC/OL/123 | 1 | STATE H 7, DENSILOG |
| CATO | NC/OL/124 | 1 | STATE H 7, FL |
| CATO | NC/OL/125 | 1 | STATE H 7, MFL |
| CATO | NC/OL/126 | 1 | STATE H 7, MOV OIL PLOT |
| CATO | NC/OL/127 | 1 | STATE H 10, DENSILOG |
| CATO | NC/OL/128 | 1 | STATE H 12, DENSILOG |
| CATO | NC/OL/129 | 1 | STATE H 13, DENSILOG |
| CATO | NC/OL/130 | 1 | STATE H 13, FL |
| CATO | NC/OL/131 | 1 | STATE H 14, DENSILOG |
| CATO | NC/OL/132 | 1 | STATE H 16, DENSILOG |
| CATO | NC/OL/133 | 1 | THELMA CROSBY 1, FDC |
| CATO | NC/OL/134 | 1 | THELMA CROSBY 1, LL |
| CATO | NC/OL/135 | 1 | THELMA CROSBY 1, MLL |

| | | | |
|---|---|---|---|
| ATO | NC/OL/136 | 1 | CROSBY F 1, FDC |
| ATO | NC/OL/137 | 1 | CROSBY F 1, MLL |
| ATO | NC/OL/138 | 1 | CROSBY F 1, LL |
| CATO | NC/OL/139 | 1 | BAXTER FED 1, DENSITY |
| CATO | NC/OL/140 | 1 | BAXTER FED 1, GUARD |
| ATO | NC/OL/141 | 1 | BAXTER FED 1, FoRxo |
| CATO | NC/OL/142 | 1 | CROSBY 17 1, DENSITY |
| CATO | NC/OL/143 | 1 | CROSBY 17 1, GUARD |
| CATO | NC/OL/144 | 1 | CROSBY 17 1, FoRxo |
| CATO | NC/OL/145 | 1 | CROSBY 12, DENSITY |
| CATO | NC/OL/146 | 1 | CROSBY 12, GUARD |
| CATO | NC/OL/147 | 1 | HODGES FED C 1, BSGR |
| CATO | NC/OL/148 | 1 | HODGES FED C 2, BSGR |
| CATO | NC/OL/149 | 1 | HODGES FED C 2, SNP |
| CATO | NC/OL/150 | 1 | HODGES FED C 3, DENSILOG |
| CATO | NC/OL/151 | 1 | HODGES FED C 3, ACOUSTILOG |
| CATO | NC/OL/152 | 1 | HODGES FED C 3, LL |
| CATO | NC/OL/153 | 1 | HODGES FED C 3, MLL |
| CATO | NC/OL/154 | 1 | BROWN FED 1, SNP |
| CATO | NC/OL/155 | 1 | BROWN FED 1, LL |
| CATO | NC/OL/156 | 1 | BROWN FED 1, MLL |
| CATO | NC/OL/157 | 1 | BROWN FED 2, SNP |
| CATO | NC/OL/158 | 1 | BROWN FED 2, FDC |
| CATO | NC/OL/159 | 1 | BROWN FED 2, LL |
| CATO | NC/OL/160 | 1 | BROWN FED 2, MLL |
| CATO | NC/OL/161 | 1 | BROWN FED 3, FDC |
| CATO | NC/OL/162 | 1 | BROWN FED 3, SNP |
| CATO | NC/OL/163 | 1 | BROWN FED 3, LL |
| CATO | NC/OL/164 | 1 | BROWN FED 3, MLL |
| CATO | NC/OL/165 | 1 | WINKLER FED 3, DENSITY |
| CATO | NC/OL/166 | 1 | WINKLER FED 3, GUARD |
| CATO | NC/OL/167 | 1 | WINKLER FED 3, FoRxo |
| CATO | NC/OL/168 | 1 | CATO B FED 3, FDC |
| CATO | NC/OL/169 | 1 | CATO B FED 3, DENSILOG |
| CATO | NC/OL/170 | 1 | CATO B FED 3, SNP |
| CATO | NC/OL/171 | 1 | CATO B FED 3, BSGR |
| CATO | NC/OL/172 | 1 | CATO B FED 3, LL |
| CATO | NC/OL/173 | 1 | CATO B FED 3, FL |
| CATO | NC/OL/174 | 1 | CATO B FED 3, MLL |
| CATO | NC/OL/175 | 1 | CATO B FED 3, MFL |
| CATO | NC/OL/176 | 1 | CATO B FED 3, COMP. LOG |
| CATO | NC/OL/177 | 1 | CATO B FED 3, MOV OIL PLOT |
| CATO | NC/OL/178 | 1 | HODGES FED 2, SNP |
| CATO | NC/OL/179 | 1 | HODGES FED 3, SNP |
| CATO | NC/OL/180 | 1 | HODGES FED 1, SNP |
| CATO | NC/OL/181 | 1 | HODGES FED 1, BSGR |
| CATO | NC/OL/182 | 1 | HODGES FED 1, LL |
| CATO | NC/OL/183 | 1 | HODGES FED 1, MLL |
| CATO | NC/OL/184 | 1 | BROWN FED A 1, SNP |
| CATO | NC/OL/185 | 1 | BROWN FED A 1, LL |
| CATO | NC/OL/186 | 1 | BROWN FED A 1, MLL |
| CATO | NC/OL/187 | 1 | BROWN FED A 2, SNP |
| CATO | NC/OL/188 | 1 | BROWN FED A 2, BSGR |
| CATO | NC/OL/189 | 1 | BROWN FED A 4, SNP |
| CATO | NC/OL/190 | 1 | BROWN FED A 4, BSGR |
| CATO | NC/OL/191 | 1 | BROWN FED A 4, LL |
| CATO | NC/OL/192 | 1 | BROWN FED A 4, MLL |
| CATO | NC/OL/193 | 1 | BROWN FED A 6, LL |
| CATO | NC/OL/194 | 1 | BROWN FED A 6, SNP |
| CATO | NC/OL/195 | 1 | BROWN FED A 6, BSGR |
| CATO | NC/OL/196 | 1 | BROWN FED A 6, MLL |
| CATO | NC/OL/196 | 1 | HODGES FED A 1, FDC |
| CATO | NC/OL/197 | 1 | HODGES FED 3, SNP |
| CATO | NC/OL/198 | 1 | HODGES FED 3, BSGR |
| CATO | NC/OL/200 | 1 | HODGES FED 3, LL |
| CATO | NC/OL/201 | 1 | HODGES FED 4, SNP |
| CATO | NC/OL/202 | 1 | HODGES FED 4, BSGR |
| CATO | NC/OL/203 | 1 | HODGES FED 4, LL |
| CATO | NC/OL/204 | 1 | HODGES FED 4, MLL |
| CATO | NC/OL/205 | 1 | HODGES FED 5, SNP |
| CATO | NC/OL/206 | 1 | HODGES FED 5, BSGR |
| CATO | NC/OL/207 | 1 | HODGES FED 5, LL |
| CATO | NC/OL/208 | 1 | HODGES FED 5, MLL |
| CATO | NC/OL/209 | 1 | HODGES FED 2, SNP |
| CATO | NC/OL/210 | 1 | SHELL FED A 1, ACOUSTIC |
| CATO | NC/OL/211 | 1 | SHELL FED A 1, FoRxo-GUARD |
| CATO | NC/OL/212 | 1 | HODGES FED A 2, DENSILOG |
| CATO | NC/OL/213 | 1 | HODGES FED A 5, ACOUSTILOG |
| CATO | NC/OL/214 | 1 | HODGES FED A 5, FL |
| CATO | NC/OL/215 | 1 | AMCO FED 1, SNP |

| | | | |
|---|---|---|---|
| CATO | NC/OL/216 | 1 | AMCO FED 1, BSGR |
| CATO | NC/OL/217 | 1 | AMCO FED 1, LL |
| CATO | NC/OL/218 | 1 | AMCO FED 1, MLL |
| CATO | NC/OL/219 | 1 | AMCO FED 2, SNP |
| CATO | NC/OL/220 | 1 | AMCO FED 2, BSGR |
| CATO | NC/OL/221 | 1 | AMCO FED 2, LL |
| CATO | NC/OL/222 | 1 | AMCO FED 2, MLL |
| CATO | NC/OL/223 | 1 | AMCO FED 3, SNP |
| CATO | NC/OL/224 | 1 | AMCO FED 3, LL |
| CATO | NC/OL/225 | 1 | AMCO FED 3, BSGR |
| CATO | NC/OL/226 | 1 | AMCO FED 4, GR/N |
| CATO | NC/OL/227 | 1 | AMCO FED 4, ACOUSTILOG |
| CATO | NC/OL/228 | 1 | AMCO FED 4, FL |
| CATO | NC/OL/229 | 1 | AMCO FED 4, MFL |
| CATO | NC/OL/230 | 1 | AMCO FED 5, SNP |
| CATO | NC/OL/231 | 1 | AMCO FED 5, BSGR |
| CATO | NC/OL/232 | 1 | AMCO FED 5, LL |
| CATO | NC/OL/233 | 1 | AMCO FED 5, MLL |
| CATO | NC/OL/234 | 1 | AMCO FED 6, SNP |
| CATO | NC/OL/235 | 1 | AMCO FED 6, BSGR |
| CATO | NC/OL/236 | 1 | AMCO FED 6, LL |
| CATO | NC/OL/237 | 1 | AMCO FED 6, MLL |
| CATO | NC/OL/238 | 1 | AMCO FED 7, SNP |
| CATO | NC/OL/239 | 1 | AMCO FED 7, BSGR |
| CATO | NC/OL/240 | 1 | AMCO FED 7, LL |
| CATO | NC/OL/241 | 1 | AMCO FED 8, SNP |
| CATO | NC/OL/242 | 1 | AMCO FED 8, BSGR |
| CATO | NC/OL/243 | 1 | AMCO FED 8, LL |
| CATO | NC/OL/244 | 1 | AMCO FED 8, MLL |
| CATO | NC/OL/245 | 1 | AMCO FED 9, SNP |
| CATO | NC/OL/246 | 1 | AMCO FED 9, BSGR |
| CATO | NC/OL/247 | 1 | AMCO FED 9, LL |
| CATO | NC/OL/248 | 1 | AMCO FED 9, MLL |
| CATO | NC/OL/249 | 1 | AMCO FED 10, ACOUSTILOG |
| CATO | NC/OL/250 | 1 | AMCO FED 10, FL |
| CATO | NC/OL/251 | 1 | AMCO FED 11, SNP |
| CATO | NC/OL/252 | 1 | AMCO FED 12, BSGR |
| CATO | NC/OL/253 | 1 | AMCO FED 12, LL |
| CATO | NC/OL/254 | 1 | AMCO FED 13, SNP |
| CATO | NC/OL/255 | 1 | AMCO FED 13, BSGR |
| CATO | NC/OL/256 | 1 | AMCO FED 13, MLL |
| CATO | NC/OL/257 | 1 | AMCO FED 14, SNP |
| CATO | NC/OL/258 | 1 | AMCO FED 14, LL |
| CATO | NC/OL/259 | 1 | HODGES FED B 1, BSGR |
| CATO | NC/OL/260 | 1 | HODGES FED B 4, SNP |
| CATO | NC/OL/261 | 1 | HODGES FED B 4, BSGR |
| CATO | NC/OL/262 | 1 | HODGES FED B 4, LL |
| CATO | NC/OL/263 | 1 | HODGES FED B 4, MLL |
| CATO | NC/OL/264 | 1 | HODGES FED B 5, SNP |
| CATO | NC/OL/265 | 1 | HODGES FED B 5, BSGR |
| CATO | NC/OL/266 | 1 | HODGES FED B 5, LL |
| CATO | NC/OL/267 | 1 | HODGES FED B 5, MLL |
| CATO | NC/OL/268 | 1 | SHELL FED 1, SNP |
| CATO | NC/OL/269 | 1 | SHELL FED 1, BSGR |
| CATO | NC/OL/270 | 1 | SHELL FED 1, LL |
| CATO | NC/OL/271 | 1 | SHELL FED 1, MLL |
| CATO | NC/OL/272 | 1 | HODGES D 1, SNP |
| CATO | NC/OL/273 | 1 | HODGES D 1, BSGRR |
| CATO | NC/OL/274 | 1 | AMCO FED A 1, SNP |
| CATO | NC/OL/275 | 1 | AMCO FED A 1, BSGR |
| CATO | NC/OL/276 | 1 | AMCO FED A 1, LL |
| CATO | NC/OL/277 | 1 | AMCO FED A 1, MLL |
| CATO | NC/OL/278 | 1 | AMCO FED A 2, SNP |
| CATO | NC/OL/279 | 1 | AMCO FED A 2, BSGR |
| CATO | NC/OL/280 | 1 | AMCO FED A 2, LL |
| CATO | NC/OL/281 | 1 | AMCO FED A 2, MLL |
| CATO | NC/OL/282 | 1 | AMCO FED A 3, SNP |
| CATO | NC/OL/283 | 1 | AMCO FED A 3, BSGR |
| CATO | NC/OL/284 | 1 | AMCO FED A 3, LL |
| CATO | NC/OL/285 | 1 | AMCO FED A 4, SNP |
| CATO | NC/OL/286 | 1 | AMCO FED A 4, BSGR |
| CATO | NC/OL/287 | 1 | AMCO FED A 4, LL |
| CATO | NC/OL/288 | 1 | AMCO FED A 4, MLL |
| CATO | NC/OL/289 | 1 | AMCO FED A 5, SNP |
| CATO | NC/OL/290 | 1 | AMCO FED A 5, LL |
| CATO | NC/OL/291 | 1 | AMCO FED A 6, SNP |
| CATO | NC/OL/292 | 1 | AMCO FED A 6, BSGR |
| CATO | NC/OL/293 | 1 | AMCO FED A 6, DLL |
| CATO | NC/OL/294 | 1 | AMCO FED A 6, MLL |
| CATO | NC/OL/295 | 1 | AMCO FED A 7, SNP |

| | | | |
|---|---|---|---|
| CATO | NC/OL/296 | 1 | AMCO FED A 7, BSGR |
| CATO | NC/OL/297 | 1 | AMCO FED A 7, DLL |
| CATO | NC/OL/298 | 1 | AMCO FED A 7, MLL |
| CATO | NC/OL/299 | 1 | AMCO FED A 8, SNP |
| CATO | NC/OL/300 | 1 | AMCO FED A 8, BSGR |
| CATO | NC/OL/301 | 1 | AMCO FED A 8, DLL |
| CATO | NC/OL/302 | 1 | AMCO FED A 8, MLL |
| CATO | NC/OL/303 | 1 | CORDER FED A 1, SNP |
| CATO | NC/OL/304 | 1 | CORDER FED A 1, BSGR |
| CATO | NC/OL/305 | 1 | CORDER FED 5, SNP |
| CATO | NC/OL/306 | 1 | CORDER FED 5, BSGR |
| CATO | NC/OL/307 | 1 | CORDER FED 5, DLL |
| CATO | NC/OL/308 | 1 | CORDER FED 5, MLL |
| CATO | NC/OL/309 | 1 | SHELL T.CROSBY 1, SNP |
| CATO | NC/OL/310 | 1 | SHELL T.CROSBY 1, BSGR |
| CATO | NC/OL/311 | 1 | SHELL T.CROSBY 2, SNP |
| CATO | NC/OL/312 | 1 | SHELL CROSBY 2, BSGR |
| CATO | NC/OL/313 | 1 | SHELL CROSBY 2, DLL |
| CATO | NC/OL/314 | 1 | SHELL CROSBY 2, MLL |
| CATO | NC/OL/315 | 1 | CROSBY B 1, SNP |
| CATO | NC/OL/316 | 1 | CROSBY B 1, BSGR |
| CATO | NC/OL/317 | 1 | CROSBY B 2, SNP |
| CATO | NC/OL/318 | 1 | CROSBY B 3, SNP |
| CATO | NC/OL/319 | 1 | CROSBY B 3, BSGR |
| CATO | NC/OL/320 | 1 | CROSBY B 3, DLL |
| CATO | NC/OL/321 | 1 | CROSBY B 3, MLL |
| CATO | NC/OL/322 | 1 | CROSBY B 4, SNP |
| CATO | NC/OL/323 | 1 | CROSBY B 4, BSGR |
| CATO | NC/OL/324 | 1 | CROSBY B 4, DLL |
| CATO | NC/OL/325 | 1 | CROSBY B 4, MLL |
| CATO | NC/OL/326 | 1 | CORDER FED 2, SNP |
| CATO | NC/OL/327 | 1 | CORDER FED 4, SNP |
| CATO | NC/OL/328 | 1 | CORDER FED 4, BSGR |
| CATO | NC/OL/329 | 1 | CORDER FED 4, DLL |
| CATO | NC/OL/330 | 1 | CORDER FED 4, MLL |
| CATO | NC/OL/331 | 1 | McGRAIL 1, SNP |
| CATO | NC/OL/332 | 1 | McGRAIL 1, BSGR |
| CATO | NC/OL/333 | 1 | McGRAIL 2, SNP |
| CATO | NC/OL/334 | 1 | McGRAIL 2, BSGR |
| CATO | NC/OL/335 | 1 | McGRAIL 2, MLL |
| CATO | NC/OL/336 | 1 | McGRAIL 2, DLL |
| CATO | NC/OL/337 | 1 | McGRAIL 3, SNP |
| CATO | NC/OL/338 | 1 | McGRAIL 3, BSGR |
| CATO | NC/OL/339 | 1 | McGRAIL 3, MLL |
| CATO | NC/OL/340 | 1 | McGRAIL 3, DLL |
| CATO | NC/OL/341 | 1 | CROSBY C 1, SNP |
| CATO | NC/OL/342 | 1 | CROSBY C 1, BSGR |
| CATO | NC/CL/1 | 1 | T. CROSBY B 1,GR |
| CATO | NC/CL/2 | 1 | CROSBY B 2,GR/N |
| CATO | NC/CL/3 | 1 | CROSBY 3 #2,GR/N |
| CATO | NC/CL/4 | 1 | BARHYTE 1,GR/N |
| CATO | NC/CL/5 | 1 | BAXTER FED 2,GR |
| CATO | NC/CL/6 | 1 | BAXTER FED 1,GR/N |
| CATO | NC/CL/7 | 1 | BAXTER FED 5,GR/N |
| CATO | NC/CL/8 | 1 | CROSBY FED A1,GR |
| CATO | NC/CL/9 | 1 | CROSBY FED G1,GR/N |
| CATO | NC/CL/10 | 1 | CROSBY G 2,GR/N |
| CATO | NC/CL/11 | 1 | CROSBY B FED 1,GR |
| CATO | NC/CL/12 | 1 | CROSBY H 1,GR |
| CATO | NC/CL/13 | 1 | CROSBY H 2,GR/N |
| CATO | NC/CL/14 | 1 | WINKLER FED 1,GR/N |
| CATO | NC/CL/15 | 1 | GRIMM FED 1,GR |
| CATO | NC/CL/16 | 1 | GRIMM FED 2,GR/N |
| CATO | NC/CL/17 | 1 | CROSBY 10,GR/N |
| CATO | NC/CL/18 | 1 | CROSBY 9, GR/N |
| CATO | NC/CL/19 | 1 | CROSBY 8, GR/N |
| CATO | NC/CL/20 | 1 | CROSBY 7. GR/N |
| CATO | NC/CL/21 | 1 | CROSBY 6, GR/N |
| CATO | NC/CL/22 | 1 | CROSBY 5, GR/N |
| CATO | NC/CL/23 | 1 | CROSBY 1, GR (UT) |
| CATO | NC/CL/24 | 1 | CROSBY 2, GR/N (UT) |
| CATO | NC/CL/25 | 1 | QUEEN 1, GR/N |
| CATO | NC/CL/26 | 1 | QUEEN 2, GR |
| CATO | NC/CL/27 | 1 | QUEEN 3, GR/N |
| CATO | NC/CL/28 | 1 | CATO 1, GR/N |
| CATO | NC/CL/29 | 1 | ABKO FED 1, GR |
| CATO | NC/CL/29A | 1 | ABKO FED 2, GR |
| CATO | NC/CL/30 | 1 | ABKO FED 3, GR |
| CATO | NC/CL/31 | 1 | ABKO FED 4, GR/N |
| CATO | NC/CL/32 | 1 | BASKETT C 1, GR/N |

| | | | |
|---|---|---|---|
| CATO | NC/CL/33 | 1 | BASKETT C 2, GR |
| CATO | NC/CL/34 | 1 | CROSBY E 1, GR |
| CATO | NC/CL/35 | 1 | CROSBY E 2Y, GR/N |
| CATO | NC/CL/36 | 1 | BASKETT B 1, GR/N |
| CATO | NC/CL/37 | 1 | DAPHNE CATO BASKETT 1, GR |
| CATO | NC/CL/38 | 1 | BASKETT B 2, GR/N |
| CATO | NC/CL/39 | 1 | BASKETT PMP 1, GR/N |
| CATO | NC/CL/40 | 1 | BASKETT D 1, GR/TEMP |
| CATO | NC/CL/41 | 1 | BASKETT D 2, GR/N |
| CATO | NC/CL/42 | 1 | BASKETT D 3, GR |
| CATO | NC/CL/43 | 1 | BASKETT D 4, GR/N |
| CATO | NC/CL/44 | 1 | BASKETT D 5, GR |
| CATO | NC/CL/45 | 1 | BASKETT D 6, GR/N |
| CATO | NC/CL/46 | 1 | BASKETT D 7, GR/N |
| CATO | NC/CL/47 | 1 | BASKETT D 8, GR/N |
| CATO | NC/CL/48 | 1 | FISCHER FED 1, GR |
| CATO | NC/CL/49 | 1 | FISCHER FED 2, GR |
| CATO | NC/CL/50 | 1 | CATO FED B 1, GR |
| CATO | NC/CL/51 | 1 | CATO FED B 2, GR/N |
| CATO | NC/CL/52 | 1 | CATO FED B 4, GR/N |
| CATO | NC/CL/53 | 1 | CATO FED B 6, GR/N |
| CATO | NC/CL/54 | 1 | CATO C FED 1, GR |
| CATO | NC/CL/55 | 1 | CATO C FED 2, GR/N |
| CATO | NC/CL/56 | 1 | CATO C FED 3, GR/N |
| CATO | NC/CL/57 | 1 | CATO C FED 4, GR |
| CATO | NC/CL/58 | 1 | WASLEY 2, GR |
| CATO | NC/CL/59 | 1 | CATO BASKETT PMP 7, GR |
| CATO | NC/CL/60 | 1 | WASLEY 4, GR/N |
| CATO | NC/CL/61 | 1 | WASLEY 5, GR |
| CATO | NC/CL/62 | 1 | WASLEY 6, GR/N |
| CATO | NC/CL/63 | 1 | WASLEY 7, GR/N |
| CATO | NC/CL/64 | 1 | WASLEY 8, GR/N |
| CATO | NC/CL/65 | 1 | BASKETT E 1, GR/N |
| CATO | NC/CL/66 | 1 | BASKETT E 2, GR/N |
| CATO | NC/CL/67 | 1 | CROSBY D 1, GR |
| CATO | NC/CL/68 | 1 | CROSBY D 2,GR/N |
| CATO | NC/CL/69 | 1 | CATO A FED 1, GR |
| CATO | NC/CL/70 | 1 | CATO A FED 2, GR |
| CATO | NC/CL/71 | 1 | CATO A FED 3, GR/N |
| CATO | NC/CL/72 | 1 | CROSBY 3, GR/N |
| CATO | NC/CL/73 | 1 | CROSBY 4, GR/N |
| CATO | NC/CL/74 | 1 | STATE H 1, GR |
| CATO | NC/CL/75 | 1 | STATE H 1, RAD. PERF. |
| CATO | NC/CL/76 | 1 | STATE H 3, GR/N |
| CATO | NC/CL/77 | 1 | STATE H 4, GR |
| CATO | NC/CL/78 | 1 | STATE H 4, DRESSER GR |
| CATO | NC/CL/79 | 1 | STATE H 5, GR (3/3/67) |
| CATO | NC/CL/80 | 1 | STATE H 5, GR (2/27/67) |
| CATO | NC/CL/81 | 1 | STATE H 6, GR/N |
| CATO | NC/CL/82 | 1 | STATE H 7, GR |
| CATO | NC/CL/83 | 1 | STATE H 9, GR/N |
| CATO | NC/CL/84 | 1 | STATE H 10, GR |
| CATO | NC/CL/85 | 1 | STATE H 11, GR/N |
| CATO | NC/CL/86 | 1 | STATE H 11, GR |
| CATO | NC/CL/87 | 1 | STATE H 13, GR |
| CATO | NC/CL/88 | 1 | STATE H 14, GR |
| CATO | NC/CL/89 | 1 | STATE H 15, GR/N |
| CATO | NC/CL/90 | 1 | STATE H 16, GR/N |
| CATO | NC/CL/91 | 1 | STATE H 17, GR/COMP.N |
| CATO | NC/CL/92 | 1 | CROSBY 1, GR/N |
| CATO | NC/CL/93 | 1 | THELMA CROSBY 1, GR (PAN AM) |
| CATO | NC/CL/94 | 1 | CROSBY F 1, GR |
| CATO | NC/CL/95 | 1 | CROSBY F 1, GR (LANE WELLS) |
| CATO | NC/CL/96 | 1 | BAXTER FED 1, GR/N |
| CATO | NC/CL/97 | 1 | BAXTER FED 3, GR/N |
| CATO | NC/CL/98 | 1 | CROSBY 17 2, GR/N |
| CATO | NC/CL/99 | 1 | CROSBY 1, GR/N (NC/CL/92) |
| CATO | NC/CL/100 | 1 | CROSBY 17 3, GR/N |
| CATO | NC/CL/101 | 1 | CROSBY 11, GR/N |
| CATO | NC/CL/102 | 1 | HODGES FED C 2, GR (5/7/85) |
| CATO | NC/CL/103 | 1 | HODGES FED C 2, GR (2/11/68) |
| CATO | NC/CL/104 | 1 | HODGES FED C 3, GR |
| CATO | NC/CL/105 | 1 | BROWN FED 2, GR |
| CATO | NC/CL/106 | 1 | CROSBY C FED 1, GR/N |
| CATO | NC/CL/107 | 1 | WINKLER FED 3, TEMP. |
| CATO | NC/CL/108 | 1 | WINKLER FED 3, GR |
| CATO | NC/CL/109 | 1 | CATO B FED 3, GR |
| CATO | NC/CL/110 | 1 | CATO B FED 5, GR/N |
| CATO | NC/CL/111 | 1 | CATO B FED 7, GR/N |
| CATO | NC/CL/112 | 1 | CATO B FED 8, GR/N |

| | | | |
|---|---|---|---|
| CATO | NC/CL/113 | 1 | CATO D FED 1, GR/N |
| CATO | NC/CL/114 | 1 | CATO D FED 2, GR/N |
| CATO | NC/CL/115 | 1 | CATO D FED 3, GR/N |
| CATO | NC/CL/116 | 1 | HODGES FED 2, GR/N |
| CATO | NC/CL/117 | 1 | HODGES FED 3, GR/N |
| CATO | NC/CL/118 | 1 | HODGES FED 1, GR |
| CATO | NC/CL/119 | 1 | BROWN FED A 1, GR |
| CATO | NC/CL/120 | 1 | HODGES FED A 3, GR |
| CATO | NC/CL/121 | 1 | HODGES FED A 6, GR |
| CATO | NC/CL/122 | 1 | HODGES FED 3, GR |
| CATO | NC/CL/123 | 1 | HODGES FED 4, GR |
| CATO | NC/CL/124 | 1 | HODGES FED 5, GR |
| CATO | NC/CL/125 | 1 | HODGES FED 2, GR |
| CATO | NC/CL/126 | 1 | HODGES FED A 2, GR |
| CATO | NC/CL/127 | 1 | FISHER B FED 1, GR/N |
| CATO | NC/CL/128 | 1 | AMCO FED 4, GR |
| CATO | NC/CL/129 | 1 | AMCO FED 6, "F" OVERLAY |
| CATO | NC/CL/130 | 1 | AMCO FED 6, TDT |
| CATO | NC/CL/131 | 1 | AMCO FED 8, GR |
| CATO | NC/CL/132 | 1 | AMCO FED 9, "F" OVERLAY |
| CATO | NC/CL/133 | 1 | AMCO FED 9, TDT |
| CATO | NC/CL/134 | 1 | AMCO FED 11, GR |
| CATO | NC/CL/135 | 1 | AMCO FED 13, GR |
| CATO | NC/CL/136 | 1 | HODGES FED B 1, GR |
| CATO | NC/CL/137 | 1 | SHELL EASTLAND FED 1, GR |
| CATO | NC/CL/138 | 1 | AMCO FED A 2, GR |
| CATO | NC/CL/139 | 1 | CORDER FED A 1, GR |
| CATO | NC/CL/140 | 1 | SHELL T. CROSBY 1, GR |
| CATO | NC/CL/141 | 1 | SHELL CROSBY 2, GR |
| CATO | NC/CL/142 | 1 | CROSBY B 1, GR |
| CATO | NC/CL/143 | 1 | CROSBY B 2, GR |
| CATO | NC/CL/144 | 1 | CROSBY B 3, CBL |
| CATO | NC/CL/145 | 1 | CROSBY B 4, GR |
| CATO | NC/CL/146 | 1 | CORDER FED 2, GR/N |
| CATO | NC/CL/147 | 1 | McGRAIL 1, GR/N |
| CATO | NC/CL/148 | 1 | McGRAIL 2, GR |
| CATO | NC/CL/149 | 1 | McGRAIL 3, GR |
| CATO | NC/CL/150 | 1 | CROSBY C 1, GR |

Tract / Sub-Tract Participation
Weighting Factors ............... Percent

| | Phase I | Phase II |
|---|---|---|
| WF1 = Surface Acreage | 0.05 | 0.05 |
| WF2 = Active Well Count | 0.18 | 0.10 |
| WF3 = Shut-In Well Count | 0.05 | 0.05 |
| WF4 = Temporaryly Abandoned Well Count | 0.02 | 0.05 |
| WF5 = Plugged & Abandoned Well Count | 0.00 | 0.00 |
| WF6 = Injection Well Count | 0.05 | 0.00 |
| WF7 = Cumm Production | 0.15 | 0.10 |
| WF8 = Estimated Remaining Primary Production | 0.50 | 0.20 |
| WF9 = Estimated Remaining secondary Production | 0.00 | 0.45 |

** Note: During phase II calculations, injection wells are included in the temporarly abandoned well count.

Formula (%) = WF1*(1) + WF2*(2) + ... + WF9*(9)

Last Revision: 1 Feb 89

| Tr. | Tract / Lease | Acreage Gross | Acreage (1) Unit | TB | Well Count Producer (2) Active | (3) SI | (4) TA'd | (5) P&A'd | (6) Injec | Total | Cum Oil thru 6/30/88 (STB) | (7) Unit % | Est. Remain. Primary (STB) | (8) Unit % | Est. Secondary Reserves (STB) | (9) Unit % | Phase I % | Phase II % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ******* Federal Leases ******* | | | | | | | | | | | | | | | | | |
| 1 | Fed 13 | | 80 | -- | 0 | 0 | 0 | 1 | 0 | 1 | 17449 | 0.12 | 0 | 0.00 | 0 | 0.00 | 0.04166349 | 0.03590574 |
| 2 | Fed 21 | | 80 | -- | 0 | 0 | 0 | 1 | 0 | 1 | 193 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0.02458130 | 0.02451761 |
| 3 | Abko Fed | | 160 | Cato III | 1 | 2 | 1 | 0 | 0 | 4 | 211187 | 1.39 | 23946 | 5.35 | 201845 | 1.76 | 3.41386205 | 2.45896965 |
| 4 | Alexander Fed | | 200 | -- | 0 | 0 | 0 | 1 | 0 | 1 | 57362 | 0.38 | 0 | 0.00 | 5736 | 0.05 | 0.11775983 | 0.12130801 |
| 5 | Alexander YPC Fed | | 40 | -- | 0 | 0 | 0 | 1 | 0 | 1 | 319 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0.01251091 | 0.01240565 |

Exh 1.

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | Alexander Crist Fed | | 40 | -- | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0.01219512 | 0.01219512 |
| 7 | Amco Fed | 880 | | | | | | | | | | | | | | | | | |
| | Amco Fed | | 560 | Amoco Cen | 2 | 1 | 0 | 7 | 4 | 14 | | 1301656 | 8.59 | 2666 | 0.60 | 462906 | 4.03 | 3.86819052 | 3.56837514 |
| | Amco A Fed | | 320 | Amoco Cen | 0 | 1 | 1 | 5 | 0 | 7 | | 528603 | 3.49 | 0 | 0.00 | 167479 | 1.46 | 0.76011978 | 1.27330705 |
| | | | | | | | | | | | Tr. Tot. | 1830259 | 12.08 | 2666 | 0.60 | 630385 | 5.49 | 4.62831029 | 4.84168219 |
| 8 | Anderson Fed | | 80 | Amoco Cen | 0 | 1 | 0 | 0 | 0 | 1 | | 11794 | 0.08 | 3557 | 0.79 | 12228 | 0.11 | 0.54450728 | 0.35013197 |
| 9 | Brown Fed | 800 | | | | | | | | | | | | | | | | | |
| | Brown Fed | | 160 | Brown Fed | 1 | 0 | 0 | 2 | 0 | 3 | | 201012 | 1.33 | 0 | 0.00 | 328462 | 2.86 | 0.47853704 | 1.59670696 |
| | Brown A Fed | | 640 | Brown Fed | 1 | 0 | 0 | 2 | 0 | 3 | | 120012 | 0.79 | 3027 | 0.68 | 0 | 0.00 | 0.88282203 | 0.53778027 |
| | | | | | | | | | | | Tr. Tot. | 321024 | 2.12 | 3027 | 0.68 | 328462 | 2.86 | 1.36135907 | 2.13448723 |
| 10 | Cato A & B Fed | 640 | | | | | | | | | | | | | | | | | |
| | Cato A Fed | | 160 | Cato II | 3 | 0 | 0 | 0 | 0 | 3 | | 124455 | 0.82 | 5365 | 1.20 | 272520 | 2.37 | 1.46358096 | 1.82310370 |
| | Cato A1 Fed | | 160 | Cato II | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0.04878049 | 0.04878049 |
| | Cato B Fed | | 320 | Cato II | 2 | 2 | 4 | 0 | 0 | 8 | | 661463 | 4.37 | 1418 | 0.32 | 252108 | 2.20 | 1.70719428 | 2.30205429 |
| | | | | | | | | | | | Tr. Tot. | 785918 | 5.19 | 6783 | 1.52 | 524628 | 4.57 | 3.21955573 | 4.17393847 |
| 11 | Cato C Fed | | 160 | Cato II | 1 | 0 | 3 | 0 | 0 | 4 | | 253290 | 1.67 | 5501 | 1.23 | 195131 | 1.70 | 1.22927859 | 1.53312123 |
| 12 | Coll Fed | | 40 | Coll Fed | 1 | 0 | 0 | 0 | 0 | 1 | | 29578 | 0.20 | 3876 | 0.87 | 0 | 0.00 | 0.70520869 | 0.33310601 |
| 13 | Amoco Coll Fed | | 40 | -- | 0 | 0 | 0 | 1 | 0 | 1 | | 1234 | 0.01 | 0 | 0.00 | 0 | 0.00 | 0.01341669 | 0.01300950 |
| 14 | Conley Fed | | 40 | -- | 0 | 1 | 0 | 0 | 0 | 1 | | 30059 | 0.20 | 0 | 0.00 | 59934 | 0.52 | 0.15306247 | 0.37799232 |
| 15 | Arco Conley Fed | | 40 | -- | 0 | 0 | 0 | 1 | 0 | 1 | | 58502 | 0.39 | 0 | 0.00 | 17551 | 0.15 | 0.07010786 | 0.11957640 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | Corder Fed | | 480 | Amoco Cen | 2 | 2 | 0 | 1 | 0 | 5 | | 221746 | 1.46 | 3238 | 0.72 | 229418 | 2.00 | 1.41131181 | 1.81495827 |
| 17 | Crosby A Fed | 640 | | | | | | | | | | | | | | | | | |
| | Crosby A Fed | | 80 | Cato III | 0 | 2 | 0 | 0 | 0 | 2 | | 44137 | 0.29 | 4224 | 0.94 | 50209 | 0.44 | 0.76214211 | 0.66121728 |
| | Baxter Fed | | 480 | UT Bax Fed | 3 | 3 | 0 | 0 | 0 | 6 | | 208631 | 1.38 | 5758 | 1.29 | 247643 | 2.16 | 2.02170304 | 2.22963058 |
| | No Wells | | 80 | -- | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0.02439024 | 0.02439024 |
| | | | | | | | | | | | Tr. Tot. | 252768 | 1.67 | 9982 | 2.23 | 297852 | 2.59 | 2.80823540 | 2.91523810 |
| 18 | Crosby B Fed | 320 | | | | | | | | | | | | | | | | | |
| | Crosby B Fed | | 80 | Cato III | 0 | 0 | 2 | 0 | 0 | 2 | | 80080 | 0.53 | 9565 | 2.14 | 113373 | 0.99 | 1.22844934 | 1.06791271 |
| | UT Winkler Fed | | 160 | -- | 2 | 1 | 0 | 0 | 0 | 3 | | 141459 | 0.93 | 961 | 0.21 | 222861 | 1.94 | 0.86881166 | 1.42586744 |
| | | | | | | | | | | | Tr. Tot. | 221539 | 1.46 | 10526 | 2.35 | 336234 | 2.93 | 2.09726100 | 2.49378015 |
| 19 | Crosby C, Grimm and Cato D Fed | 400 | | | | | | | | | | | | | | | | | |
| | Crosby C Fed | | 80 | Cato II | 0 | 0 | 1 | 0 | 0 | 1 | | 25853 | 0.17 | 0 | 0.00 | 109487 | 0.95 | 0.07815186 | 0.52999552 |
| | Grimm Fed | | 80 | Cato III | 2 | 0 | 0 | 0 | 0 | 2 | | 241045 | 1.59 | 62954 | 14.06 | 113373 | 0.99 | 7.75675226 | 3.69700799 |
| | Cato D Fed | | 160 | Cato II | 2 | 0 | 1 | 0 | 0 | 3 | | 168059 | 1.11 | 2689 | 0.60 | 56977 | 0.50 | 1.00522595 | 0.81903581 |
| | | | . | | | | | | | | Tr. Tot. | 434957 | 2.87 | 65643 | 14.67 | 279837 | 2.44 | 8.84013006 | 5.04603933 |
| 20 | Fischer Fed | 400 | | | | | | | | | | | | | | | | | |
| | Fischer Fed | | 320 | Cato II | 1 | 0 | 1 | 0 | 0 | 2 | | 22147 | 0.15 | 6265 | 1.40 | 0 | 0.00 | 1.07824799 | 0.57983580 |
| | Fischer B Fed | | 40 | -- | 0 | 0 | 1 | 0 | 0 | 1 | | 41575 | 0.27 | 0 | 0.00 | 34151 | 0.30 | 0.08152037 | 0.23297553 |
| | | | | | | | | | | | Tr. Tot. | 63722 | 0.42 | 6265 | 1.40 | 34151 | 0.30 | 1.15976837 | 0.81281134 |
| 21 | Hodges Fed | 1760 | | | | | | | | | | | | | | | | | |
| | Hodges Fed | | 240 | Brown | 2 | 0 | 0 | 1 | 0 | 3 | | 363759 | 2.40 | 22494 | 5.03 | 42733 | 0.37 | 3.40747147 | 1.74215853 |
| | Hodges 1 Fed | | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0.00000000 | 0.00000000 |
| | Hodges A Fed | | 480 | HodgesA&B | 3 | 0 | 0 | 3 | 0 | 6 | | 448325 | -2.96 | 18102 | 4.04 | 306756 | 2.67 | 3.30452218 | 2.83766437 |
| | Hodges B Fed | | 320 | HodgesA&B | 1 | 0 | 0 | 3 | 1 | 5 | | 244786 | 1.62 | 0 | 0.00 | 265088 | 2.31 | 0.95526600 | 1.48557190 |
| | Hodges C Fed | | 160 | Brown | 3 | 0 | 0 | 0 | 0 | 3 | | 165810 | 1.09 | 5325 | 1.19 | 328462 | 2.86 | 1.50005126 | 2.06781487 |
| | Eastland Hodges Fed (N) | | 80 | Eastland | 0 | 1 | 0 | 0 | 0 | 1 | | 38131 | 0.25 | 0 | 0.00 | 14244 | 0.12 | 0.17324828 | 0.21648043 |
| | Eastland Hodges Fed (S) | | 160 | Eastland | 3 | 0 | 0 | 1 | 0 | 4 | | 139961 | 0.92 | 7359 | 1.64 | 204504 | 1.78 | 1.70166833 | 1.65591438 |
| | | | | | | | | | | | Tr. Tot. | 1400772 | 9.24 | 53280 | 11.90 | 1161787 | 10.12 | 11.04222752 | 10.00560448 |

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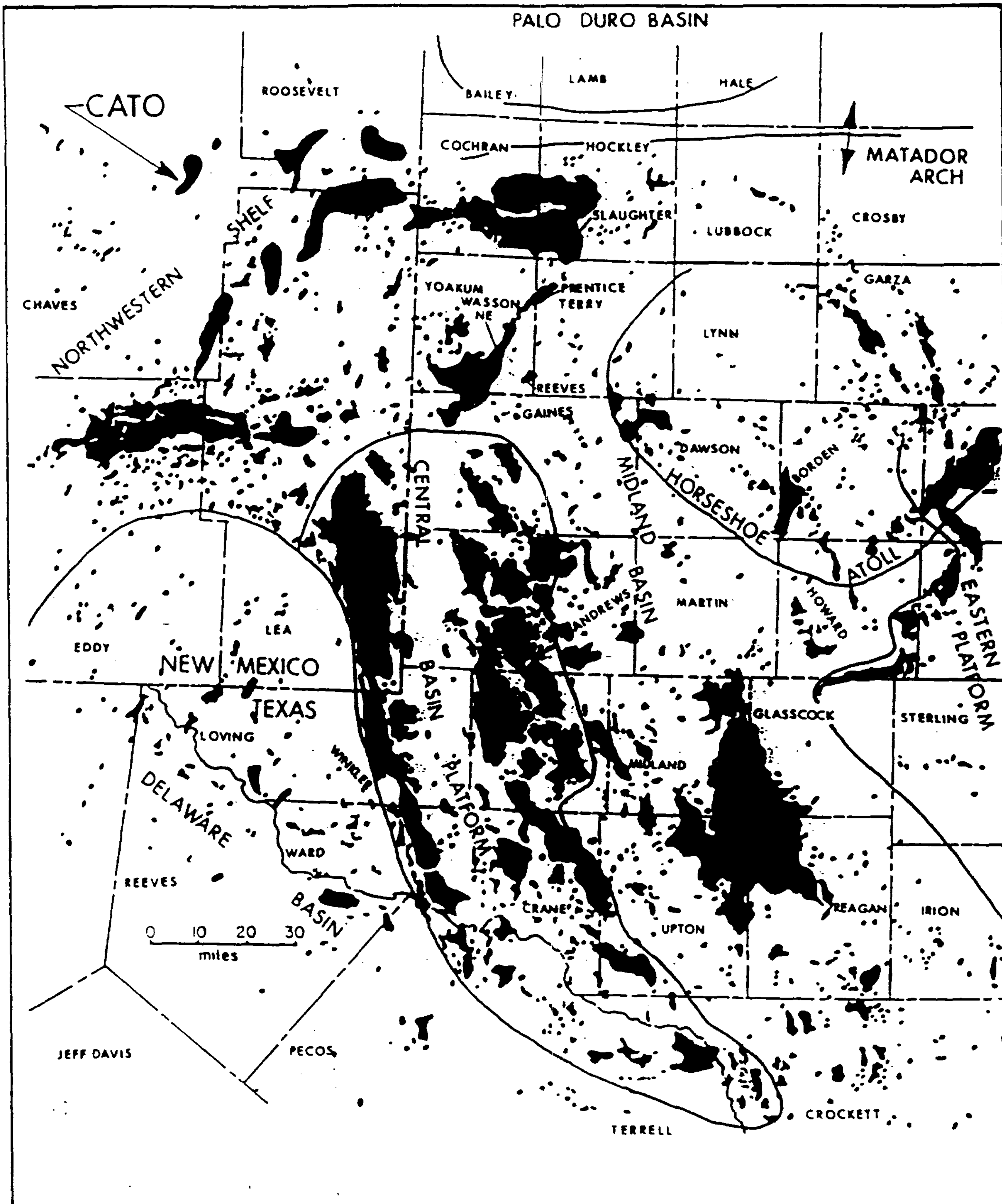
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22 | Hodges D Fed | 640 | Amoco Cen | 1 | 0 | 0 | 0 | 0 | 1 | 59876 | 0.40 | 0 | 0.00 | 41590 | 0.36 | 0.48516408 | 0.52581084 |
| 23 | Mac Fed | 160 | Mac | 1 | 0 | 0 | 0 | 1 | 2 | 62191 | 0.41 | 28162 | 6.29 | 62682 | 0.55 | 3.87153454 | 1.78149093 |
| 24 | Packer Fed | 80 | -- | 0 | 0 | 1 | 1 | 0 | 2 | 106889 | 0.71 | 0 | 0.00 | 10689 | 0.09 | 0.15837162 | 0.19633998 |
| 25 | Packer A Fed | 40 | -- | 0 | 0 | 0 | 1 | 0 | 1 | 35787 | 0.24 | 0 | 0.00 | 3579 | 0.03 | 0.04762166 | 0.04983696 |
| 26 | Peterson Fed | 80 | -- | 0 | 1 | 0 | 1 | 0 | 2 | 32696 | 0.22 | 0 | 0.00 | 31341 | 0.27 | 0.16786803 | 0.27988739 |
| 27 | East Sinclair Fed | 40 | -- | 0 | 0 | 0 | 1 | 0 | 1 | 548 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0.01273760 | 0.01255678 |
| 28 | West Sinclair Fed | 40 | -- | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0.01219512 | 0.01219512 |
| 29 | Skinner Fed | 240 | -- | 0 | 2 | 0 | 0 | 0 | 2 | 77588 | 0.51 | 0 | 0.00 | 15518 | 0.14 | 0.37219945 | 0.40740385 |
| 30 | Smith Fed | 40 | Smith Fed | 1 | 0 | 0 | 0 | 0 | 1 | 112220 | 0.74 | 28230 | 6.31 | 0 | 0.00 | 3.50745474 | 1.47582032 |
| 31 | Winkler Fed | 480 | Winkler | 0 | 1 | 11 | 0 | 0 | 12 | 843652 | 5.57 | 0 | 0.00 | 530554 | 4.62 | 1.40246609 | 3.54793532 |
| 32 | Arco Winkler Fed | 200 | -- | 0 | 0 | 0 | 2 | 0 | 2 | 16069 | 0.11 | 0 | 0.00 | 3214 | 0.03 | 0.07688276 | 0.08417428 |
| 33 | Woodman Fed | 280 | Woodman | 2 | 2 | 3 | 1 | 0 | 8 | 181158 | 1.20 | 0 | 0.00 | 316722 | 2.76 | 1.03296688 | 2.10318577 |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 34 | Amoco Woodman Fed | | 80 | -- | 0 | 0 | 0 | 1 | 0 | 1 | | 2233 | 0.01 | 0 | 0.00 | 0 | 0.00 | 0.02660075 | 0.02586392 |
| 35 | Arco Woodman Fed | | 160 | -- | 0 | 0 | 0 | 4 | 0 | 4 | | 217124 | 1.43 | 0 | 0.00 | 43425 | 0.38 | 0.26371752 | 0.36223069 |
| 36 | Horward Smith | | 40 | -- | 0 | 0 | 0 | 1 | 0 | 1 | | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0.01219512 | 0.01219512 |
| 37 | A State | | 40 | -- | 0 | 0 | 0 | 1 | 0 | 1 | | 86022 | 0.57 | 0 | 0.00 | 8602 | 0.07 | 0.09735067 | 0.10267203 |
| 38 | H State | | 640 | State H | 0 | 7 | 10 | 0 | 0 | 17 | | 921085 | 6.08 | 4494 | 1.00 | 1933753 | 16.84 | 2.66839456 | 9.95412988 |
| 39 | Bell State | | 80 | -- | 0 | 0 | 0 | 1 | 0 | 1 | | 58589 | 0.39 | 0 | 0.00 | 5859 | 0.05 | 0.08238911 | 0.08601437 |
| 40 | Cato State (HWJ Producing Co.) | | 640 | -- | 3 | 0 | 1 | 0 | 0 | 4 | | 72776 | 0.48 | 3625 | 0.81 | 21833 | 0.19 | 1.39256821 | 0.93481202 |
| 41 | Barhyte | | 160 | Cato IV | 0 | 1 | 0 | 0 | 0 | 1 | | 24679 | 0.16 | 0 | 0.00 | 29185 | 0.25 | 0.18432202 | 0.29053862 |
| 42 | Daphne C. Baskett 1 | 640 | | | | | | | | | | | | | | | | | |
| | Cato Baskett | | 80 | Cato I | 1 | 0 | 1 | 0 | 0 | 2 | | 161474 | 1.07 | 0 | 0.00 | 0 | 0.00 | 0.44317605 | 0.31868422 |
| | Baskett B | | 80 | Cato I | 0 | 0 | 1 | 0 | 1 | 2 | | 160762 | 1.06 | 0 | 0.00 | 0 | 0.00 | 0.59631738 | 0.24953302 |
| | | | | | | | | | | | Sub-Tot. | 322236 | 2.13 | 0 | 0.00 | 0 | 0.00 | 1.03949343 | 0.56821724 |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Baskett C | | 80 | Cato I | 0 | 0 | 2 | 0 | 0 | 2 | | 124097 | 0.82 | 0 | 0.00 | 100923 | 0.88 | 0.20357531 | 0.62079799 |
| | Baskett E | | 80 | Cato I | 0 | 0 | 2 | 0 | 0 | 2 | | 131822 | 0.87 | 0 | 0.00 | 181680 | 1.58 | 0.21122250 | 0.94233868 |
| | | | | | | | | | | | Sub-Tot. | 255919 | 1.69 | 0 | 0.00 | 282603 | 2.46 | 0.41479781 | 1.56313667 |
| | UT Baskett | | 160 | Cato IV | 0 | 1 | 2 | 1 | 0 | 4 | | 324444 | 2.14 | 0 | 0.00 | 0 | 0.00 | 0.53740568 | 0.49305659 |
| | UT JE Cato | | 160 | UT JE Cato | 1 | 1 | 2 | 0 | 0 | 4 | | 324493 | 2.14 | 0 | 0.00 | 282603 | 2.46 | 0.76822342 | 1.72866082 |
| | | | | | | | | | | | Tr. Tot. | 1227092 | 8.10 | 0 | 0.00 | 565206 | 4.92 | 2.75992034 | 4.35307131 |
| 43 | Daphne C. Baskett 2 | 320 | | | | | | | | | | | | | | | | | |
| | Baskett D | | 320 | Cato I | 3 | 1 | 0 | 0 | 4 | 8 | | 599396 | 3.96 | 2736 | 0.61 | 0 | 0.00 | 3.33842177 | 1.34920385 |
| 44 | Marie Crosby | 1920 | | | | | | | | | | | | | | | | | |
| | Crosby B | | 80 | Cato I | 1 | 1 | 0 | 0 | 0 | 2 | | 127082 | 0.84 | 5821 | 1.30 | 24089 | 0.21 | 1.14230088 | 0.70205742 |
| | Crosby D | | 80 | Cato I | 1 | 0 | 1 | 0 | 0 | 2 | | 130717 | 0.86 | 0 | 0.00 | 181680 | 1.58 | 0.41272885 | 1.01029075 |
| | Crosby E | | 80 | Cato I | 1 | 1 | 0 | 0 | 0 | 2 | | 103749 | 0.68 | 3550 | 0.79 | 100923 | 0.88 | 0.86552338 | 0.88625743 |
| | Crosby F | | 80 | Cato IV | 1 | 0 | 1 | 0 | 0 | 2 | | 95463 | 0.63 | 6797 | 1.52 | 147225 | 1.28 | 1.13708126 | 1.15571502 |
| | Crosby G | | 80 | Cato IV | 2 | 0 | 0 | 0 | 0 | 2 | | 162672 | 1.07 | 31031 | 6.93 | 113373 | 0.99 | 4.11324550 | 2.21891633 |
| | Crosby H | | 80 | Cato IV | 2 | 0 | 0 | 0 | 0 | 2 | | 237613 | 1.57 | 6054 | 1.35 | 113373 | 0.99 | 1.39740369 | 1.15236258 |
| | | | | | | | | | | | Sub-Tot. | 857296 | 5.66 | 53253 | 11.90 | 680663 | 5.93 | 9.06828355 | 7.12559954 |
| | UT Crosby 1 | | 240 | UTCrosby1 | 1 | 0 | 5 | 0 | 0 | 6 | | 440980 | 2.91 | 3200 | 0.71 | 395976 | 3.45 | 1.23877572 | 2.48461499 |
| | UT Crosby 2 | | 160 | UTCrosby2 | 4 | 0 | 0 | 0 | 0 | 4 | | 376314 | 2.48 | 66863 | 14.94 | 226747 | 1.97 | 8.81323796 | 4.68599046 |
| | UT Crosby 3 | | 160 | UTCrosby3 | 2 | 0 | 0 | 0 | 0 | 2 | | 69696 | 0.46 | 8352 | 1.87 | 24089 | 0.21 | 1.51226380 | 0.81875871 |
| | UT Crosby 3A | | 200 | - | 0 | 0 | 0 | 1 | 0 | 1 | | 0 | 0.00 | 0 | 0.00 | 12044 | 0.10 | 0.06097561 | 0.10816947 |
| | UT Crosby 17 | | 160 | UTCrosb17 | 0 | 1 | 2 | 0 | 0 | 3 | | 237237 | 1.57 | 0 | 0.00 | 220838 | 1.92 | 0.45107707 | 1.30084765 |
| | UT Crosby 18 | | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0.00000000 | 0.00000000 |
| | UT Crosby 21 | | 160 | - | 0 | 0 | 0 | 2 | 0 | 2 | | 0 | 0.00 | 0 | 0.00 | 18964 | 0.17 | 0.04878049 | 0.12309004 |
| | | | | | | | | | | | Sub-Tot. | 1124227 | 7.42 | 78415 | 17.52 | 898658 | 7.83 | 12.12511065 | 9.52147133 |
| | Annek Crosby | | 40 | Cato IV | 1 | 0 | 0 | 0 | 0 | 1 | | 84397 | 0.56 | 0 | 0.00 | 73613 | 0.64 | 0.32651127 | 0.48454732 |
| | | | | | | | | | | | Tr. Tot. | 2065920 | 13.63 | 131668 | 29.42 | 1652934 | 14.39 | 21.51990548 | 17.13161819 |
| 45 | Crosby (Seville-Trident Corp.) | | 40 | -- | 0 | 0 | 1 | 0 | 0 | 1 | | 393 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0.04075318 | 0.07197829 |
| 46 | Crosby (Eugene E. Nearburg) | | 80 | -- | 0 | 0 | 0 | 1 | 0 | 1 | | 460 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0.02484561 | 0.02469382 |
| 47 | Crosby (Tamarack Petroleum Co. Inc.) | | 40 | -- | 0 | 0 | 0 | 1 | 0 | 1 | | 1496 | 0.01 | 0 | 0.00 | 0 | 0.00 | 0.01367605 | 0.01318241 |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 48 | Thelma Crosby | 640 | | | | | | | | | | | | | | | | | |
| | T Crosby A1 | | 40 | T Crosby | 0 | 1 | 0 | 0 | 0 | 1 | | 57521 | 0.38 | 0 | 0.00 | 46887 | 0.41 | 0.18024786 | 0.34499185 |
| | T Crosby A2 | | 120 | T Crosby | 1 | 0 | 0 | 0 | 0 | 1 | | 22163 | 0.15 | 22354 | 4.99 | 46887 | 0.41 | 2.78632304 | 1.36195301 |
| | T Crosby A3 | | 160 | - | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0.04878049 | 0.04878049 |
| | T Crosby B | | 160 | T Crosby | 4 | 0 | 0 | 0 | 0 | 4 | | 365710 | 2.41 | 16914 | 3.78 | 187548 | 1.63 | 3.22324335 | 2.29359390 |
| | | | | | | | | | | | Sub-Tot. | 365710 | 2.41 | 16914 | 3.78 | 187548 | 1.63 | 3.27202384 | 2.34237439 |
| | T Crosby C | | 160 | T Crosby | 1 | 0 | 0 | 0 | 0 | 1 | | 12847 | 0.08 | 3492 | 0.78 | 20953 | 0.18 | 0.68233729 | 0.42359536 |
| | | | | | | | | | | | Tr. Tot. | 458241 | 3.02 | 42760 | 9.55 | 302275 | 2.63 | 6.92093202 | 4.47291462 |
| 49 | D.H. Fowler | | 40 | T Crosby | 0 | 1 | 0 | 0 | 0 | 1 | | 4197 | 0.03 | 0 | 0.00 | 20953 | 0.18 | 0.12746096 | 0.20817941 |
| 50 | L.C. Harris | | 320 | LC Harris | 0 | 4 | 4 | 0 | 0 | 8 | | 547687 | 3.61 | 0 | 0.00 | 801310 | 6.98 | 1.19685193 | 4.28144374 |
| 51 | Marshall | | 160 | Marshall | 1 | 0 | 0 | 1 | 0 | 2 | | 72265 | 0.48 | 0 | 0.00 | 62682 | 0.55 | 0.35108683 | 0.47029354 |
| 52 | McGrail | | 160 | T Crosby | 3 | 0 | 0 | 0 | 0 | 3 | | 198253 | 1.31 | 5053 | 1.13 | 140661 | 1.22 | 1.50178403 | 1.34118278 |
| 53 | North Cato<br>(Yates Energy Corp.) | | 480 | -- | 1 | 0 | 1 | 0 | 0 | 2 | | 5924 | 0.04 | 1080 | 0.24 | 1777 | 0.02 | 0.53178424 | 0.39319913 |
| 54 | Queen | | 160 | Cato I | 2 | 1 | 0 | 0 | 0 | 3 | | 173059 | 1.14 | 1514 | 0.34 | 151384 | 1.32 | 0.96186562 | 1.19135150 |
| 55 | Rector | | 40 | -- | 0 | 1 | 0 | 0 | 0 | 1 | | 11845 | 0.08 | 0 | 0.00 | 20953 | 0.18 | 0.13503192 | 0.21322672 |
| 56 | Sellers<br>(Pan American Corp.) | | 160 | -- | 0 | 0 | 0 | 1 | 0 | 1 | | 74 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0.04885374 | 0.04882932 |
| 57 | Calla Cato Wasley | | 320 | Cato I | 0 | 0 | 5 | 0 | 2 | 7 | | 671468 | 4.43 | 0 | 0.00 | 390262 | 3.40 | 1.67234149 | 2.48658766 |
| 58 | FEE 21 | | 160 | -- | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0.04878049 | 0.04878049 |
| 59 | FEE 07 | | 80 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0.02439024 | 0.02439024 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ======= | ==== | ==== | ==== | ==== | ==== | ==== | | =========== | ===== | ======== | ===== | =========== | ===== | ========= | ========= |
| UNIT TOTALS =========> | 16400 | 78 | 45 | 71 | 54 | 13 | 261 | | 15,152,624 | 100.00 | 447,612 | 100.00 | 11,484,122 | 100.00 | 100.00000000 | 100.00000000 |
| | | | | | | | | Totals Check | 15,152,624 | | 447,612 | | 11,484,122 | | 100.00000000 | 100.00000000 |




# PERMIAN BASIN FIELD MAP

## SOUTHEAST NEW MEXICO & WEST TEXAS

FIG. 1

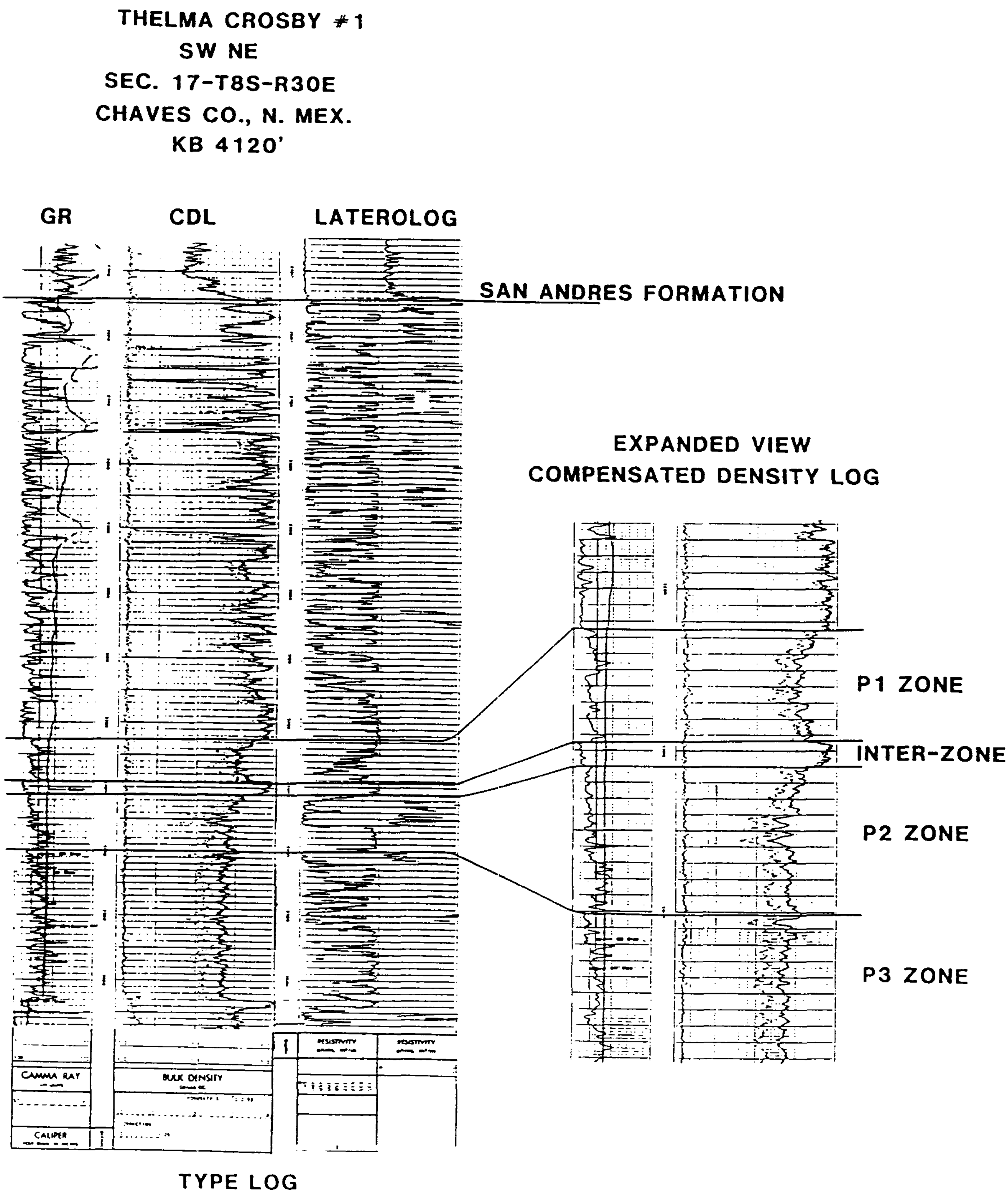

THELMA CROSBY #1
SW NE
SEC. 17-T8S-R30E
CHAVES CO., N. MEX.
KB 4120'
GR
CDL
LATEROLOG
SAN ANDRES FORMATION
EXPANDED VIEW
COMPENSATED DENSITY LOG
P1 ZONE
INTER-ZONE
P2 ZONE
P3 ZONE
GAMMA RAY
BULK DENSITY
CALIPER
TYPE LOG

FIG. 2

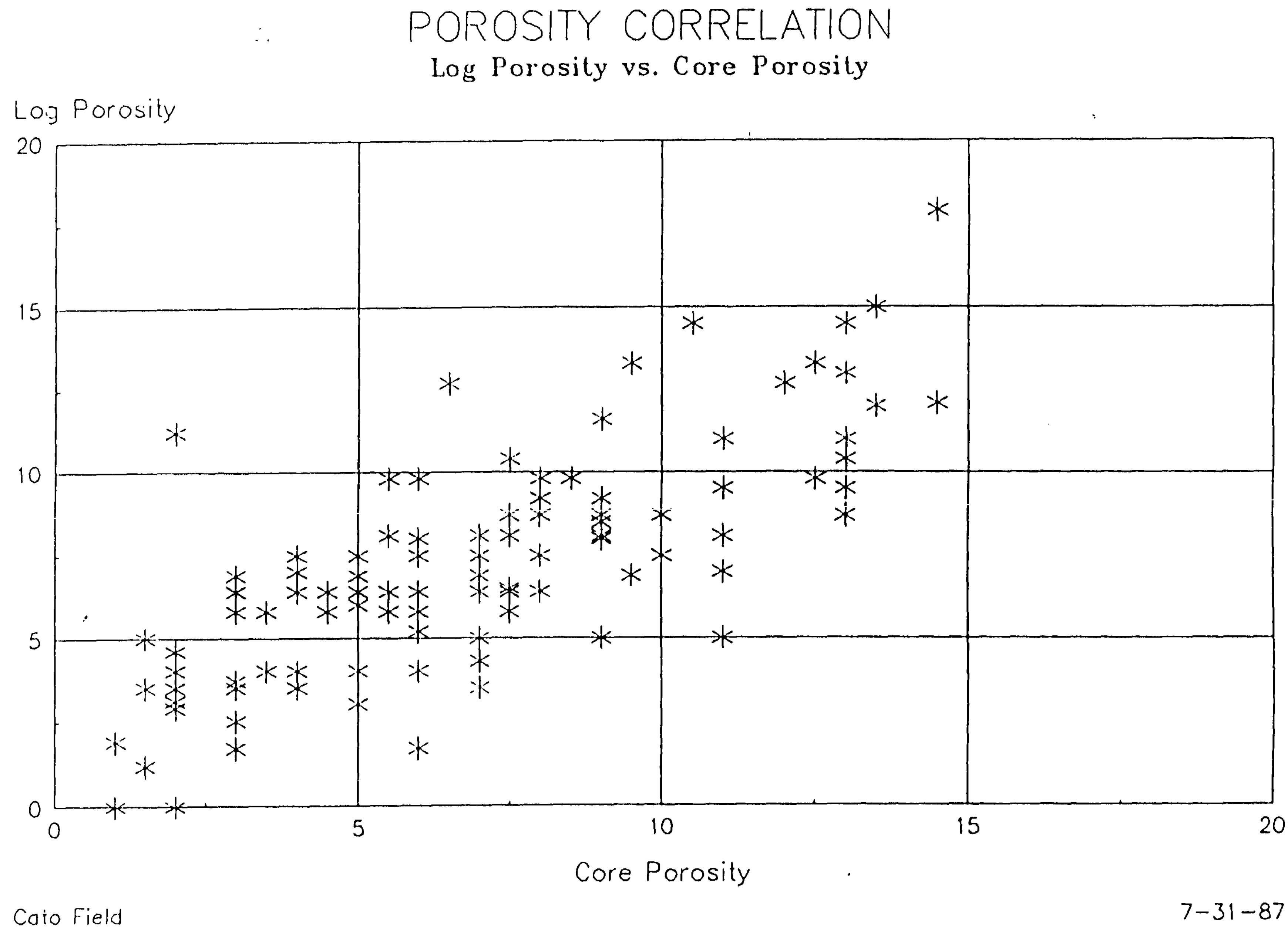
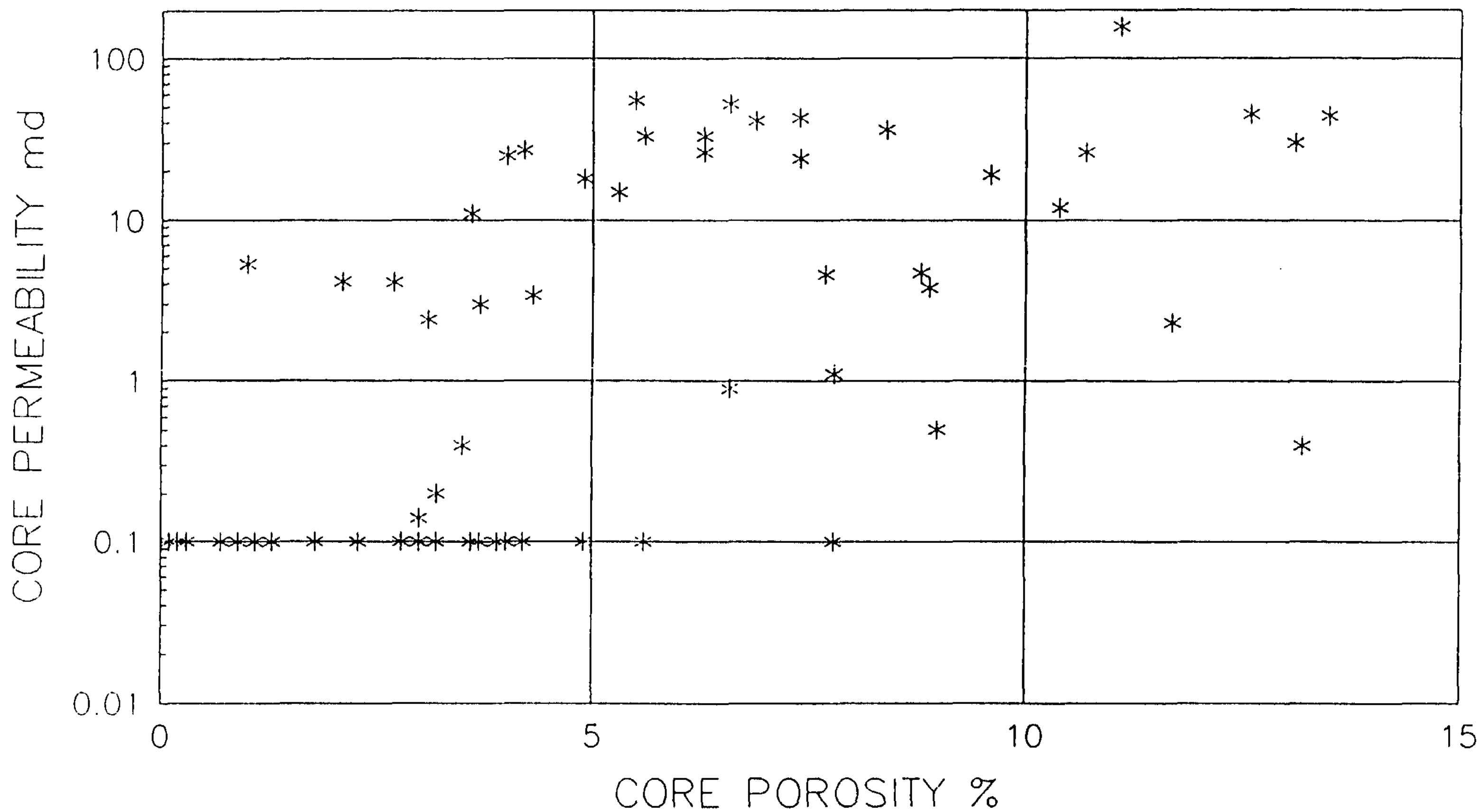

POROSITY CORRELATION
Log Porosity vs. Core Porosity
Log Porosity
20
15
10
5
0
0
5
10
15
20
Core Porosity
Cato Field
7-31-87

FIG 3

# CORE POROSITY % VS. CORE PERMEABILITY MD.

## VUGGY DOLOMITE INTERVALS–SAN ANDRES FM
## CATO FIELD, CHAVES CO., NM

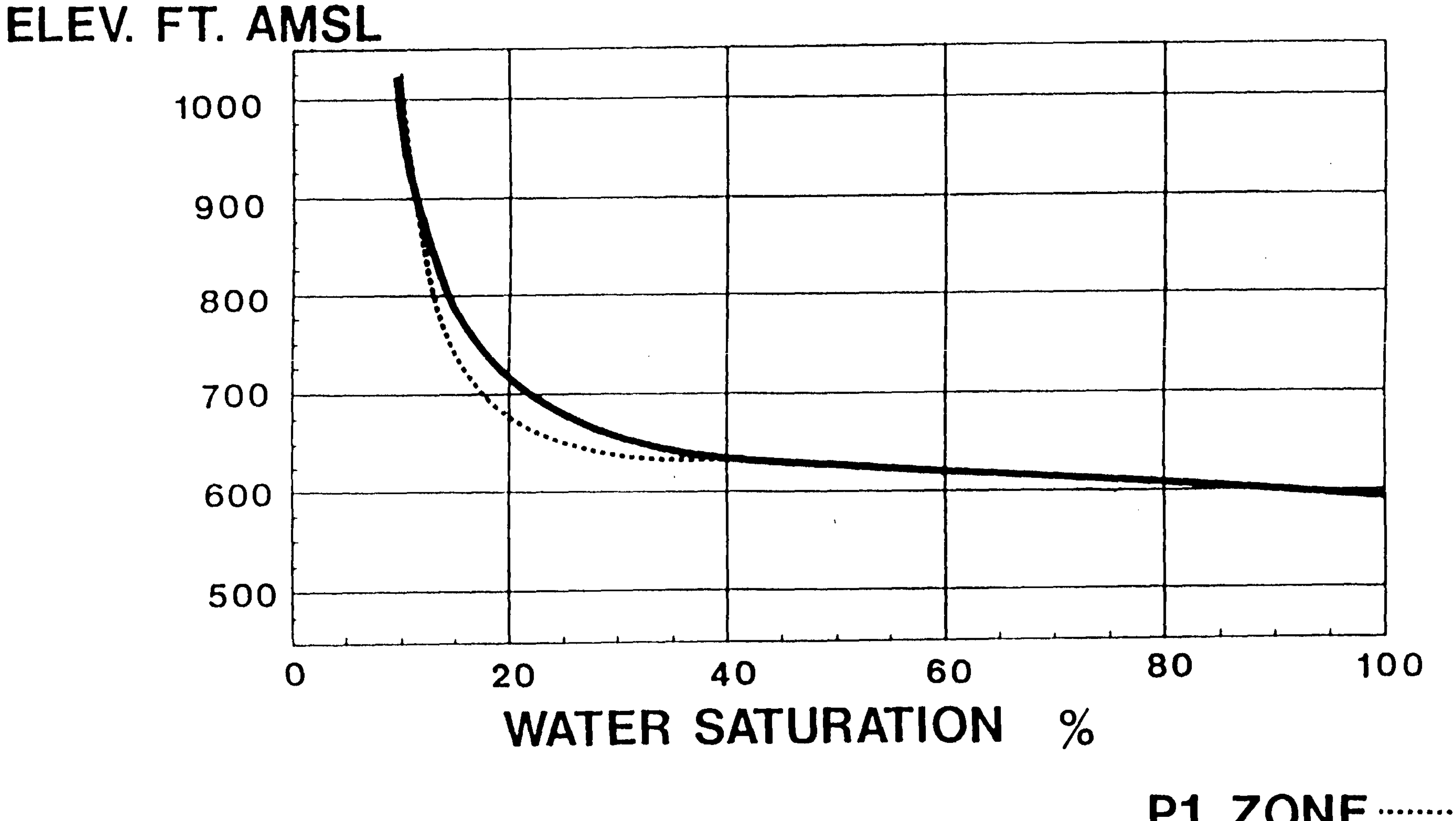



KELT OIL AND GAS

FIG. 4

## KELT OIL AND GAS

### CATO WATER SATURATION RESULTS
### ELEV. FT. AMSL vs SW %

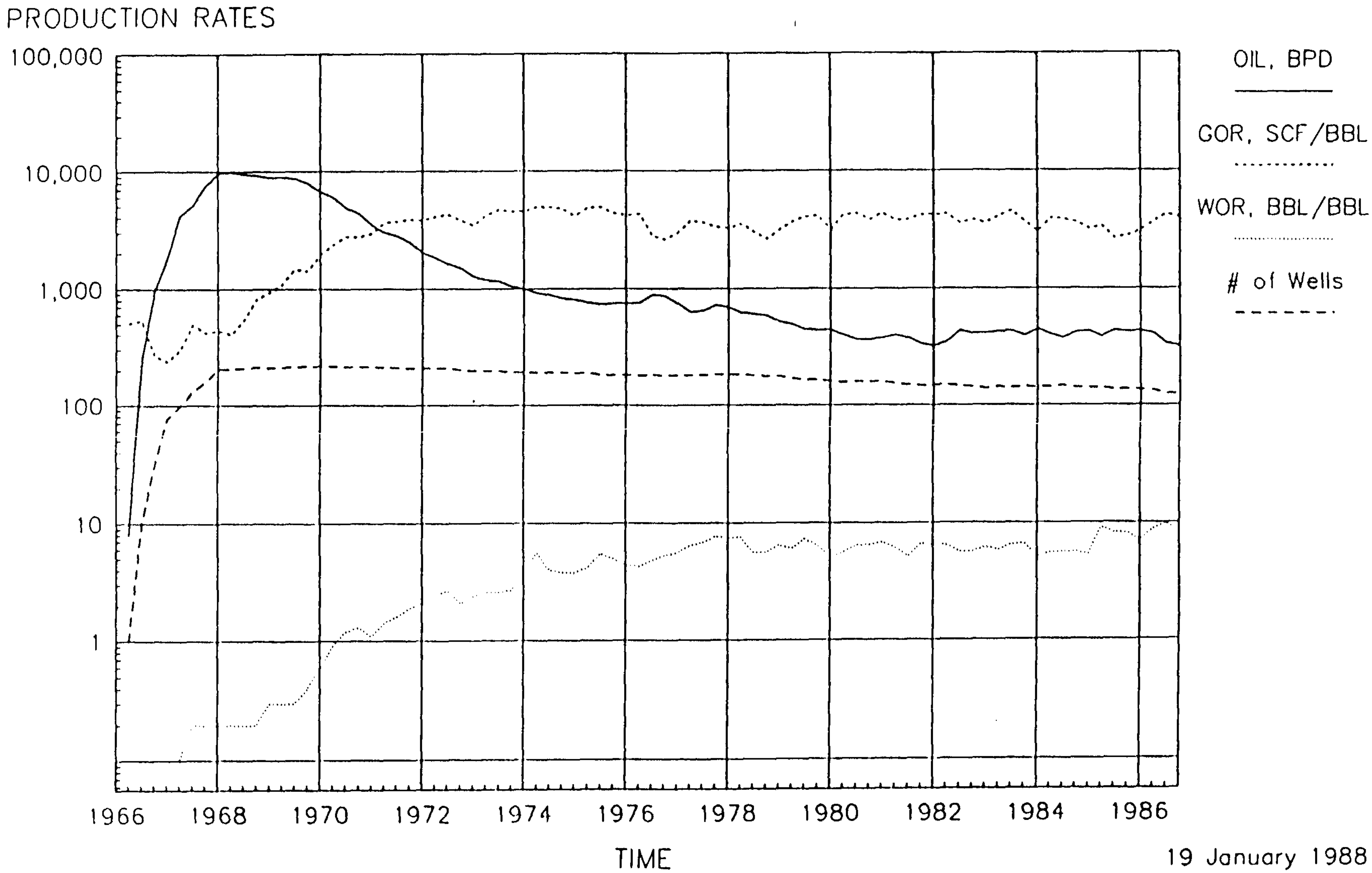



CATO
CHAVES CO., N. MEXICO

FIG. 5

## CATO TOTAL FIELD

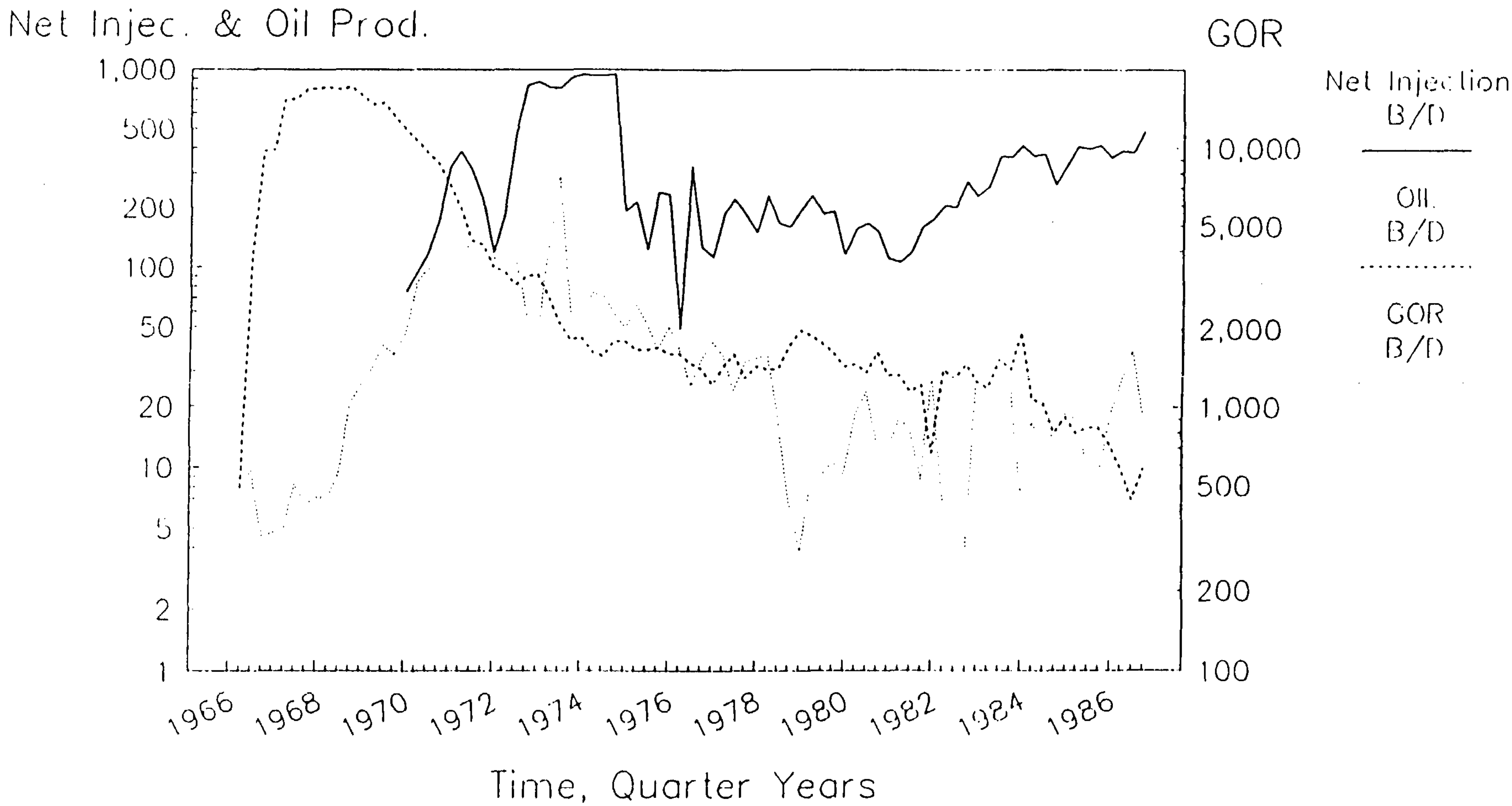
### OIL, GOR, WOR & Number of Wells vs. TIME




19 January 1988

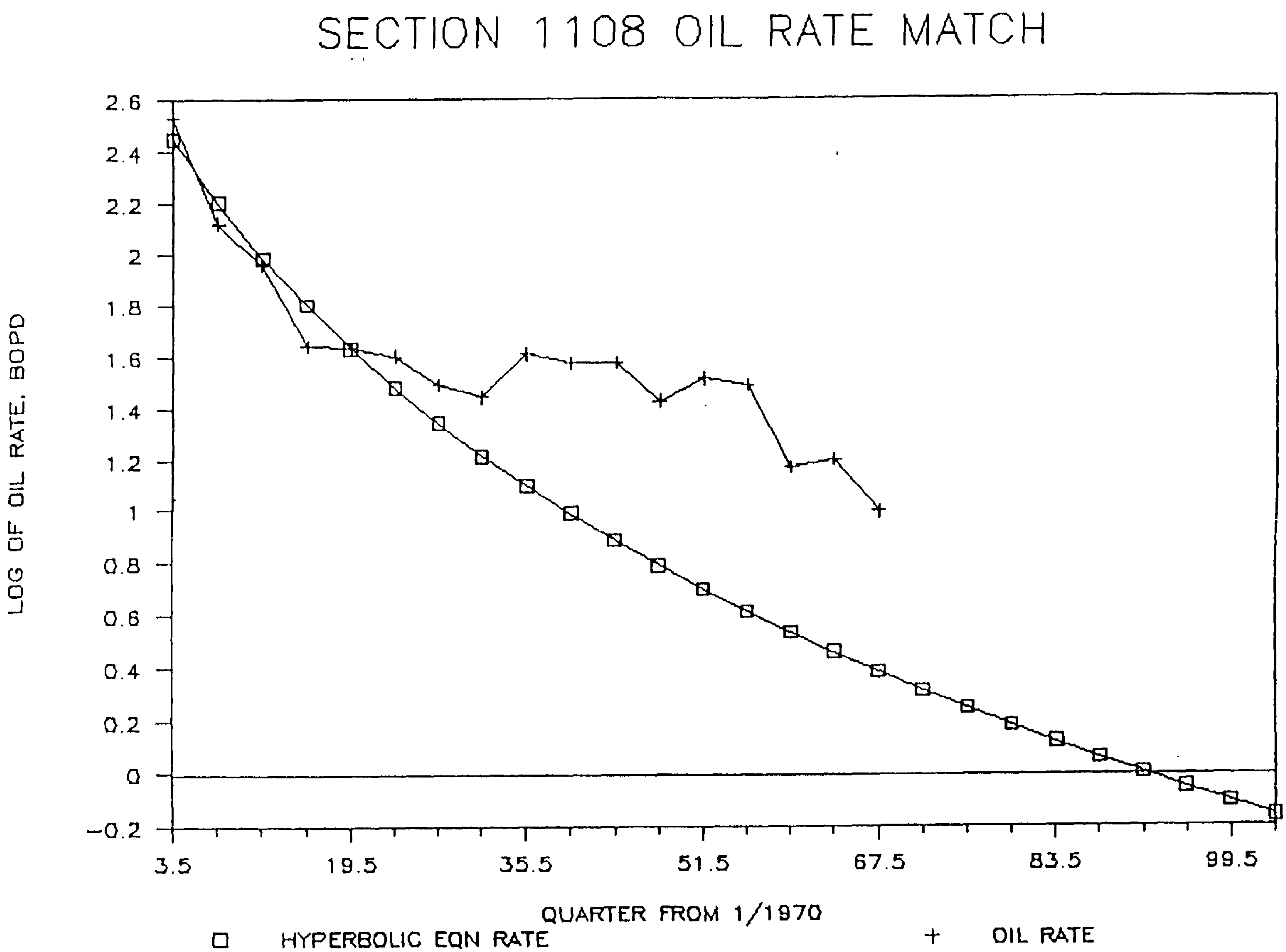
# Waterflood Evaluation -- CATO FIELD

## SECTION 11 & 14 NET INJECTION vs. TIME
## SECTION 11 OIL,GOR vs. TIME




08 October 1987
Net Injection = Water Prod. - Water Injection

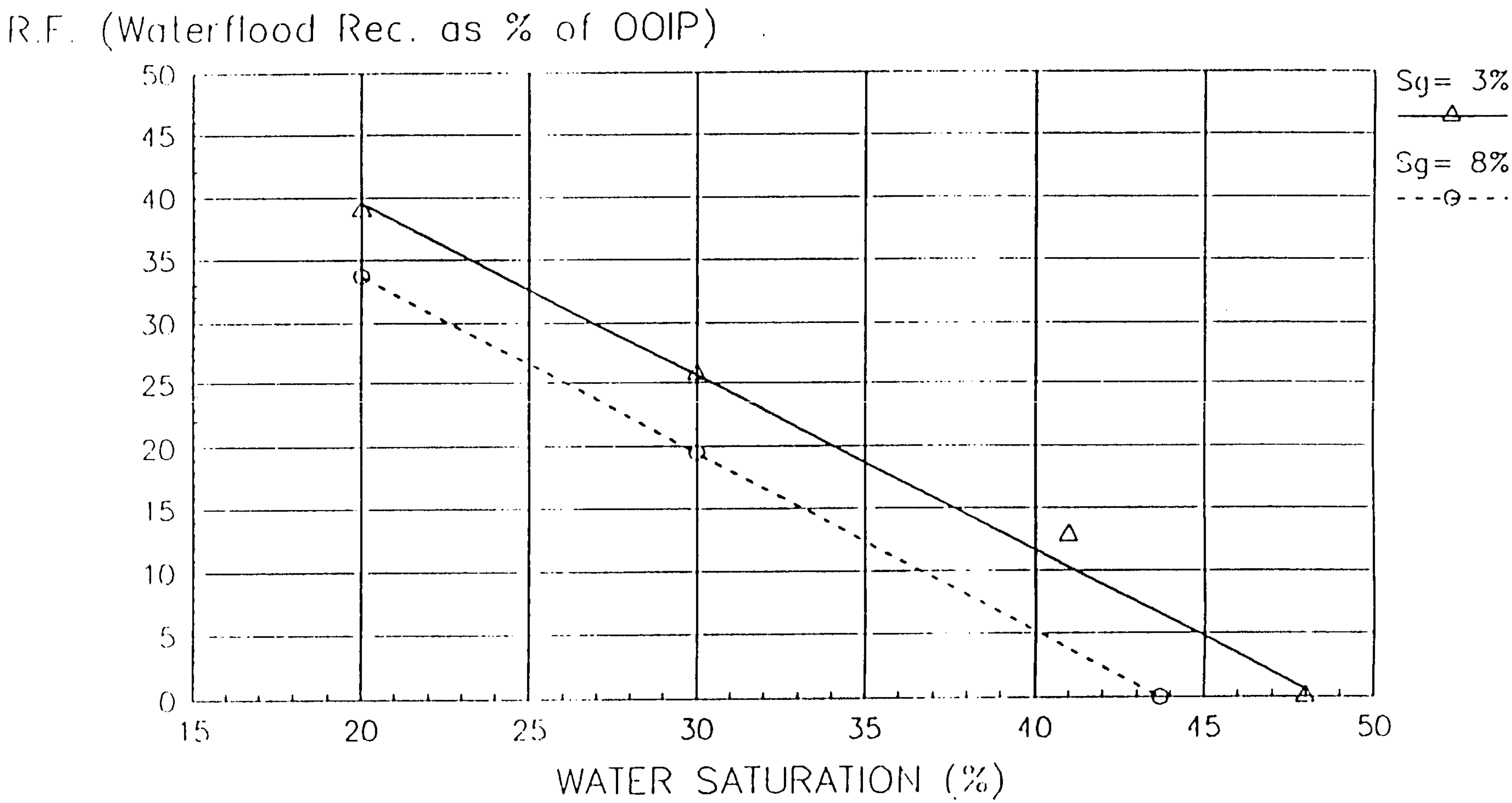
Kelt Oil & Gas



SECTION 1108 OIL RATE MATCH
LOG OF OIL RATE, BOPD
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-0.2
3.5
19.5
35.5
51.5
67.5
83.5
99.5
QUARTER FROM 1/1970
HYPERBOLIC EQN RATE
OIL RATE

# CATO RESERVOIR SIMULATION

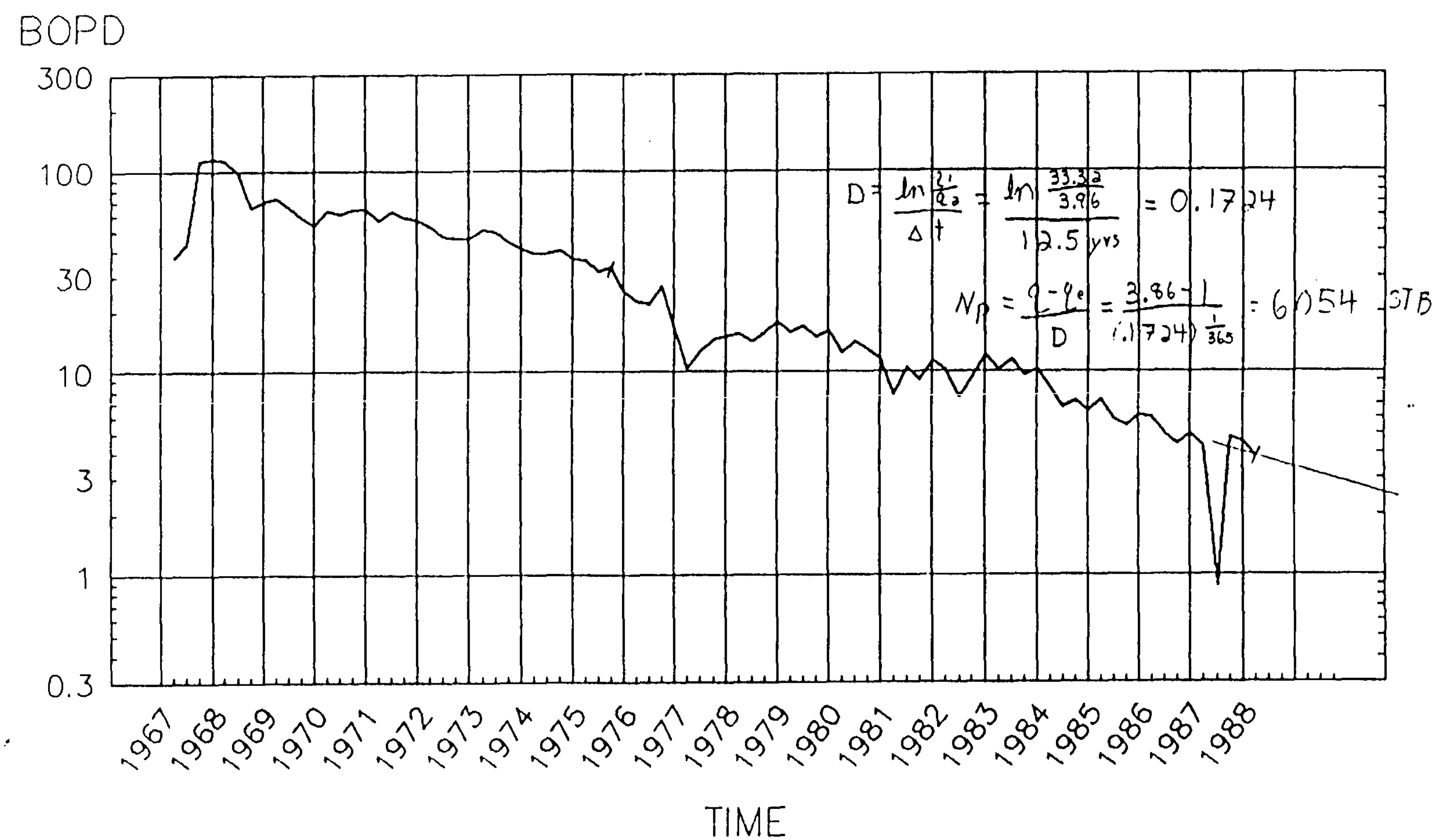
## RECOVERY FACTOR AS A FUNCTION OF Sw & Sg




KELT OIL & GAS
11-12-87

FIELD-WIDE APPLICATION
WATER CUT= 98%

## NC3H CROSBY H LEASE
## OIL RATE -vs- TIME

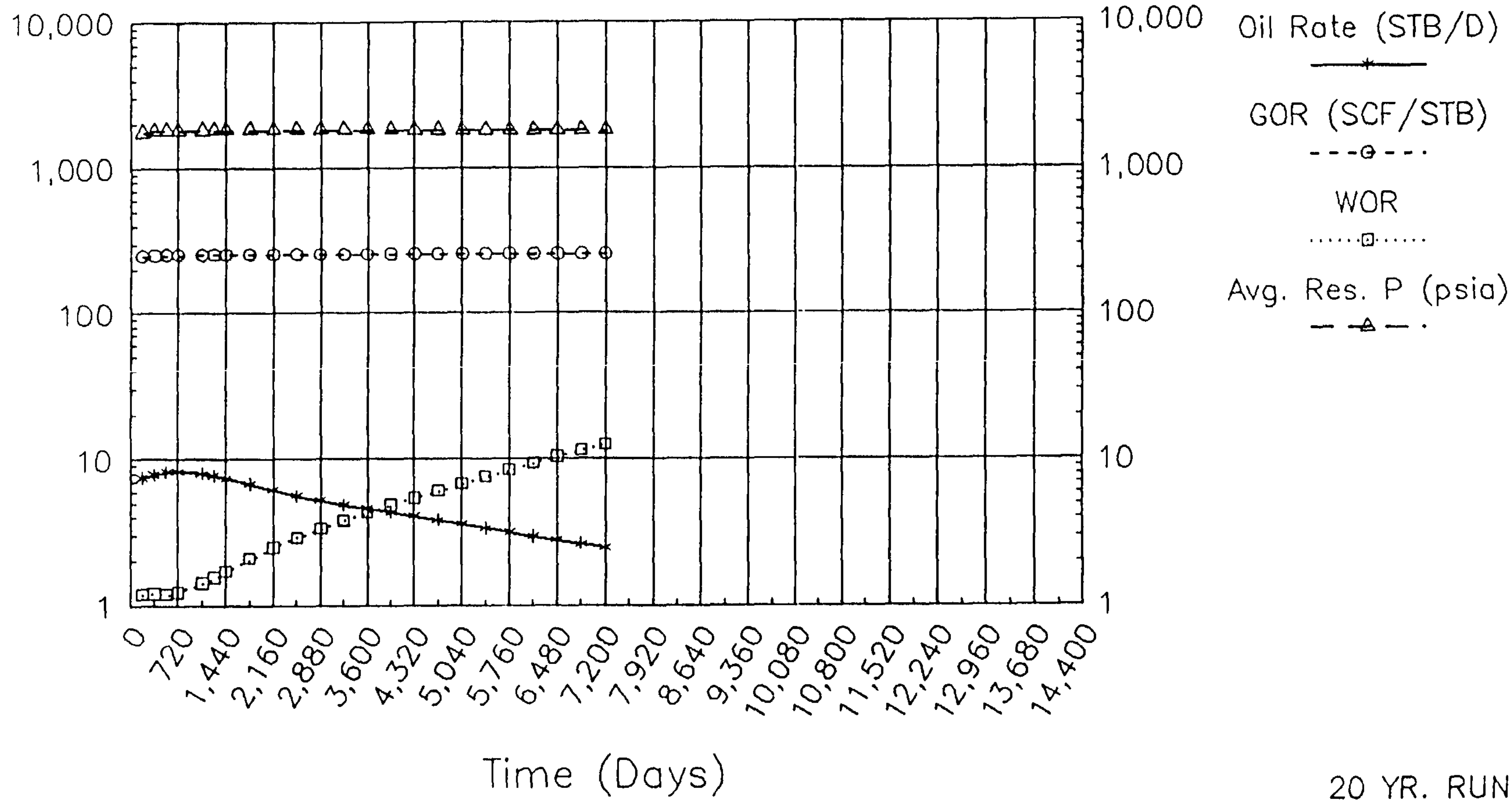



Kelt Oil & Gas
August 1988

2 active producers on lease

# CATO--Sect. 11 Twp. 08 P1 ZONE

## 5-SPOT WATERFLOOD
## SENSITIVITY RUN




Kelt Oil & Gas
11-11-87

20 YR. RUN
Sw= 20%
Sg= 3%