

PROBABILITY RANGES FOR GAS RESERVE ESTIMATES  
FROM MATERIAL BALANCE METHOD

by

Thotsaphon Chaianansutcharit

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A thesis submitted to the Faculty and the Board of Trustees of the Colorado School of Mines in the partial fulfillment of the requirements for the degree of Master of Science (Petroleum Engineering).

Golden, Colorado

Date 3/27/96

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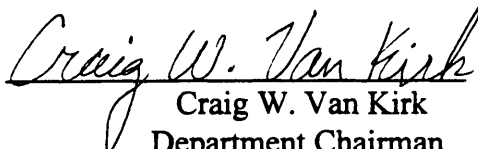
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## ABSTRACT

Deterministic and probabilistic reserve estimates were made for 28 wells in the Glick Field, Kiowa and Comanche County, Kansas and 5 wells located in Laredo County, Texas. The analysis was done in one year periods, starting with the initial production. At each point in time, plots of pressure (P/Z) versus time and pressure (P/Z) versus cumulative gas produced (Gp) were evaluated. The pressure versus time plots were used as an indication of pressure communication and were the basis for grouping the wells. Two approaches were used to estimate the remaining reserves. In one case, a least squares best fit of the P/Z versus Gp data is the basis for the deterministic reserve estimate. In the other case the “best fit” was done visually and biased by the high pressures in the data set. The scatter of the actual data around the best fit was used to estimate prediction intervals for future gas production in each case. Prediction intervals were calculated for P<sub>90</sub> (90 % probability that the actual gas production would be greater), and P<sub>10</sub> (10 % probability that the actual gas production would be greater). The results indicate that the P<sub>90</sub>- P<sub>10</sub> prediction interval is too narrow when calculated using the student’s t distribution. Also the ARR (Actual Remaining Reserves) were greater than the P<sub>50</sub> value more than 50 percent of the time indicating the deterministic estimates are biased on the low side. This indicates that a deterministic estimate of remaining reserves represented by the P<sub>50</sub>

value underestimates the actual remaining reserves. This bias is believed to be a result of incomplete pressure buildup data used in the analysis and the impact of liquid accumulation in the wellbore not accounted for because of the use of surface pressure data to estimate bottom hole pressures.

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Finally, I would like to dedicate this thesis to my parents for their sponsorship and support.

## 1. INTRODUCTION

This thesis tests the hypothesis that an 80 percent prediction interval calculated using the variability in  $P/Z$  on  $G_p$  data can be used to estimate the  $P_{90}$  (90 percent probability that the actual gas production would be greater) and  $P_{10}$  (10 percent probability that the actual gas production would be greater) probability levels for the remaining gas reserves. The Student's  $t$  distribution was used to estimate the  $P_{90}$  and  $P_{10}$  probability levels. The hypothesis was tested by comparing the actual production (truth) at an assumed abandonment pressure to the calculated prediction interval. If the actual remaining production is within the prediction interval ( $P_{90}$  and  $P_{10}$  values) approximately 80 percent of the time the hypothesis will be assumed to be true.

The hypothesis was tested using a least squares fit through the  $P/Z$  versus  $G_p$  data (Least Square method). In cases where an established data trend changes, only the most recent data following the new trend were used in the statistical analysis and prediction interval calculation. A second method that is biased to honor the highest pressure (the empirical High Pressure method) trend data was also used to test the hypothesis. Evaluators sometimes use a fit that honors the highest pressure data based on the assumption that the pressure data will be low due to incomplete pressure buildup and liquid accumulation in the well bore. Again, in cases where an established data trend

changes, only the most recent data following the new trend were used in the prediction interval calculation. Production data from 28 wells in the Glick Field, Kiowa and Comanche County, Kansas and five wells from Laredo County, Texas were used to test the hypothesis.

The Glick Field wells and the Texas wells are discussed in the following paragraphs.

### 1.1 Glick Field Wells

The Glick Field, located in Kiowa and Comanche Counties of Kansas, is one of 29 gas fields in south-central Kansas and north central Oklahoma. It is on the extreme eastern flank of the Hugoton gas field ( Dodge County ) of the Anadarko Basin. It was discovered in 1957 and has produced more than 362 BCF. Mississippian Osage Chert, known as “Chat”, is the main production zone. The Glick Field reservoir is dominated by chert containing abundant sponge spicules. It is believed that late Mississippian or early Pennsylvanian conglomerate at Glick is a valley fill deposit. Porosity is between 25 to 50 percent with a highest measured value of 52 percent. Median permeability in the chert is around 32 millidarcies. The initial pressures were approximately 2050 psi (Longman et al. 1995)

## 1.2 Texas Wells

The unnamed (at the operator's request) Texas wells are located in Laredo County, South Texas. The producing zone is the tertiary 'Lobo' sand series (Lower Wilcox). Porosity ranges from 18 to 26 percent and permeabilities range from 1 to 10 millidarcies. Most wells were hydraulically fracture stimulated after completion. Initial pressures range from 2300 to 3500 psi.

## 2. LITERATURE SEARCH

Many papers since late 1960's have presented the idea of applying statistical approaches to reserves estimates because of uncertainties in the oil and gas business. Monte Carlo simulation is used to combine the uncertainties from each reservoir parameters in determining probability ranges of hydrocarbon in place from the volumetric method (Glen Van Horn, 1970). Monte Carlo simulation is also used in feasibility and sensitivity studies for decision making in investment, exploration, production and stimulation (Dougherty, 1972).

In 1993, Capen presented a definition of probabilistic reserves. The author defined the terms "proved", "probable" and "possible" reserves as the level of reserves that is exceeded 97 percent, 60 percent and 10 percent of the time, respectively. Monte Carlo simulation was also used to combine proved reserves from each well to determine proved field reserves. The results indicate that simple addition of individual well reserves did not mean the same as proved field reserves because the result of adding proved reserves from each well were not equal to total field reserves.

In 1967, McCray and Corner introduced the idea of applying confidence intervals, based on Student's t distribution, to decline curve analysis. The technique was

used in both exponential and hyperbolic decline. At that time, the authors evaluated only 90 percent confidence intervals. In 1994, Huffman added the use of prediction intervals to decline curve analysis. The author applied the concept to wells in the Bugle Field, Colorado. In this study, various probability ranges were evaluated. The author also screened the data by using residual analysis and neglecting some early data for more appropriate generated prediction intervals. In some cases, a narrow prediction interval range was used to estimate the  $P_{90}$  and  $P_{10}$  values. This is based on the assumption of a lognormal distribution. Screening the data and the alternative method for estimating  $P_{90}$  and  $P_{10}$  resulted in 77 percent of the time ARR in the calculated range for  $P_{90}$  and  $P_{10}$  compared to 65 percent from using every data point.

In 1987, Thompson, Wright and Digert evaluated the decline curve analysis method for evaluating estimated remaining reserves. Approximately 80 analysts used decline curve methods to estimate ultimate reserves and remaining reserves on an annual basis for wells in Campbell County, Wyoming. The results were evaluated by using accuracy ratio plots (both ERR/ARR and EUR/AUR). The authors found that during early years ERR/ARR ratios ranged from 0.4 to 3.0 and in some cases did not improve significantly after receiving more data. The computerized best fit must be applied with care to decline curve analysis, especially with erratic production data.

Ambastha and van Kruysdijk (1993) investigated the affect of quality and quantity of data to estimate gas in place, by gas material balance calculation. The author used Monte Carlo simulation in data error modeling. It was found that the influence of systematic errors in  $P/Z$  on percent error in estimating initial gas in place is stronger than systematic error in  $G_p$ . The author also noted that the error in estimating gas in place will be reduced if data is collected more frequently. The author claims that if later data points have smaller error than error for the earlier data, the estimated gas in place will be underestimated. On the other hand, if the errors in later data points are larger than the errors for the earlier data, the estimated gas in place will be overestimated. Sources of error for the gas material balance method are problems from well test data acquisition and interpretation, techniques to estimate average reservoir pressure, phase behavior effects for gas condensate fluids, inadequate accounting of the production fluid, human errors, and metering problems. Unfortunately, the study was purely hypothetical. There was an absence of real data and methods to quantify the actual error were not proposed.

### 3. METHODOLOGY

Deterministic and probabilistic reserve estimates were made for 28 wells in the Glick Field, Kansas and 5 wells located in Laredo, County Texas. The methods used to estimate the best fit, group the wells, calculate prediction intervals, combine individual distributions for a field total distribution, and graph the results are presented in the following paragraphs.

#### 3.1 Estimating the Best Fit

Two approaches were used to determine the best fit. The first case used a combination of linear regression and estimator judgment (Least Square method) as to which data to include in the least squares calculation. An example of the change in  $P/Z$  versus  $G_p$  trend and the best fit are shown in Figure 1. For example, early data is ignored if data exhibits a new trend. The second method, referred as the High Pressure method, favored the “high pressures” in the data set, Figure 2. This procedure was tested since it is common practice for engineers to bias their best fit line to honor the higher pressures. This practice is based on the assumption that the recorded pressures are likely understated. Pressure data used in  $P/Z$  versus  $G_p$  analysis are often based on incomplete pressure buildup (24 or 72 hour is common). Surface pressures are also commonly used

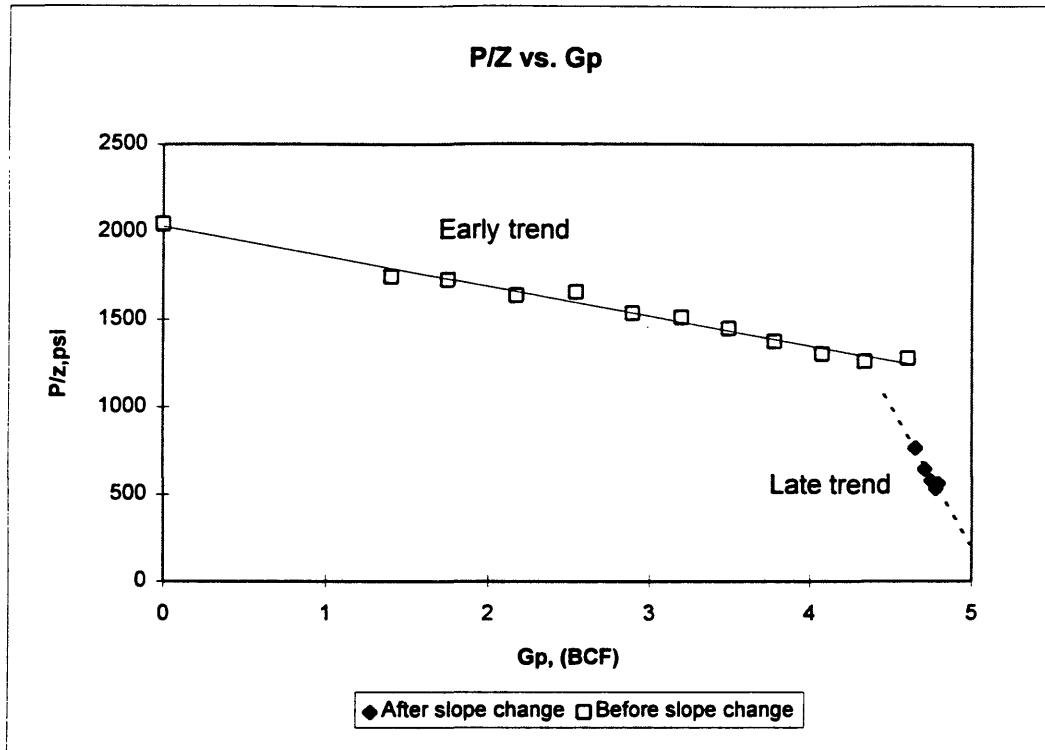


Figure 1. An example of The Least Square method

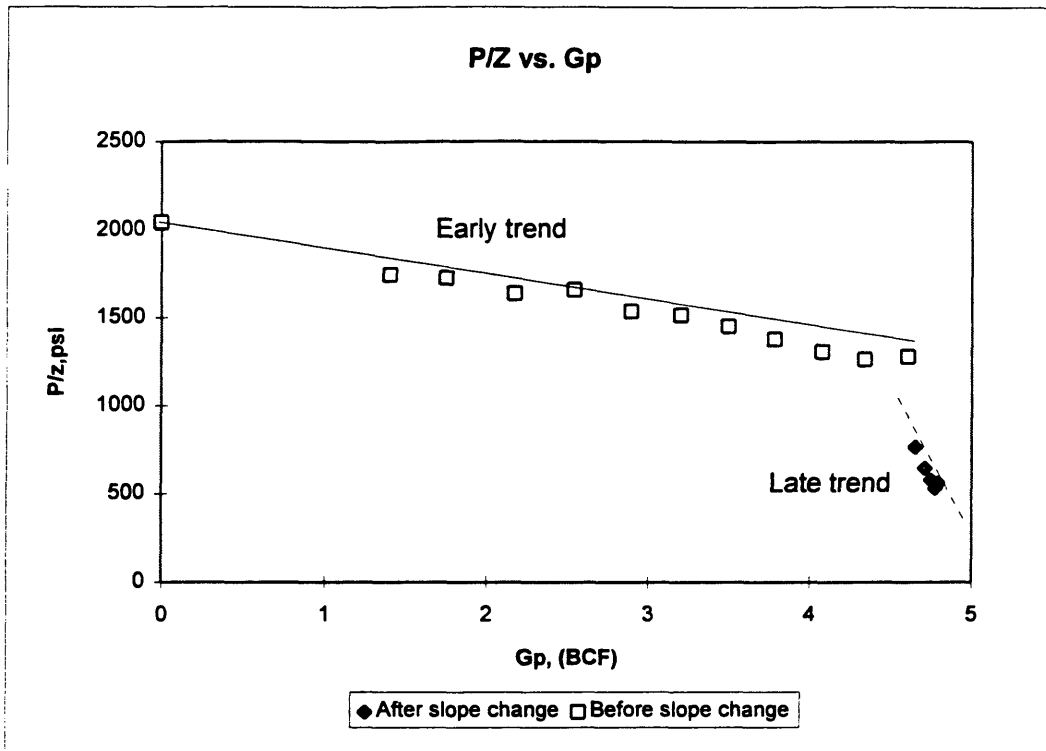


Figure 2. An example of the High Pressure method

in lieu of bottom hole pressure measurements. These pressures must be corrected to downhole conditions. This correction in itself could be high or low. However, any fluid accumulation in the wellbore is usually not accounted for in the adjustment from surface to downhole conditions. Fluid accumulation in the wellbore would have the impact of understating the downhole pressure.

### 3.2 Chronologic Analysis

Annual estimates of remaining reserves were made starting in the year in which at least three data points were recorded. This approach is intended to model the annual estimates made by reserve estimators. A minimum of three data points are needed to calculate the prediction intervals. Each year pressure versus time plots were used to estimate possible pressure communication. Figure 3 and Figure 4 demonstrate the method used to estimate pressure communication. For cases where the wells were determined to be in pressure communication, the wells in pressure communication were placed in a group. The pressure data and cumulative production for the grouped wells was used in calculating the  $P_{90}$ - $P_{10}$  prediction intervals.

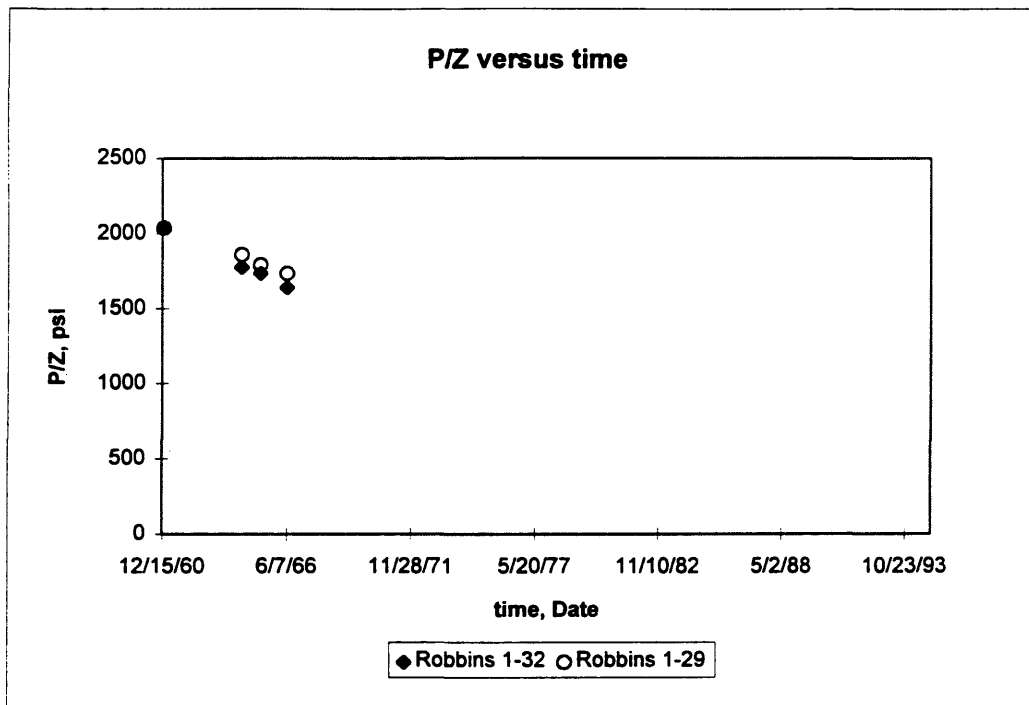


Figure 3. The plot of P/Z versus time before pressure communication

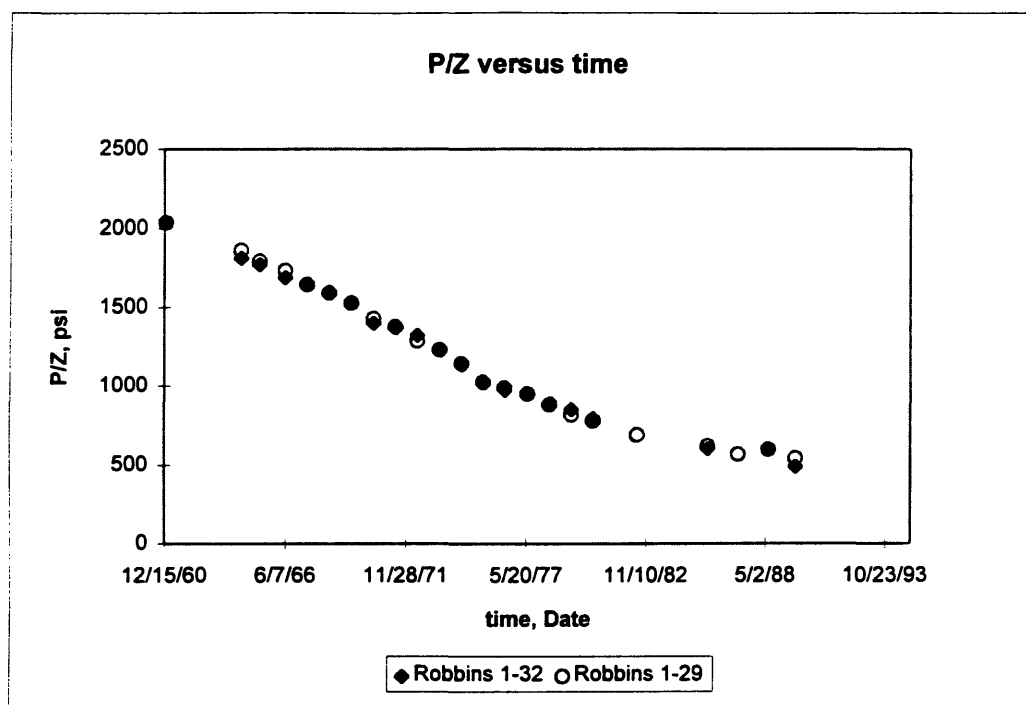


Figure 4. The plot of P/Z versus time after pressure communication

### 3.3 Prediction Interval Calculations

In the analysis, the recorded cumulative gas production was assumed to have no or negligible error. The recorded pressure was assumed to have sampling variability. For this reason, in using the  $P/Z$  versus  $G_p$  plot to estimate ultimate gas reserves at an assumed abandonment pressure,  $G_p$  was assumed to be the “x” variable and  $P/Z$  was assumed to be the “y” variable. This assumption permits an analysis of the variability of “y on x.”

The “best fit” line through the  $P/Z$  versus  $G_p$  data is used to calculate the variability of the  $P/Z$  data on  $G_p$ . The Student’s  $t$  distribution is used to model the variability. The Student’s  $t$  distribution is applicable for sampling from normal distributions but can be used when the distribution is not normal as long as the distribution is “at least symmetrical, unimodal, and with a variance that is not inordinately large” (Dowdy and Wearden, 1983, 175).

The following prediction interval equation is used to estimate future values for  $P/Z$  at  $P_{90}$  and  $P_{10}$  values. The prediction interval equation gives the prediction of the next  $y$  observation at a given level of  $x$  (Dowdy and Wearden, 1983, 226). An example is presented in Figure 5.

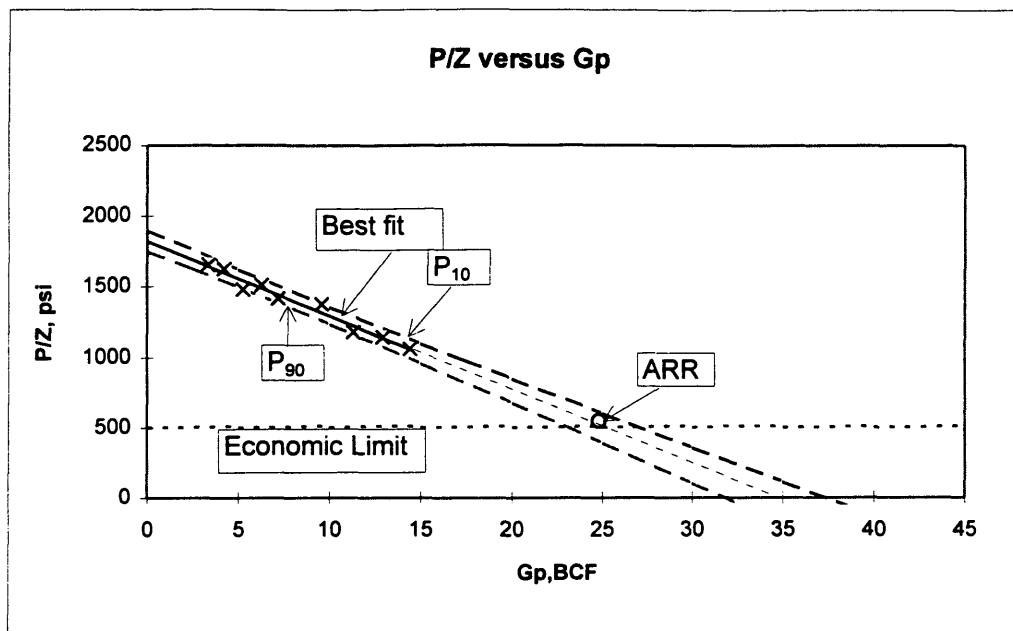


Figure 5. An example of prediction intervals

$$PI_{1-\alpha} = y \pm t_{\alpha/2, n-2} S_{yx} \sqrt{1 + \frac{1}{n} + \frac{(x - \bar{x})^2}{S_{xx}}} \dots\dots\dots(1)$$

where

$$S_{yx}^2 = \frac{S_{yy} - S_{xy}^2 / S_{xx}}{n - 2}$$

$$S_{xy} = \sum xy - (\sum x)(\sum y)/n$$

$$S_{xx} = \sum x^2 - (\sum x)^2/n$$

$$S_{yy} = \sum y^2 - (\sum y)^2/n$$

$\bar{x}$  = mean of x

n = Sample population.

$\alpha$  = Probability level.

v = degree of freedom.

PI = Prediction interval.

t = Student's t distribution.

Student "t" distribution is described by equation:

$$t = \frac{\bar{y} - \mu}{s / \sqrt{n}} \dots\dots\dots(2)$$

where

$\bar{y}$  = linearized pressure data.

$\mu$  = mean of the sample population.

s = sample standard deviation

$s/\sqrt{n}$  = estimate of standard error

n = sample population.

The use of the Student's t distribution requires the variability of P/Z on Gp be random around the best fit. The use of the least squares fit increases the likelihood that the random requirement is met. However, the best fit honoring the highest pressures does not pass this test. For this reason the High Pressure approach will be referred to as an empirical method.

The random and independent requirement for the Student's t distribution is tested using residual plots where the difference between actual P/Z and the best fit P/Z is plotted against the best fit P/Z.

### 3.4 Remaining Reserves - Field Total

Monte Carlo simulation was used to determine the total estimated remaining reserves for the Glick Field wells. The remaining reserves distribution for each well or group of wells was used as input into a Monte Carlo simulation model. The individual wells were modeled as a normal distribution using the  $P_{90}$  and  $P_{10}$  values from the prediction interval calculation. Monte Carlo simulation addition is necessary since the addition of individual  $P_{90}$  and  $P_{10}$  values will give misleading results when combining

wells (or groups) into a total (Hefner 1995; Capen 1996). The results for Glick Field individual wells, groups of wells and field total are summarized in Appendix B-1. An example for the field total with and without group 8 at the 800 psi abandonment pressure is presented in Table 1.

### 3.5 Examination of Residuals

Residual analysis can provide an indication of the quality of a regression, in general, or best fit of a P/Z plot. For this project, the errors (differences between best fit and real pressure data) were plotted against the least square fit pressure data to examine data trends and/or scatter. The ordinate value of zero represents the best fit and the errors were plotted as negative or positive distance at each point of cumulative gas production for the pressure history. The application of the proposed method requires good scatter of historic data to provide quality prediction intervals. Examples of residual plots are presented in Figure 6 and Figure 7.

### 3.6 Accuracy Ratio Plots

Two plots are used to graphically represent the results of the study. The implications of the two plots, referred to as accuracy ratio plots, are presented in the following paragraphs.

Table 1. An example of field total remaining reserves

<b>Total Field Results from Monte Carlo Simulation</b>											
@800 psi W/Group 8	EUR			Least Square method			ERR			ARR	BIAS
	P90	P50	P10	AUR	Logic	CUM	P90	P50	P10		
EUR until 4/65	165.26	182.83	200.56	206.92	FALSE	48.97	116.29	133.86	151.59	157.95	HIGH
EUR until 6/66	176.49	183.63	190.81	206.92	FALSE	62.00	114.49	121.63	128.81	144.92	HIGH
EUR until 6/67	182.92	188.59	194.19	211.12	FALSE	72.81	110.11	115.78	121.38	138.31	HIGH
EUR until 6/68	167.09	173.54	180.11	219.91	FALSE	78.95	88.14	94.59	101.16	140.96	HIGH
EUR until 6/69	168.34	173.95	179.00	219.91	FALSE	90.23	78.11	83.72	88.77	129.68	HIGH
EUR until 6/70	181.84	188.02	194.23	219.91	FALSE	98.93	82.91	89.09	95.30	120.98	HIGH
EUR until 6/71	200.00	206.98	213.51	219.91	FALSE	116.43	83.57	90.55	97.08	103.48	HIGH
EUR until 6/72	190.25	208.96	227.20	219.91	TRUE	132.32	57.93	76.64	94.88	87.59	HIGH
EUR until 6/73	204.97	210.28	215.88	219.91	FALSE	145.08	59.89	65.20	70.80	74.83	HIGH
EUR until 6/74	207.84	211.32	215.97	219.91	FALSE	153.19	54.65	58.13	62.78	66.72	HIGH
EUR until 6/75	209.77	212.54	215.89	219.91	FALSE	166.06	43.71	46.48	49.83	53.85	HIGH
EUR until 6/76	208.68	214.37	220.25	219.91	TRUE	175.37	33.31	39.00	44.88	44.54	HIGH
EUR until 6/77	214.51	215.43	220.60	219.91	TRUE	183.50	31.01	31.93	37.10	36.41	HIGH
EUR until 6/78	214.31	216.33	220.22	219.91	TRUE	190.98	23.33	25.35	29.24	28.93	HIGH
EUR until 6/79	213.25	216.16	219.93	219.91	TRUE	197.47	15.78	18.69	22.46	22.44	HIGH
EUR until 6/80	214.00	216.10	219.99	219.91	TRUE	199.91	14.09	16.19	20.08	20.00	HIGH
EUR until 6/82	211.97	215.73	219.97	219.91	TRUE	200.30	11.67	15.43	19.67	19.61	HIGH
				%TRUE	42%					%HIGH	100%
				%FALSE	58%					%LOW	0%

<b>Total Field without group 8 Results From Monte Carlo Simulation</b>											
@ 800 psi W/O Group 8	EUR			Least Square method			ERR			ARR	BIAS
	P90	P50	P10	AUR	Logic	CUM	P90	P50	P10		
EUR until 4/65	165.26	182.83	200.56	194.90	TRUE	48.97	116.29	133.86	151.59	145.93	HIGH
EUR until 6/66	176.49	183.63	190.81	194.90	FALSE	62.00	114.49	121.63	128.81	132.90	HIGH
EUR until 6/67	182.92	188.59	194.19	199.10	FALSE	75.47	107.45	113.12	118.72	123.63	HIGH
EUR until 6/68	167.09	173.54	180.11	207.89	FALSE	77.14	89.95	96.40	102.97	130.75	HIGH
EUR until 6/69	168.34	173.95	179.00	207.89	FALSE	87.31	81.03	86.64	91.69	120.58	HIGH
EUR until 6/70	181.84	188.02	194.23	207.89	FALSE	98.93	82.91	89.09	95.30	108.96	HIGH
EUR until 6/71	189.63	196.67	203.98	207.89	FALSE	110.23	79.40	86.44	93.75	97.66	HIGH
EUR until 6/72	179.43	198.07	216.26	207.89	TRUE	124.94	54.49	73.13	91.32	82.95	HIGH
EUR until 6/73	194.01	199.23	204.10	207.89	FALSE	136.80	57.21	62.43	67.30	71.09	HIGH
EUR until 6/74	196.55	200.05	203.99	207.89	FALSE	144.91	51.64	55.14	59.08	62.98	HIGH
EUR until 6/75	198.25	200.95	203.99	207.89	FALSE	156.07	42.18	44.88	47.92	51.82	HIGH
EUR until 6/76	197.04	202.64	208.57	207.89	TRUE	164.22	32.82	38.42	44.35	43.67	HIGH
EUR until 6/77	201.67	203.57	207.95	207.89	TRUE	171.86	29.81	31.71	36.09	36.03	HIGH
EUR until 6/78	200.47	204.49	208.31	207.89	TRUE	178.84	21.63	25.65	29.47	29.05	HIGH
EUR until 6/79	201.42	204.27	207.95	207.89	TRUE	185.33	16.09	18.94	22.62	22.56	HIGH
EUR until 6/80	200.20	204.19	208.04	207.89	TRUE	187.77	12.43	16.42	20.27	20.12	HIGH
EUR until 6/82	200.09	203.88	207.93	207.89	TRUE	188.16	11.93	15.72	19.77	19.73	HIGH
				%TRUE	47%					%UP	100%
				%FALSE	53%					%LOW	0%

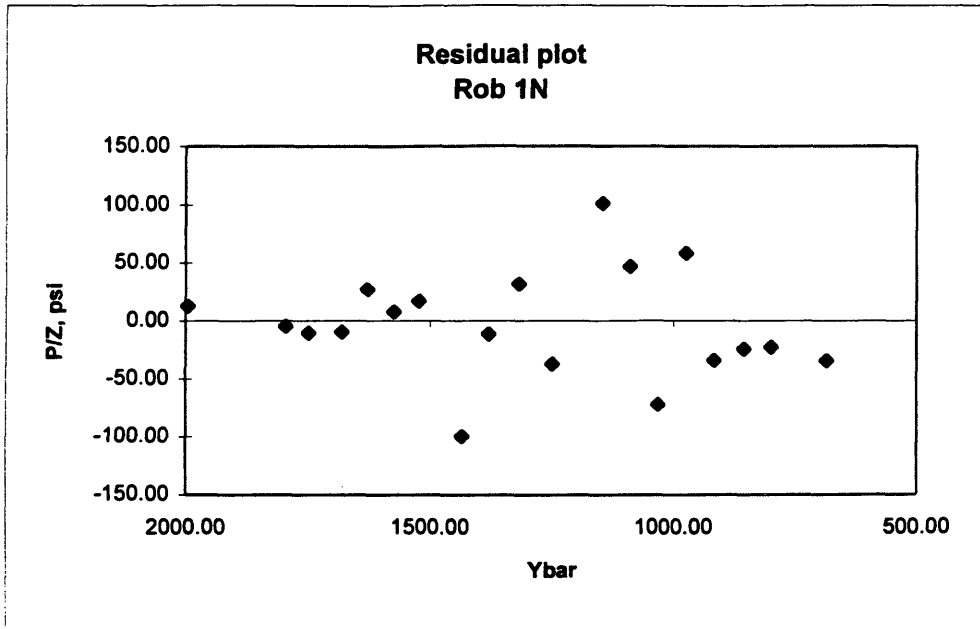


Figure 6 Example of good random scatter data

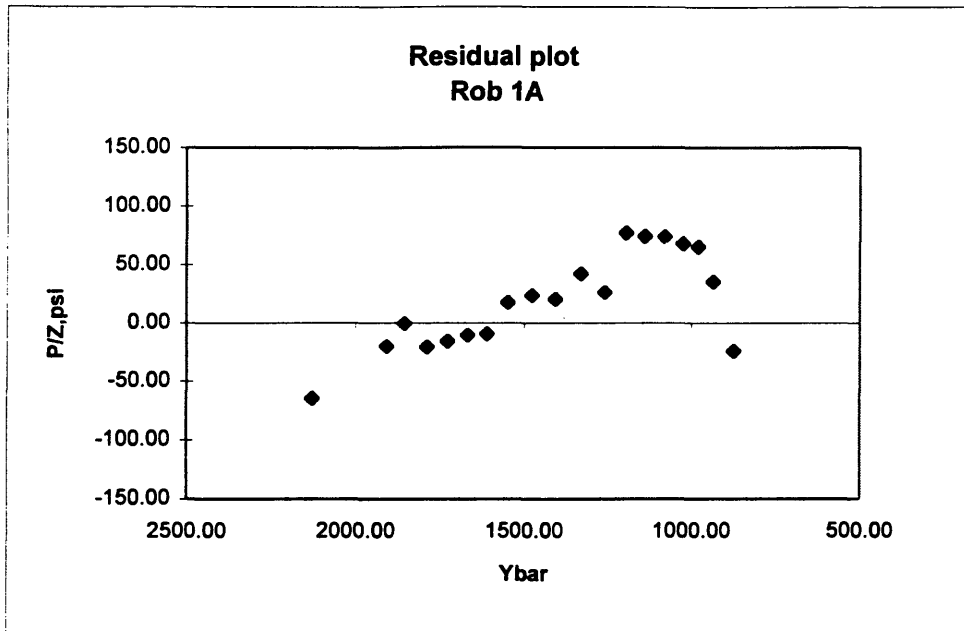


Figure 7 Example of non-random scatter data

### 3.6.1 ERR/ARR vs. Gp/Gabn Plot

A plot of the ratio of estimated remaining reserves (ERR) over actual remaining reserves (ARR) versus cumulative gas production as a fraction of gas produced at the abandonment pressure graphically depicts the ability of the prediction interval to bracket the actual remaining reserves over time. As the value of ERR approaches ARR, the ratio ERR/ARR approaches 1. A ratio of 1 is referred to as the baseline value and represents the case where ERR equals ARR. If the plot of  $P_{10}/ARR$  and  $P_{90}/ARR$  bracket the baseline ratio of 1, then the 80 percent prediction interval brackets the actual remaining reserves. A sample of this plot was shown in Figure 8 .

### 3.6.2 EUR/AUR vs. Gp/Gabn Plot

A plot similar to this was introduced by Arps (1956), Figure 9. The Arps schematic implies that as more data becomes available, the range of estimated ultimate reserves (EUR) should narrow and approach actual ultimate reserves (AUR). The ratio of EUR over AUR should approach 1 with increasing cumulative production. This is the case since EUR is equal to ERR plus cumulative production. With increasing cumulative production, EUR consists of a greater fraction of a certain number and less of an uncertain number, ERR. The issue is to determine if the range of EUR systematically

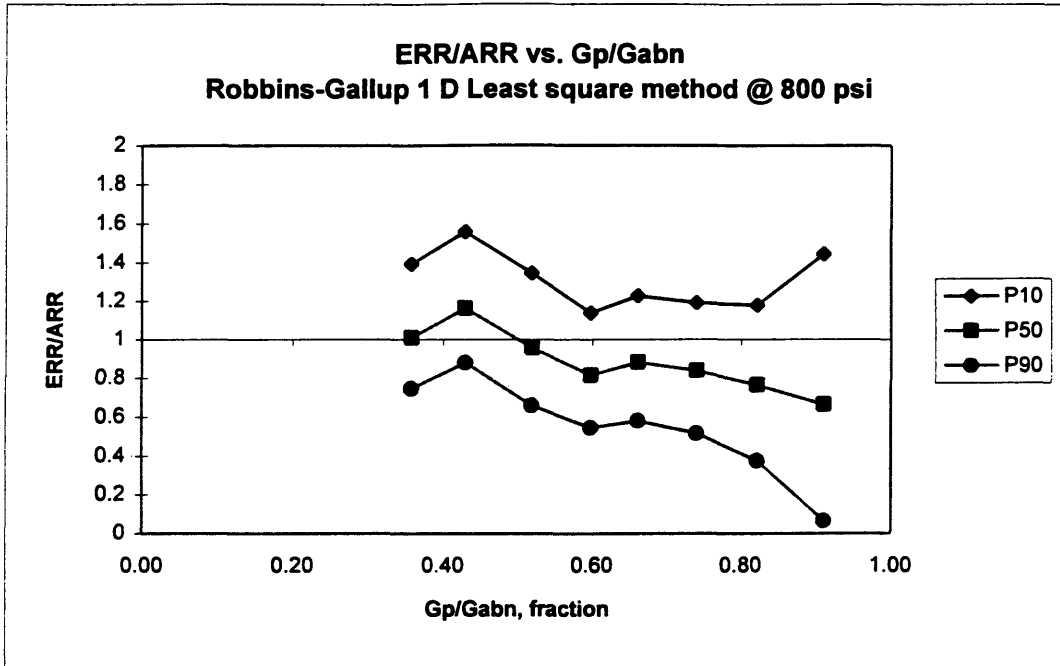
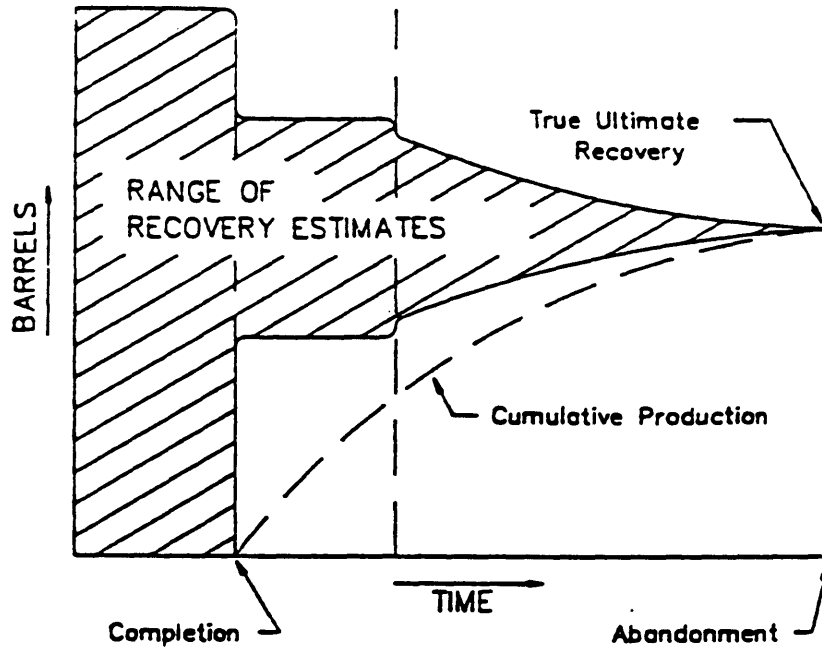


Figure 8 ERR/ARR plot



PERIOD	I BARRELS PER ACRE PERIOD	II BARRELS PER ACRE-- FOOT PERIOD	III DECLINE CURVE PERIOD
TYPE OF DATA	COMPARATIVE DATA	VOLUMETRIC DATA	PERFORMANCE DATA

Figure 9 Arp's accuracy ratio plot

brackets a ratio of 1 for EUR/AUR as implied by the Arps schematic. A sample of this plot is shown in Figure 10.

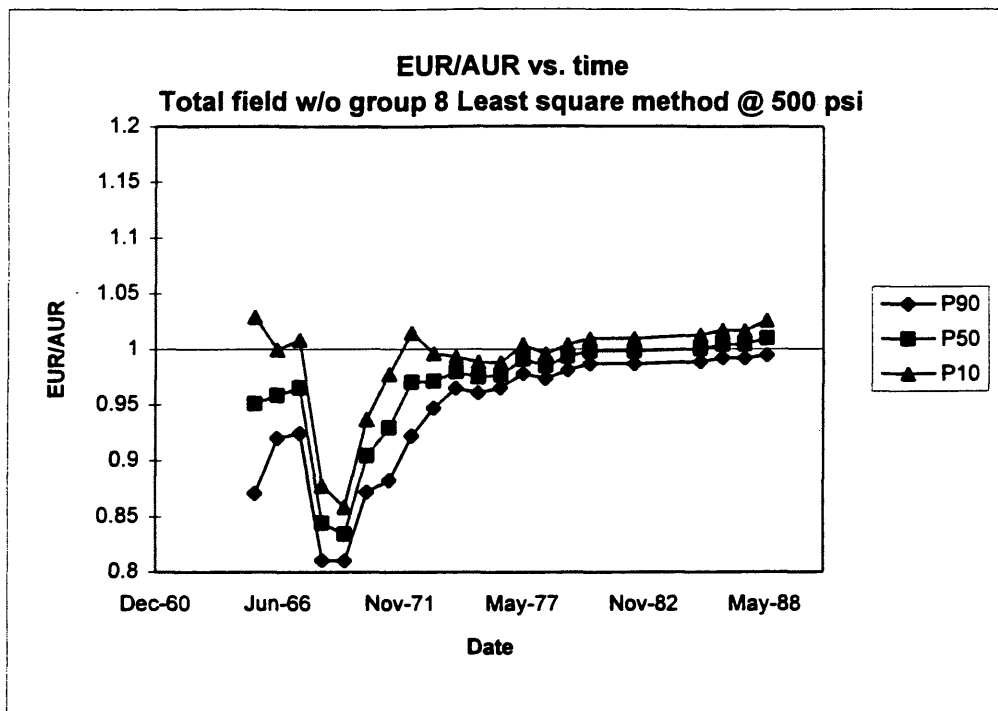


Figure 10. An example of EUR/AUR plot

## 4. RESULTS

The following paragraphs present the results of the analysis for the Glick Field and the unnamed Texas Field. A discussion of these results is presented in the discussion section of the thesis.

### 4.1 Glick Field

The chronologic grouping of the Glick Field wells for the P/Z analysis is summarized in Tables 2(a) and 2(b). The Glick Field wells were placed into 7 groups as shown in Table 3(a) and 3(b). Figure 11 is a plot showing the relative location and grouping of the Glick Field wells.

Using this grouping of wells, the proposed hypothesis was tested for two assumed abandonment pressures. Late in the production history at approximately 800 psi reservoir pressure, some of the wells were shut in due to production curtailment. Some wells were shut in for nearly two years. At the time of this analysis, production data was available for all the study wells at the 500 psi abandonment pressure. The abandonment pressures of 500 and 800 psi were tested to isolate the possible impact of the curtailment.

Table 2(a). Chronologic Grouping Scheme for Glick Field wells  
Effective Date of Evaluation

Well Name	Location	Jun-65	Jun-66	Jun-67	Jun-68	Jun-69	Jun-70	Jun-71	Jun-72	Jun-73	Jun-74	Jun-75	Jun-76
Rob1-32	32-30-16 C SW NE	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p
Rob1-33	33-30-16 C SW NE	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p
Rob1-20	20-30-16 C SE	3,p	3,p	3,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p
Rob1-29	29-30-16 C SW NE	3,p	3,p	3,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p
Rob1-28	28-30-16 C NE NW	3,p	3,p	3,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p
Rob1-L	22-30-16 C SW	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p
Rob1-J	27-30-16 C NE SW	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p
Rob 2-21	21-30-16 NE SW SW	p	p	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p
RobGal1C	12-31-16 C NW	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p
RobGal 1	1-31-16 C SW	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p
Rob. 1-K	3-31-16 NW SE NW	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p
RobGal1A6	2-31-16 NW SE NW	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p
Hash1B11	11-31-16 C E1/2 NW	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p
Run1B23	23-30-17 C N1/2 SE	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p
Run1B14	14-30-17 C SE	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p
Rice 1	24-30-17 C SE SE	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p
Runn1E	17-30-17 C SE	np	p	p	8,p	8,p	8,p	8,p	8,p	8,p	8,p	8,p	8,p
KaneC2	18-303-17 C SE	np	p	p	8,p	8,p	8,p	8,p	8,p	8,p	8,p	8,p	8,p
Canton1C	20-30-17 NW	np	p	p	p	p	8,p	8,p	8,p	8,p	8,p	8,p	8,p
Rob1A	31-30-16 C SW NE	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p
RobED/C	30-30-16 C SW NE	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p
Rob.1G	34-30-16 C SE NW	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p
Rob.1H	4-31-16 SW NE NE	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p
Rob.1N	26-30-16 C SW	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p
Rob.1	6-31-16 CNW	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p
RobGal1D	13-31-16 SE NW NW	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p
Hash1A	10-31-16 NW SW NE	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p
Hash1B14	14-31-16 C N1/2	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p

ng = not in group  
 p = producing  
 np = not producing  
 eg. 2,p = Group2, producing

Table 2(b) Chronologic Grouping Scheme for Glick Field wells  
Effective Date of Evaluation

Well Name	Location	Jun-77	Jun-78	Jun-79	Jun-80	Jun-81	Jun-82	Jun-83	Jun-84	Jun-85	Jun-86	Jun-87	Jun-88
Rob1-32	32-30-16 C SW NE	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	np	np	2,p
Rob1-33	33-30-16 C SW NE	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	np	np	2,p
Rob1-20	20-30-16 C SE	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p
Rob1-29	29-30-16 C SW NE	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p
Rob1-28	28-30-16 C NE NW	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p	2,p
Rob1-L	22-30-16 C SW	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p	N/A	N/A	4,p
Rob1-J	27-30-16 C NE SW	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p	np	np	4,p
Rob 2-21	21-30-16 NE SW SW	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p	4,p
RobGal1C	12-31-16 CNW	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p
RobGal 1	1-31-16 C SW	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p	5,p
Rob. 1-K	3-31-16 NW SE NW	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	np	np	6,p
RobGal1A6	2-31-16 NW SE NW	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	np	np	6,p
Hash1B11	11-31-16 CE1/2 NW	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p	6,p
Run1B23	23-30-17 CN1/2 SE	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p
Run1B14	14-30-17 C SE	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p
Rice 1	24-30-17 C SE SE	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p	7,p
Runn1E	17-30-17 C SE	8,p	8,p	8,p	8,p	8,p	8,p	8,p	8,p	8,p	8,p	8,p	8,p
KaneC2	18-303-17 C SE	8,p	8,p	8,p	8,p	8,p	8,p	8,p	8,p	8,p	8,p	8,p	8,p
Canton1C	20-30-17 NW	8,p	8,p	8,p	8,p	8,p	8,p	8,p	8,p	8,p	8,p	8,p	8,p
Rob1A	31-30-16 C SW NE	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,np	ng,np	ng,p
RobED/C	30-30-16 C SW NE	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p
Rob.1G	34-30-16 C SE NW	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,np	ng,np	ng,p
Rob.1H	4-31-16 SW NE NE	ng,p	ng,p	ng,np	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	N/A	N/A	ng,p
Rob.1N	26-30-16 C SW	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	N/A	N/A	ng,p
Rob.1	6-31-16 CNW	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,np	ng,np	ng,p
RobGal1D	13-31-16 SE NW NW	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,np	ng,p	ng,p
Hash1A	10-31-16 NW SW NE	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p
Hash1B14	14-31-16 CN1/2	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,p	ng,np	ng,p	ng,p	ng,p	ng,p

ng = not in group

p = producing

np = not producing

eg. 2,p = Group 2, producing

Table 3(a). Number of wells in each group, Glick Field

Group No.	Effective Date of Evaluation													
	Jun-65	Jun-66	Jun-67	Jun-68	Jun-69	Jun-70	Jun-71	Jun-72	Jun-73	Jun-74	Jun-75	Jun-76	Jun-77	
Group 2	2	2	2	5	5	5	5	5	5	5	5	5	5	
Group 3	3	3	3	Group 2	Group 2	Group 2	Group 2	Group 2	Group 2	Group 2	Group 2	Group 2	Group 2	
Group 4	2	2	3	3	3	3	3	3	3	3	3	3	3	
Group 5	2	2	2	2	2	2	2	2	2	2	2	2	2	
Group 6	3	3	3	3	3	3	3	3	3	3	3	3	3	
Group 7	3	3	3	3	3	3	3	3	3	3	3	3	3	
Group 8	0	0	2	2	2	3	3	3	3	3	3	3	3	

ng = not in group  
 p = producing  
 np = not producing  
 eg. 2,p = Group2, producing

Table 3(b). Number of wells in each group, Glick Field

Group No.	Effective Date of Evaluation									
	Jun-78	Jun-79	Jun-80	Jun-81	Jun-82	Jun-83	Jun-84	Jun-85	Jun-86	Jun-87
Group 2	5	5	5	5	5	5	5	5	3	3
Group 3	Group 2	Group 2	Group 2	Group 2	Group 2	Group 2	Group 2	Group 2	Group 2	Group 2
Group 4	3	3	3	3	3	3	3	3	1	1
Group 5	2	2	2	2	2	2	2	2	2	2
Group 6	3	3	3	3	3	3	3	3	1	1
Group 7	3	3	3	3	3	3	3	3	3	3
Group 8	3	3	3	3	3	3	3	3	3	3

ng = not in group  
 p = producing  
 np = not producing  
 eg. 2,p = Group2, producing

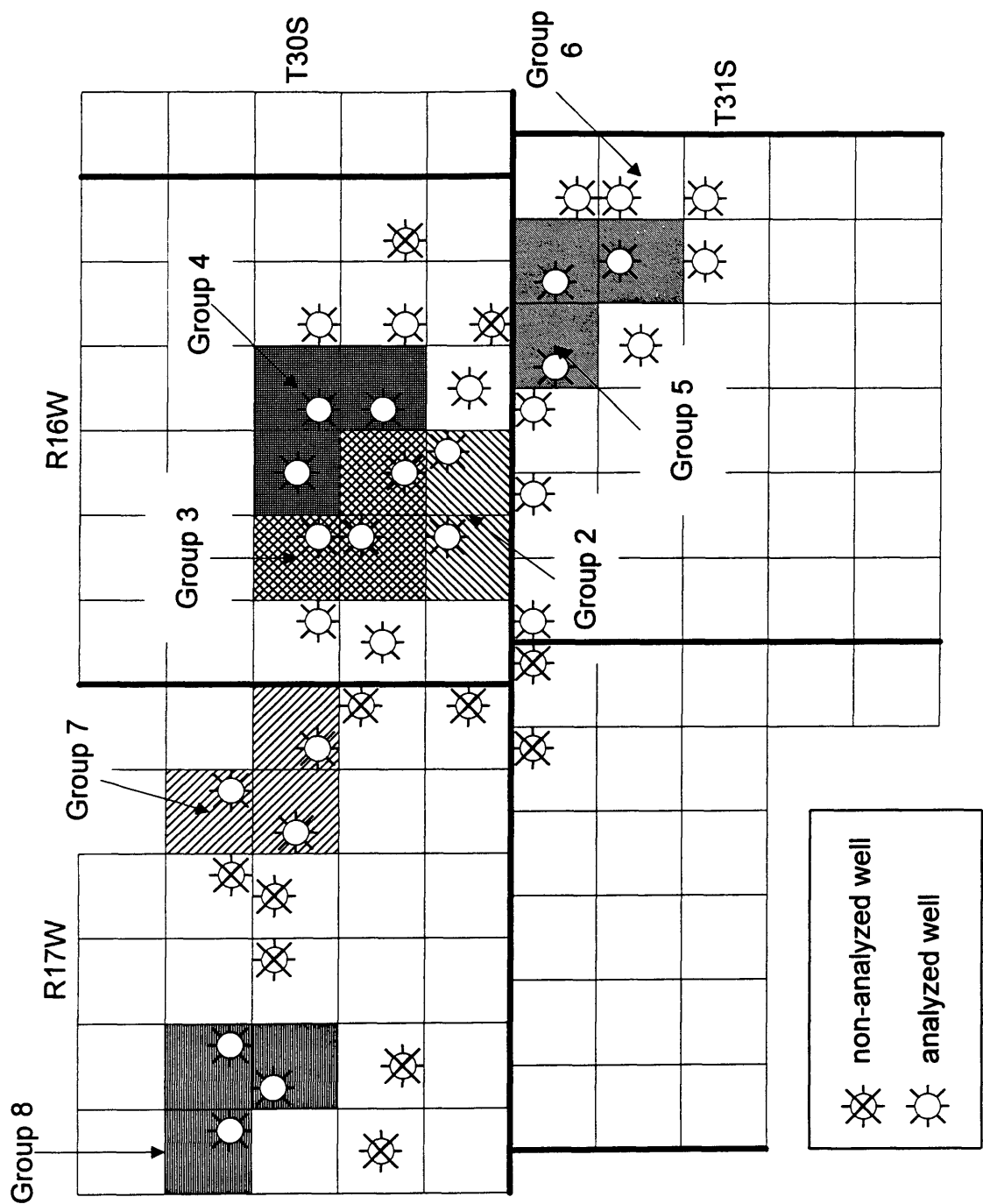


Figure 11. Groups and wells in Glick Field

Late production history for group 8 (Figure 12) deviated significantly from the early long term trend. Accordingly, the results are reported with and without group 8 to test the impact of this Group on the overall results.

The frequency of ARR within the  $P_{90}$  and  $P_{10}$  prediction interval for each group, individual wells not included in a group, and the field total is summarized in Table 4 for both methods and abandonment pressures.

The field total (including group 8) results indicate that the empirical High Pressure method produces better results at the 500 psi abandon pressure while the Least Square method performs better at the 800 psi abandon pressure. The best results for the field total, 43 percent, were from the Least Square method at the 800 psi abandonment pressure.

For the total field, excluding group 8, both methods had similar performance. The frequency of the ARR included in the  $P_{90}$  -  $P_{10}$  interval ranged from 43 percent to 53 percent regardless of the method and abandonment pressure. The best overall results of 53 percent came from the empirical High Pressure method at an 800 psi abandonment pressure without group 8.

Using the empirical High Pressure method, grouped wells when compared to the performance of individual wells generally performed better. Results from Group 2 and

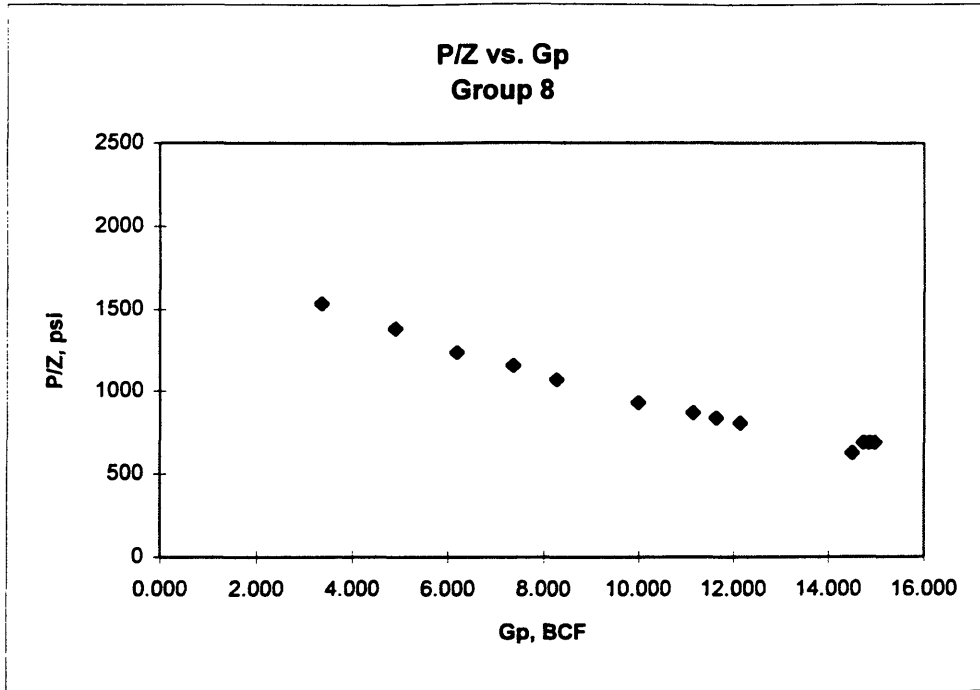


Figure 12 P/Z versus Gp from Group 8

Table 4. Glick Field successful results from each group, each well and total field

Frequency ARR Within $P_{90}$ - $P_{10}$ Predictive Interval				
Well or Group name	Least Square fit		High pressure fit	
	800 psi Abn	500 psi Abn	800 psi Abn	500 psi Abn
Group 2	80%	24%	87%	19%
Group 4	91%	62%	100%	71%
Group 5	27%	29%	53%	48%
Group 6	94%	90%	19%	38%
Group 7	0%	33%	89%	43%
Group 8	36%	0%	82%	27%
Robbins 1A	0%	0%	6%	0%
Robbins ED/C	69%	0%	6%	5%
Robbins 1G	0%	48%	38%	52%
Robbins 1H	0%	0%	0%	0%
Robbins 1N	87%	90%	40%	33%
Robbins 1	40%	48%	40%	43%
Rob. Gal 1D	100%	29%	38%	48%
Hashknife 1A	0%	38%	0%	0%
Hashknife 1B	100%	52%	58%	14%
Total field	43%	0%	29%	33%
Total field without group 8	48%	52%	53%	43%

Group 4, at 800 psi from both methods, approached the stated hypothesis. On the other hand, the Least Square method gave the better results for individual wells as shown in Table 4.

The frequency of the ARR around the  $P_{50}$  value was also analyzed, Table 5. A good statistical scatter would give approximately 50 percent of the ARR's on each side of the  $P_{50}$  value. For the field total at an assumed 500 psi abandonment pressure the Least Square method results were biased high (underestimate ARR) 100 percent of the time while the empirical High Pressure method generated a better balance of results, 48 percent of the time ARR was greater than  $P_{50}$  and 52 percent of the time ARR was less than  $P_{50}$ .

For a field total the best combination of prediction interval frequency (33 percent at 500 psi abandonment) and balance of ARR's (48 percent at 500 psi abandonment) around the  $P_{50}$  value resulted from the empirical High Pressure method.

Accuracy Ratio plots for EUR and ERR for both methods and abandonment pressure for the Glick field are presented as Figures 13 to 19. All accuracy ratio plots are presented in Appendix B-2.

Table 5. Glick Field bias results from individual wells, grouped wells and Field Total

Well or Group name	Least Square fit		High pressure fit	
	800 psi Abn	500 psi Abn	800 psi Abn	500 psi Abn
Group 2	73%	100%	80%	100%
Group 4	100%	100%	82%	100%
Group 5	100%	100%	100%	100%
Group 6	88%	95%	0%	95%
Group 7	100%	100%	67%	100%
Group 8	100%	100%	64%	100%
Robbins 1A	0%	0%	0%	0%
Robbins ED/C	0%	0%	0%	0%
Robbins 1G	100%	81%	81%	57%
Robbins 1H	0%	0%	0%	0%
Robbins 1N	40%	57%	13%	29%
Robbins 1	100%	29%	100%	24%
Rob. Gal 1D	75%	81%	88%	76%
Hashknife 1A	0%	0%	0%	0%
Hashknife 1B	17%	29%	8%	5%
Total field	100%	100%	41%	48%
Total field without group 8	100%	81%	35%	33%

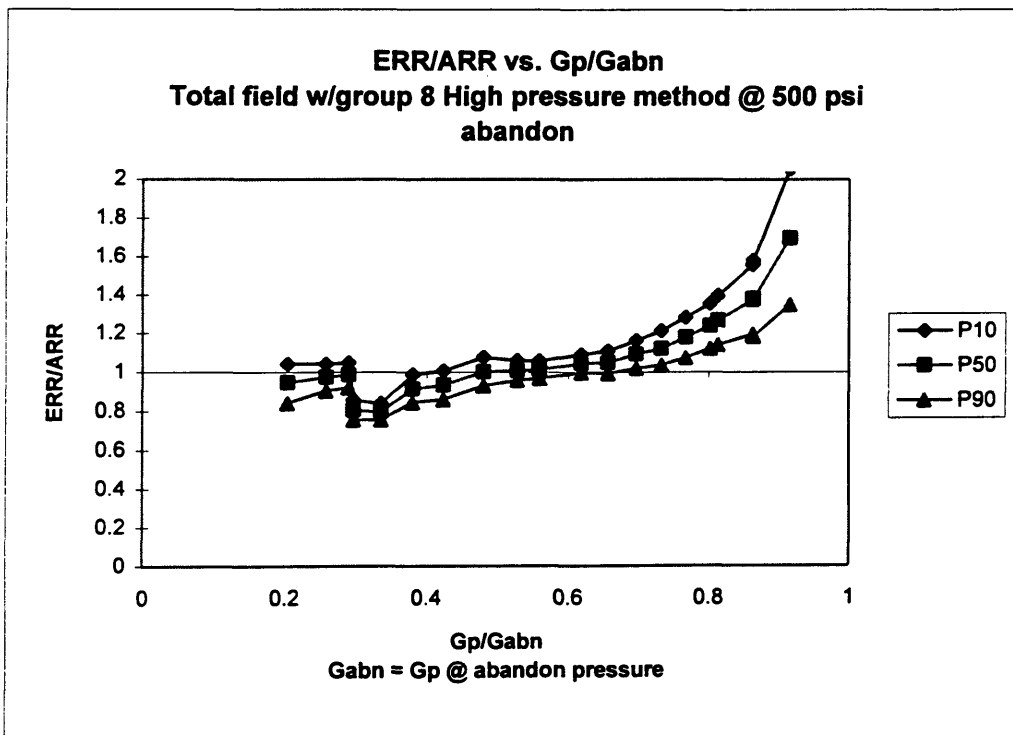
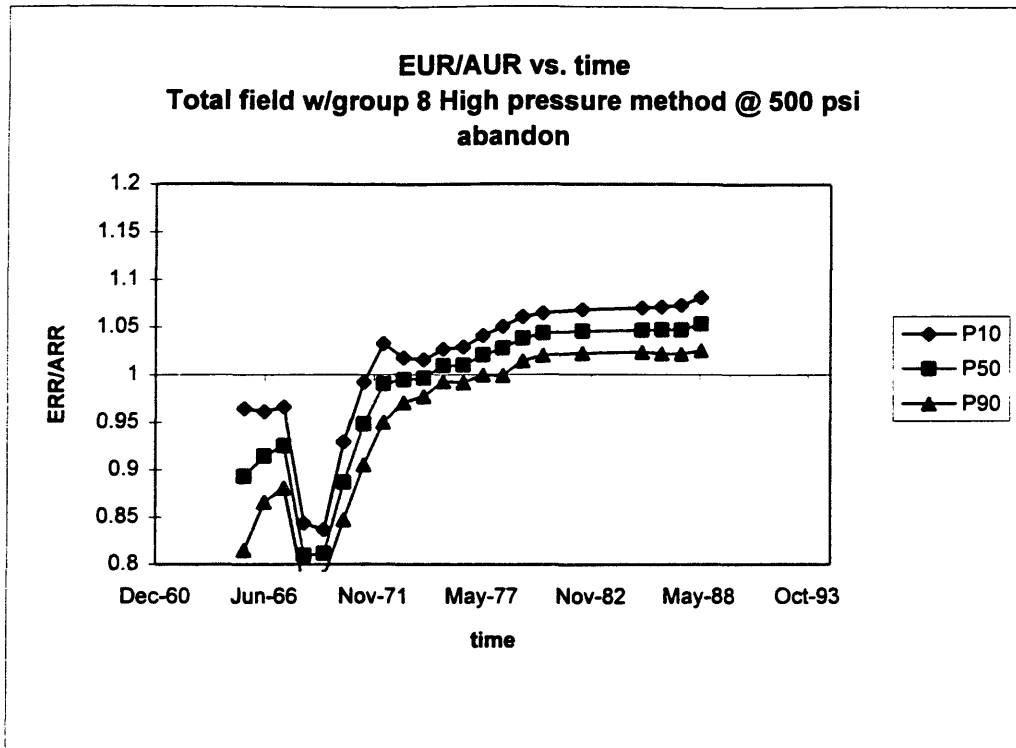


Figure 13. Accuracy ratio plots for Total field with group 8 from the empirical High Pressure method at 500 psi abandonment

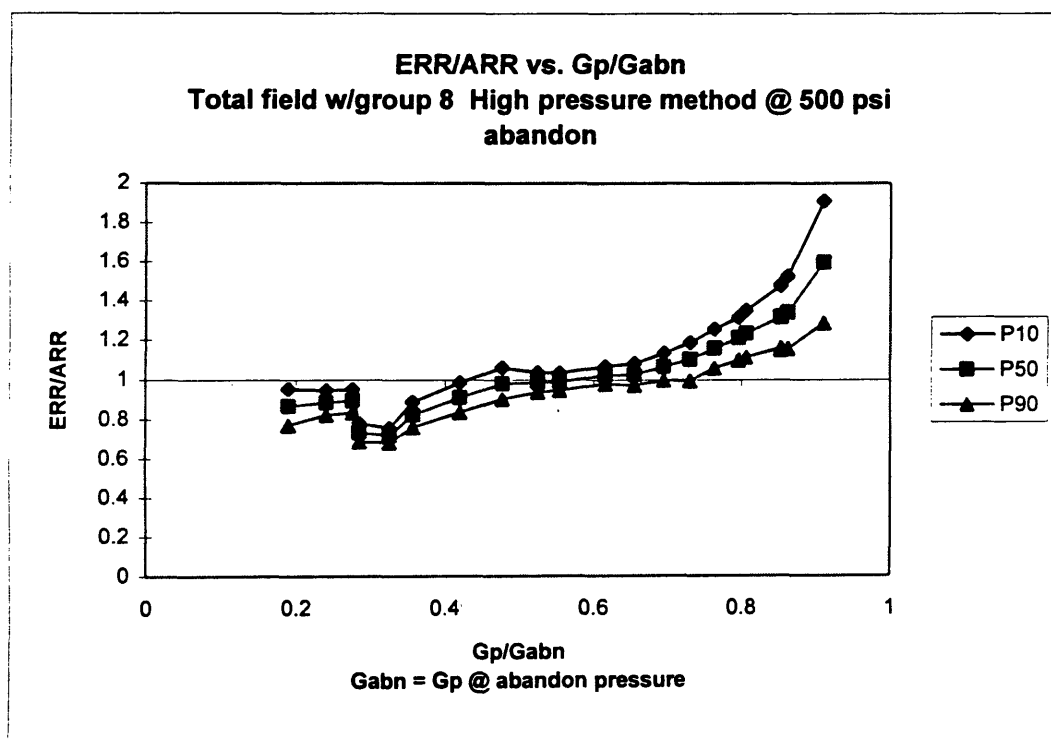
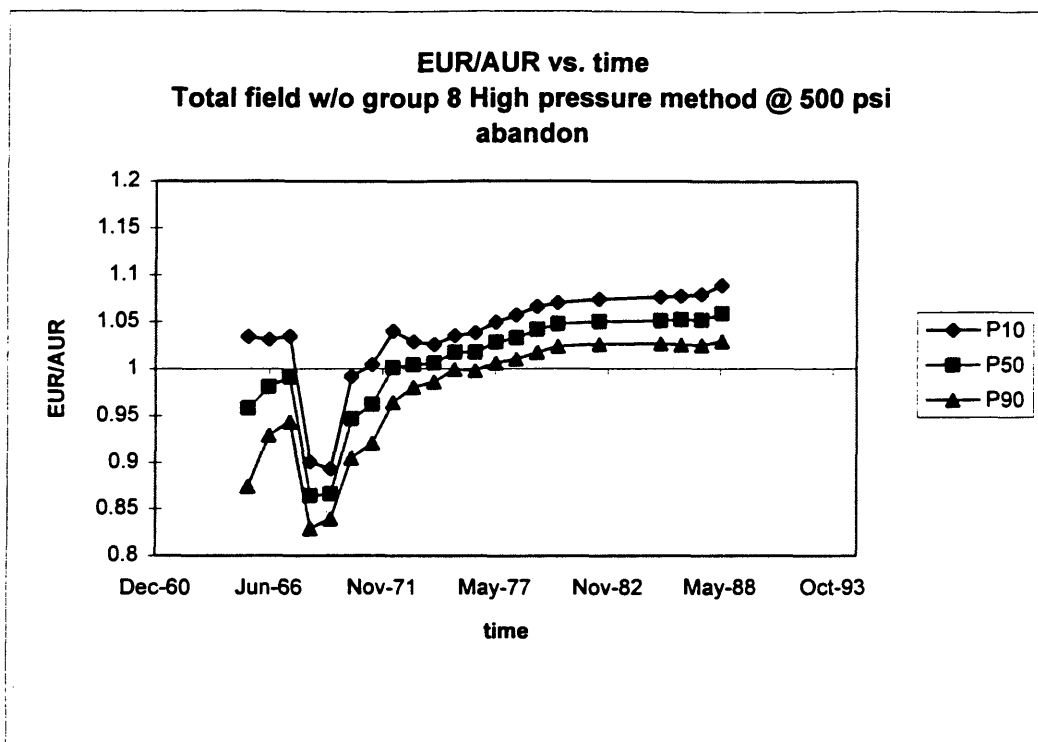


Figure 14. Accuracy ratio plots for Total field without group 8 from the empirical High Pressure method at 500 psi abandonment

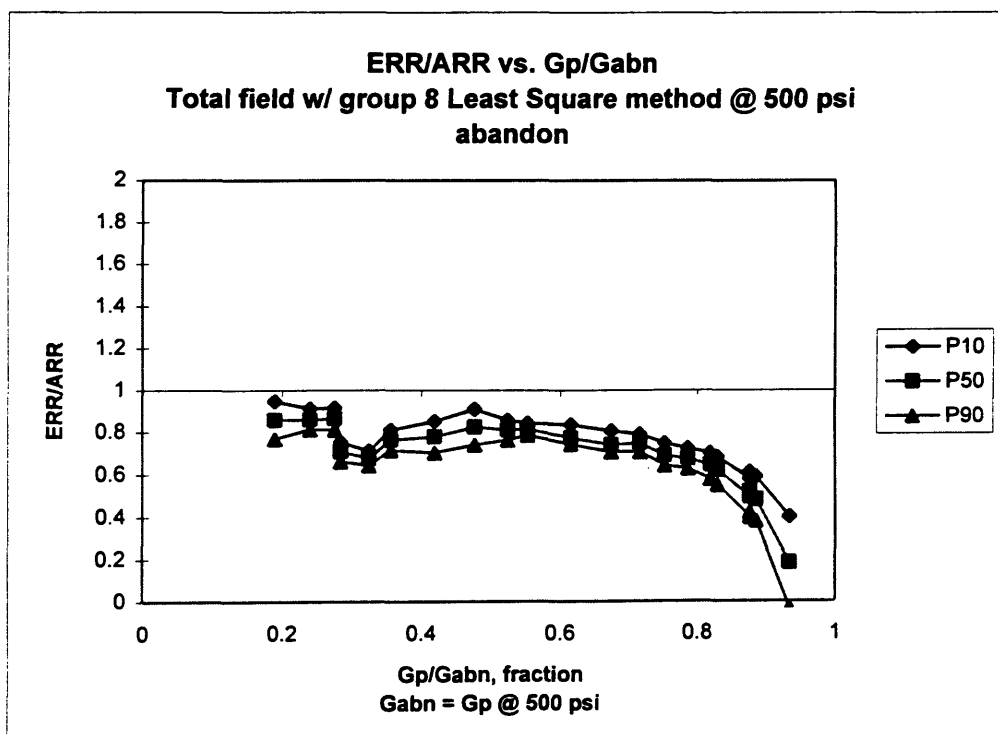
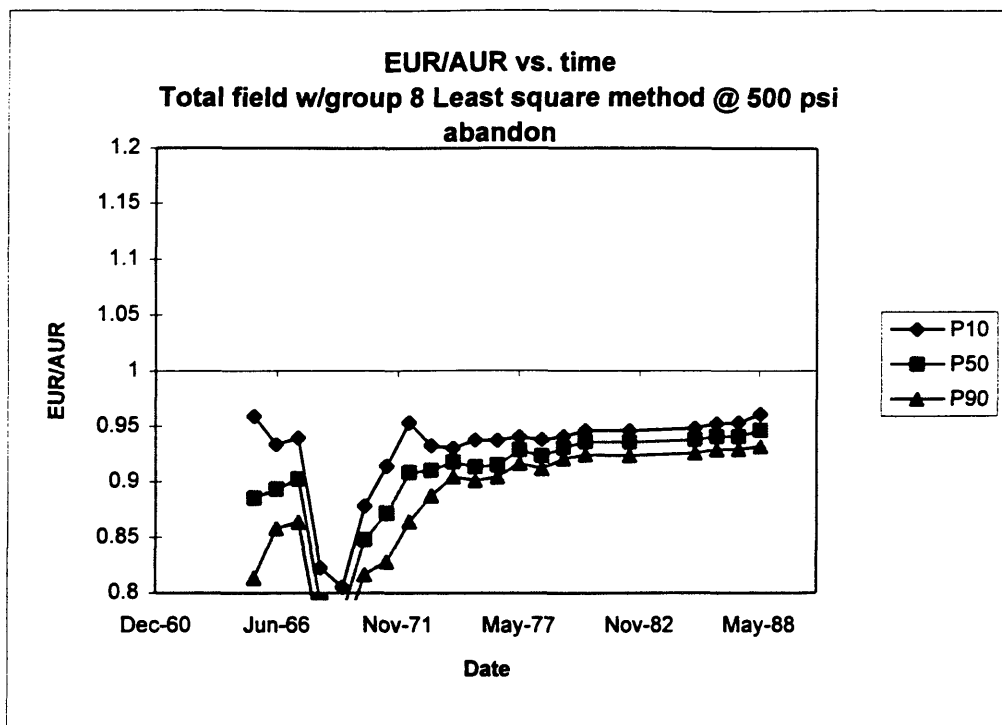


Figure 15. Accuracy ratio plots for Total field with group 8 from the Least Square method at 500 psi abandonment.

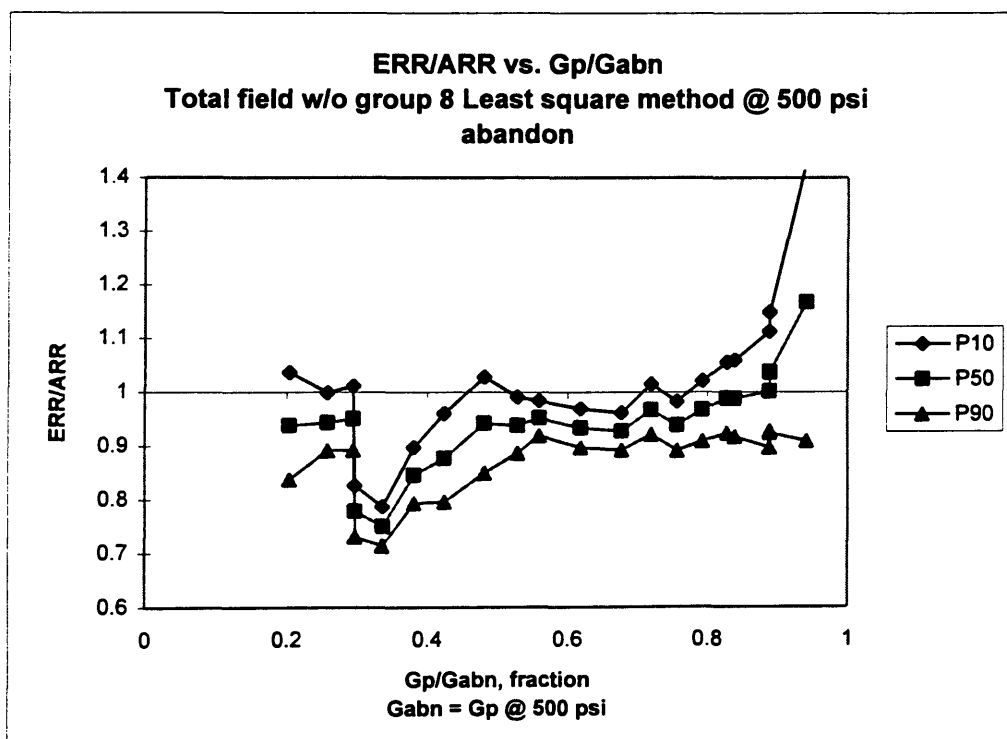
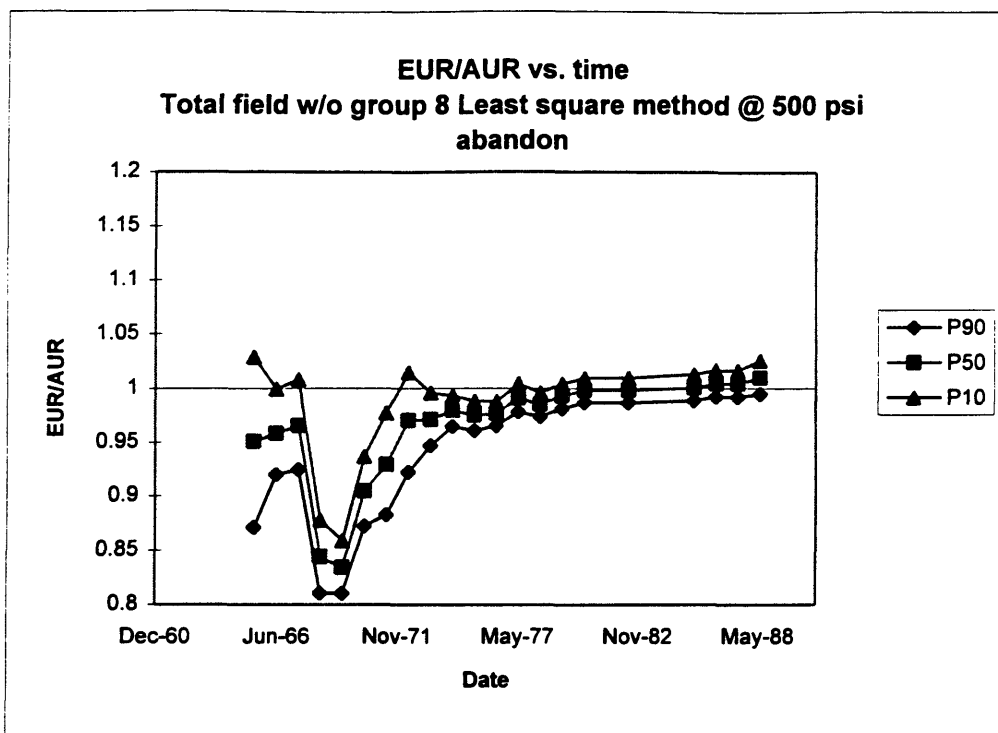


Figure 16. Accuracy ratio plots for Total field without group 8 from the Least Square method at 500 psi abandonment.

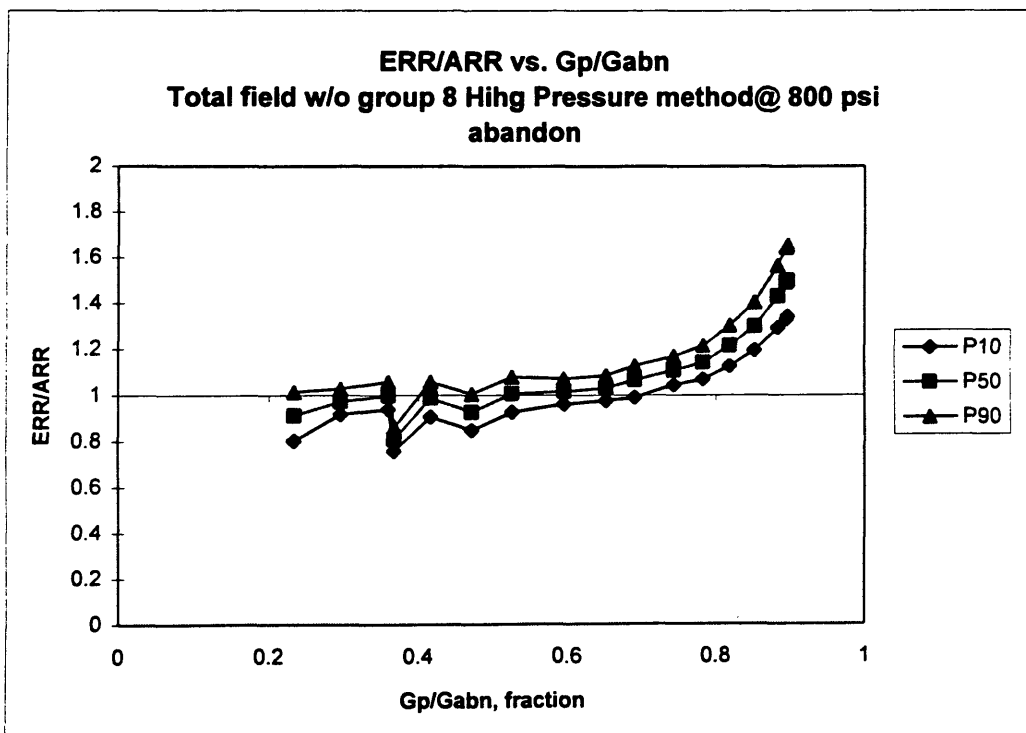
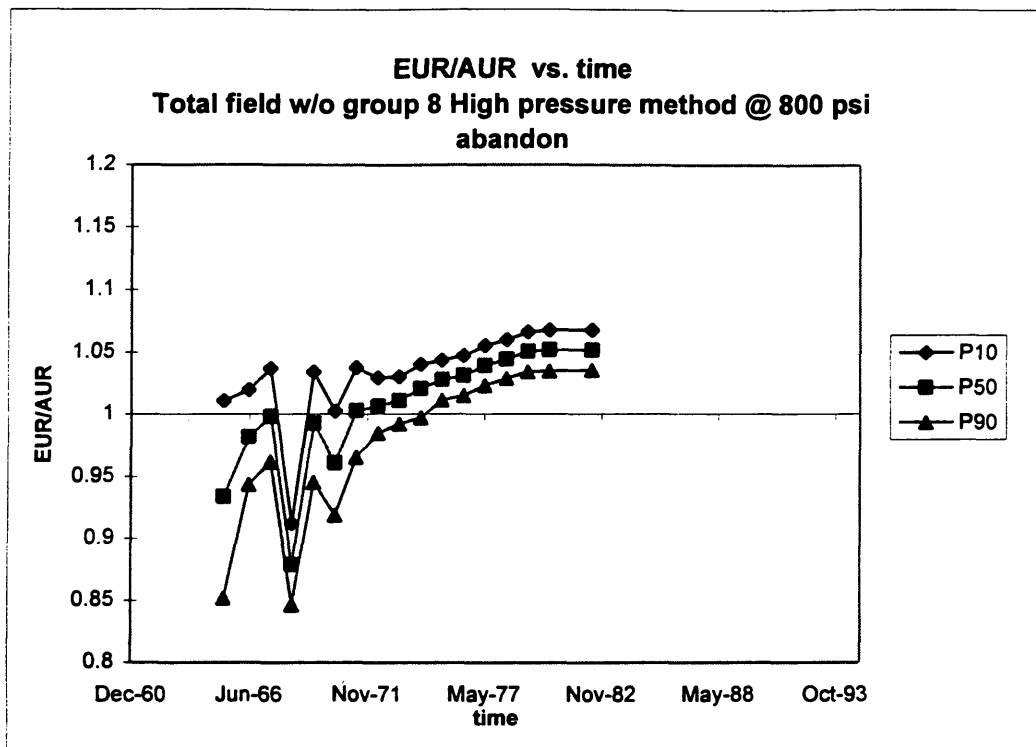


Figure 17. Accuracy ratio plots for Total field without group 8 from the empirical High Pressure method at 800 psi abandonment

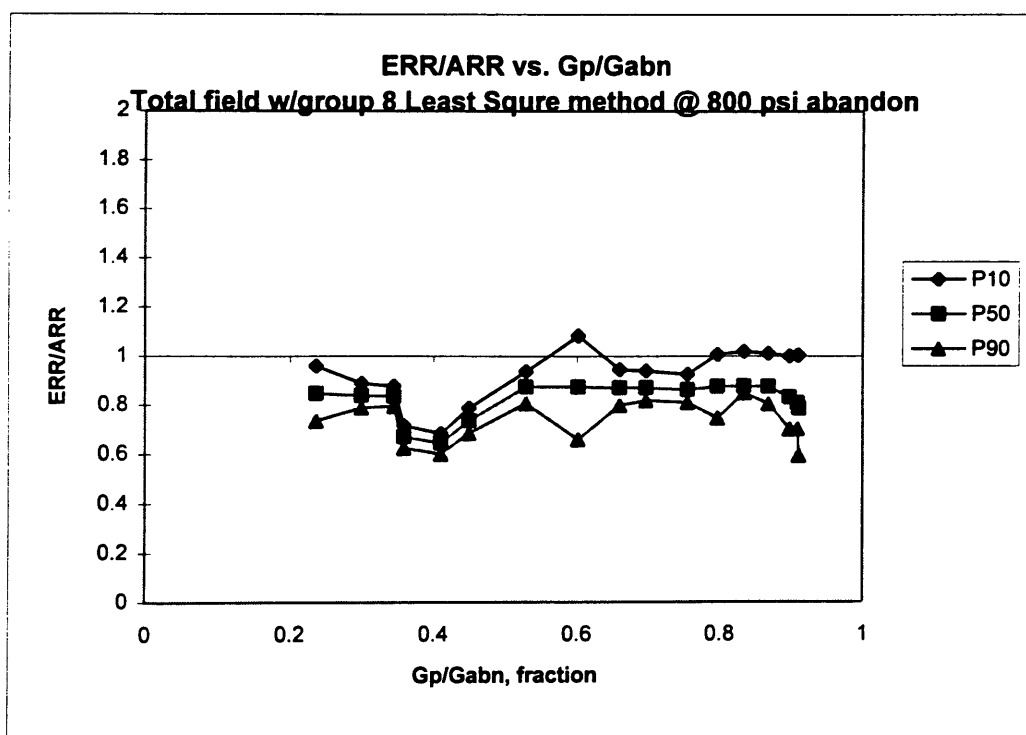
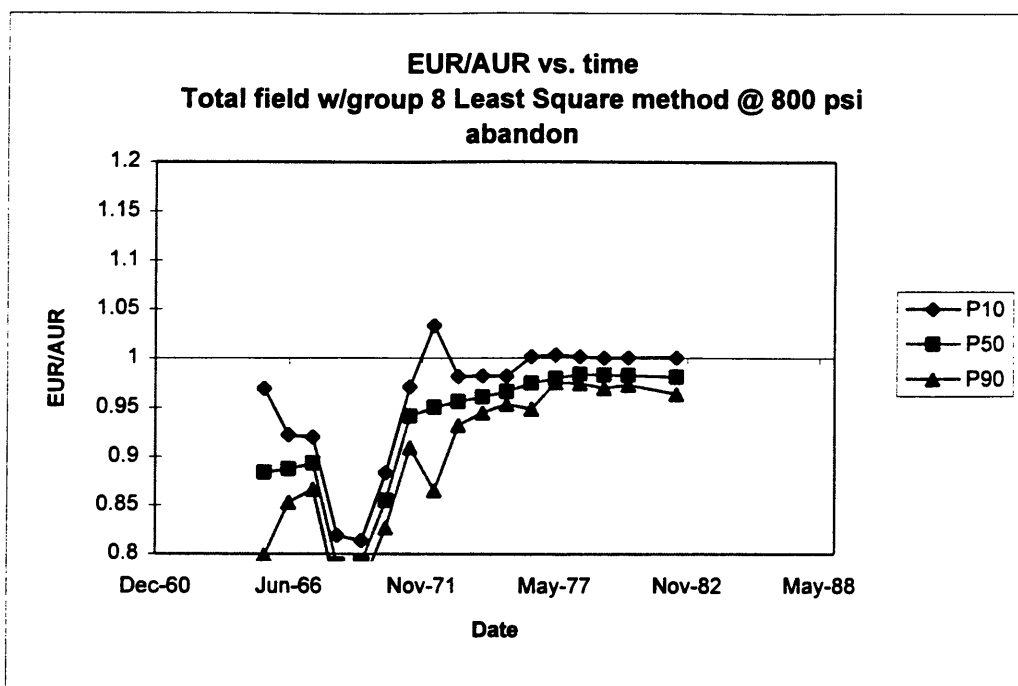


Figure 18. Accuracy ratio plots for Total field with group 8 from the Least Square method at 800 psi abandonment.

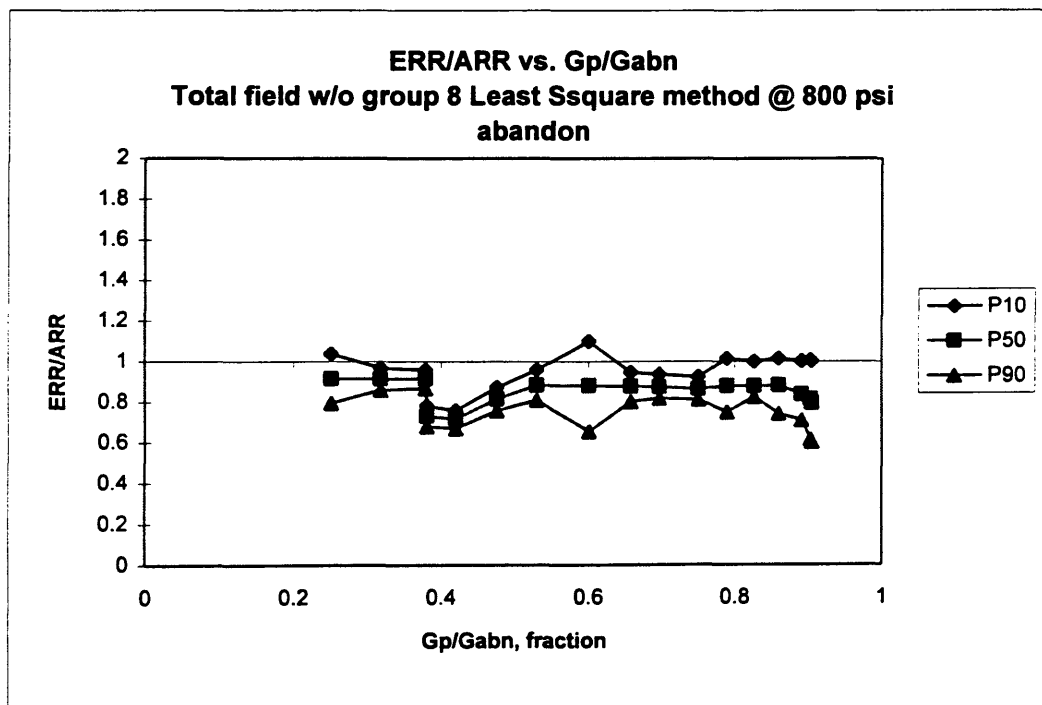
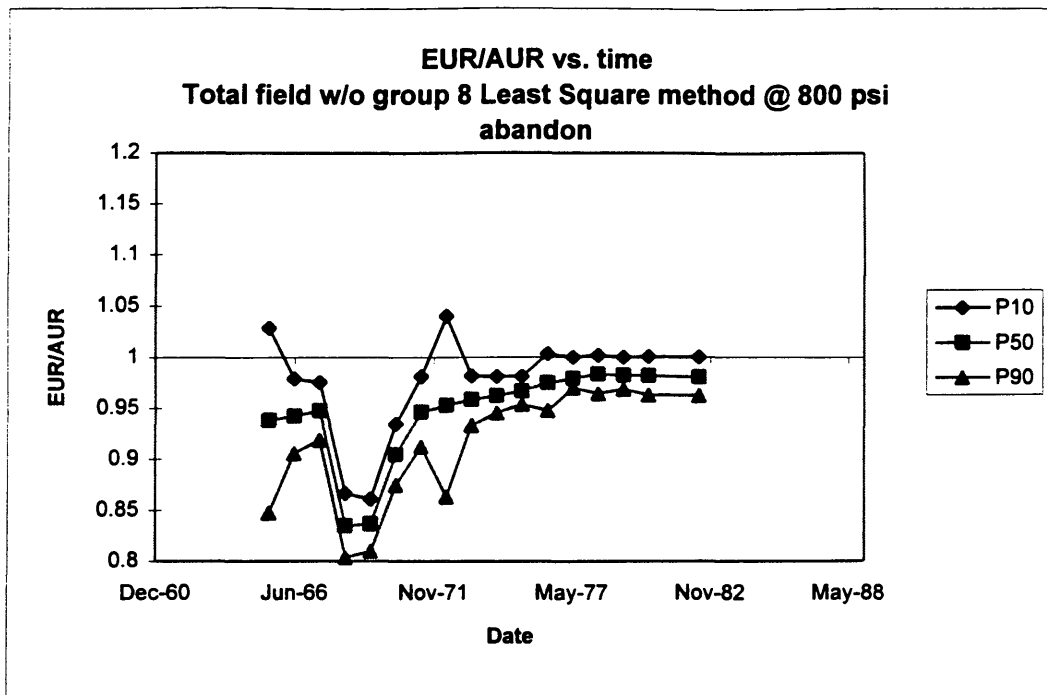


Figure 19. Accuracy ration plot for Total field without group 8 from the Least Square method at 800 psi abandonment.

## 4.2 Texas Field

Five wells with good pressure data in this field were selected. Some wells have long producing history while others have only a few years of production history.

Therefore, there was no consistent economic limit applied to this analysis. The actual remaining reserves (ARR) were based on the last production available. Bottom hole pressure (BHP) data from this field came from 2 sources: bottom hole pressure gauge and the Cullender and Smith correlation for calculating bottom hole pressures from surface shut in pressures. The analysis was performed using 3 sets of data: all data, pressure gauge data only, and correlation data only.

Generally the results from both methods support the stated hypothesis although the sample is too small to make statistically significant conclusions. The data from the pressure gauge led to better results than the data from the Cullender and Smith correlation, using both the Least Square and empirical High Pressure methods. The results, from both approaches, also indicates that more than 50 percent of the time ARR were greater than  $P_{50}$  although in many cases the actual difference in ARR and the  $P_{50}$  value is small, Figure 20. A visual inspection the accuracy ratio plots would indicate a slight preference of the Least Square method (over the empirical High Pressure method) using the pressure gauge data. The results are shown in Tables 6 and 7. Accuracy Ratio plots for pressure gauge and Cullender and Smith data for the five Texas field wells are

Table 6. Texas wells successful results

Well name	Frequency ARR Within $P_{90}$ - $P_{10}$ Predictive Interval (%)					
	Least Square Method			High Pressure Method		
	All data	BHP gauge	C&S	All data	BHP gauge	C&S
TX1 @1100 psi abn	81	100	93	89	100	93
TX2 @ 339 psi abn	93	100	20	100	100	40
TX3 @ 344 psi abn	23	60	50	100	100	38
TX4 @671 psi abn	89	100	100	100	100	100
TX5 @ 511 psi abn	96	95	18	100	74	91

\* C&S is Cullender and Smith correlation

Table 7. Texas wells bias results

Well name	Frequency of ARR greater than $P_{50}$ (%)					
	Least Square Method			High Pressure Method		
	All data	BHP gauge	C&S	All data	BHP gauge	C&S
TX1 @1100 psi abn	44	31	53	26	21	20
TX2 @ 339 psi abn	53	67	100	20	30	100
TX3 @ 344 psi abn	100	100	100	100	100	100
TX4 @671 psi abn	100	100	100	100	100	100
TX5 @ 511 psi abn	74	68	100	100	100	100

\* C&S is Cullender and Smith correlation

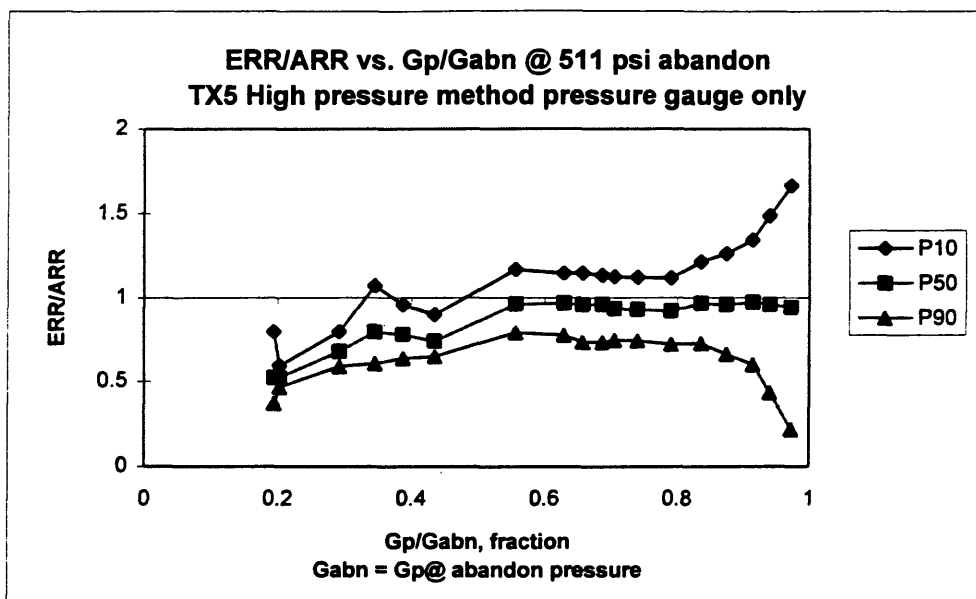


Figure 20. An example of small difference between  $P_{50}$  and ARR

shown in Figures 21 to 30. All accuracy ratio plots for the Texas Field wells are shown in Appendix C-2.

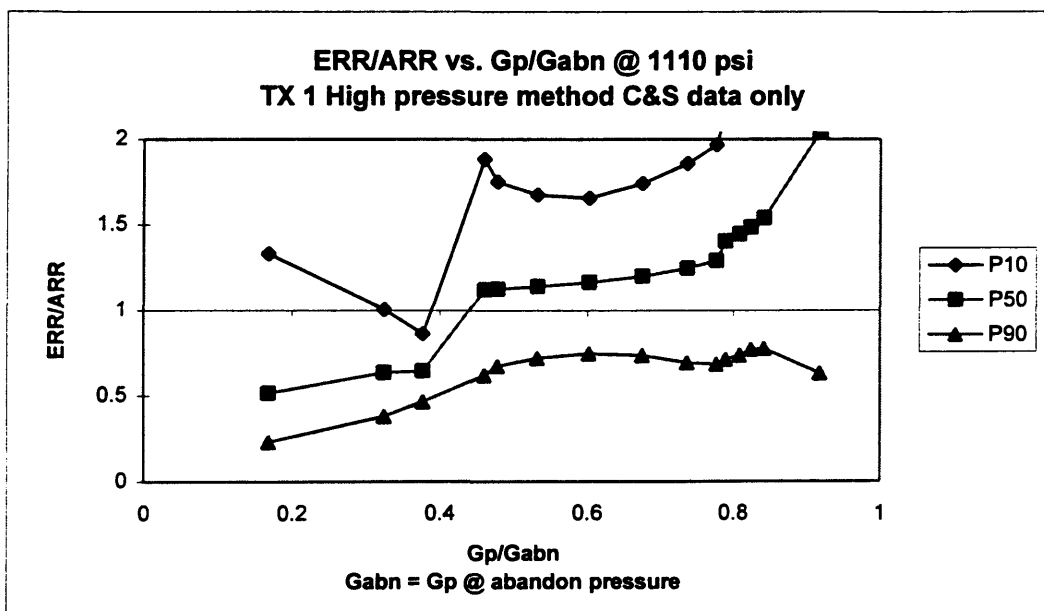
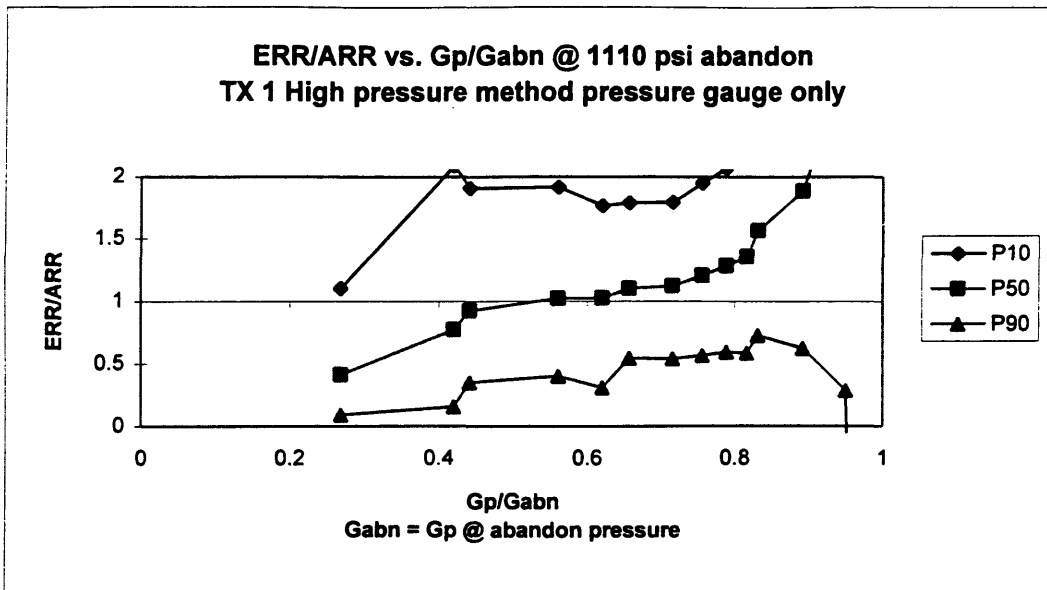


Figure 21. The accuracy ratio plots for well TX1 from the High Pressure method

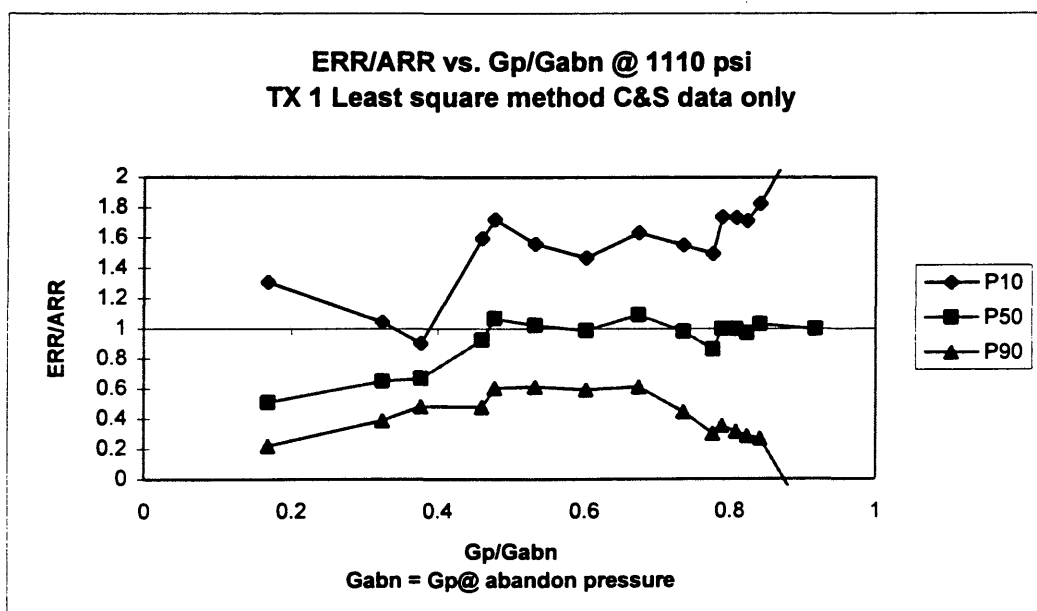
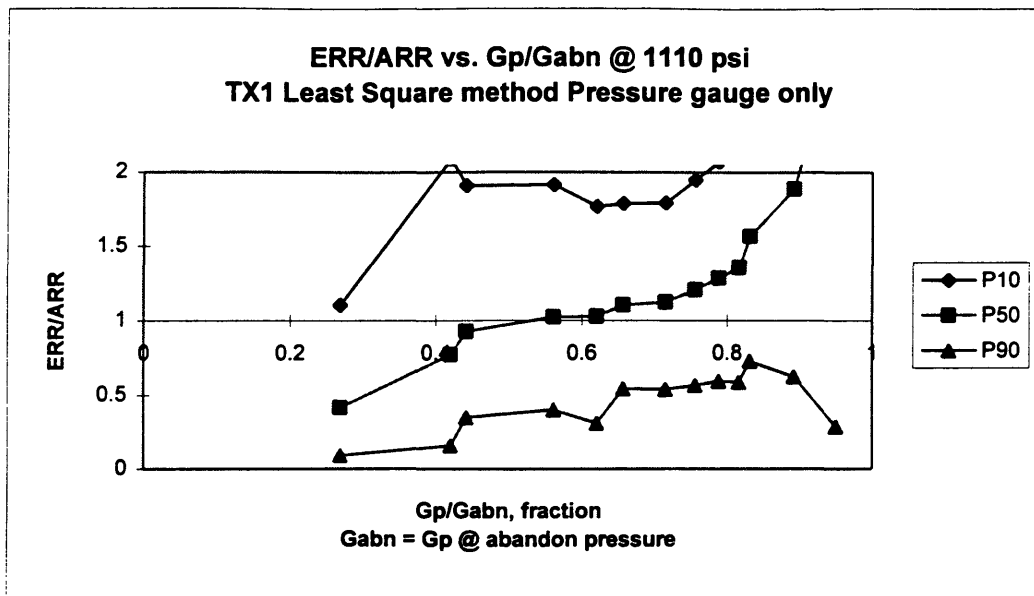


Figure 22. The accuracy ratio plots for well TX1 from the Least Square method

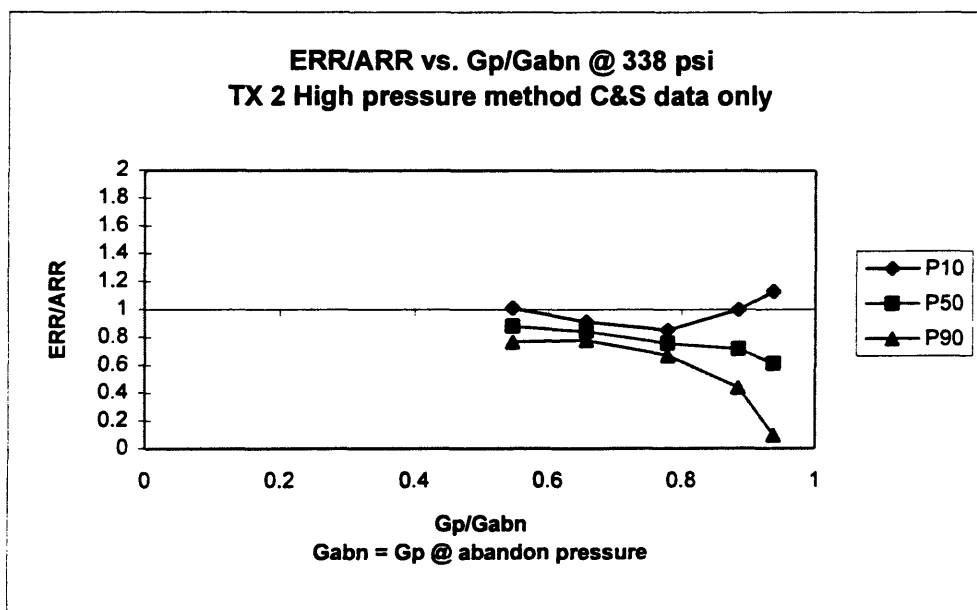
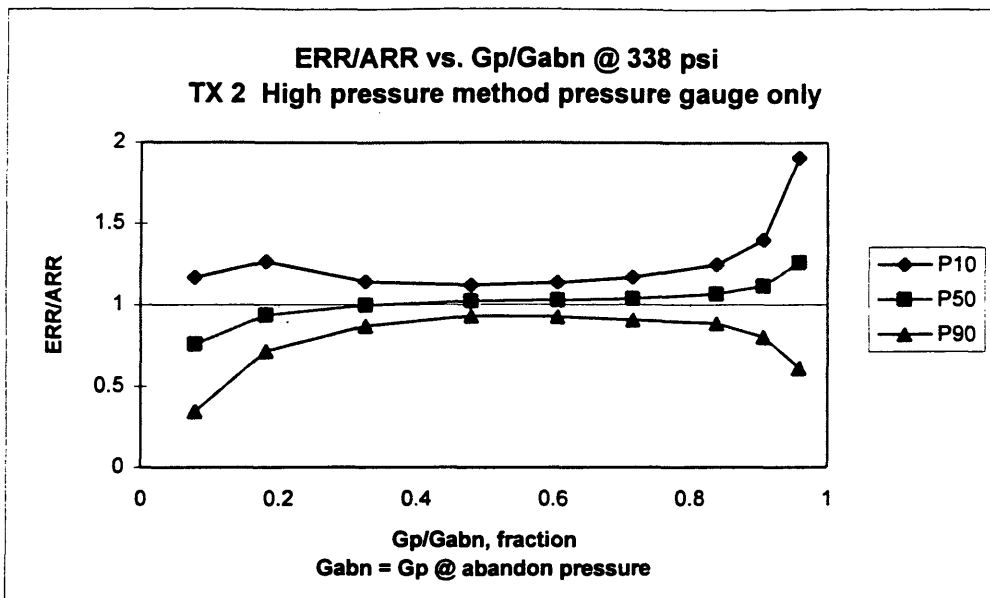


Figure 23. The accuracy ratio plots for well TX2 from the High Pressure method

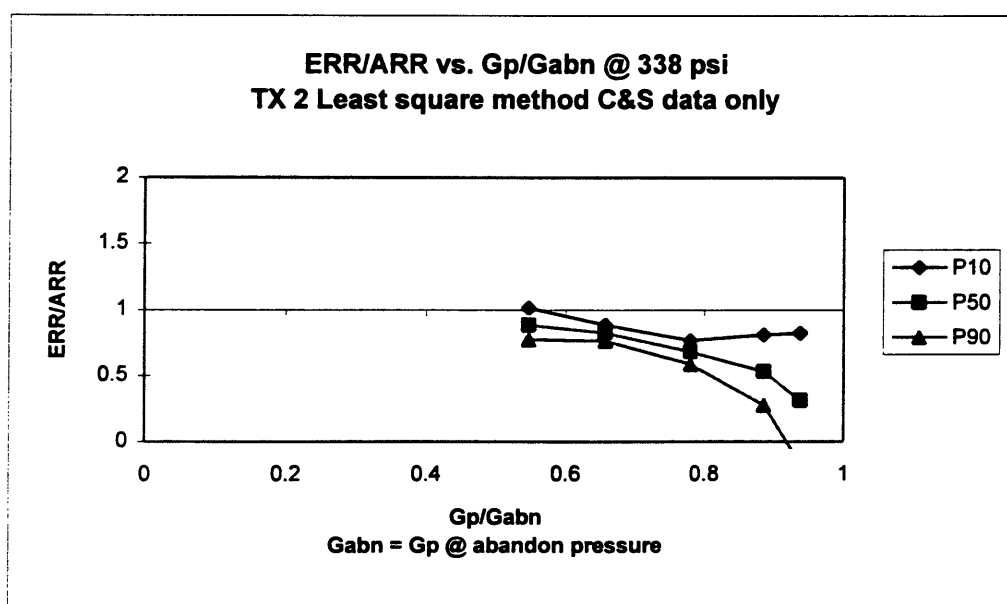
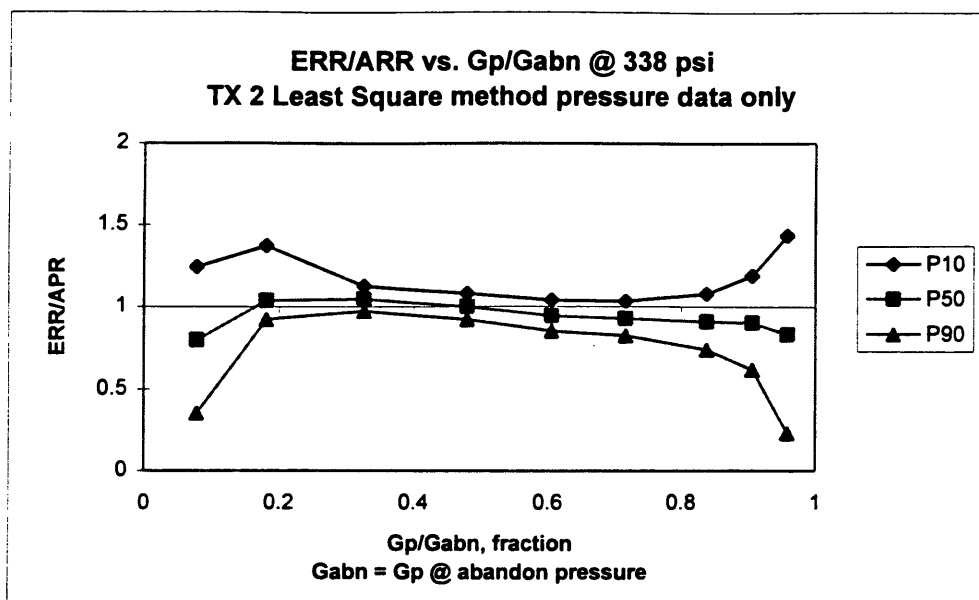


Figure 24. The accuracy ratio plots for well TX2 from the Least Square method

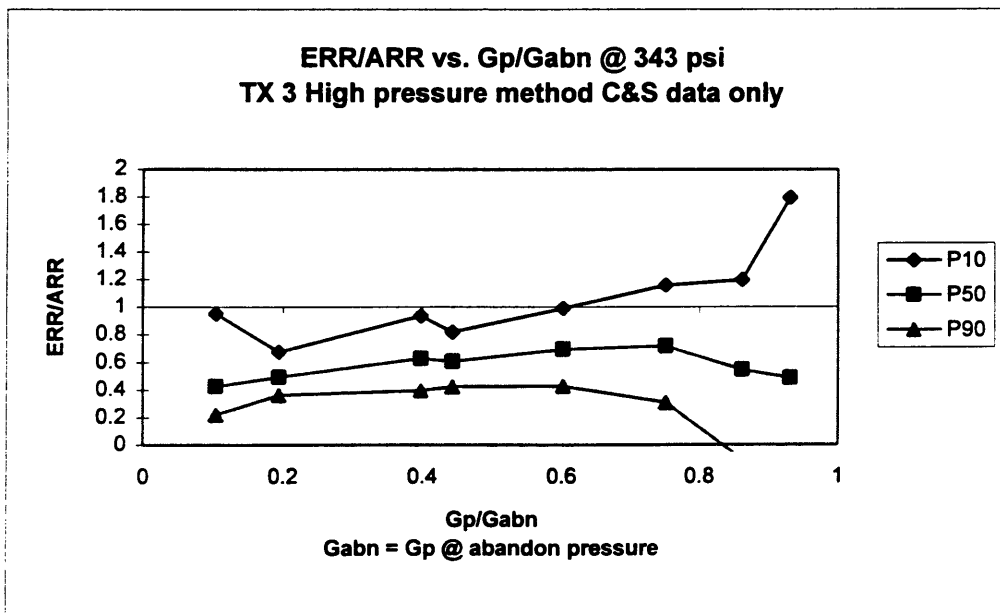
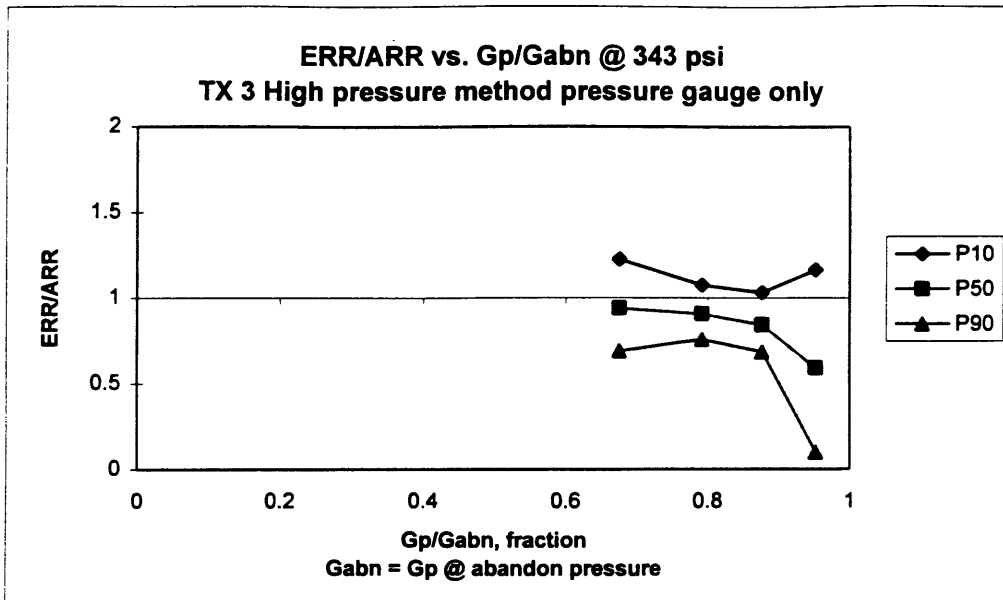


Figure 25. The accuracy ratio plots for well TX3 from the High Pressure method

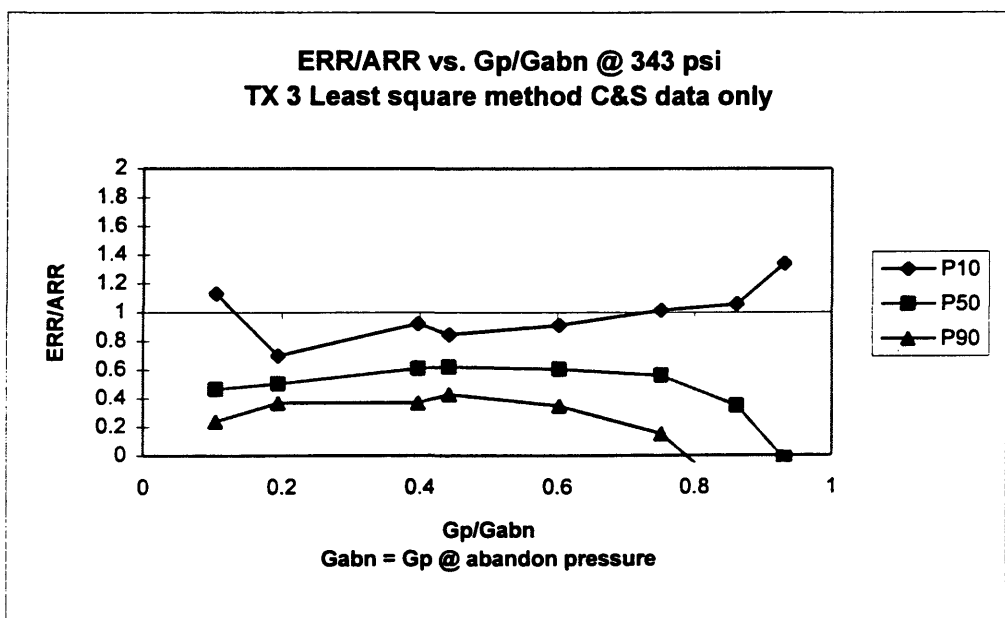
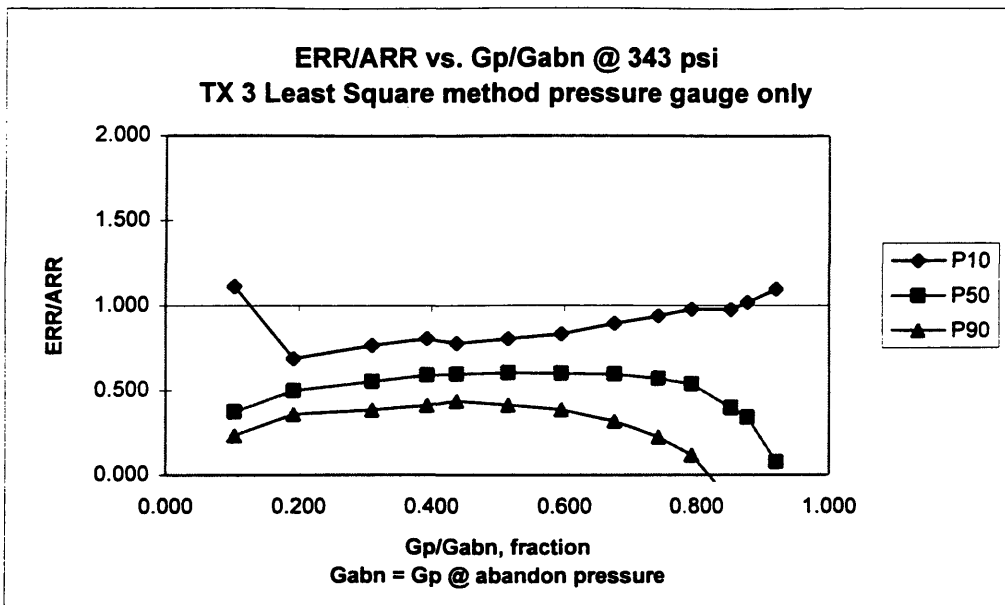


Figure 26. The accuracy ratio plots for well TX3 from the Least Square method

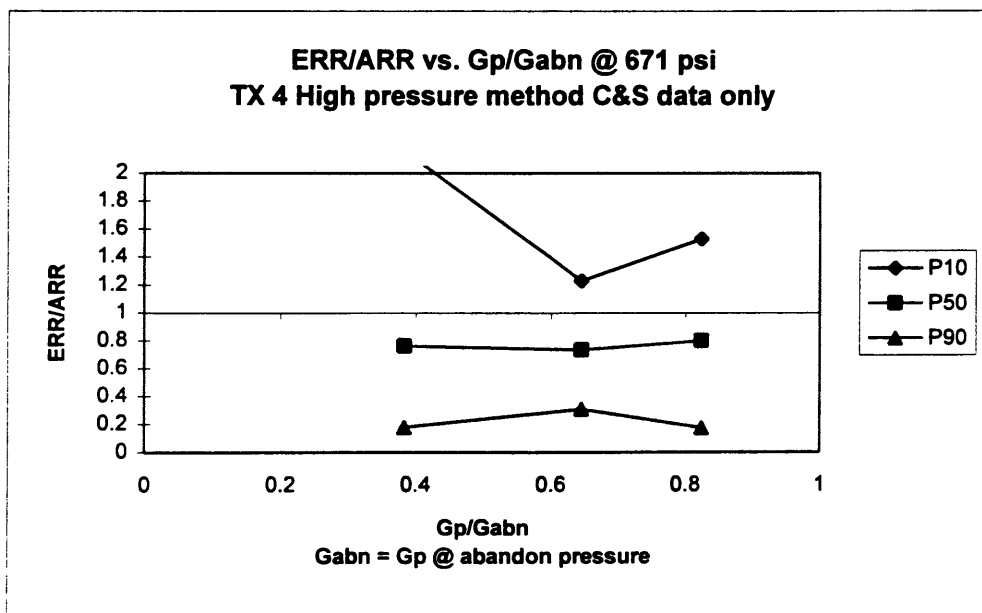
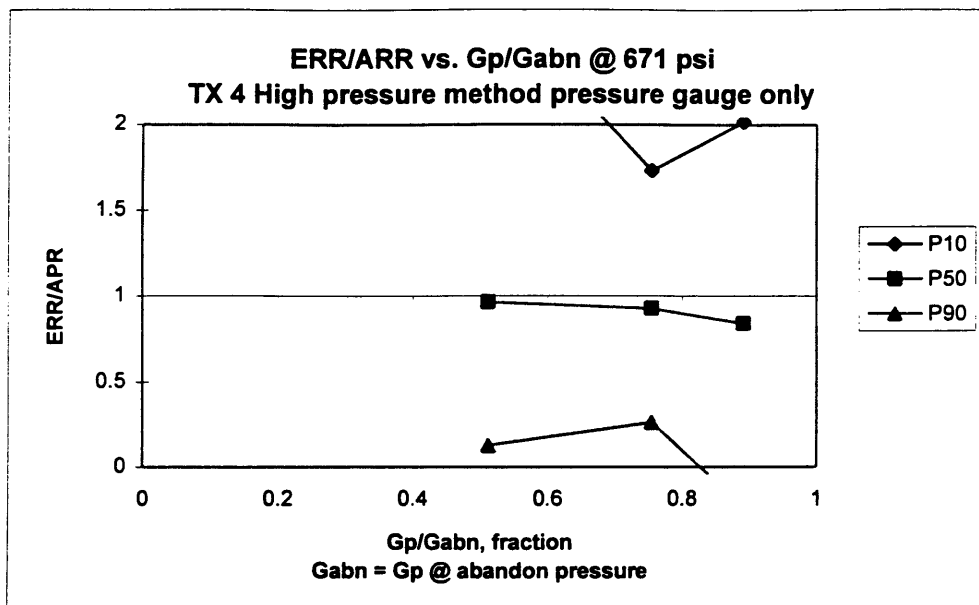


Figure 27. The accuracy ratio plots for well TX4 from the High Pressure method

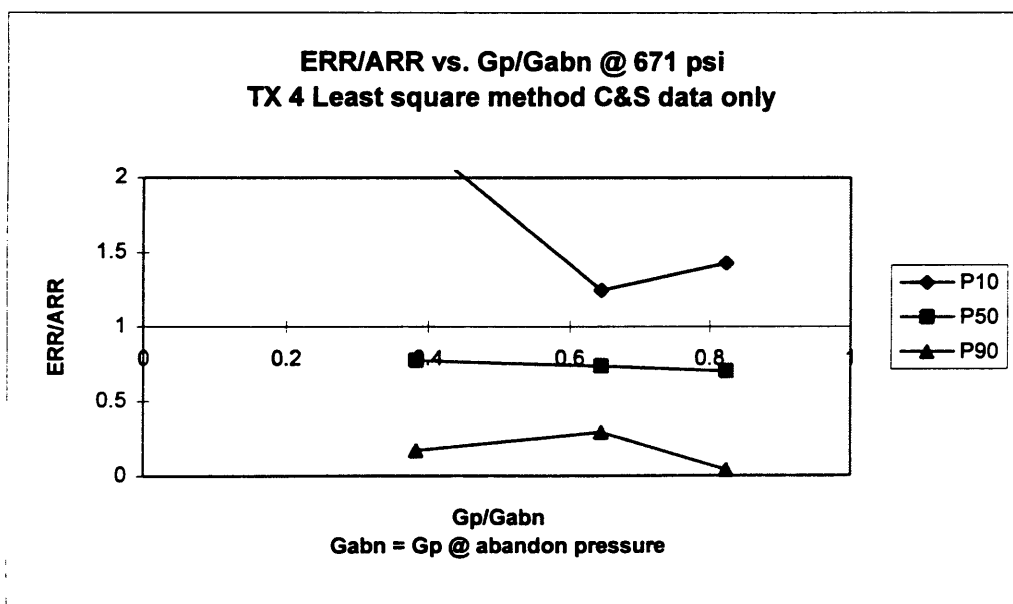
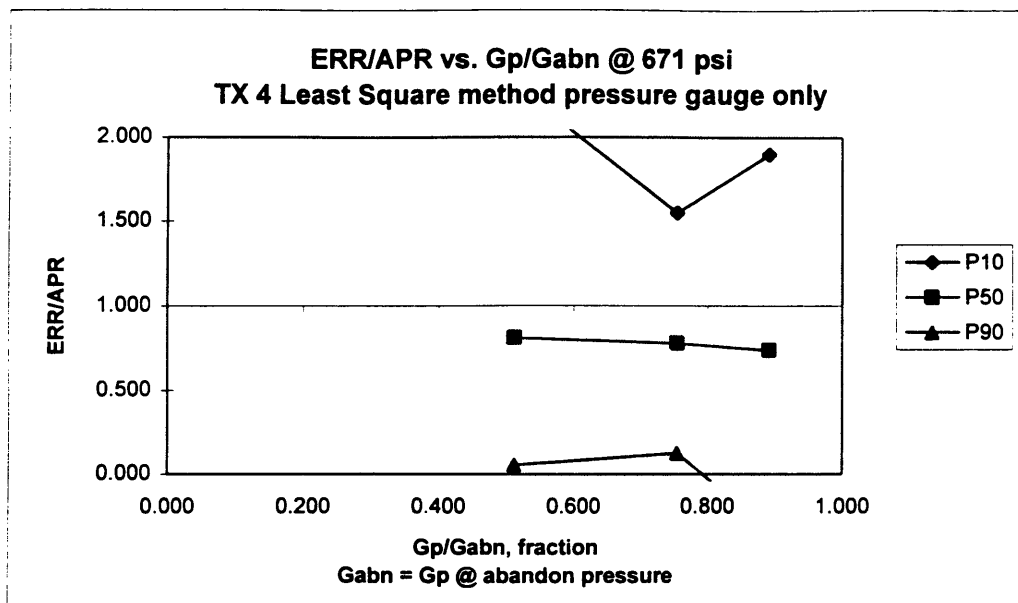


Figure 28. The accuracy ratio plots for well TX4 from the Least Square method

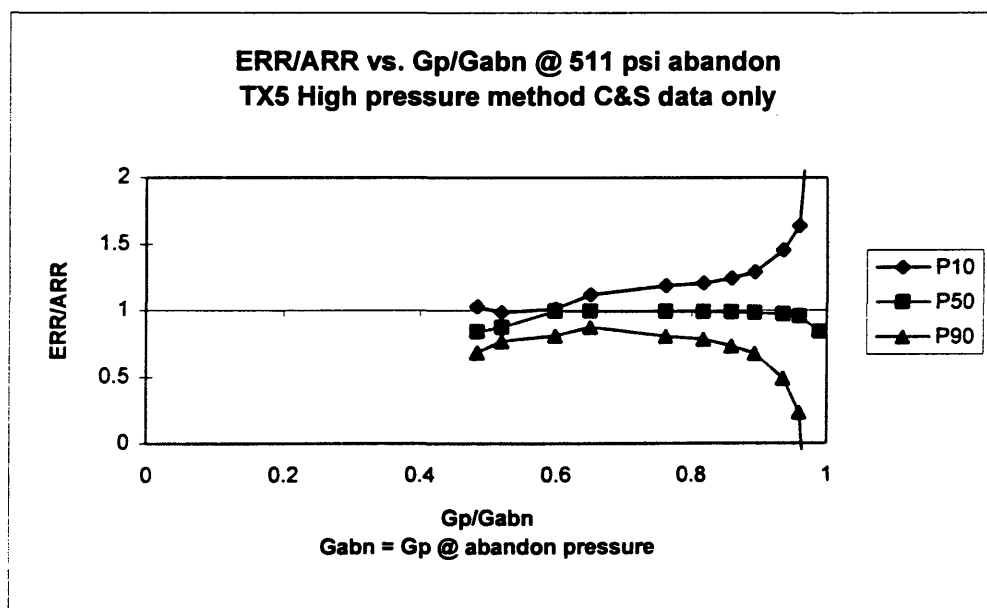
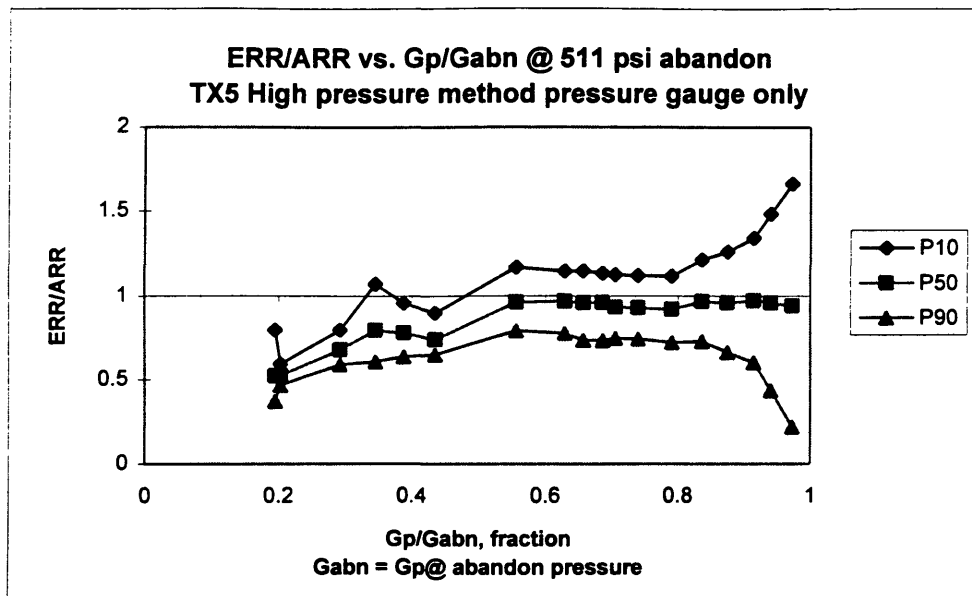


Figure 29. The accuracy ratio plots for well TX5 from the High Pressure method

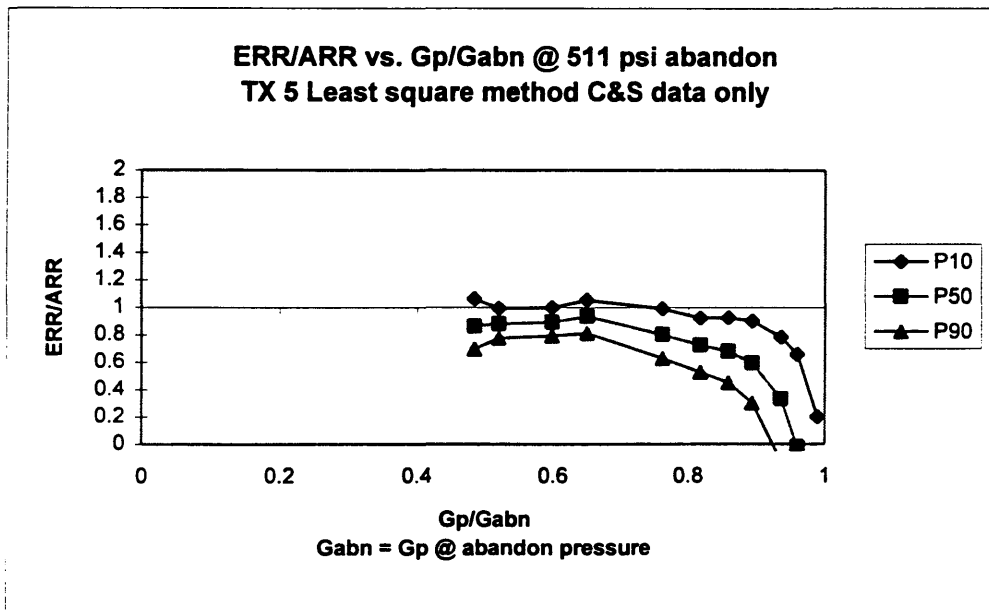
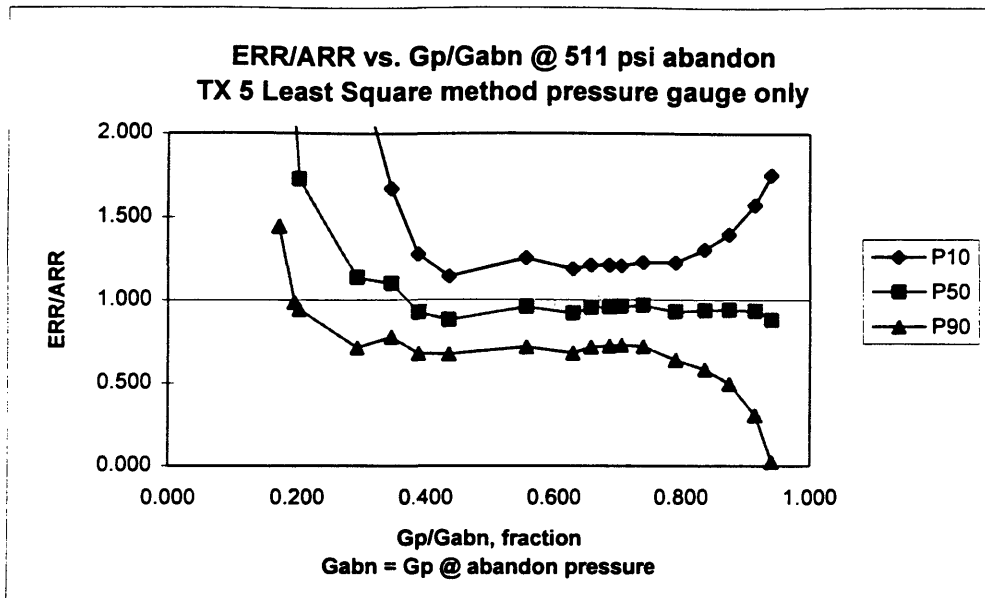


Figure 30. The accuracy ratio plots for well TX5 from the Least Square method

## 5. DISCUSSION

The following paragraphs discuss the results and implications of the use of prediction intervals calculated using the Student's t distribution.

### 5.1 Glick Field Performance

After examining Glick Field results, it was found that the prediction interval, based on Student's t distribution, does not bracket ARR with the 80 percent frequency stated in the hypothesis. This may be due to incomplete data on surrounding wells, incomplete pressure buildup, and incomplete understanding of the reservoir heterogeneity. An analysis of the reservoir heterogeneity was not performed in this thesis. The possible impact of incomplete data on surrounding wells and incomplete pressure buildup is presented in the following paragraphs. The implications of the empirical High Pressure method and the importance of the residual analysis plots will also be discussed.

### 5.1.1 Incomplete Data

There are two types of data characteristics in the Glick Field. Both types have two trends, an early trend and a late trend. The first type is where the early trend in  $P/Z$  versus  $G_p$  data is steeper than the late trend which is the case for the majority of the data. The second type is where the early data trend is flatter than the later trend. In most wells the early trends changed gradually rather than making an abrupt change. Use of type one data (steeper early trend) underestimates ARR (ARR greater than  $P_{50}$ ). This is demonstrated in Figure 9 the accuracy ratio plot for EUR/AUR. The use of type two data (flatter early trend) overestimates ARR (ARR less than  $P_{50}$ ). The transition to the later trend was abrupt for some wells which exhibited type two data. In these cases only the last few points of data can be used to estimate remaining reserves. The results are more variable when the sample size is small.

The type one and type two data behavior may be explained by comparing the location of individual wells (common type one data) with other wells. The data set available for this project did not include all the wells in the Glick Field. In some cases production data was available but the pressure data was not reported. It is possible that the changes in the production trends could be explained by a more complete production and pressure history. This may also explain the difference in the performance of the individual wells and the grouped wells.

The difference in the performance in the individual wells in comparison with the grouped wells may also be explained by the fact the groups' pressure data are the average pressure from wells in that group. Therefore, there is more variation in group pressure data than single well pressure data. This variation generates the wider ranges of prediction intervals giving better results from group data than from individual well data.

#### 5.1.2 Incomplete Pressure Buildup Data

Glick Field bottom hole pressure data were determined from 72 hour well head shut in pressures. Although the reservoir permeability is relatively high (32.1 md) the recorded pressures are low. Liquid build up in the wellbore could also cause the calculated bottom hole pressures to be too low.

#### 5.1.3 Residual Analysis

Fifty six percent of the residual plots from the Least Square method show good random scatter of data around the best fit line. Sixty seven percent of wells with good data scatter resulted in prediction intervals which bracket ARR more than 50 percent of the time.

Almost 100 percent of wells, in which data did not randomly scatter, failed to estimate a prediction range that included ARR. This implies the importance of random data in the application of this method to estimate the prediction intervals for remaining gas reserves.

Wells or Groups of wells with wide scattering residuals always generated better results than wells with narrow ranges of residual. That is because the greater variability generates wider prediction intervals which have a greater chance to capture the variability in the future data. Residual plots from Glick field are shown in Appendix B-3.

#### 5.1.4 Empirical High Pressure Method

The empirical High Pressure method was introduced to determine if the changing trends in the data including both type one and type two data could be captured by the variability in the early data. The method is designated an empirical method since a fit of the high pressure data assumes that the best fit represents the mean of the pressure data and the variability of the data above the best fit (no actual data points) can be modeled by the variability of the existing data below the best fit. There is no basis for the assumption concerning the variability of the data. The assumption about the best fit representing the mean value is based on the assumption the pressure data is understated

and in the Glick Field the permeability is relatively high and the 72 hour pressure buildups are near the final build up pressure.

An analysis of the results indicates that the use of the high pressure data in the Glick Field gave a better distribution of the ARR around the  $P_{50}$  estimate but the range was too narrow. This seemed to work for the total field, but when group 8 was excluded from the analysis the results were not as consistent. This seems to make the application of the method rather arbitrary.

The results of the residual analysis also gives cause for concern in using the empirical High Pressure method.

## 5.2 Texas Field Performance

The Texas wells are samples of better quality pressure data. The results indicate that when only pressure from a bottom hole pressure gauge was analyzed, the prediction interval included ARR more than 80 percent of the time. A visual inspection of the accuracy ratio plots gave a slight edge to the pressure gauge data over the surface reported pressures corrected to bottom hole conditions using the Cullender and Smith correlation.

Most of the wells in this field had very good data scattering for the Least Squares method regardless of the data source. This adds support for the importance of random variability in the data. Wells with non-random data scatter data did not perform as well. Residual plots from the Texas Field are shown in Appendix C-3.

### 5.3 Accuracy Ratio Plots

The ERR/ARR accuracy ratio plots frequently exhibit an increase in the P90 and P10 range near the end of the production history. This is to be expected. For example near the end of the life of a well the ARR may be relatively low when compare to the ERR. An ARR of 1000 Mcf compared to an ERR of 2000 Mcf would give a ratio of 2 but would be relatively insignificant from an economic point of view. Figure 20 is a good example of this behavior. This behavior was also observed by Thompson, Wright and Digert (1987).

A visual inspection of the EUR/AUR accuracy ratio plots demonstrates that the range of EUR/AUR over time does not necessarily bracket the ratio of one. This behavior was also noticed by Thompson, Wright and Digert (1987).

## 6. CONCLUSIONS

1. Prediction intervals from using P/Z versus Gp data and a Student's t distribution, are too narrow to include heterogeneity and uncertainties in Glick Field's reservoir performance. Improved results were demonstrated when working with production data having less apparent uncertainty. This was demonstrated by the improved performance of the method in the Texas Field wells. Complete production history is essential. More knowledge about the Glick Field could significantly improve the results.

2. The calculation of prediction intervals requires random variability about the best fit trend line. In the case of the empirical High Pressure method this assumption is probably not honored. The results of the residual analysis supports the importance of randomly scattered data. Application of the empirical High Pressure method is not recommended for this reason.

3. Future work should focus on methods to adjust incomplete pressure buildup data to average reservoir pressure, based on early pressure transient analysis. Another approach would be to investigate other types of probability distributions with wider ranges in order to capture the behavior of incomplete pressure buildup data.

## NOMENCLATURE

$P$	=	Pressure, psi
$Z$	=	Gas deviation factor
$G_p$	=	Cumulative gas production
$G_{abn}$	=	Cumulative gas production at abandonment pressure
$n$	=	Sample population.
$\bar{x}$	=	Mean of cumulative production
$\alpha$	=	Probability level.
$t$	=	Student's t distribution.
$v$	=	Degree of freedom.
PI	=	Prediction interval
$\bar{y}$	=	Linearized pressure data.
$\mu$	=	Mean of the sample population.
$s$	=	Sample standard deviation
ERR	=	Estimated Remaining Reserves
ARR	=	Actual Remaining Reserves
EUR	=	Estimated Ultimate Recovery
AUR	=	Actual Ultimate Recovery

## REFERENCES CITED

1. Ambastha, A.K., van Kruysdijk, C.P.J.W. 1993. Effects of Input Data Errors on Material Balance Analysis for Volumetric, Gas and Gas-Condensate Reservoirs. Paper CIM 93-04 presented at the CIM 1993 Annual Technical Conference. Calgary May 9-12.
2. Boone,D. 1990. Are Your Gas Wells Communicating? Petroleum Engineer International. December.
3. Capen, E.C. 1993. A Consistent Probabilistic Definition of Reserves. Paper SPE 25830 presented at the 1993 Hydrocarbon Economics and Evaluation Symposium. Dallas. March 29-30.
4. Digert, S.A., Thompson, R.S. and Wright, J.D. 1987. The Error in Estimating Reserves Using Decline Curves. Paper SPE 16295 presented at the 1987 SPE Hydrocarbon Economics and Evaluation Symposium. Dallas. March 2-3.

5. Hefner, J.M. and Thompson R.S. 1996. A Comparison of Probabilistic and Deterministic Reserve Estimates: A Case Study. SPE Reservoir Engineering : 43-47.
6. Huffman, C. 1994. Probability Ranges for Reserves Estimates and Net Present Values from Decline Curve Analysis. MS thesis. Colorado School of Mines. Golden, CO.
7. McCray, A.W. and Comer, A.G. 1967. Statistical Basis for Choice among Hyperbolic Decline Curves and Computer Application in Calculating Confidence Limits of Reserves Predictions. Paper SPE 1930 presented at the 1967 SPE Annual Fall Meeting, Houston, Oct. 1-4.
8. Rogers, J.P., Longman, M.W. and Lloyd R.M. 1995. Spiculitic Chert Reservoir in Glick Field, South-Central Kansas. The Mountain Geologist. Vol. 32, No.1 (January): 1-22.
9. Rubinstein, R.Y. 1981. Simulation and The Monte Carlo Method. New York: John Wiley & Sons, Inc.: 6-12.

10. Wearden, S. and Dowdy, S. 1983. Statistics for Research. New York: John Wiley & Sons, Inc.: 537.

## APPENDIX A

The following pages present the Glick Field and Texas Field P/Z versus Gp plots from each well.

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Table A. 1 The Glick Field P/Z versus Gp data

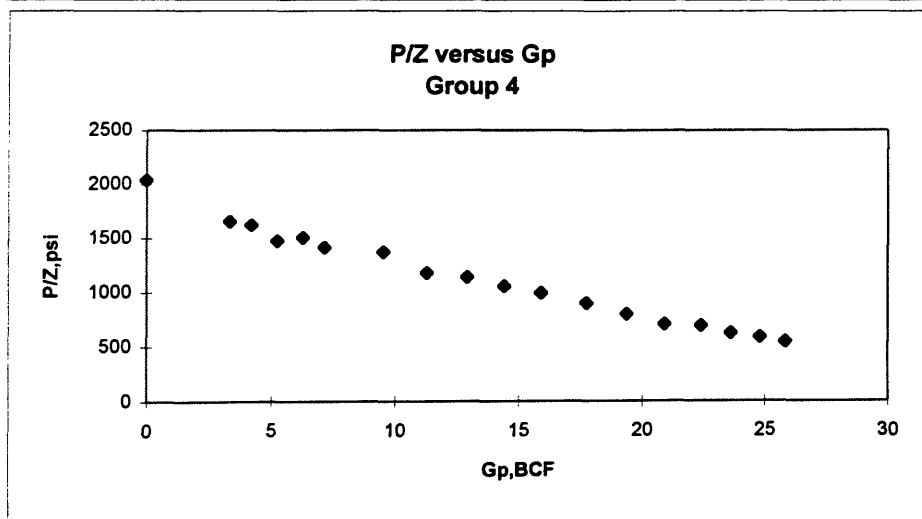
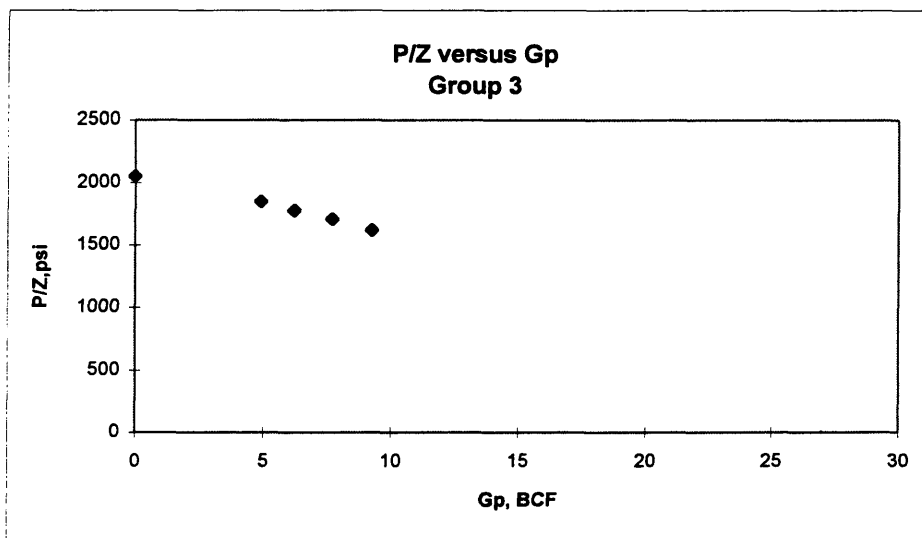
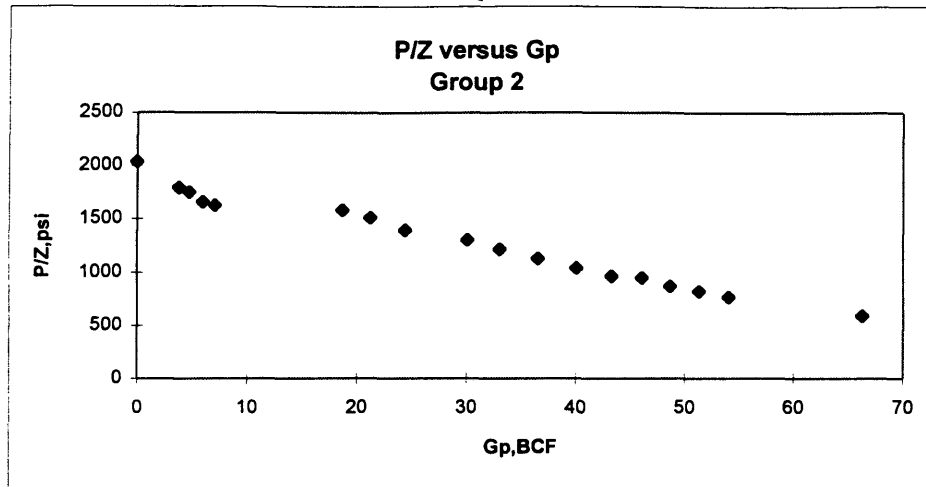


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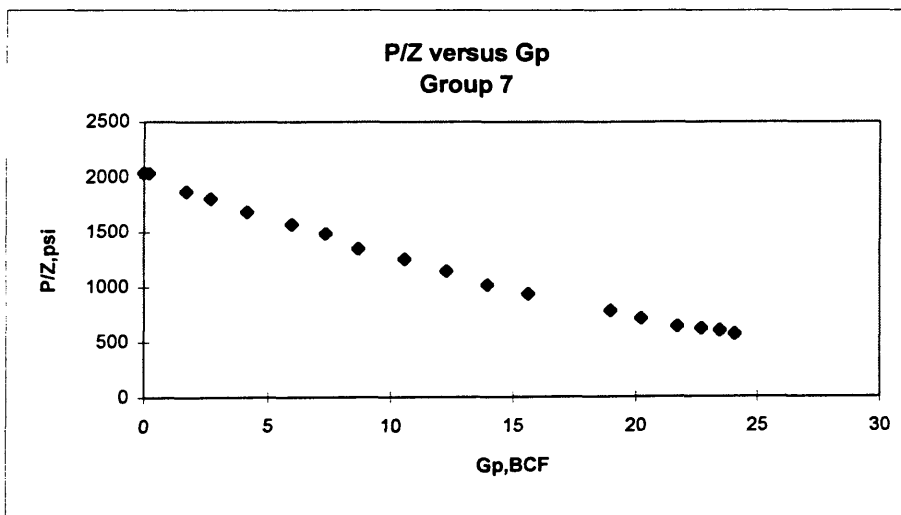
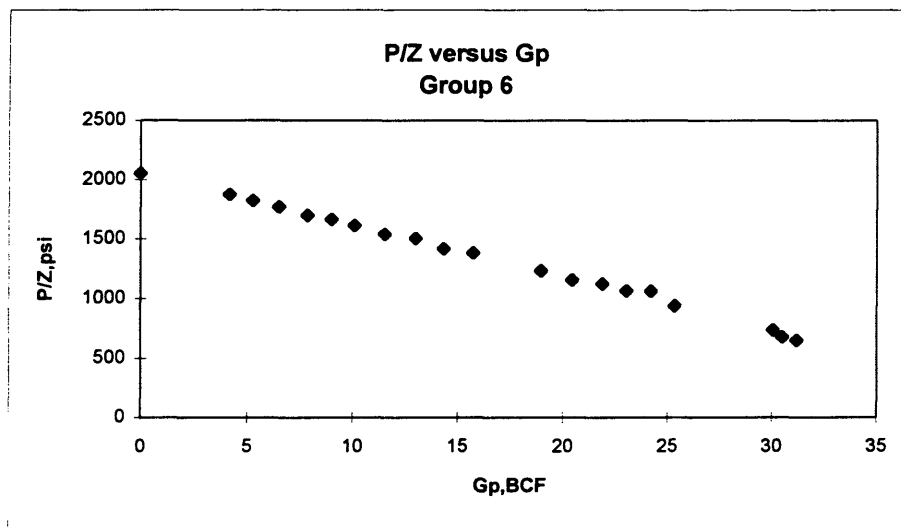
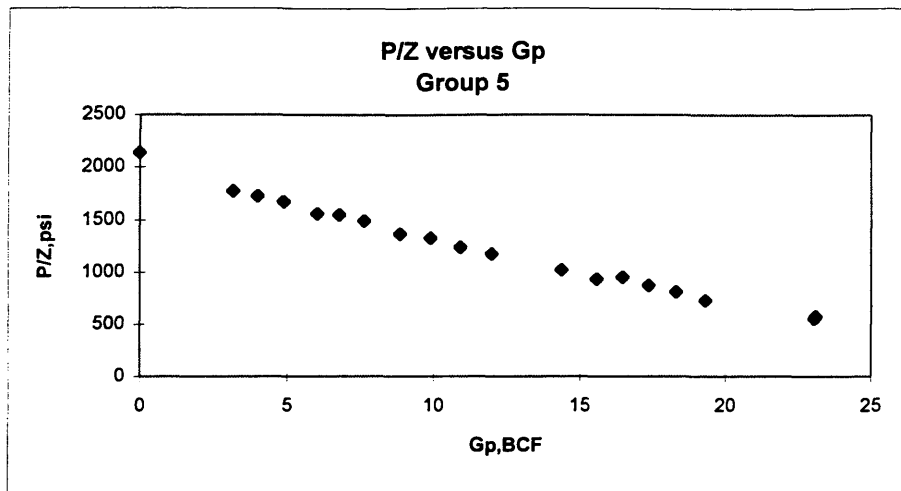


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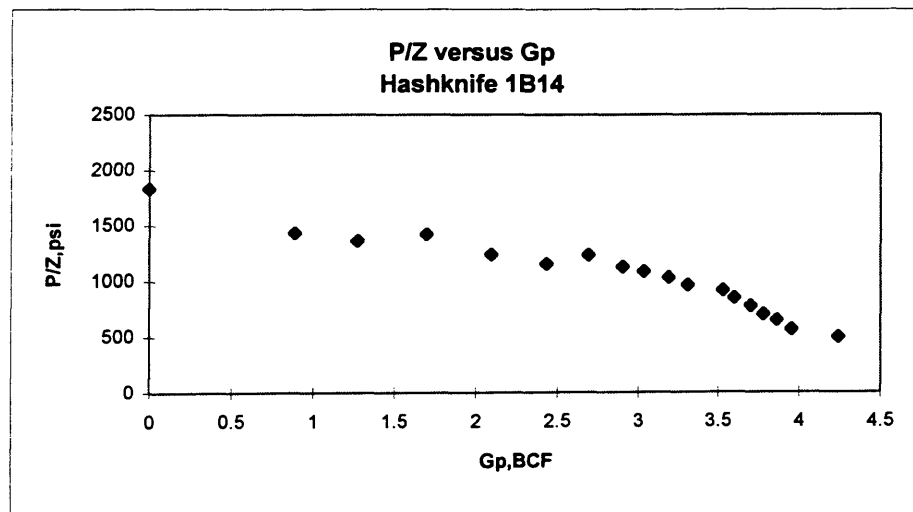
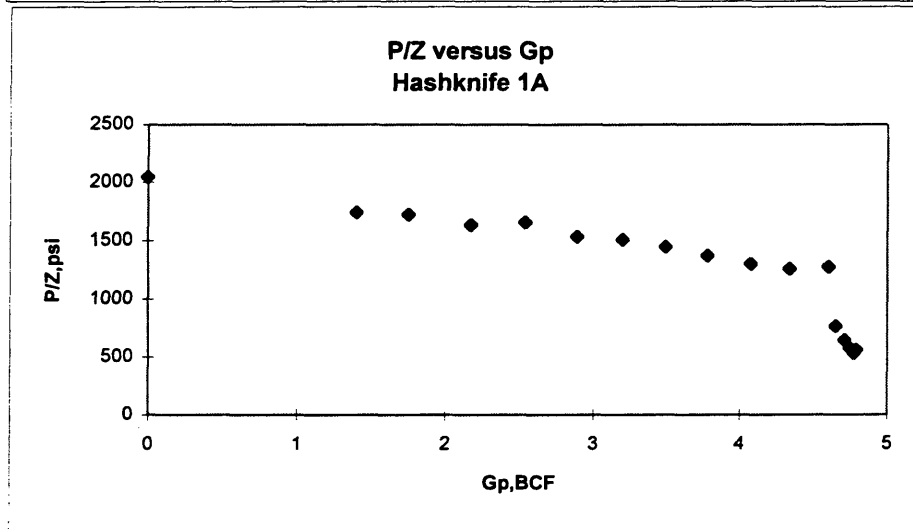
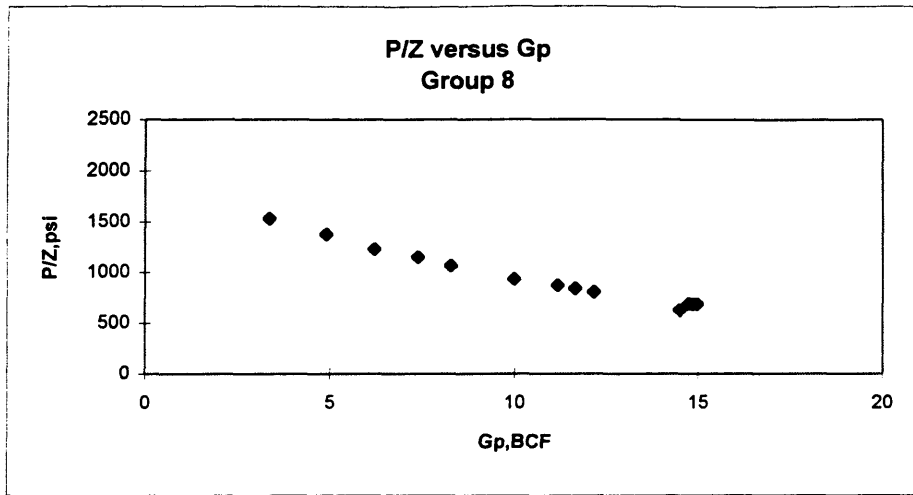


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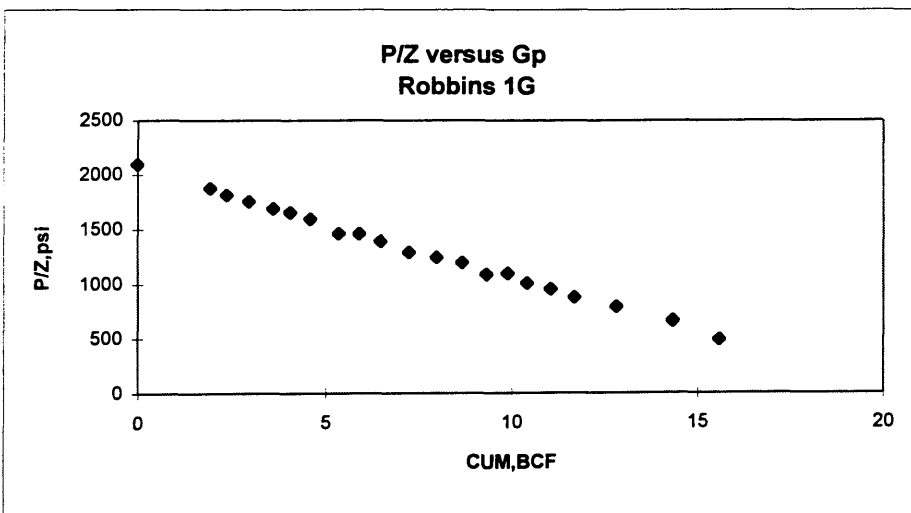
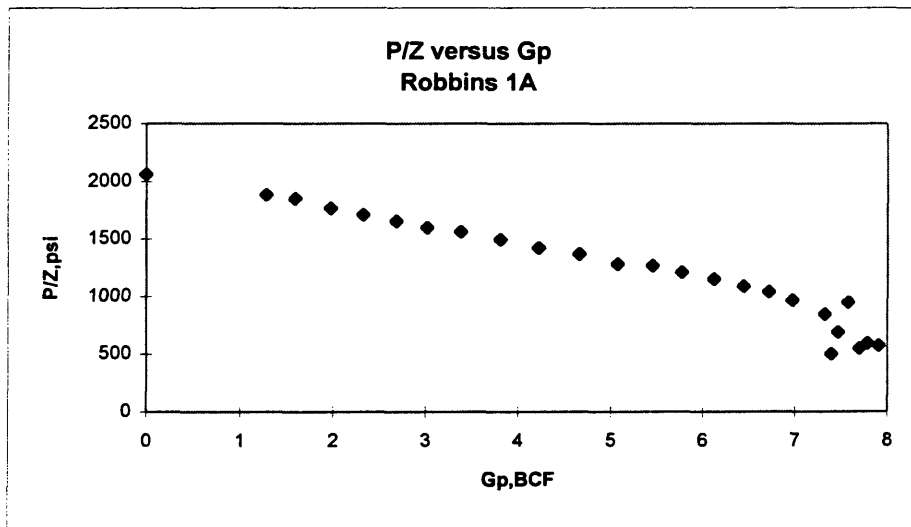
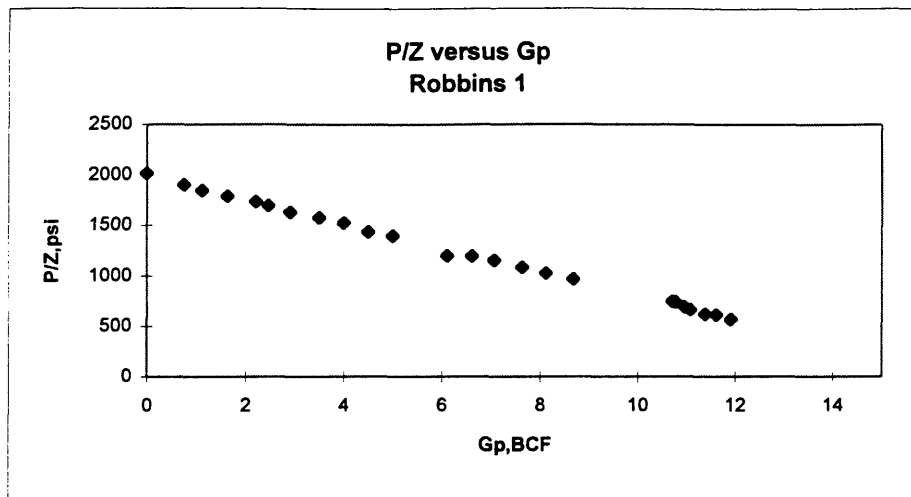


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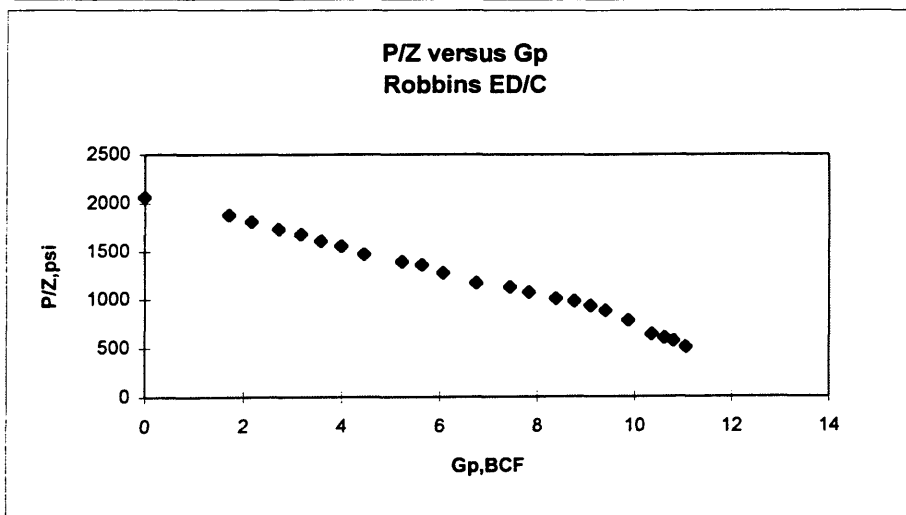
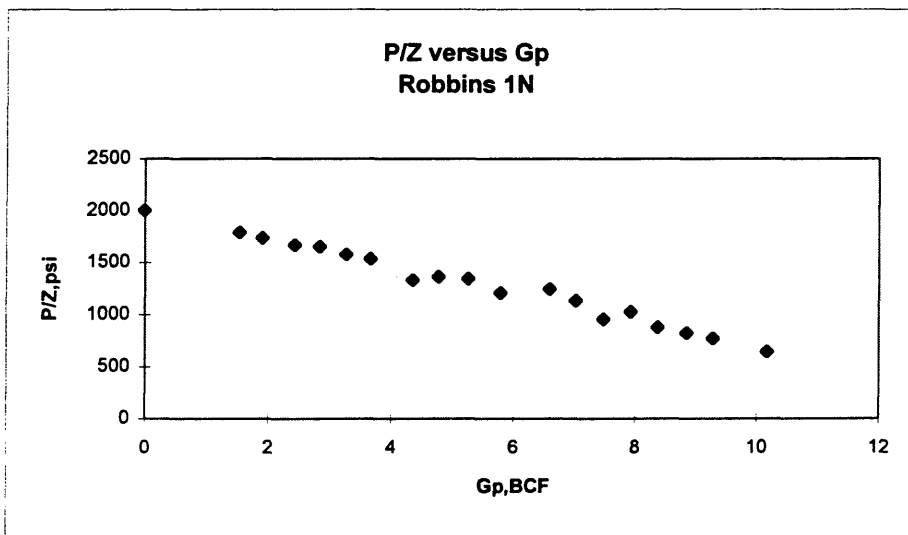
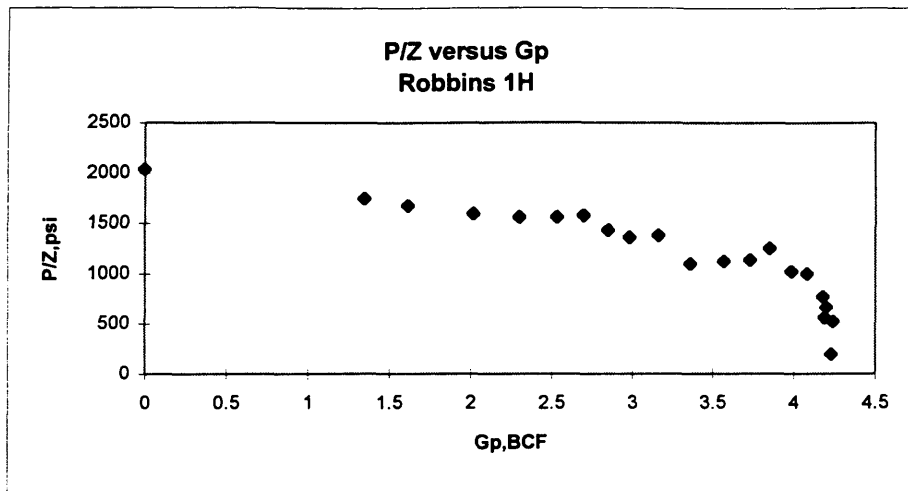


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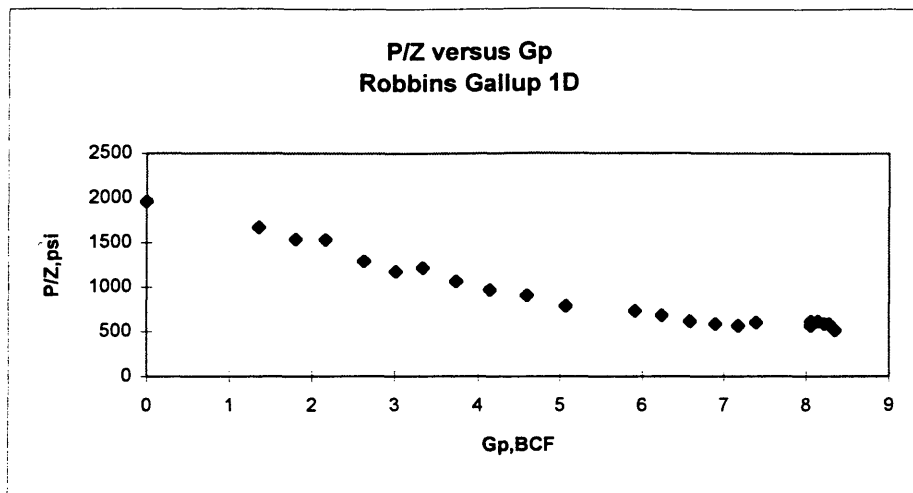


Table A.2 The Texas Field wells P/Z versus CUM data

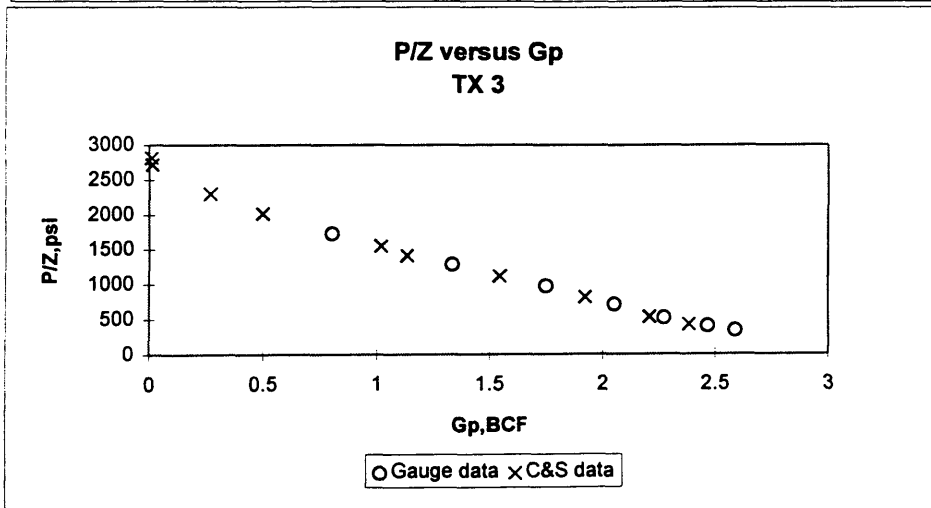
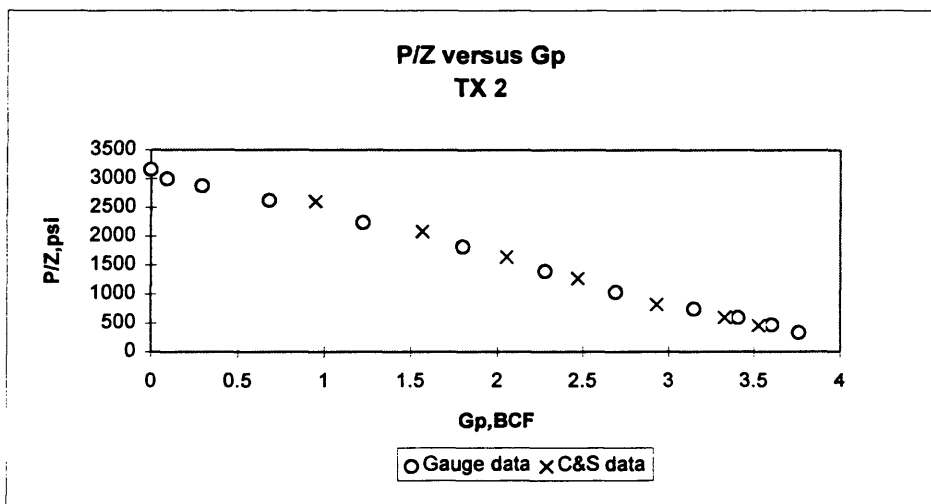
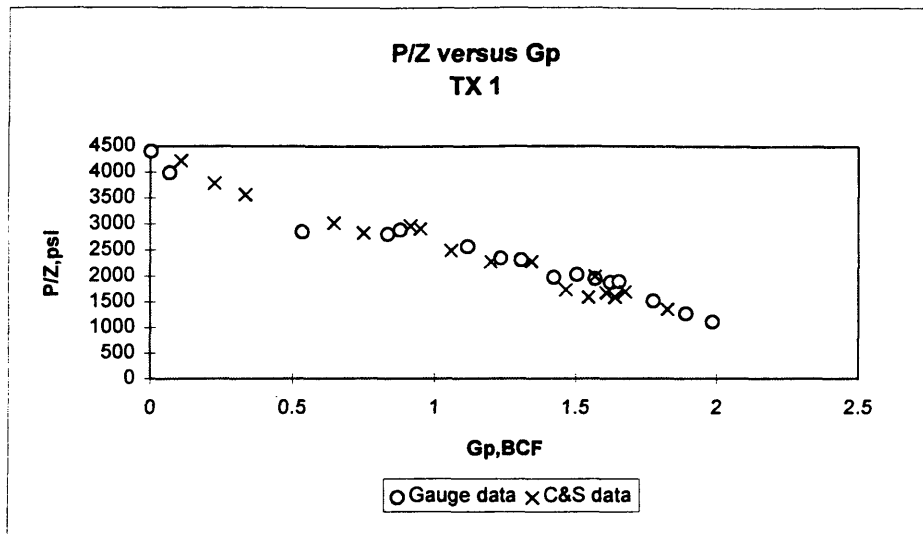
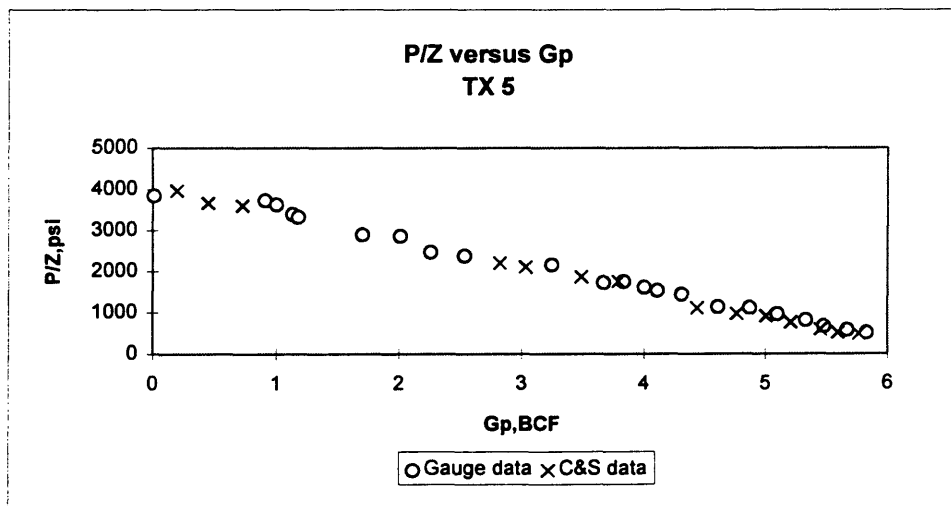
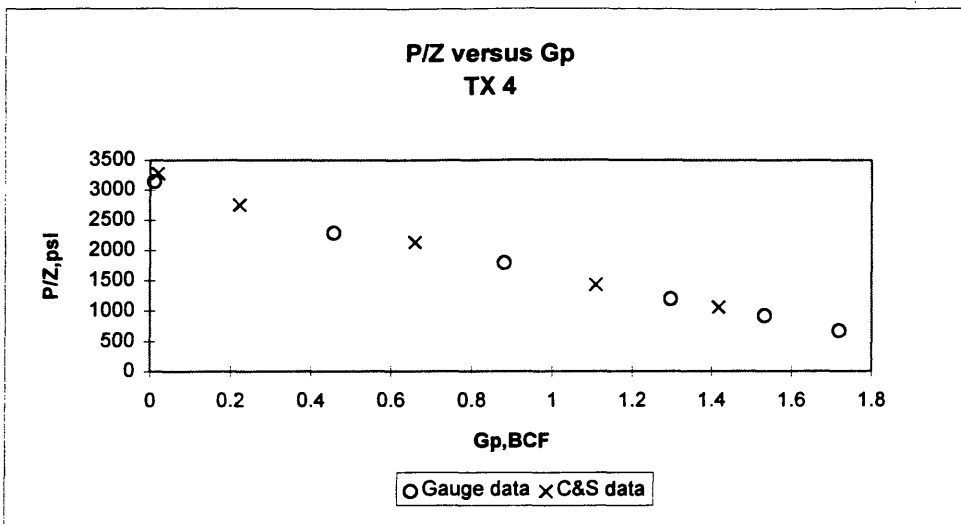


Table A. (Continued)



## APPENDIX B

The following pages present the statistical results, the accuracy ratio plots and the residual plots for the Glick Field from the Least Square and empirical High pressure method at 500 psi and 800 psi abandonment pressures.

## APPENDIX B-1

The following pages present the statistical results for the Glick Filed from the Least Square method and the empirical High Pressure method at 500 psi and 800 psi abandonment pressures.

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Table B-1.1 Results for Glick Field from the Least Square method at 800 psi abandonment

Group 2 @ 800 psi	EUR			Least square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	24.18	20.03	16.60	23.46	TRUE	10.96	13.22	9.07	5.64	12.50	HIGH
Jun-66	21.18	19.82	18.44	23.46	FALSE	13.7	7.48	6.12	4.74	9.76	HIGH
Jun-67	22.50	20.67	19.01	23.46	FALSE	16.34	6.16	4.33	2.67	7.12	HIGH
Jun-68	111.22	59.10	40.86	51.34	TRUE	16.34	94.88	42.76	24.52	35.00	LOW
Jun-69	111.22	59.10	40.86	51.34	TRUE	16.34	94.88	42.76	24.52	35.00	LOW
Jun-70	51.61	43.20	37.11	51.34	TRUE	24.4	27.21	18.80	12.71	26.94	HIGH
Jun-71	58.77	50.14	43.97	51.34	TRUE	24.4	34.37	25.74	19.57	26.94	HIGH
Jun-72	53.79	50.05	46.81	51.34	TRUE	30.12	23.67	19.93	16.69	21.22	HIGH
Jun-73	52.38	49.98	47.75	51.34	TRUE	33.1	19.28	16.88	14.65	18.24	HIGH
Jun-74	51.55	49.89	48.30	51.34	TRUE	36.54	15.01	13.35	11.76	14.80	HIGH
Jun-75	51.18	49.90	48.67	51.34	FALSE	36.54	14.64	13.36	12.13	14.80	HIGH
Jun-76	52.64	50.88	49.19	51.34	TRUE	43.27	9.37	7.61	5.92	8.07	HIGH
Jun-77	52.75	51.17	49.63	51.34	TRUE	46.07	6.68	5.10	3.56	5.27	HIGH
Jun-78	53.00	51.49	50.00	51.34	TRUE	48.67	4.33	2.82	1.33	2.67	LOW
Jun-79	53.26	51.78	50.32	51.34	TRUE	51.24	2.02	0.54	-0.92	0.10	LOW
				%TRUE	80%					%HIGH	73%
				%FALSE	20%					%LOW	27%

Group 4 @ 800 psi	EUR			Least square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	19.54	12	8.08	14.59	TRUE	4.21	15.33	7.79	3.87	10.38	HIGH
Jun-66	13.78	11.81	10.2	14.59	FALSE	5.25	8.53	6.56	4.95	9.34	HIGH
Jun-67	17.17	13.34	10.55	14.59	TRUE	6.28	10.89	7.06	4.27	8.31	HIGH
Jun-68	16.92	13.97	11.62	14.59	TRUE	7.17	9.75	6.80	4.45	7.42	HIGH
Jun-69	20.75	16.35	13.06	19.38	TRUE	9.55	11.20	6.80	3.51	9.83	HIGH
Jun-70	19.76	16.65	14.05	19.38	TRUE	11.31	8.45	5.34	2.74	8.07	HIGH
Jun-71	20.20	17.45	15.05	19.38	TRUE	12.93	7.27	4.52	2.12	6.45	HIGH
Jun-72	20.38	17.95	15.77	19.38	TRUE	14.44	5.94	3.51	1.33	4.94	HIGH
Jun-73	20.65	18.42	16.37	19.38	TRUE	15.93	4.72	2.49	0.44	3.45	HIGH
Jun-74	20.81	18.76	16.84	19.38	TRUE	17.76	3.05	1.00	-0.92	1.62	HIGH
Jun-75	20.81	18.94	17.15	19.38	TRUE	19.38	1.43	-0.44	-2.23	0.00	HIGH
				%TRUE	91%					%HIGH	100%
				%FALSE	9%					%LOW	0%

Table B-1.1 (Continued)

Group 5 @ 800 psi	Group 5			Least square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	N/A	12.61	9.95	18.33	TRUE	3.99	N/A	12.61	9.95	18.33	HIGH
Jun-66	17.69	13.48	11.54	18.33	FALSE	4.87	17.69	13.48	11.54	18.33	HIGH
Jun-67	15.82	13.85	12.53	18.33	FALSE	6.02	15.82	13.85	12.53	18.33	HIGH
Jun-68	17.06	14.75	13.23	18.33	FALSE	6.77	17.06	14.75	13.23	18.33	HIGH
Jun-69	17.52	15.43	13.96	18.33	FALSE	7.62	17.52	15.43	13.96	18.33	HIGH
Jun-70	17.12	15.64	14.46	18.33	FALSE	8.85	17.12	15.64	14.46	18.33	HIGH
Jun-71	17.47	16.14	15.02	18.33	FALSE	9.91	17.47	16.14	15.02	18.33	HIGH
Jun-72	17.48	16.36	15.38	18.33	FALSE	10.93	17.48	16.36	15.38	18.33	HIGH
Jun-73	17.60	16.60	15.70	18.33	FALSE	12.00	17.60	16.60	15.70	18.33	HIGH
Jun-74	17.60	16.60	15.70	18.33	FALSE	12.00	17.60	16.60	15.70	18.33	HIGH
Jun-75	17.87	16.93	16.05	18.33	FALSE	14.39	17.87	16.93	16.05	18.33	HIGH
Jun-76	17.96	17.1	16.27	18.33	FALSE	15.58	17.96	17.10	16.27	18.33	HIGH
Jun-77	18.57	17.54	16.55	18.33	TRUE	16.47	18.57	17.54	16.55	18.33	HIGH
Jun-78	18.79	17.76	16.77	18.33	TRUE	17.37	18.79	17.76	16.77	18.33	HIGH
Jun-79	18.93	17.92	16.94	18.33	TRUE	18.33	18.93	17.92	16.94	18.33	HIGH
				%TRUE	27%					%HIGH	100%
				%FALSE	73%					%LOW	0%

Group 6 @ 800 psi	EUR			Least square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	32.63	28.92	26.51	29.19	TRUE	5.28	32.63	28.92	26.51	29.19	HIGH
Jun-66	29.98	28.82	27.83	29.19	TRUE	6.52	29.98	28.82	27.83	29.19	HIGH
Jun-67	29.45	28.18	27.10	29.19	TRUE	7.87	29.45	28.18	27.10	29.19	HIGH
Jun-68	29.58	28.59	27.72	29.19	TRUE	9.02	29.58	28.59	27.72	29.19	HIGH
Jun-69	29.31	28.66	28.07	29.19	TRUE	10.10	29.31	28.66	28.07	29.19	HIGH
Jun-70	28.89	28.39	27.92	29.19	FALSE	11.53	28.89	28.39	27.92	29.19	HIGH
Jun-71	29.57	28.95	28.38	29.19	TRUE	13.01	29.57	28.95	28.38	29.19	HIGH
Jun-72	29.22	28.73	28.26	29.19	TRUE	14.35	29.22	28.73	28.26	29.19	HIGH
Jun-73	29.48	29.01	28.57	29.19	TRUE	15.75	29.48	29.01	28.57	29.19	HIGH
Jun-74	29.48	29.01	28.57	29.19	TRUE	15.75	29.48	29.01	28.57	29.19	HIGH
Jun-75	29.41	29.04	28.68	29.19	TRUE	18.95	29.41	29.04	28.68	29.19	HIGH
Jun-76	29.21	28.88	28.56	29.19	TRUE	20.45	29.21	28.88	28.56	29.19	HIGH
Jun-77	29.48	29.12	28.77	29.19	TRUE	21.89	29.48	29.12	28.77	29.19	HIGH
Jun-78	29.51	29.18	28.86	29.19	TRUE	23.05	29.51	29.18	28.86	29.19	HIGH
Jun-79	30.01	29.54	29.08	29.19	TRUE	24.21	30.01	29.54	29.08	29.19	LOW
Jun-80	29.83	29.36	28.88	29.19	TRUE	25.36	29.83	29.36	28.88	29.19	LOW
				%TRUE	94%					%HIGH	88%
				%FALSE	6%					%LOW	13%

Table B-1.1 (Continued)

Group 7 @ 800 psi	EUR			Least square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	15.44	13.44	12.09	17.56	FALSE	2.69	12.76	10.76	9.41	14.88	HIGH
Jun-66	15.29	14.17	13.28	17.56	FALSE	4.16	11.13	10.01	9.12	13.40	HIGH
Jun-67	16.41	15.30	14.40	17.56	FALSE	5.97	10.44	9.33	8.43	11.59	HIGH
Jun-68	16.93	16.00	15.21	17.56	FALSE	7.34	9.59	8.66	7.87	10.22	HIGH
Jun-69	16.47	15.86	15.30	17.56	FALSE	8.69	7.79	7.18	6.62	8.88	HIGH
Jun-70	16.84	16.28	15.75	17.56	FALSE	10.58	6.26	5.70	5.17	6.98	HIGH
Jun-71	17.14	16.61	16.10	17.56	FALSE	12.29	4.85	4.32	3.81	5.27	HIGH
Jun-72	17.22	16.75	16.30	17.56	FALSE	13.96	3.26	2.79	2.34	3.60	HIGH
Jun-73	17.51	17.02	16.54	17.56	FALSE	15.63	1.88	1.39	0.91	1.93	HIGH
				%TRUE	0%					%HIGH	100%
				%FALSE	100%					%LOW	0%

Group 8 @ 800 psi	EUR			Least Square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Jun-71	11.08	10.31	9.74	12.14	FALSE	6.20	4.88	4.11	3.54	5.94	HIGH
Jun-72	11.84	10.9	10.19	12.14	FALSE	7.38	4.46	3.52	2.81	4.76	HIGH
Jun-73	11.56	11.05	10.6	12.14	FALSE	8.28	3.28	2.77	2.32	3.86	HIGH
Jun-74	11.56	11.05	10.6	12.14	FALSE	8.28	3.28	2.77	2.32	3.86	HIGH
Jun-75	11.68	11.27	10.89	12.14	FALSE	9.99	1.69	1.28	0.90	2.15	HIGH
Jun-76	11.68	11.27	10.89	12.14	FALSE	11.15	0.53	0.12	-0.26	0.99	HIGH
Jun-77	12.09	11.58	11.1	12.14	FALSE	11.64	0.45	-0.06	-0.54	0.50	HIGH
Jun-78	12.26	11.75	11.26	12.14	TRUE	12.14	0.12	-0.39	-0.88	0.00	HIGH
Jun-79	12.39	11.88	11.38	12.14	TRUE	12.14	0.25	-0.26	-0.76	0.00	HIGH
Jun-80	12.39	11.88	11.38	12.14	TRUE	12.14	0.25	-0.26	-0.76	0.00	HIGH
Jun-82	12.39	11.88	11.38	12.14	TRUE	12.14	0.25	-0.26	-0.76	0.00	HIGH
				%TRUE	36%					%HIGH	100%
				%FALSE	64%					%LOW	0%

Table B-1.1 (Continued)

Hash.1B(14) @800 psi	EUR			Least square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	5.00	2.68	1.61	3.70	TRUE	1.28	3.72	1.40	0.33	2.42	HIGH
Jun-66	N/A	3.67	1.97	3.70	TRUE	1.7	N/A	1.97	0.27	2.00	HIGH
Jun-67	5.76	3.77	2.63	3.70	TRUE	2.1	3.66	1.67	0.53	1.60	LOW
Jun-68	4.99	3.82	2.98	3.70	TRUE	2.44	2.55	1.38	0.54	1.26	LOW
Jun-69	5.57	4.25	3.30	3.70	TRUE	2.7	2.87	1.55	0.60	1.00	LOW
Jun-70	5.39	4.34	3.52	3.70	TRUE	2.91	2.48	1.43	0.61	0.79	LOW
Jun-71	5.23	4.37	3.65	3.70	TRUE	3.04	2.19	1.33	0.61	0.66	LOW
Jun-72	5.08	4.34	3.69	3.70	TRUE	3.19	1.89	1.15	0.50	0.51	LOW
Jun-73	4.93	4.27	3.67	3.70	TRUE	3.31	1.62	0.96	0.36	0.39	LOW
Jun-74	4.93	4.27	3.67	3.70	TRUE	3.31	1.62	0.96	0.36	0.39	LOW
Jun-75	4.82	4.22	3.66	3.70	TRUE	3.53	1.29	0.69	0.13	0.17	LOW
Jun-76	4.7	4.13	3.59	3.70	TRUE	3.6	1.10	0.53	-0.01	0.10	LOW
				%TRUE	100%					%HIGH	17%
				%FALSE	0%					%LOW	83%

Robbins 1 @ 800 psi	EUR			Least square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	8.23	8.10	7.96	10.10	FALSE	1.12	7.11	6.98	6.84	8.98	HIGH
Jun-66	9.46	8.64	7.98	10.10	FALSE	1.63	7.83	7.01	6.35	8.47	HIGH
Jun-67	10.45	9.39	8.57	10.10	TRUE	2.20	8.25	7.19	6.37	7.90	HIGH
Jun-68	10.20	9.51	8.93	10.10	TRUE	2.46	7.74	7.05	6.47	7.64	HIGH
Jun-69	9.87	9.40	8.99	10.10	FALSE	2.90	6.97	6.50	6.09	7.20	HIGH
Jun-70	10.02	9.62	9.25	10.10	FALSE	3.50	6.52	6.12	5.75	6.60	HIGH
Jun-71	10.21	9.83	9.49	10.10	TRUE	4.00	6.21	5.83	5.49	6.10	HIGH
Jun-72	10.02	9.73	9.46	10.10	FALSE	4.50	5.52	5.23	4.96	5.60	HIGH
Jun-73	10.07	9.82	9.58	10.10	FALSE	5.00	5.07	4.82	4.58	5.10	HIGH
Jun-74	10.07	9.82	9.58	10.10	FALSE	5.00	5.07	4.82	4.58	5.10	HIGH
Jun-75	9.83	9.53	9.25	10.10	FALSE	6.11	3.72	3.42	3.14	3.99	HIGH
Jun-76	10.05	9.77	9.5	10.10	FALSE	6.85	3.20	2.92	2.65	3.25	HIGH
Jun-77	10.11	9.84	9.57	10.10	TRUE	7.65	2.47	2.20	1.93	2.46	HIGH
Jun-78	10.14	9.89	9.63	10.10	TRUE	8.13	2.01	1.76	1.50	1.97	HIGH
Jun-79	10.2	9.94	9.69	10.10	TRUE	8.69	1.51	1.25	1.00	1.41	HIGH
				%TRUE	40%					%HIGH	100%
				%FALSE	60%					%LOW	0%

Hash.1A @ 800 psi	EUR			Least square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	12.15	6.46	4.65	4.65	FALSE	1.75	10.40	4.71	2.90	2.90	LOW
Jun-66	7.68	6.60	5.81	4.65	FALSE	2.17	5.51	4.43	3.64	2.48	LOW
Jun-67	9.63	7.46	6.22	4.65	FALSE	2.54	7.09	4.92	3.68	2.11	LOW
Jun-68	8.61	7.37	6.50	4.65	FALSE	2.9	5.71	4.47	3.60	1.75	LOW
Jun-69	8.44	7.51	6.80	4.65	FALSE	3.2	5.24	4.31	3.60	1.45	LOW
Jun-70	8.20	7.50	6.93	4.65	FALSE	3.5	4.70	4.00	3.43	1.15	LOW
Jun-71	7.92	7.37	6.90	4.65	FALSE	3.78	4.14	3.59	3.12	0.87	LOW
Jun-72	7.68	7.21	6.79	4.65	FALSE	4.08	3.60	3.13	2.71	0.57	LOW
Jun-73	7.52	7.12	6.75	4.65	FALSE	4.34	3.18	2.78	2.41	0.31	LOW
Jun-74	7.52	7.12	6.75	4.65	FALSE	4.34	3.18	2.78	2.41	0.31	LOW
Jun-75	7.63	7.23	6.86	4.65	FALSE	4.61	3.02	2.62	2.25	0.04	LOW
				%TRUE	0%					%HIGH	0%
				%FALSE	100%					%LOW	100%

Table B-1.1 (Continued)

Robbins ED/C @ 800 psi	EUR			Least square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	14.81	10.98	9.18	9.70	TRUE	2.17	12.64	8.81	7.01	7.53	LOW
Jun-66	11.83	10.52	9.59	9.70	TRUE	2.72	9.11	7.80	6.87	6.98	LOW
Jun-67	11.11	10.42	9.85	9.70	FALSE	3.18	7.93	7.24	6.67	6.52	LOW
Jun-68	10.72	10.15	9.66	9.70	TRUE	3.59	7.13	6.56	6.07	6.11	LOW
Jun-69	10.44	10.00	9.62	9.70	TRUE	4.00	6.44	6.00	5.62	5.70	LOW
Jun-70	10.17	9.74	9.36	9.70	TRUE	4.47	5.70	5.27	4.89	5.23	LOW
Jun-71	10.06	9.74	9.44	9.70	TRUE	5.24	4.82	4.50	4.20	4.46	LOW
Jun-72	10.12	9.84	9.57	9.70	TRUE	5.64	4.48	4.20	3.93	4.06	LOW
Jun-73	10.03	9.79	9.56	9.70	TRUE	6.08	3.95	3.71	3.48	3.62	LOW
Jun-74	9.92	9.70	9.49	9.70	TRUE	6.75	3.17	2.95	2.74	2.95	LOW
Jun-75	10.03	9.8	9.58	9.70	TRUE	7.45	2.58	2.35	2.13	2.25	LOW
Jun-76	10.08	9.86	9.65	9.70	TRUE	7.83	2.25	2.03	1.82	1.87	LOW
Jun-77	10.12	9.91	9.7	9.70	FALSE	8.12	2.00	1.79	1.58	1.58	LOW
Jun-78	10.2	9.98	9.75	9.70	FALSE	8.76	1.44	1.22	0.99	0.94	LOW
Jun-79	10.24	10.02	9.8	9.70	FALSE	9.09	1.15	0.93	0.71	0.61	LOW
Jun-80	10.25	10.03	9.82	9.70	FALSE	9.41	0.84	0.62	0.41	0.29	LOW
				%TRUE	69%					%HIGH	0%
				%FALSE	31%					%LOW	100%

Robbins 1H @ 800 psi	Robbins 1H			Least square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	6.14	5.58	5.12	4.13	FALSE	1.61	4.53	3.97	3.51	2.52	LOW
Jun-66	5.79	5.61	5.44	4.13	FALSE	2.02	3.77	3.59	3.42	2.11	LOW
Jun-67	6.13	5.8	5.5	4.13	FALSE	2.3	3.83	3.50	3.20	1.83	LOW
Jun-68	6.79	6.16	5.63	4.13	FALSE	2.53	4.26	3.63	3.10	1.60	LOW
Jun-69	7.61	6.62	5.87	4.13	FALSE	2.7	4.91	3.92	3.17	1.43	LOW
Jun-70	7.17	6.38	5.75	4.13	FALSE	2.85	4.32	3.53	2.90	1.28	LOW
Jun-71	6.81	6.09	5.51	4.13	FALSE	2.99	3.82	3.10	2.52	1.14	LOW
Jun-72	6.67	6.06	5.55	4.13	FALSE	3.17	3.50	2.89	2.38	0.96	LOW
Jun-73	6.39	5.50	4.77	4.13	FALSE	3.36	3.03	2.14	1.41	0.77	LOW
Jun-74	6.09	5.30	4.61	4.13	FALSE	3.57	2.52	1.73	1.04	0.56	LOW
Jun-75	5.95	5.24	4.61	4.13	FALSE	3.73	2.22	1.51	0.88	0.40	LOW
Jun-76	6.13	5.38	4.71	4.13	FALSE	3.85	2.28	1.53	0.86	0.28	LOW
Jun-77	5.97	5.26	4.62	4.13	FALSE	3.99	1.98	1.27	0.63	0.14	LOW
Jun-78	5.84	5.18	4.56	4.13	FALSE	4.08	1.76	1.10	0.48	0.05	LOW
				%TRUE	0%					%HIGH	0%
				%FALSE	100%					%LOW	100%

Table B-1.1 (Continued)

Robbins 1A		EUR			Least square method			ERR				
@ 800 psi	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90	ARR	BIAS	
Apr-65	10.69	9.52	8.65	7.35	FALSE	1.6	9.09	7.92	7.05	5.75	LOW	
Jun-66	10.32	8.83	7.82	7.35	FALSE	1.98	8.34	6.85	5.84	5.37	LOW	
Jun-67	9.39	8.53	7.86	7.35	FALSE	2.33	7.06	6.20	5.53	5.02	LOW	
Jun-68	8.93	8.37	7.89	7.35	FALSE	2.69	6.24	5.68	5.20	4.66	LOW	
Jun-69	8.68	8.35	8.04	7.35	FALSE	3.02	5.66	5.33	5.02	4.33	LOW	
Jun-70	8.65	8.39	8.14	7.35	FALSE	3.38	5.27	5.01	4.76	3.97	LOW	
Jun-71	8.56	8.35	8.15	7.35	FALSE	3.81	4.75	4.54	4.34	3.54	LOW	
Jun-72	8.56	8.35	8.15	7.35	FALSE	4.22	4.34	4.13	3.93	3.13	LOW	
Jun-73	8.57	8.39	8.21	7.35	FALSE	4.66	3.91	3.73	3.55	2.69	LOW	
Jun-74	8.48	8.32	8.16	7.35	FALSE	5.08	3.40	3.24	3.08	2.27	LOW	
Jun-75	8.6	8.42	8.24	7.35	FALSE	5.45	3.15	2.97	2.79	1.90	LOW	
Jun-76	8.63	8.46	8.29	7.35	FALSE	5.78	2.85	2.68	2.51	1.57	LOW	
Jun-77	8.62	8.47	8.31	7.35	FALSE	6.12	2.50	2.35	2.19	1.23	LOW	
Jun-78	8.59	8.44	8.3	7.35	FALSE	6.45	2.14	1.99	1.85	0.90	LOW	
Jun-79	8.55	8.41	8.27	7.35	FALSE	6.72	1.83	1.69	1.55	0.63	LOW	
Jun-80	8.51	8.34	8.16	7.35	FALSE	6.94	1.57	1.40	1.22	0.41	LOW	
Jun-82	8.48	8.19	7.91	7.35	FALSE	7.33	1.15	0.86	0.58	0.02	LOW	
				%TRUE	0%					%HIGH	0%	
				%FALSE	100%					%LOW	100%	

Robbins 1G		EUR			Least square method			ERR				
@ 800 psi	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90	ARR	BIAS	
Apr-65	12.69	11.06	9.95	12.81	FALSE	2.36	10.33	8.70	7.59	10.45	HIGH	
Jun-66	11.73	11.18	10.7	12.81	FALSE	2.95	8.78	8.23	7.75	9.86	HIGH	
Jun-67	11.94	11.42	10.98	12.81	FALSE	3.6	8.34	7.82	7.38	9.21	HIGH	
Jun-68	12.37	11.75	11.22	12.81	FALSE	4.06	8.31	7.69	7.16	8.75	HIGH	
Jun-69	12.41	11.91	11.47	12.81	FALSE	4.59	7.82	7.32	6.88	8.22	HIGH	
Jun-70	12.04	11.49	11.00	12.81	FALSE	5.56	6.48	5.93	5.44	7.25	HIGH	
Jun-71	12.31	11.76	11.27	12.81	FALSE	5.9	6.41	5.86	5.37	6.91	HIGH	
Jun-72	12.31	11.86	11.45	12.81	FALSE	6.48	5.83	5.38	4.97	6.33	HIGH	
Jun-73	12.18	11.82	11.48	12.81	FALSE	7.25	4.93	4.57	4.23	5.56	HIGH	
Jun-74	12.31	11.97	11.63	12.81	FALSE	7.99	4.32	3.98	3.64	4.82	HIGH	
Jun-75	12.55	12.17	11.8	12.81	FALSE	8.67	3.88	3.50	3.13	4.14	HIGH	
Jun-76	12.48	12.14	11.82	12.81	FALSE	9.33	3.15	2.81	2.49	3.48	HIGH	
Jun-77	12.75	12.34	11.95	12.81	FALSE	9.89	2.86	2.45	2.06	2.92	HIGH	
Jun-78	12.75	12.38	12.01	12.81	FALSE	10.41	2.34	1.97	1.60	2.40	HIGH	
Jun-79	12.79	12.43	12.07	12.81	FALSE	11.03	1.76	1.40	1.04	1.78	HIGH	
Jun-80	12.78	12.44	12.1	12.81	FALSE	11.68	1.10	0.76	0.42	1.13	HIGH	
				%TRUE	0%					%HIGH	100%	
				%FALSE	100%					%LOW	0%	

Table B-1.1 (Continued)

Robbins 1N @ 800 psi	EUR			Least square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	8.74	8.59	8.45	9.20	FALSE	1.91	6.83	6.68	6.54	7.29	HIGH
Jun-66	8.89	8.7	8.52	9.20	FALSE	2.44	6.45	6.26	6.08	6.76	HIGH
Jun-67	10.42	9.3	8.48	9.20	TRUE	2.85	7.57	6.45	5.63	6.35	LOW
Jun-68	10.08	9.36	8.77	9.20	TRUE	3.27	6.81	6.09	5.50	5.93	LOW
Jun-69	10.02	9.48	9.01	9.20	TRUE	3.67	6.35	5.81	5.34	5.53	LOW
Jun-70	9.51	8.61	7.86	9.20	TRUE	4.35	5.16	4.26	3.51	4.85	HIGH
Jun-71	9.49	8.75	8.13	9.20	TRUE	4.78	4.71	3.97	3.35	4.42	HIGH
Jun-72	9.81	9.07	8.44	9.20	TRUE	5.26	4.55	3.81	3.18	3.94	HIGH
Jun-73	9.42	8.98	8.56	9.20	TRUE	5.79	3.63	3.19	2.77	3.41	HIGH
Jun-74	10.07	9.48	8.93	9.20	TRUE	6.59	3.48	2.89	2.34	2.61	LOW
Jun-75	10.12	9.59	9.08	9.20	TRUE	7.03	3.09	2.56	2.05	2.17	LOW
Jun-76	9.83	9.3	8.81	9.20	TRUE	7.35	2.48	1.95	1.46	1.85	LOW
Jun-77	9.95	9.44	8.95	9.20	TRUE	7.49	2.46	1.95	1.46	1.71	LOW
Jun-78	9.81	9.33	8.87	9.20	TRUE	7.94	1.87	1.39	0.93	1.26	LOW
Jun-79	9.73	9.28	8.84	9.20	TRUE	8.38	1.35	0.90	0.46	0.82	LOW
				%TRUE	87%					%HIGH	40%
				%FALSE	13%					%LOW	60%

Robbins-Gallup 1D @ 800 psi	EUR			Least square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	6.32	5.08	4.23	5.05	TRUE	1.81	4.51	3.27	2.42	3.24	LOW
Jun-66	6.66	5.52	4.71	5.05	TRUE	2.17	4.49	3.35	2.54	2.88	LOW
Jun-67	5.89	4.95	4.23	5.05	TRUE	2.62	3.27	2.33	1.61	2.43	HIGH
Jun-68	5.33	4.68	4.13	5.05	TRUE	3.02	2.31	1.66	1.11	2.03	HIGH
Jun-69	5.44	4.85	4.34	5.05	TRUE	3.34	2.10	1.51	1.00	1.71	HIGH
Jun-70	5.30	4.84	4.42	5.05	TRUE	3.74	1.56	1.10	0.68	1.31	HIGH
Jun-71	5.21	4.84	4.49	5.05	TRUE	4.15	1.06	0.69	0.34	0.90	HIGH
Jun-72	5.25	4.90	4.57	5.05	TRUE	4.6	0.65	0.30	-0.03	0.45	HIGH
				%TRUE	100%					%HIGH	75%
				%FALSE	0%					%LOW	25%

Table B-1.2 Results for Glick Field from the High Pressure method at 800 psi abandonment

Group 2 @ 800 psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM.	P10	P50	P90		
Apr-65	27.57	22.28	16.99	23.46	TRUE	10.96	16.61	11.32	6.03	12.50	HIGH
Jun-66	24.23	22.5	20.77	23.46	TRUE	13.70	10.53	8.80	7.07	9.76	HIGH
Jun-67	23.33	21.82	20.31	23.46	FALSE	16.34	6.99	5.48	3.97	7.12	HIGH
Jun-68	23.33	21.82	20.31	23.46	FALSE	18.69	4.64	3.13	1.62	4.76	HIGH
Jun-69	53.62	45.39	37.16	51.34	TRUE	21.23	32.39	24.16	15.93	30.11	HIGH
Jun-70	53.62	45.39	37.16	51.34	TRUE	24.40	29.22	20.99	12.76	26.94	HIGH
Jun-71	58.35	51.31	44.27	51.34	TRUE	24.40	33.95	26.91	19.87	26.94	HIGH
Jun-72	53.82	50.68	47.54	51.34	TRUE	30.12	23.70	20.56	17.42	21.22	HIGH
Jun-73	52.35	50.45	48.55	51.34	TRUE	33.10	19.25	17.35	15.45	18.24	HIGH
Jun-74	52.78	51.18	49.58	51.34	TRUE	36.54	16.24	14.64	13.04	14.80	HIGH
Jun-75	52.35	51.12	49.89	51.34	TRUE	36.54	15.81	14.58	13.35	14.80	HIGH
Jun-76	53.14	51.78	50.42	51.34	TRUE	43.27	9.87	8.51	7.15	8.07	LOW
Jun-77	53.38	52.11	50.84	51.34	TRUE	46.07	7.31	6.04	4.77	5.27	LOW
Jun-78	53.91	52.56	51.21	51.34	TRUE	48.67	5.24	3.89	2.54	2.67	LOW
Jun-79	54.26	52.89	51.22	51.34	TRUE	51.34	2.92	1.55	-0.12	0.00	LOW
				%TRUE	87%					%HIGH	80%
				%FALSE	13%					%LOW	20%

Group 4 @ 800 psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM.	P10	P50	P90		
Apr-65	19.14	12.13	5.12	14.59	TRUE	4.21	14.93	7.92	0.91	10.38	HIGH
Jun-66	15.33	12.73	10.13	14.59	TRUE	5.25	10.08	7.48	4.88	9.34	HIGH
Jun-67	18.42	14.34	10.26	14.59	TRUE	6.28	12.14	8.06	3.98	8.31	HIGH
Jun-68	17.14	14.47	11.80	14.59	TRUE	7.17	9.97	7.30	4.63	7.42	HIGH
Jun-69	20.64	16.73	12.82	19.38	TRUE	9.55	11.09	7.18	3.27	9.83	HIGH
Jun-70	20.40	17.18	13.96	19.38	TRUE	11.31	9.09	5.87	2.65	8.07	HIGH
Jun-71	22.18	18.84	15.50	19.38	TRUE	12.93	9.25	5.91	2.57	6.45	HIGH
Jun-72	22.18	19.33	16.48	19.38	TRUE	14.44	7.74	4.89	2.04	4.94	HIGH
Jun-73	22.81	20.07	17.33	19.38	TRUE	15.93	6.88	4.14	1.40	3.45	LOW
Jun-74	23.11	20.58	18.05	19.38	TRUE	17.76	5.35	2.82	0.29	1.62	LOW
Jun-75	22.60	20.39	18.18	19.38	TRUE	19.38	3.22	1.01	-1.20	0.00	LOW
				%TRUE	100%					%HIGH	82%
				%FALSE	0%					%LOW	18%

Table B-1.2 (Continued)

Group 5 @ 800 psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	19.62	11.45	3.28	18.33	TRUE	3.99	15.63	7.46	-0.71	14.34	HIGH
Jun-66	16.82	12.44	8.06	18.33	FALSE	4.87	11.95	7.57	3.19	13.46	HIGH
Jun-67	17.18	13.49	9.80	18.33	FALSE	6.02	11.16	7.47	3.78	12.31	HIGH
Jun-68	17.42	14.33	11.24	18.33	FALSE	6.77	10.65	7.56	4.47	11.56	HIGH
Jun-69	17.45	14.96	12.47	18.33	FALSE	7.62	9.83	7.34	4.85	10.71	HIGH
Jun-70	17.65	15.58	13.51	18.33	FALSE	8.85	8.80	6.73	4.66	9.48	HIGH
Jun-71	17.82	16.07	14.32	18.33	FALSE	9.91	7.91	6.16	4.41	8.42	HIGH
Jun-72	18.11	16.54	14.97	18.33	FALSE	10.93	7.18	5.61	4.04	7.40	HIGH
Jun-73	18.54	17.03	15.52	18.33	TRUE	12.00	6.54	5.03	3.52	6.33	HIGH
Jun-74	19.00	17.55	16.10	18.33	TRUE	12.00	7.00	5.55	4.10	6.33	HIGH
Jun-75	19.00	17.55	16.10	18.33	TRUE	14.39	4.61	3.16	1.71	3.94	HIGH
Jun-76	18.76	17.52	16.28	18.33	TRUE	15.58	3.18	1.94	0.70	2.75	HIGH
Jun-77	19.15	17.88	16.61	18.33	TRUE	16.47	2.68	1.41	0.14	1.86	HIGH
Jun-78	19.4	18.14	16.88	18.33	TRUE	17.37	2.03	0.77	-0.49	0.96	HIGH
Jun-79	19.56	18.32	17.08	18.33	TRUE	18.33	1.23	-0.01	-1.25	0.00	HIGH
				%TRUE	53%					%HIGH	100%
				%FALSE	47%					%LOW	0%

Group 6 @ 800 psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	38.79	30.79	22.79	29.19	TRUE	5.28	33.51	25.51	17.51	23.91	LOW
Jun-66	33.33	31.04	28.75	29.19	TRUE	6.52	26.81	24.52	22.23	22.67	LOW
Jun-67	32.08	30.99	29.90	29.19	FALSE	7.87	24.21	23.12	22.03	21.32	LOW
Jun-68	31.45	30.59	29.73	29.19	FALSE	9.02	22.43	21.57	20.71	20.17	LOW
Jun-69	30.94	30.27	29.60	29.19	FALSE	10.1	20.84	20.17	19.50	19.09	LOW
Jun-70	30.45	29.85	29.25	29.19	FALSE	11.53	18.92	18.32	17.72	17.66	LOW
Jun-71	30.33	29.91	29.49	29.19	FALSE	13.01	17.32	16.90	16.48	16.18	LOW
Jun-72	30.47	30.10	29.73	29.19	FALSE	14.35	16.12	15.75	15.38	14.84	LOW
Jun-73	30.17	29.81	29.45	29.19	FALSE	15.75	14.42	14.06	13.70	13.44	LOW
Jun-74	30.17	29.81	29.45	29.19	FALSE	15.75	14.42	14.06	13.70	13.44	LOW
Jun-75	30.50	30.14	29.78	29.19	FALSE	18.95	11.55	11.19	10.83	10.24	LOW
Jun-76	30.44	30.14	29.84	29.19	FALSE	20.45	9.99	9.69	9.39	8.74	LOW
Jun-77	30.61	30.31	30.01	29.19	FALSE	21.89	8.72	8.42	8.12	7.30	LOW
Jun-78	30.63	30.35	30.07	29.19	FALSE	23.05	7.58	7.30	7.02	6.14	LOW
Jun-79	31.41	30.86	30.31	29.19	FALSE	24.21	7.20	6.65	6.10	4.98	LOW
Jun-80	32.23	30.69	29.15	29.19	TRUE	25.36	6.87	5.33	3.79	3.83	LOW
				%TRUE	19%					%HIGH	0%
				%FALSE	81%					%LOW	100%

Table B-1.2 (Continued)

Group 7 @ 800 psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	19.99	14.93	9.87	17.56	TRUE	2.69	17.31	12.25	7.19	14.88	HIGH
Jun-66	17.17	14.74	12.31	17.56	FALSE	4.16	13.01	10.58	8.15	13.40	HIGH
Jun-67	17.66	15.82	13.98	17.56	TRUE	5.97	11.69	9.85	8.01	11.59	HIGH
Jun-68	17.59	16.34	15.09	17.56	TRUE	7.34	10.25	9.00	7.75	10.22	HIGH
Jun-69	17.98	16.90	15.82	17.56	TRUE	8.69	9.30	8.22	7.14	8.88	HIGH
Jun-70	18.15	17.28	16.41	17.56	TRUE	10.58	7.57	6.70	5.83	6.98	HIGH
Jun-71	18.30	17.56	16.82	17.56	TRUE	12.29	6.01	5.27	4.53	5.27	LOW
Jun-72	18.65	17.90	17.15	17.56	TRUE	13.96	4.69	3.94	3.19	3.60	LOW
Jun-73	18.83	18.12	17.41	17.56	TRUE	15.63	3.20	2.49	1.78	1.93	LOW
				%TRUE	<b>89%</b>					%HIGH	<b>67%</b>
				%FALSE	<b>11%</b>					%LOW	<b>33%</b>

Group 8 @ 800 psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Jun-71	12.08	10.27	8.46	12.14	FALSE	6.20	5.88	4.07	2.26	5.94	HIGH
Jun-72	13.43	11.27	9.11	12.14	TRUE	7.38	6.05	3.89	1.73	4.76	HIGH
Jun-73	12.37	11.43	10.49	12.14	TRUE	8.28	4.09	3.15	2.21	3.86	HIGH
Jun-74	12.05	11.49	10.93	12.14	FALSE	8.28	3.77	3.21	2.65	3.86	HIGH
Jun-75	12.57	11.89	11.21	12.14	TRUE	9.99	2.58	1.90	1.22	2.15	HIGH
Jun-76	12.57	11.99	11.41	12.14	TRUE	11.15	1.42	0.84	0.26	0.99	HIGH
Jun-77	12.65	12.10	11.55	12.14	TRUE	11.64	1.01	0.46	-0.09	0.50	HIGH
Jun-78	13.45	12.54	11.63	12.14	TRUE	12.14	1.31	0.40	-0.51	0.00	LOW
Jun-79	13.83	12.79	11.75	12.14	TRUE	12.14	1.69	0.65	-0.39	0.00	LOW
Jun-80	14.01	12.95	11.89	12.14	TRUE	12.14	1.87	0.81	-0.25	0.00	LOW
Jun-82	14.1	13.05	12.00	12.14	TRUE	12.14	1.96	0.91	-0.14	0.00	LOW
				%TRUE	<b>82%</b>					%HIGH	<b>64%</b>
				%FALSE	<b>18%</b>					%LOW	<b>36%</b>

Table B-1.2 (Continued)

Hash.1A @ 800 psi	EUR			AUR	Logic	CUM.	ERR			ARR	BIAS
	P10	P50	P90				P10	P50	P90		
Apr-65	8.86	6.81	4.87	4.65	FALSE	1.75	7.11	5.06	3.12	2.90	LOW
Jun-66	7.97	6.81	5.98	4.65	FALSE	2.17	5.80	4.64	3.81	2.48	LOW
Jun-67	10.99	8.14	6.71	4.65	FALSE	2.54	8.45	5.60	4.17	2.11	LOW
Jun-68	9.75	8.14	7.10	4.65	FALSE	2.90	6.85	5.24	4.20	1.75	LOW
Jun-69	9.27	8.14	7.32	4.65	FALSE	3.20	6.07	4.94	4.12	1.45	LOW
Jun-70	8.98	8.14	7.48	4.65	FALSE	3.50	5.48	4.64	3.98	1.15	LOW
Jun-71	8.83	8.14	7.57	4.65	FALSE	3.78	5.05	4.36	3.79	0.87	LOW
Jun-72	8.74	8.14	7.62	4.65	FALSE	4.08	4.66	4.06	3.54	0.57	LOW
Jun-73	8.66	8.14	7.68	4.65	FALSE	4.34	4.32	3.80	3.34	0.31	LOW
Jun-74	8.62	8.14	7.70	4.65	FALSE	4.34	4.28	3.80	3.36	0.31	LOW
Jun-75	8.62	8.14	7.70	4.65	FALSE	4.61	4.01	3.53	3.09	0.04	LOW
				%TRUE	0%					%HIGH	0%
				%FALSE	100%					%LOW	100%

Hash 1B 14 @ 800 psi	EUR			High Pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	5.43	2.82	1.69	3.70	TRUE	1.28	4.15	1.54	0.41	2.42	HIGH
Jun-66	6.28	4.29	2.30	3.70	TRUE	1.70	4.58	2.59	0.60	2.00	LOW
Jun-67	6.81	4.29	2.99	3.70	TRUE	2.10	4.71	2.19	0.89	1.60	LOW
Jun-68	5.63	4.29	3.36	3.70	TRUE	2.44	3.19	1.85	0.92	1.26	LOW
Jun-69	5.44	4.29	3.43	3.70	TRUE	2.70	2.74	1.59	0.73	1.00	LOW
Jun-70	5.26	4.29	3.52	3.70	TRUE	2.91	2.35	1.38	0.61	0.79	LOW
Jun-71	5.05	4.29	3.64	3.70	TRUE	3.04	2.01	1.25	0.60	0.66	LOW
Jun-72	4.91	4.29	3.73	3.70	FALSE	3.19	1.72	1.10	0.54	0.51	LOW
Jun-73	4.85	4.29	3.78	3.70	FALSE	3.31	1.54	0.98	0.47	0.39	LOW
Jun-74	4.79	4.29	3.81	3.70	FALSE	3.31	1.48	0.98	0.50	0.39	LOW
Jun-75	4.78	4.29	3.82	3.70	FALSE	3.53	1.25	0.76	0.29	0.17	LOW
Jun-76	4.78	4.29	3.82	3.70	FALSE	3.60	1.18	0.69	0.22	0.10	LOW
				%TRUE	58%					%HIGH	8%
				%FALSE	42%					%LOW	92%

Robbins 1 @ 800 psi	EUR			High Pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	8.25	8.10	7.97	10.10	FALSE	1.12	7.13	6.98	6.85	8.98	HIGH
Jun-66	9.60	8.75	8.07	10.10	FALSE	1.63	7.97	7.12	6.44	8.47	HIGH
Jun-67	10.62	9.52	8.68	10.10	TRUE	2.20	8.42	7.32	6.48	7.90	HIGH
Jun-68	10.21	9.52	8.94	10.10	TRUE	2.46	7.75	7.06	6.48	7.64	HIGH
Jun-69	9.96	9.52	9.09	10.10	FALSE	2.90	7.06	6.62	6.19	7.20	HIGH
Jun-70	10.04	9.64	9.28	10.10	FALSE	3.50	6.54	6.14	5.78	6.60	HIGH
Jun-71	10.25	9.88	9.54	10.10	TRUE	4.00	6.25	5.88	5.54	6.10	HIGH
Jun-72	10.18	9.88	9.60	10.10	TRUE	4.50	5.68	5.38	5.10	5.60	HIGH
Jun-73	10.13	9.88	9.64	10.10	TRUE	5.00	5.13	4.88	4.64	5.10	HIGH
Jun-74	10.19	9.88	9.58	10.10	TRUE	5.00	5.19	4.88	4.58	5.10	HIGH
Jun-75	10.16	9.88	9.6	10.10	TRUE	6.11	4.05	3.77	3.49	3.99	HIGH
Jun-76	10.27	10	9.74	10.10	TRUE	6.85	3.42	3.15	2.89	3.25	HIGH
Jun-77	10.26	10	9.75	10.10	TRUE	7.65	2.62	2.36	2.11	2.46	HIGH
Jun-78	10.36	10.1	9.85	10.10	TRUE	8.13	2.23	1.97	1.72	1.97	LOW
Jun-79	10.36	10.1	9.85	10.10	TRUE	8.69	1.67	1.41	1.16	1.41	LOW
				%TRUE	40%					%HIGH	100%
				%FALSE	60%					%LOW	0%

Table B-1.2 (Continued)

Robbins 1A		EUR			High Pressure method			ERR				
@ 800 psi	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90	ARR	BIAS	
Apr-65	10.85	9.64	8.75	7.35	FALSE	1.60	9.25	8.04	7.15	5.75	LOW	
Jun-66	10.52	8.48	7.24	7.35	TRUE	1.98	8.54	6.50	5.26	5.37	LOW	
Jun-67	9.11	8.48	7.96	7.35	FALSE	2.33	6.78	6.15	5.63	5.02	LOW	
Jun-68	8.86	8.48	8.15	7.35	FALSE	2.69	6.17	5.79	5.46	4.66	LOW	
Jun-69	8.76	8.48	8.22	7.35	FALSE	3.02	5.74	5.46	5.20	4.33	LOW	
Jun-70	8.86	8.60	8.36	7.35	FALSE	3.38	5.48	5.22	4.98	3.97	LOW	
Jun-71	8.80	8.60	8.41	7.35	FALSE	3.81	4.99	4.79	4.60	3.54	LOW	
Jun-72	8.77	8.60	8.44	7.35	FALSE	4.22	4.55	4.38	4.22	3.13	LOW	
Jun-73	8.74	8.60	8.46	7.35	FALSE	4.66	4.08	3.94	3.80	2.69	LOW	
Jun-74	8.74	8.60	8.46	7.35	FALSE	5.08	3.66	3.52	3.38	2.27	LOW	
Jun-75	8.87	8.7	8.53	7.35	FALSE	5.45	3.42	3.25	3.08	1.90	LOW	
Jun-76	8.86	8.7	8.54	7.35	FALSE	5.78	3.08	2.92	2.76	1.57	LOW	
Jun-77	8.84	8.7	8.56	7.35	FALSE	6.12	2.72	2.58	2.44	1.23	LOW	
Jun-78	8.83	8.7	8.56	7.35	FALSE	6.45	2.38	2.25	2.11	0.90	LOW	
Jun-79	8.83	8.7	8.56	7.35	FALSE	6.72	2.11	1.98	1.84	0.63	LOW	
Jun-80	8.88	8.7	8.52	7.35	FALSE	6.94	1.94	1.76	1.58	0.41	LOW	
Jun-82	9.02	8.7	8.39	7.35	FALSE	7.33	1.69	1.37	1.06	0.02	LOW	
				%TRUE	6%					%HIGH	0%	
				%FALSE	94%					%LOW	100%	

Robbins 1G		EUR			High Pressure method			ERR				
@ 800 psi	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90	ARR	BIAS	
Apr-65	12.47	10.91	9.83	12.81	FALSE	2.36	10.11	8.55	7.47	10.45	HIGH	
Jun-66	11.83	11.27	10.79	12.81	FALSE	2.95	8.88	8.32	7.84	9.86	HIGH	
Jun-67	12.12	11.58	11.12	12.81	FALSE	3.6	8.52	7.98	7.52	9.21	HIGH	
Jun-68	12.64	11.99	11.43	12.81	FALSE	4.06	8.58	7.93	7.37	8.75	HIGH	
Jun-69	12.49	11.99	11.54	12.81	FALSE	4.59	7.90	7.40	6.95	8.22	HIGH	
Jun-70	12.61	11.99	11.45	12.81	FALSE	5.56	7.05	6.43	5.89	7.25	HIGH	
Jun-71	12.71	12.11	11.59	12.81	FALSE	5.9	6.81	6.21	5.69	6.91	HIGH	
Jun-72	12.58	12.11	11.68	12.81	FALSE	6.48	6.10	5.63	5.20	6.33	HIGH	
Jun-73	12.49	12.11	11.76	12.81	FALSE	7.25	5.24	4.86	4.51	5.56	HIGH	
Jun-74	12.54	12.18	11.85	12.81	FALSE	7.99	4.55	4.19	3.86	4.82	HIGH	
Jun-75	12.94	12.54	12.17	12.81	TRUE	8.67	4.27	3.87	3.50	4.14	HIGH	
Jun-76	12.9	12.55	12.21	12.81	TRUE	9.33	3.57	3.22	2.88	3.48	HIGH	
Jun-77	13.29	12.87	12.46	12.81	TRUE	9.89	3.40	2.98	2.57	2.92	LOW	
Jun-78	13.26	12.87	12.49	12.81	TRUE	10.41	2.85	2.46	2.08	2.40	LOW	
Jun-79	13.24	12.87	12.51	12.81	TRUE	11.03	2.21	1.84	1.48	1.78	LOW	
Jun-80	13.22	12.87	12.53	12.81	TRUE	11.68	1.54	1.19	0.85	1.13	LOW	
				%TRUE	38%					%HIGH	81%	
				%FALSE	63%					%LOW	19%	

Table B-1.2 (Continued)

Robbins ED/C @ 800 psi	EUR			High Pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	14.22	10.72	9.00	9.70	TRUE	2.17	12.05	8.55	6.83	7.53	LOW
Jun-66	12.11	10.72	9.74	9.70	FALSE	2.72	9.39	8.00	7.02	6.98	LOW
Jun-67	11.48	10.72	10.11	9.70	FALSE	3.18	8.30	7.54	6.93	6.52	LOW
Jun-68	11.40	10.72	10.16	9.70	FALSE	3.59	7.81	7.13	6.57	6.11	LOW
Jun-69	11.26	10.72	10.26	9.70	FALSE	4.00	7.26	6.72	6.26	5.70	LOW
Jun-70	11.29	10.72	10.24	9.70	FALSE	4.47	6.82	6.25	5.77	5.23	LOW
Jun-71	11.15	10.72	10.35	9.70	FALSE	5.24	5.91	5.48	5.11	4.46	LOW
Jun-72	11.07	10.72	10.40	9.70	FALSE	5.64	5.43	5.08	4.76	4.06	LOW
Jun-73	11.01	10.72	10.45	9.70	FALSE	6.08	4.93	4.64	4.37	3.62	LOW
Jun-74	11.00	10.72	10.47	9.70	FALSE	6.75	4.25	3.97	3.72	2.95	LOW
Jun-75	10.99	10.72	10.47	9.70	FALSE	7.45	3.54	3.27	3.02	2.25	LOW
Jun-76	10.98	10.72	10.48	9.70	FALSE	7.83	3.15	2.89	2.65	1.87	LOW
Jun-77	10.96	10.72	10.49	9.70	FALSE	8.12	2.84	2.60	2.37	1.58	LOW
Jun-78	10.97	10.72	10.48	9.70	FALSE	8.76	2.21	1.96	1.72	0.94	LOW
Jun-79	10.97	10.72	10.48	9.70	FALSE	9.09	1.88	1.63	1.39	0.61	LOW
Jun-80	10.98	10.72	10.50	9.70	FALSE	9.41	1.57	1.31	1.09	0.29	LOW
				%TRUE	6%					%HIGH	0%
				%FALSE	94%					%LOW	100%

Robbins 1H @ 800 psi	EUR			High Pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	6.05	5.51	5.06	4.13	FALSE	1.61	4.44	3.90	3.45	2.52	LOW
Jun-66	5.81	5.63	5.46	4.13	FALSE	2.02	3.79	3.61	3.44	2.11	LOW
Jun-67	6.33	5.98	5.67	4.13	FALSE	2.3	4.03	3.68	3.37	1.83	LOW
Jun-68	7.30	6.57	5.99	4.13	FALSE	2.53	4.77	4.04	3.46	1.60	LOW
Jun-69	8.46	7.24	6.38	4.13	FALSE	2.7	5.76	4.54	3.68	1.43	LOW
Jun-70	8.31	7.24	6.46	4.13	FALSE	2.85	5.46	4.39	3.61	1.28	LOW
Jun-71	8.32	7.24	6.45	4.13	FALSE	2.99	5.33	4.25	3.46	1.14	LOW
Jun-72	8.13	7.24	6.54	4.13	FALSE	3.17	4.96	4.07	3.37	0.96	LOW
Jun-73	8.89	7.24	6.09	4.13	FALSE	3.36	5.53	3.88	2.73	0.77	LOW
Jun-74	8.78	7.24	6.11	4.13	FALSE	3.57	5.21	3.67	2.54	0.56	LOW
Jun-75	8.6	7.24	6.19	4.13	FALSE	3.73	4.87	3.51	2.46	0.40	LOW
Jun-76	8.55	7.24	6.19	4.13	FALSE	3.85	4.70	3.39	2.34	0.28	LOW
Jun-77	8.5	7.24	6.21	4.13	FALSE	3.99	4.51	3.25	2.22	0.14	LOW
Jun-78	8.45	7.24	6.23	4.13	FALSE	4.08	4.37	3.16	2.15	0.05	LOW
				%TRUE	0%					%HIGH	0%
				%FALSE	100%					%LOW	100%

Table B-1.2 (Continued)

Robbins 1N		EUR			High Pressure method			ERR			ARR	BIAS
@ 800 psi	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90			
Apr-65	8.72	8.57	8.43	9.20	FALSE	1.91	6.81	6.66	6.52	7.29	HIGH	
Jun-66	8.96	8.76	8.57	9.20	FALSE	2.44	6.52	6.32	6.13	6.76	HIGH	
Jun-67	11.03	9.76	8.85	9.20	TRUE	2.85	8.18	6.91	6.00	6.35	LOW	
Jun-68	10.56	9.76	9.12	9.20	TRUE	3.27	7.29	6.49	5.85	5.93	LOW	
Jun-69	10.34	9.76	9.27	9.20	FALSE	3.67	6.67	6.09	5.60	5.53	LOW	
Jun-70	11.05	9.76	8.82	9.20	TRUE	4.35	6.70	5.41	4.47	4.85	LOW	
Jun-71	10.73	9.76	8.99	9.20	TRUE	4.78	5.95	4.98	4.21	4.42	LOW	
Jun-72	10.62	9.76	9.04	9.20	TRUE	5.26	5.36	4.50	3.78	3.94	LOW	
Jun-73	10.46	9.76	9.14	9.20	TRUE	5.79	4.67	3.97	3.35	3.41	LOW	
Jun-74	11.42	10.47	9.66	9.20	FALSE	6.59	4.83	3.88	3.07	2.61	LOW	
Jun-75	11.29	10.47	9.74	9.20	FALSE	7.03	4.26	3.44	2.71	2.17	LOW	
Jun-76	11.3	10.47	9.72	9.20	FALSE	7.85	3.45	2.62	1.87	1.35	LOW	
Jun-77	11.24	10.47	9.75	9.20	FALSE	7.49	3.75	2.98	2.26	1.71	LOW	
Jun-78	11.2	10.47	9.78	9.20	FALSE	7.94	3.26	2.53	1.84	1.26	LOW	
Jun-79	11.16	10.47	9.82	9.20	FALSE	8.38	2.78	2.09	1.44	0.82	LOW	
				%TRUE	40%					%HIGH	13%	
				%FALSE	60%					%LOW	87%	

Robbins Gallup 1D		EUR			High Pressure method			ERR			ARR	BIAS
@ 800 psi	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90			
Apr-65	6.14	4.96	4.14	5.05	TRUE	1.81	4.33	3.15	2.33	3.24	HIGH	
Jun-66	7.22	5.89	4.98	5.05	TRUE	2.17	5.05	3.72	2.81	2.88	LOW	
Jun-67	7.35	5.89	4.92	5.05	TRUE	2.62	4.73	3.27	2.30	2.43	LOW	
Jun-68	7.60	5.89	5.07	5.05	FALSE	3.02	4.58	2.87	2.05	2.03	LOW	
Jun-69	6.77	5.89	5.07	5.05	FALSE	3.34	3.43	2.55	1.73	1.71	LOW	
Jun-70	6.77	5.89	5.19	5.05	FALSE	3.74	3.03	2.15	1.45	1.31	LOW	
Jun-71	6.55	5.89	5.32	5.05	FALSE	4.15	2.40	1.74	1.17	0.90	LOW	
Jun-72	6.42	5.89	5.41	5.05	FALSE	4.6	1.82	1.29	0.81	0.45	LOW	
				%TRUE	38%					%HIGH	88%	
				%FALSE	62%					%LOW	12%	

Table B-1.3 Results for Glick Field from the Least Square method at 500 psi abandon

Group 2 @500 psi	EUR			Least Square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
Apr-65	50	24.89	19.96	29.07	TRUE	10.96	39.04	13.93	9.00	18.11	HIGH
Jun-66	27.79	24.62	22.55	29.07	FALSE	13.70	14.09	10.92	8.85	15.37	HIGH
Jun-67	29.82	25.70	23.24	29.07	TRUE	16.34	13.48	9.36	6.90	12.73	HIGH
Jun-68	29.82	25.70	23.24	29.07	TRUE	18.69	11.13	7.01	4.55	10.38	HIGH
Jun-69	29.82	25.70	23.24	68.61	FALSE	21.23	8.59	4.47	2.01	47.38	HIGH
Jun-70	63.83	52.54	45.29	68.61	FALSE	24.40	39.43	28.14	20.89	44.21	HIGH
Jun-71	63.83	52.54	45.29	68.61	FALSE	24.40	39.43	28.14	20.89	44.21	HIGH
Jun-72	75.12	62.38	54.57	68.61	TRUE	30.12	45.00	32.26	24.45	38.49	HIGH
Jun-73	67.37	62.25	58.12	68.61	FALSE	33.10	34.27	29.15	25.02	35.51	HIGH
Jun-74	65.11	62.15	59.53	68.61	FALSE	36.54	28.57	25.61	22.99	32.07	HIGH
Jun-75	64.00	62.01	60.17	68.61	FALSE	36.54	27.46	25.47	23.63	32.07	HIGH
Jun-76	63.53	62.04	60.63	68.61	FALSE	43.27	20.26	18.77	17.36	25.34	HIGH
Jun-77	65.57	63.52	61.60	68.61	FALSE	46.07	19.50	17.45	15.53	22.54	HIGH
Jun-78	65.77	63.96	62.24	68.61	FALSE	48.67	17.10	15.29	13.57	19.94	HIGH
Jun-79	66.16	64.46	62.83	68.61	FALSE	51.34	14.82	13.12	11.49	17.27	HIGH
Jun-80	66.56	64.92	63.33	68.61	FALSE	54.06	12.50	10.86	9.27	14.55	HIGH
Jun-82	66.56	64.92	63.33	68.61	FALSE	54.06	12.50	10.86	9.27	14.55	HIGH
Jun-85	66.56	64.92	63.33	68.61	FALSE	54.06	12.50	10.86	9.27	14.55	HIGH
Jun-86	66.56	64.92	63.33	68.61	FALSE	54.06	12.50	10.86	9.27	14.55	HIGH
Jun-87	66.56	64.92	63.33	68.61	FALSE	54.06	12.50	10.86	9.27	14.55	HIGH
Jun-88	69.79	67.05	64.42	68.61	TRUE	66.30	3.49	0.75	-1.88	2.31	HIGH
				%True	24%					%HIGH	100%
				%False	76%					%LOW	0%

Group 4 @500 psi	EUR			Least Square method			ERR			True ERR	BIAS
	P10	P50	P90	True EUR	Logic	Cum.	P10	P50	P90		
Apr-65	30	14.91	10.87	27.00	TRUE	4.21	25.79	10.70	6.66	22.79	HIGH
Jun-66	17.89	14.67	12.92	27.00	FALSE	5.25	12.64	9.42	7.67	21.75	HIGH
Jun-67	30	16.65	13.65	27.00	TRUE	6.28	23.72	10.37	7.37	20.72	HIGH
Jun-68	23.14	17.46	14.91	27.00	FALSE	7.17	15.97	10.29	7.74	19.83	HIGH
Jun-69	23.14	17.46	14.91	27.00	FALSE	9.55	13.59	7.91	5.36	17.45	HIGH
Jun-70	23.14	17.46	14.91	27.00	FALSE	11.31	11.83	6.15	3.60	15.69	HIGH
Jun-71	30	21.84	16.95	27.00	TRUE	12.93	17.07	8.91	4.02	14.07	HIGH
Jun-72	31.35	23.39	18.86	27.00	TRUE	14.44	16.91	8.95	4.42	12.56	HIGH
Jun-73	28.64	24.53	21.53	27.00	TRUE	15.93	12.71	8.60	5.60	11.07	HIGH
Jun-74	27.5	25.63	22.97	27.00	TRUE	17.76	9.74	7.87	5.21	9.24	HIGH
Jun-75	26.66	25.02	23.55	27.00	FALSE	19.38	7.28	5.64	4.17	7.62	HIGH
Jun-76	26.13	24.91	23.78	27.00	FALSE	20.93	5.20	3.98	2.85	6.07	HIGH
Jun-77	26.7	25.45	24.28	27.00	FALSE	22.41	4.29	3.04	1.87	4.59	HIGH
Jun-78	26.82	25.69	24.16	27.00	FALSE	23.63	3.20	2.07	0.54	3.38	HIGH
Jun-79	27.1	25.98	24.91	27.00	TRUE	24.82	2.28	1.16	0.09	2.18	HIGH
Jun-80	27.29	26.2	25.15	27.00	TRUE	25.85	1.44	0.35	-0.70	1.15	HIGH
Jun-82	27.29	26.2	25.15	27.00	TRUE	25.85	1.44	0.35	-0.70	1.15	HIGH
Jun-85	27.29	26.2	25.15	27.00	TRUE	25.85	1.44	0.35	-0.70	1.15	HIGH
Jun-86	27.29	26.2	25.15	27.00	TRUE	25.85	1.44	0.35	-0.70	1.15	HIGH
Jun-87	27.29	26.2	25.15	27.00	TRUE	25.85	1.44	0.35	-0.70	1.15	HIGH
Jun-88	27.29	26.2	25.15	27.00	TRUE	25.85	1.44	0.35	-0.70	1.15	HIGH
				%True	62%					%HIGH	100%
				%False	38%					%LOW	0%

Table B-1.3 (Continued)

Group 5 @500 psi	EUR			Least Square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
Apr-65	50.00	15.45	11.90	23.50	TRUE	3.99	46.01	11.46	7.91	19.51	HIGH
Jun-66	25.08	16.53	13.88	23.50	TRUE	4.87	20.21	11.66	9.01	18.63	HIGH
Jun-67	20.12	17.00	15.17	23.50	FALSE	6.02	14.10	10.98	9.15	17.48	HIGH
Jun-68	21.84	18.14	16.06	23.50	FALSE	6.77	15.07	11.37	9.29	16.73	HIGH
Jun-69	22.23	19.01	17.02	23.50	FALSE	7.62	14.61	11.39	9.40	15.88	HIGH
Jun-70	21.4	19.29	17.73	23.50	FALSE	8.85	12.55	10.44	8.88	14.65	HIGH
Jun-71	21.77	19.93	18.49	23.50	FALSE	9.91	11.86	10.02	8.58	13.59	HIGH
Jun-72	21.70	20.23	19.00	23.50	FALSE	10.93	10.77	9.30	8.07	12.57	HIGH
Jun-73	21.18	20.55	19.45	23.50	FALSE	12.00	9.18	8.55	7.45	11.50	HIGH
Jun-74	21.18	20.55	19.45	23.50	FALSE	12.00	9.18	8.55	7.45	11.50	HIGH
Jun-75	22.12	20.99	19.97	23.50	FALSE	14.39	7.73	6.60	5.58	9.11	HIGH
Jun-76	22.22	21.22	20.29	23.50	FALSE	15.58	6.64	5.64	4.71	7.92	HIGH
Jun-77	22.99	21.82	20.73	23.50	FALSE	16.47	6.52	5.35	4.26	7.03	HIGH
Jun-78	23.26	22.12	21.04	23.50	FALSE	17.37	5.89	4.75	3.67	6.13	HIGH
Jun-79	23.45	22.34	21.29	23.50	FALSE	18.33	5.12	4.01	2.96	5.17	HIGH
Jun-80	23.48	22.44	21.43	23.50	FALSE	19.32	4.16	3.12	2.11	4.18	HIGH
Jun-82	23.48	22.44	21.43	23.50	FALSE	19.32	4.16	3.12	2.11	4.18	HIGH
Jun-85	23.91	22.80	21.73	23.50	TRUE	23.06	0.85	-0.26	-1.33	0.44	HIGH
Jun-86	24.27	23.10	21.97	23.50	TRUE	23.11	1.16	-0.01	-1.14	0.39	HIGH
Jun-87	24.27	23.10	21.97	23.50	TRUE	23.11	1.16	-0.01	-1.14	0.39	HIGH
Jun-88	24.27	23.10	21.97	23.50	TRUE	23.11	1.16	-0.01	-1.14	0.39	HIGH
				%True	29%					%HIGH	100%
				%False	71%					%LOW	0%

Group 6 @500 psi	EUR			Least Square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
Apr-65	53.22	35.82	30.41	36.50	TRUE	5.28	47.94	30.54	25.13	31.22	HIGH
Jun-66	38.53	35.7	33.58	36.50	TRUE	6.52	32.01	29.18	27.06	29.98	HIGH
Jun-67	37.85	34.89	32.71	36.50	TRUE	7.87	29.98	27.02	24.84	28.63	HIGH
Jun-68	37.6	35.41	33.67	36.50	TRUE	9.02	28.58	26.39	24.65	27.48	HIGH
Jun-69	36.85	35.50	34.33	36.50	TRUE	10.10	26.75	25.40	24.23	26.40	HIGH
Jun-70	36.15	35.15	34.25	36.50	FALSE	11.53	24.62	23.62	22.72	24.97	HIGH
Jun-71	37.08	35.88	34.81	36.50	TRUE	13.01	24.07	22.87	21.80	23.49	HIGH
Jun-72	36.51	35.59	34.74	36.50	TRUE	14.35	22.16	21.24	20.39	22.15	HIGH
Jun-73	36.79	35.96	35.18	36.50	TRUE	15.75	21.04	20.21	19.43	20.75	HIGH
Jun-74	36.79	35.96	35.18	36.50	TRUE	15.75	21.04	20.21	19.43	20.75	HIGH
Jun-75	36.63	36.00	35.4	36.50	TRUE	18.95	17.68	17.05	16.45	17.55	HIGH
Jun-76	36.32	35.78	35.26	36.50	FALSE	20.45	15.87	15.33	14.81	16.05	HIGH
Jun-77	36.66	36.10	35.56	36.50	TRUE	21.89	14.77	14.21	13.67	14.61	HIGH
Jun-78	36.68	36.18	35.70	36.50	TRUE	23.05	13.63	13.13	12.65	13.45	HIGH
Jun-79	37.37	36.66	35.98	36.50	TRUE	24.21	13.16	12.45	11.77	12.29	LOW
Jun-80	37.11	36.41	35.73	36.50	TRUE	25.36	11.75	11.05	10.37	11.14	HIGH
Jun-82	37.11	36.41	35.73	36.50	TRUE	25.36	11.75	11.05	10.37	11.14	HIGH
Jun-85	36.86	36.19	35.53	36.50	TRUE	30.07	6.79	6.12	5.46	6.43	HIGH
Jun-86	36.86	36.19	35.53	36.50	TRUE	30.07	6.79	6.12	5.46	6.43	HIGH
Jun-87	36.86	36.19	35.53	36.50	TRUE	30.07	6.79	6.12	5.46	6.43	HIGH
Jun-88	36.58	35.81	35.05	36.50	TRUE	30.52	6.06	5.29	4.53	5.98	HIGH
				%True	90%					%HIGH	5%
				%False	10%					%LOW	95%

Table B-1.3 (Continued)

Group 7 @500 psi	EUR			Least Square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
Apr-65	21.98	16.67	14.17	24.60	FALSE	2.69	19.29	13.98	11.48	21.91	HIGH
Jun-66	20.09	17.58	15.93	24.60	FALSE	4.16	15.93	13.42	11.77	20.44	HIGH
Jun-67	21.39	19.00	17.36	24.60	FALSE	5.97	15.42	13.03	11.39	18.63	HIGH
Jun-68	21.76	19.9	18.49	24.60	FALSE	7.34	14.42	12.56	11.15	17.26	HIGH
Jun-69	20.84	19.72	18.75	24.60	FALSE	8.69	12.15	11.03	10.06	15.91	HIGH
Jun-70	21.22	20.25	19.39	24.60	FALSE	10.58	10.64	9.67	8.81	14.02	HIGH
Jun-71	21.55	20.69	19.89	24.60	FALSE	12.29	9.26	8.40	7.60	12.31	HIGH
Jun-72	21.59	20.87	20.19	24.60	FALSE	13.96	7.63	6.91	6.23	10.64	HIGH
Jun-73	21.95	21.22	20.53	24.60	FALSE	15.63	6.32	5.59	4.90	8.97	HIGH
Jun-74	21.95	21.22	20.53	24.60	FALSE	15.63	6.32	5.59	4.90	8.97	HIGH
Jun-75	22.97	21.95	20.99	24.60	FALSE	18.97	4.00	2.98	2.02	5.63	HIGH
Jun-76	23.54	22.44	21.37	24.60	FALSE	20.23	3.31	2.21	1.14	4.37	HIGH
Jun-77	23.98	22.82	21.69	24.60	FALSE	21.71	2.27	1.11	-0.02	2.89	HIGH
Jun-78	24.51	23.22	21.98	24.60	FALSE	22.71	1.80	0.51	-0.73	1.89	HIGH
Jun-79	25.01	23.6	22.23	24.60	TRUE	23.47	1.54	0.13	-1.24	1.13	HIGH
Jun-80	25.36	23.89	22.46	24.60	TRUE	24.08	1.28	-0.19	-1.62	0.52	HIGH
Jun-82	25.36	23.89	22.46	24.60	TRUE	24.08	1.28	-0.19	-1.62	0.52	HIGH
Jun-85	25.36	23.89	22.46	24.60	TRUE	24.08	1.28	-0.19	-1.62	0.52	HIGH
Jun-86	25.36	23.89	22.46	24.60	TRUE	24.08	1.28	-0.19	-1.62	0.52	HIGH
Jun-87	25.36	23.89	22.46	24.60	TRUE	24.08	1.28	-0.19	-1.62	0.52	HIGH
Jun-88	25.36	23.89	22.46	24.60	TRUE	24.08	1.28	-0.19	-1.62	0.52	HIGH
				%True	33%					%HIGH	100%
				%False	67%					%LOW	0%

Group 8 @500 psi	EUR			Least Square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
Jun-71	14.7	13.14	12.17	17.5	FALSE	6.20	8.50	6.94	5.97	11.30	HIGH
Jun-72	15.82	14	12.87	17.5	FALSE	7.38	8.44	6.62	5.49	10.12	HIGH
Jun-73	15.07	14.23	13.56	17.5	FALSE	8.28	6.79	5.95	5.28	9.22	HIGH
Jun-74	15.07	14.23	13.56	17.5	FALSE	8.28	6.79	5.95	5.28	9.22	HIGH
Jun-75	15.16	14.58	14.06	17.5	FALSE	9.99	5.17	4.59	4.07	7.51	HIGH
Jun-76	15.16	14.58	14.06	17.5	FALSE	11.15	4.01	3.43	2.91	6.35	HIGH
Jun-77	15.74	15.07	14.47	17.5	FALSE	11.64	4.10	3.43	2.83	5.86	HIGH
Jun-78	15.97	15.34	14.76	17.5	FALSE	12.14	3.83	3.20	2.62	5.36	HIGH
Jun-79	16.15	15.55	14.98	17.5	FALSE	12.14	4.01	3.41	2.84	5.36	HIGH
Jun-80	16.15	15.55	14.98	17.5	FALSE	12.14	4.01	3.41	2.84	5.36	HIGH
Jun-82	16.15	15.55	14.98	17.5	FALSE	12.14	4.01	3.41	2.84	5.36	HIGH
Jun-85	16.15	15.55	14.98	17.5	FALSE	12.14	4.01	3.41	2.84	5.36	HIGH
Jun-86	16.15	15.55	14.98	17.5	FALSE	12.14	4.01	3.41	2.84	5.36	HIGH
Jun-87	16.15	15.55	14.98	17.5	FALSE	14.50	1.65	1.05	0.48	3.00	HIGH
Jun-88	16.15	15.55	14.98	17.5	FALSE	14.50	1.65	1.05	0.48	3.00	HIGH
				%TRUE	0%					%HIGH	100%
				%FALSE	100%					%LOW	0%

Table B-1.3 (Continued)

Rob 1A @500 psi	EUR			Least Square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	13.42	11.79	10.63	7.7	FALSE	1.60	11.82	10.19	9.03	6.10	LOW
Jun-66	13.06	10.93	9.59	7.7	FALSE	1.98	11.08	8.95	7.61	5.72	LOW
Jun-67	11.76	10.54	9.65	7.7	FALSE	2.33	9.43	8.21	7.32	5.37	LOW
Jun-68	11.13	10.34	9.71	7.7	FALSE	2.69	8.44	7.65	7.02	5.01	LOW
Jun-69	10.76	10.19	9.7	7.7	FALSE	3.02	7.74	7.17	6.68	4.68	LOW
Jun-70	10.77	10.31	9.9	7.7	FALSE	3.38	7.39	6.93	6.52	4.32	LOW
Jun-71	10.72	10.36	10.04	7.7	FALSE	3.81	6.91	6.55	6.23	3.89	LOW
Jun-72	10.59	10.31	10.05	7.7	FALSE	4.22	6.37	6.09	5.83	3.48	LOW
Jun-73	10.59	10.36	10.15	7.7	FALSE	4.66	5.93	5.70	5.49	3.04	LOW
Jun-74	10.47	10.27	10.08	7.7	FALSE	5.08	5.39	5.19	5.00	2.62	LOW
Jun-75	10.63	10.41	10.2	7.7	FALSE	5.45	5.18	4.96	4.75	2.25	LOW
Jun-76	10.66	10.46	10.27	7.7	FALSE	5.78	4.88	4.68	4.49	1.92	LOW
Jun-77	10.65	10.47	10.29	7.7	FALSE	6.12	4.53	4.35	4.17	1.58	LOW
Jun-78	10.6	10.44	10.27	7.7	FALSE	6.45	4.15	3.99	3.82	1.25	LOW
Jun-79	10.55	10.4	10.24	7.7	FALSE	6.72	3.83	3.68	3.52	0.98	LOW
Jun-80	10.49	10.29	10.1	7.7	FALSE	6.94	3.55	3.35	3.16	0.76	LOW
Jun-82	10.41	10.1	9.81	7.7	FALSE	7.33	3.08	2.77	2.48	0.37	LOW
Jun-85	10.41	10.1	9.81	7.7	FALSE	7.33	3.08	2.77	2.48	0.37	LOW
Jun-86	10.41	10.1	9.81	7.7	FALSE	7.33	3.08	2.77	2.48	0.37	LOW
Jun-87	10.41	10.1	9.81	7.7	FALSE	7.33	3.08	2.77	2.48	0.37	LOW
Jun-88	10.43	9.51	8.64	7.7	FALSE	7.40	3.03	2.11	1.24	0.30	LOW
				%TRUE	0%					%HIGH	0%
				%FALSE	100%					%LOW	100%

Rob.ED/C @500 psi	EUR			Least Square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
Apr-65	20.16	13.58	11.16	11.07	FALSE	2.17	17.99	11.41	8.99	8.90	LOW
Jun-66	14.96	13.00	12.25	11.07	FALSE	2.72	12.24	10.28	9.53	8.35	LOW
Jun-67	13.89	12.87	12.08	11.07	FALSE	3.18	10.71	9.69	8.90	7.89	LOW
Jun-68	13.37	12.53	11.85	11.07	FALSE	3.59	9.78	8.94	8.26	7.48	LOW
Jun-69	12.97	12.34	11.81	11.07	FALSE	4.00	8.97	8.34	7.81	7.07	LOW
Jun-70	12.61	12.01	11.49	11.07	FALSE	4.47	8.14	7.54	7.02	6.60	LOW
Jun-71	12.46	12.01	11.61	11.07	FALSE	5.24	7.22	6.77	6.37	5.83	LOW
Jun-72	12.51	12.14	11.79	11.07	FALSE	5.64	6.87	6.50	6.15	5.43	LOW
Jun-73	12.37	12.07	11.79	11.07	FALSE	6.08	6.29	5.99	5.71	4.99	LOW
Jun-74	12.22	11.96	11.7	11.07	FALSE	6.75	5.47	5.21	4.95	4.32	LOW
Jun-75	12.36	12.09	11.83	11.07	FALSE	7.45	4.91	4.64	4.38	3.62	LOW
Jun-76	12.42	12.16	11.92	11.07	FALSE	7.83	4.59	4.33	4.09	3.24	LOW
Jun-77	12.47	12.23	12	11.07	FALSE	8.39	4.08	3.84	3.61	2.68	LOW
Jun-78	12.57	12.33	12.08	11.07	FALSE	8.76	3.81	3.57	3.32	2.31	LOW
Jun-79	12.36	12.38	12.15	11.07	FALSE	9.09	3.27	3.29	3.06	1.98	LOW
Jun-80	12.63	12.4	12.18	11.07	FALSE	9.41	3.22	2.99	2.77	1.66	LOW
Jun-82	12.57	12.34	12.11	11.07	FALSE	9.87	2.70	2.47	2.24	1.20	LOW
Jun-85	12.57	12.34	12.11	11.07	FALSE	9.87	2.70	2.47	2.24	1.20	LOW
Jun-86	12.57	12.34	12.11	11.07	FALSE	9.87	2.70	2.47	2.24	1.20	LOW
Jun-87	12.57	12.34	12.11	11.07	FALSE	9.87	2.70	2.47	2.24	1.20	LOW
Jun-88	12.51	12.16	11.81	11.07	FALSE	10.36	2.15	1.80	1.45	0.71	LOW
				%True	0%					%HIGH	0%
				%False	100%					%LOW	100%

Table B-1.3 (Continued)

Rob.1G @ 500 psi	EUR			Least Square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	16.16	13.62	12.11	15.55	TRUE	2.36	13.80	11.26	9.75	13.19	HIGH
Jun-66	14.57	13.76	13.1	15.55	FALSE	2.95	11.62	10.81	10.15	12.60	HIGH
Jun-67	14.83	14.07	13.44	15.55	FALSE	3.60	11.23	10.47	9.84	11.95	HIGH
Jun-68	15.42	14.48	13.73	15.55	FALSE	4.06	11.36	10.42	9.67	11.49	HIGH
Jun-69	15.43	14.69	14.06	15.55	FALSE	4.59	10.84	10.10	9.47	10.96	HIGH
Jun-70	14.95	14.15	13.48	15.55	FALSE	3.56	11.39	10.59	9.92	11.99	HIGH
Jun-71	15.27	14.5	13.84	15.55	FALSE	5.90	9.37	8.60	7.94	9.65	HIGH
Jun-72	15.24	14.63	14.09	15.55	FALSE	6.48	8.76	8.15	7.61	9.07	HIGH
Jun-73	15.05	14.58	14.15	15.55	FALSE	7.25	7.80	7.33	6.90	8.30	HIGH
Jun-74	15.20	14.77	14.36	15.55	FALSE	7.99	7.21	6.78	6.37	7.56	HIGH
Jun-75	15.50	15.04	14.6	15.55	FALSE	8.67	6.83	6.37	5.93	6.88	HIGH
Jun-76	15.40	15.00	14.62	15.55	FALSE	9.33	6.07	5.67	5.29	6.22	HIGH
Jun-77	15.74	15.27	14.82	15.55	TRUE	9.89	5.85	5.38	4.93	5.66	HIGH
Jun-78	15.74	15.31	14.90	15.55	TRUE	10.41	5.33	4.90	4.49	5.14	HIGH
Jun-79	15.78	15.38	14.99	15.55	TRUE	11.03	4.75	4.35	3.96	4.52	HIGH
Jun-80	15.76	15.39	15.03	15.55	TRUE	11.68	4.08	3.71	3.35	3.87	HIGH
Jun-82	15.84	15.48	15.12	15.55	TRUE	12.81	3.03	2.67	2.31	2.74	HIGH
Jun-85	16.00	15.61	15.23	15.55	TRUE	14.32	1.68	1.29	0.91	1.23	LOW
Jun-86	16.00	15.61	15.23	15.55	TRUE	14.32	1.68	1.29	0.91	1.23	LOW
Jun-87	16.34	15.76	15.21	15.55	TRUE	14.32	2.02	1.44	0.89	1.23	LOW
Jun-88	16.06	15.68	15.30	15.55	TRUE	14.32	1.74	1.36	0.98	1.23	LOW
				%True	48%					%HIGH	81%
				%False	52%					%LOW	19%

Rob 1H @500psi	EUR			Least Square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	7.65	6.94	6.36	4.19	FALSE	1.61	6.04	5.33	4.75	2.58	LOW
Jun-66	7.2	6.96	6.75	4.19	FALSE	2.02	5.18	4.94	4.73	2.17	LOW
Jun-67	7.64	7.21	6.84	4.19	FALSE	2.30	5.34	4.91	4.54	1.89	LOW
Jun-68	8.52	7.67	7.01	4.19	FALSE	2.53	5.99	5.14	4.48	1.66	LOW
Jun-69	9.65	8.26	7.32	4.19	FALSE	2.70	6.95	5.56	4.62	1.49	LOW
Jun-70	9.03	7.95	7.16	4.19	FALSE	2.85	6.18	5.10	4.31	1.34	LOW
Jun-71	8.53	7.58	6.86	4.19	FALSE	2.99	5.54	4.59	3.87	1.20	LOW
Jun-72	8.31	7.54	6.92	4.19	FALSE	3.17	5.14	4.37	3.75	1.02	LOW
Jun-73	7.87	6.8	5.96	4.19	FALSE	3.36	4.51	3.44	2.60	0.83	LOW
Jun-74	7.45	6.53	5.76	4.19	FALSE	3.57	3.88	2.96	2.19	0.62	LOW
Jun-75	7.26	6.45	5.75	4.19	FALSE	3.73	3.53	2.72	2.02	0.46	LOW
Jun-76	7.49	6.65	5.91	4.19	FALSE	3.85	3.64	2.80	2.06	0.34	LOW
Jun-77	7.26	6.48	5.78	4.19	FALSE	3.99	3.27	2.49	1.79	0.20	LOW
Jun-78	7.09	6.36	5.7	4.19	FALSE	4.08	3.01	2.28	1.62	0.11	LOW
Jun-79	7.09	6.36	5.7	4.19	FALSE	4.08	3.01	2.28	1.62	0.11	LOW
Jun-80	7.09	6.36	5.7	4.19	FALSE	4.18	2.91	2.18	1.52	0.01	LOW
Jun-82	7.09	6.36	5.7	4.19	FALSE	4.18	2.91	2.18	1.52	0.01	LOW
Jun-85	6.88	6.06	5.33	4.19	FALSE	4.18	2.70	1.88	1.15	0.01	LOW
Jun-86	6.88	6.06	5.33	4.19	FALSE	4.18	2.70	1.88	1.15	0.01	LOW
Jun-87	6.88	6.06	5.33	4.19	FALSE	4.18	2.70	1.88	1.15	0.01	LOW
Jun-88	6.88	6.06	5.33	4.19	FALSE	4.18	2.70	1.88	1.15	0.01	LOW
				%TRUE	0%					%HIGH	0%
				%FALSE	100%					%LOW	100%

Table B-1.3 (Continued)

Rob.1N @500 psi	EUR			Least Square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	10.93	10.73	10.54	11.6	FALSE	1.91	9.02	8.82	8.63	9.69	HIGH
Jun-66	11.14	10.86	10.61	11.6	FALSE	2.44	8.70	8.42	8.17	9.16	HIGH
Jun-67	13.32	11.64	10.51	11.6	TRUE	2.85	10.47	8.79	7.66	8.75	LOW
Jun-68	12.78	11.71	10.9	11.6	TRUE	3.27	9.51	8.44	7.63	8.33	LOW
Jun-69	12.66	11.86	11.21	11.6	TRUE	3.67	8.99	8.19	7.54	7.93	LOW
Jun-70	12	10.72	9.79	11.6	TRUE	4.35	7.65	6.37	5.44	7.25	HIGH
Jun-71	11.93	10.91	10.12	11.6	TRUE	4.78	7.15	6.13	5.34	6.82	HIGH
Jun-72	12.32	11.34	10.54	11.6	TRUE	5.26	7.06	6.08	5.28	6.34	HIGH
Jun-73	11.96	11.21	10.55	11.6	TRUE	5.79	6.17	5.42	4.76	5.81	HIGH
Jun-74	12.88	11.88	11.04	11.6	TRUE	6.59	6.29	5.29	4.45	5.01	LOW
Jun-75	12.89	12.03	11.26	11.6	TRUE	7.03	5.86	5.00	4.23	4.57	LOW
Jun-76	12.45	11.65	10.92	11.6	TRUE	7.49	4.96	4.16	3.43	4.11	LOW
Jun-77	12.59	11.82	11.12	11.6	TRUE	7.94	4.65	3.88	3.18	3.66	LOW
Jun-78	12.38	11.68	11.03	11.6	TRUE	8.38	4.00	3.30	2.65	3.22	LOW
Jun-79	12.25	11.61	11.00	11.6	TRUE	8.86	3.39	2.75	2.14	2.74	LOW
Jun-80	12.16	11.56	10.99	11.6	TRUE	9.29	2.87	2.27	1.70	2.31	HIGH
Jun-82	12.07	11.51	10.97	11.6	TRUE	10.18	1.89	1.33	0.79	1.42	HIGH
Jun-85	12.07	11.51	10.97	11.6	TRUE	10.18	1.89	1.33	0.79	1.42	HIGH
Jun-86	12.07	11.51	10.97	11.6	TRUE	10.18	1.89	1.33	0.79	1.42	HIGH
Jun-87	12.07	11.51	10.97	11.6	TRUE	10.18	1.89	1.33	0.79	1.42	HIGH
Jun-88	12.07	11.51	10.97	11.6	TRUE	10.18	1.89	1.33	0.79	1.42	HIGH
				%TRUE		90%				%HIGH	57%
				%FALSE		10%				%LOW	43%

Rob 1 @500 psi	EUR			Least Square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	10.27	10.09	9.91	12.00	FALSE	1.12	9.15	8.97	8.79	10.88	HIGH
Jun-66	11.91	10.77	9.9	12.00	FALSE	1.63	10.28	9.14	8.27	10.37	HIGH
Jun-67	13.26	11.72	10.62	12.00	TRUE	2.20	11.06	9.52	8.42	9.80	HIGH
Jun-68	12.88	11.87	11.08	12.00	TRUE	2.46	10.42	9.41	8.62	9.54	HIGH
Jun-69	12.41	11.74	11.17	12.00	TRUE	2.90	9.51	8.84	8.27	9.10	HIGH
Jun-70	12.59	12.01	11.52	12.00	TRUE	3.50	9.09	8.51	8.02	8.50	LOW
Jun-71	12.82	12.29	11.82	12.00	TRUE	4.00	8.82	8.29	7.82	8.00	LOW
Jun-72	12.56	12.16	11.8	12.00	TRUE	4.50	8.06	7.66	7.30	7.50	LOW
Jun-73	12.6	12.27	11.97	12.00	TRUE	5.00	7.60	7.27	6.97	7.00	LOW
Jun-74	12.26	11.9	11.56	12.00	TRUE	5.00	7.26	6.90	6.56	7.00	HIGH
Jun-75	12.38	12.05	11.73	12.00	TRUE	6.11	6.27	5.94	5.62	5.89	LOW
Jun-76	12.54	12.21	11.9	12.00	TRUE	6.62	5.92	5.59	5.28	5.38	LOW
Jun-77	12.61	12.3	12.01	12.00	FALSE	7.08	5.53	5.22	4.93	4.92	LOW
Jun-78	12.66	12.37	12.09	12.00	FALSE	7.65	5.01	4.72	4.44	4.35	LOW
Jun-79	12.72	12.44	12.17	12.00	FALSE	8.13	4.59	4.31	4.04	3.87	LOW
Jun-80	12.86	12.57	12.29	12.00	FALSE	8.69	4.17	3.88	3.60	3.31	LOW
Jun-82	12.86	12.57	12.29	12.00	FALSE	8.69	4.17	3.88	3.60	3.31	LOW
Jun-85	12.95	12.66	12.37	12.00	FALSE	10.72	2.23	1.94	1.65	1.28	LOW
Jun-86	12.95	12.66	12.37	12.00	FALSE	10.72	2.23	1.94	1.65	1.28	LOW
Jun-87	12.95	12.66	12.37	12.00	FALSE	10.78	2.17	1.88	1.59	1.22	LOW
Jun-88	12.89	12.63	12.37	12.00	FALSE	10.97	1.92	1.66	1.40	1.03	LOW
				%TRUE		48%				%HIGH	29%
				%FALSE		52%				%LOW	71%

Table B-1.3 (Continued)

RobGal1D @500psi	EUR			Least Square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	8.03	6.38	5.34	8.35	FALSE	1.81	6.22	4.57	3.53	6.54	HIGH
Jun-66	8.51	6.95	5.94	8.35	TRUE	2.17	6.34	4.78	3.77	6.18	HIGH
Jun-67	7.43	6.2	5.34	8.35	FALSE	2.62	4.81	3.58	2.72	5.73	HIGH
Jun-68	6.65	5.85	5.21	8.35	FALSE	3.02	3.63	2.83	2.19	5.33	HIGH
Jun-69	6.8	6.08	5.49	8.35	FALSE	3.34	3.46	2.74	2.15	5.01	HIGH
Jun-70	6.61	6.06	5.59	8.35	FALSE	3.74	2.87	2.32	1.85	4.61	HIGH
Jun-71	6.5	6.06	5.67	8.35	FALSE	4.15	2.35	1.91	1.52	4.20	HIGH
Jun-72	6.55	6.15	5.78	8.35	FALSE	4.60	1.95	1.55	1.18	3.75	HIGH
Jun-73	6.55	6.2	5.86	8.35	FALSE	5.08	1.47	1.12	0.78	3.27	HIGH
Jun-74	6.55	6.2	5.86	8.35	FALSE	5.08	1.47	1.12	0.78	3.27	HIGH
Jun-75	6.55	6.2	5.86	8.35	FALSE	5.92	0.63	0.28	-0.06	2.43	HIGH
Jun-76	6.55	6.2	5.86	8.35	FALSE	6.25	0.30	-0.05	-0.39	2.10	HIGH
Jun-77	7.43	7.27	7.12	8.35	FALSE	6.59	0.84	0.68	0.53	1.76	HIGH
Jun-78	7.6	7.42	7.25	8.35	FALSE	6.90	0.70	0.52	0.35	1.45	HIGH
Jun-79	7.76	7.56	7.37	8.35	FALSE	7.18	0.58	0.38	0.19	1.17	HIGH
Jun-80	8.64	7.99	7.44	8.35	TRUE	7.40	1.24	0.59	0.04	0.95	HIGH
Jun-82	8.64	7.99	7.44	8.35	TRUE	7.40	1.24	0.59	0.04	0.95	HIGH
Jun-85	9.46	8.53	7.76	8.35	TRUE	8.06	1.40	0.47	-0.30	0.29	LOW
Jun-86	10.81	9.2	8.07	8.35	TRUE	8.07	2.74	1.13	0.00	0.28	LOW
Jun-87	10.81	9.2	8.07	8.35	TRUE	8.07	2.74	1.13	0.00	0.28	LOW
Jun-88	12.08	9.82	8.42	8.35	FALSE	8.15	3.93	1.67	0.27	0.20	LOW
				%TRUE	29%					%HIGH	81%
				%FALSE	71%					%LOW	19%

Hash 1A @500 psi	EUR			Least Square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	50	8.01	5.82	4.79	FALSE	1.75	48.25	6.26	4.07	3.04	LOW
Jun-66	9.68	8.19	7.2	4.79	FALSE	2.17	7.51	6.02	5.03	2.62	LOW
Jun-67	12.66	9.29	7.7	4.79	FALSE	2.54	10.12	6.75	5.16	2.25	LOW
Jun-68	10.97	9.18	8.05	4.79	FALSE	2.90	8.07	6.28	5.15	1.89	LOW
Jun-69	10.68	9.36	8.43	4.79	FALSE	3.20	7.48	6.16	5.23	1.59	LOW
Jun-70	10.32	9.35	8.61	4.79	FALSE	3.50	6.82	5.85	5.11	1.29	LOW
Jun-71	9.92	9.18	8.57	4.79	FALSE	3.78	6.14	5.40	4.79	1.01	LOW
Jun-72	9.57	8.97	8.45	4.79	FALSE	4.08	5.49	4.89	4.37	0.71	LOW
Jun-73	9.35	8.85	8.41	4.79	FALSE	4.34	5.01	4.51	4.07	0.45	LOW
Jun-74	9.47	9.00	8.56	4.79	FALSE	4.34	5.13	4.66	4.22	0.45	LOW
Jun-75	9.3	7.82	6.65	4.79	FALSE	4.61	4.69	3.21	2.04	0.18	LOW
Jun-76	9.3	7.82	6.65	4.79	FALSE	4.66	4.64	3.16	1.99	0.13	LOW
Jun-77	9.3	7.82	6.65	4.79	FALSE	4.71	4.59	3.11	1.94	0.08	LOW
Jun-78	4.84	4.79	4.74	4.79	TRUE	4.75	0.09	0.04	-0.01	0.04	LOW
Jun-79	4.83	4.79	4.75	4.79	TRUE	4.78	0.05	0.01	-0.03	0.01	LOW
Jun-80	4.97	4.81	4.65	4.79	TRUE	4.79	0.18	0.02	-0.14	0.00	LOW
Jun-82	4.97	4.81	4.65	4.79	TRUE	4.79	0.18	0.02	-0.14	0.00	LOW
Jun-85	4.97	4.81	4.65	4.79	TRUE	4.79	0.18	0.02	-0.14	0.00	LOW
Jun-86	4.97	4.81	4.65	4.79	TRUE	4.79	0.18	0.02	-0.14	0.00	LOW
Jun-87	4.97	4.81	4.65	4.79	TRUE	4.79	0.18	0.02	-0.14	0.00	LOW
Jun-88	4.97	4.81	4.65	4.79	TRUE	4.79	0.18	0.02	-0.14	0.00	LOW
				%TRUE	38%					%HIGH	0%
				%FALSE	62%					%LOW	100%

Table B-1.3 (Continued)

Hash1B14 @ 500 psi	EUR			Least Squre method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	6.51	3.46	2.21	4.25	TRUE	1.28	5.23	2.18	0.93	2.97	HIGH
Jun-66	20	4.81	2.80	4.25	TRUE	1.70	18.30	3.11	1.10	2.55	LOW
Jun-67	7.72	4.95	3.59	4.25	TRUE	2.10	5.62	2.85	1.49	2.15	LOW
Jun-68	6.52	5.02	4.03	4.25	TRUE	2.44	4.08	2.58	1.59	1.81	LOW
Jun-69	6.52	5.02	4.03	4.25	TRUE	2.70	3.82	2.32	1.33	1.55	LOW
Jun-70	7.39	5.62	4.51	4.25	FALSE	2.91	4.48	2.71	1.60	1.34	LOW
Jun-71	20.00	7.64	3.94	4.25	TRUE	3.04	16.96	4.60	0.90	1.21	LOW
Jun-72	20	6.1	4.43	4.25	FALSE	3.19	16.81	2.91	1.24	1.06	LOW
Jun-73	7.86	5.38	4.40	4.25	FALSE	3.31	4.55	2.07	1.09	0.94	LOW
Jun-74	7.86	5.38	4.40	4.25	FALSE	3.31	4.55	2.07	1.09	0.94	LOW
Jun-75	6.16	5.18	4.53	4.25	FALSE	3.53	2.63	1.65	1.00	0.72	LOW
Jun-76	6.16	5.18	4.53	4.25	FALSE	3.60	2.56	1.58	0.93	0.65	LOW
Jun-77	4.39	4.03	3.69	4.25	TRUE	3.70	0.69	0.33	-0.01	0.55	HIGH
Jun-78	4.12	4.02	3.93	4.25	FALSE	3.78	0.34	0.24	0.15	0.47	HIGH
Jun-79	4.12	4.05	3.97	4.25	FALSE	3.86	0.26	0.19	0.11	0.39	HIGH
Jun-80	4.09	4.04	4.00	4.25	FALSE	3.96	0.13	0.08	0.04	0.29	HIGH
Jun-82	4.09	4.04	4.00	4.25	FALSE	3.96	0.13	0.08	0.04	0.29	HIGH
Jun-85	4.37	4.16	3.96	4.25	TRUE	4.24	0.13	-0.08	-0.28	0.01	HIGH
Jun-86	4.37	4.16	3.96	4.25	TRUE	4.25	0.12	-0.09	-0.29	0.00	HIGH
Jun-87	4.37	4.16	3.96	4.25	TRUE	4.26	0.11	-0.10	-0.30	-0.01	HIGH
Jun-88	4.37	4.16	3.96	4.25	TRUE	4.26	0.11	-0.10	-0.30	-0.01	HIGH
				%True	<b>52%</b>					%HIGH	<b>48%</b>
				%False	<b>48%</b>					%LOW	<b>52%</b>

Table B-1.4 Results for Glick Field from the High pressure method at 500 psi abandonment

Group 2 @'500psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
Apr-65	33.89	27.55	21.21	29.07	TRUE	10.96	22.93	16.59	10.25	18.11	HIGH
Jun-66	29.89	27.83	25.77	29.07	TRUE	13.70	16.19	14.13	12.07	15.37	HIGH
Jun-67	28.75	26.97	25.19	29.07	FALSE	16.34	12.41	10.63	8.85	12.73	HIGH
Jun-68	28.75	26.97	25.19	29.07	FALSE	18.69	10.06	8.28	6.50	10.38	HIGH
Jun-69	66.06	55.4	44.74	68.61	FALSE	21.23	44.83	34.17	23.51	47.38	HIGH
Jun-70	66.06	55.4	44.74	68.61	FALSE	24.40	41.66	31.00	20.34	44.21	HIGH
Jun-71	73.33	63.75	54.17	68.61	TRUE	24.40	48.93	39.35	29.77	44.21	HIGH
Jun-72	66.93	62.85	58.77	68.61	FALSE	30.12	36.81	32.73	28.65	38.49	HIGH
Jun-73	64.92	62.53	60.14	68.61	FALSE	33.10	31.82	29.43	27.04	35.51	HIGH
Jun-74	65.57	63.58	61.59	68.61	FALSE	36.54	29.03	27.04	25.05	32.07	HIGH
Jun-75	64.98	63.51	62.04	68.61	FALSE	36.54	28.44	26.97	25.50	32.07	HIGH
Jun-76	66.1	64.49	62.88	68.61	FALSE	43.27	22.83	21.22	19.61	25.34	HIGH
Jun-77	66.47	64.99	63.51	68.61	FALSE	46.07	20.40	18.92	17.44	22.54	HIGH
Jun-78	67.23	65.69	64.15	68.61	FALSE	48.67	18.56	17.02	15.48	19.94	HIGH
Jun-79	67.74	66.21	64.68	68.61	FALSE	51.34	16.40	14.87	13.34	17.27	HIGH
Jun-80	67.74	66.21	64.68	68.61	FALSE	54.06	13.68	12.15	10.62	14.55	HIGH
Jun-82	67.74	66.21	64.68	68.61	FALSE	54.06	13.68	12.15	10.62	14.55	HIGH
Jun-85	67.74	66.21	64.68	68.61	FALSE	54.06	13.68	12.15	10.62	14.55	HIGH
Jun-86	67.74	66.21	64.68	68.61	FALSE	54.06	13.68	12.15	10.62	14.55	HIGH
Jun-87	67.74	66.21	64.68	68.61	FALSE	54.06	13.68	12.15	10.62	14.55	HIGH
Jul-88	70.86	68.07	65.28	68.61	TRUE	66.30	4.56	1.77	1.02	2.31	HIGH
				%True	19%					%HIGH	100%
				%False	81%					%LOW	0%

Group 4 @ 500 psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
Apr-65	23.53	15.05	6.57	27.00	FALSE	4.21	19.32	10.84	2.36	22.79	HIGH
Jun-66	18.89	15.81	12.73	27.00	FALSE	5.25	13.64	10.56	7.48	21.75	HIGH
Jun-67	22.78	17.88	12.98	27.00	FALSE	6.28	16.50	11.60	6.70	20.72	HIGH
Jun-68	21.21	18.06	14.91	27.00	FALSE	7.17	14.04	10.89	7.74	19.83	HIGH
Jun-69	25.75	21.04	16.33	27.00	FALSE	9.55	16.20	11.49	6.78	17.45	HIGH
Jun-70	25.03	21.64	18.25	27.00	FALSE	11.31	13.72	10.33	6.94	15.69	HIGH
Jun-71	27.86	23.87	19.88	27.00	TRUE	12.93	14.93	10.94	6.95	14.07	HIGH
Jun-72	27.89	24.53	21.17	27.00	TRUE	14.44	13.45	10.09	6.73	12.56	HIGH
Jun-73	28.74	25.56	22.38	27.00	TRUE	15.93	12.81	9.63	6.45	11.07	HIGH
Jun-74	29.16	26.26	23.36	27.00	TRUE	17.76	11.40	8.50	5.60	9.24	HIGH
Jun-75	28.46	25.99	23.52	27.00	TRUE	19.38	9.08	6.61	4.14	7.62	HIGH
Jun-76	27.89	25.71	23.53	27.00	TRUE	20.93	6.96	4.78	2.60	6.07	HIGH
Jun-77	28.1	26.04	23.98	27.00	TRUE	22.41	5.69	3.63	1.57	4.59	HIGH
Jun-78	27.99	26.08	24.17	27.00	TRUE	23.63	4.37	2.46	0.54	3.38	HIGH
Jun-79	28.01	26.21	24.41	27.00	TRUE	24.82	3.19	1.39	-0.41	2.18	HIGH
Jun-80	28.17	26.40	24.63	27.00	TRUE	25.85	2.32	0.55	-1.22	1.15	HIGH
Jun-82	28.17	26.40	24.63	27.00	TRUE	25.85	2.32	0.55	-1.22	1.15	HIGH
Jun-85	28.17	26.40	24.63	27.00	TRUE	25.85	2.32	0.55	-1.22	1.15	HIGH
Jun-86	28.17	26.40	24.63	27.00	TRUE	25.85	2.32	0.55	-1.22	1.15	HIGH
Jun-87	28.17	26.40	24.63	27.00	TRUE	25.85	2.32	0.55	-1.22	1.15	HIGH
Jun-88	28.17	26.40	24.63	27.00	TRUE	25.85	2.32	0.55	-1.22	1.15	HIGH
				%True	71%					%HIGH	100%
				%False	29%					%LOW	0%

Table B-1.4 (Continued)

Group 5 @ 500 psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
Apr-65	16.76	13.91	11.06	23.50	FALSE	3.99	12.77	9.92	7.07	19.51	HIGH
Jun-66	24.44	15.13	5.82	23.50	TRUE	4.87	19.57	10.26	0.95	18.63	HIGH
Jun-67	23.07	16.46	9.85	23.50	FALSE	6.02	17.05	10.44	3.83	17.48	HIGH
Jun-68	22.62	17.51	12.4	23.50	FALSE	6.77	15.85	10.74	5.63	16.73	HIGH
Jun-69	22.15	18.32	14.49	23.50	FALSE	7.62	14.53	10.70	6.87	15.88	HIGH
Jun-70	22.12	19.11	16.1	23.50	FALSE	8.85	13.27	10.26	7.25	14.65	HIGH
Jun-71	22.17	19.76	17.35	23.50	FALSE	9.91	12.26	9.85	7.44	13.59	HIGH
Jun-72	22.45	20.37	18.29	23.50	FALSE	10.93	11.52	9.44	7.36	12.57	HIGH
Jun-73	22.94	21.01	19.08	23.50	FALSE	12.00	10.94	9.01	7.08	11.50	HIGH
Jun-74	22.94	21.01	19.08	23.50	FALSE	12.00	10.94	9.01	7.08	11.50	HIGH
Jun-75	23.48	21.71	19.94	23.50	FALSE	14.39	9.09	7.32	5.55	9.11	HIGH
Jun-76	23.11	21.66	20.21	23.50	FALSE	15.58	7.53	6.08	4.63	7.92	HIGH
Jun-77	23.59	22.15	20.71	23.50	TRUE	16.47	7.12	5.68	4.24	7.03	HIGH
Jun-78	23.91	22.5	21.09	23.50	TRUE	17.37	6.54	5.13	3.72	6.13	HIGH
Jun-79	24.11	22.75	21.39	23.50	TRUE	18.33	5.78	4.42	3.06	5.17	HIGH
Jun-80	24.15	22.87	21.59	23.50	TRUE	19.32	4.83	3.55	2.27	4.18	HIGH
Jun-82	24.15	22.87	21.59	23.50	TRUE	19.32	4.83	3.55	2.27	4.18	HIGH
Jun-85	24.47	23.19	21.91	23.50	TRUE	23.06	1.41	0.13	-1.15	0.44	HIGH
Jun-86	24.74	23.45	22.16	23.50	TRUE	23.11	1.63	0.34	-0.95	0.39	HIGH
Jun-87	24.74	23.45	22.16	23.50	TRUE	23.11	1.63	0.34	-0.95	0.39	HIGH
Jun-88	24.74	23.45	22.16	23.50	TRUE	23.11	1.63	0.34	-0.95	0.39	HIGH
				%True	48%					%HIGH	100%
				%False	52%					%LOW	0%

Group 6 @ 500 psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
Apr-65	53.98	38.04	32.51	36.50	TRUE	5.28	48.70	32.76	27.23	31.22	LOW
Jun-66	42.1	38.56	35.02	36.50	TRUE	6.52	35.58	32.04	28.50	29.98	LOW
Jun-67	40.03	38.29	36.55	36.50	FALSE	7.87	32.16	30.42	28.68	28.63	LOW
Jun-68	39.13	37.8	36.47	36.50	TRUE	9.02	30.11	28.78	27.45	27.48	LOW
Jun-69	38.14	37.39	36.64	36.50	FALSE	10.10	28.04	27.29	26.54	26.40	LOW
Jun-70	37.74	36.85	35.96	36.50	TRUE	11.53	26.21	25.32	24.43	24.97	LOW
Jun-71	37.54	36.92	36.3	36.50	TRUE	13.01	24.53	23.91	23.29	23.49	LOW
Jun-72	37.7	37.18	36.66	36.50	FALSE	14.35	23.35	22.83	22.31	22.15	LOW
Jun-73	37.29	36.8	36.31	36.50	TRUE	15.75	21.54	21.05	20.56	20.75	LOW
Jun-74	37.29	36.8	36.31	36.50	TRUE	15.75	21.54	21.05	20.56	20.75	LOW
Jun-75	37.7	37.23	36.76	36.50	FALSE	18.95	18.75	18.28	17.81	17.55	LOW
Jun-76	37.6	37.22	36.84	36.50	FALSE	20.45	17.15	16.77	16.39	16.05	LOW
Jun-77	37.82	37.45	37.08	36.50	FALSE	21.89	15.93	15.56	15.19	14.61	LOW
Jun-78	37.83	37.51	37.19	36.50	FALSE	23.05	14.78	14.46	14.14	13.45	LOW
Jun-79	38.81	38.17	37.53	36.50	FALSE	24.21	14.60	13.96	13.32	12.29	LOW
Jun-80	38.57	37.96	37.35	36.50	FALSE	25.36	13.21	12.60	11.99	11.14	LOW
Jun-82	38.57	37.96	37.35	36.50	FALSE	25.36	13.21	12.60	11.99	11.14	LOW
Jun-85	38.11	37.45	36.79	36.50	FALSE	30.07	8.04	7.38	6.72	6.43	LOW
Jun-86	38.11	37.45	36.79	36.50	FALSE	30.07	8.04	7.38	6.72	6.43	LOW
Jun-87	38.11	37.45	36.79	36.50	FALSE	30.07	8.04	7.38	6.72	6.43	LOW
Jun-88	37.71	36.45	35.19	36.50	TRUE	30.52	7.19	5.93	4.67	5.98	HIGH
				%True	38%					%HIGH	5%
				%False	62%					%LOW	95%

Table B-1.4 (Continued)

Group 7 @ 500 psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
Apr-65	27.68	18.51	9.34	24.60	TRUE	2.69	24.99	15.82	6.65	21.91	HIGH
Jun-66	22.16	18.28	14.4	24.60	FALSE	4.16	18.00	14.12	10.24	20.44	HIGH
Jun-67	22.48	19.65	16.82	24.60	FALSE	5.97	16.51	13.68	10.85	18.63	HIGH
Jun-68	22.13	20.3	18.47	24.60	FALSE	7.34	14.79	12.96	11.13	17.26	HIGH
Jun-69	22.52	21.02	19.52	24.60	FALSE	8.69	13.83	12.33	10.83	15.91	HIGH
Jun-70	22.66	21.5	20.34	24.60	FALSE	10.58	12.08	10.92	9.76	14.02	HIGH
Jun-71	22.8	21.86	20.92	24.60	FALSE	12.29	10.51	9.57	8.63	12.31	HIGH
Jun-72	23.21	22.32	21.43	24.60	FALSE	13.96	9.25	8.36	7.47	10.64	HIGH
Jun-73	23.42	22.6	21.78	24.60	FALSE	15.63	7.79	6.97	6.15	8.97	HIGH
Jun-74	23.42	22.6	21.78	24.60	FALSE	15.63	7.79	6.97	6.15	8.97	HIGH
Jun-75	23.95	23.09	22.23	24.60	FALSE	18.97	4.98	4.12	3.26	5.63	HIGH
Jun-76	24.32	23.38	22.44	24.60	FALSE	20.23	4.09	3.15	2.21	4.37	HIGH
Jun-77	24.56	23.68	22.80	24.60	FALSE	21.71	2.85	1.97	1.09	2.89	HIGH
Jun-78	24.94	23.99	23.04	24.60	TRUE	22.71	2.23	1.28	0.33	1.89	HIGH
Jun-79	25.25	24.24	23.23	24.60	TRUE	23.47	1.78	0.77	-0.24	1.13	HIGH
Jun-80	25.48	24.44	23.40	24.60	TRUE	24.08	1.40	0.36	-0.68	0.52	HIGH
Jun-82	25.48	24.44	23.40	24.60	TRUE	24.08	1.40	0.36	-0.68	0.52	HIGH
Jun-85	25.48	24.44	23.40	24.60	TRUE	24.08	1.40	0.36	-0.68	0.52	HIGH
Jun-86	25.48	24.44	23.40	24.60	TRUE	24.08	1.40	0.36	-0.68	0.52	HIGH
Jun-87	25.48	24.44	23.40	24.60	TRUE	24.08	1.40	0.36	-0.68	0.52	HIGH
Jun-88	25.48	24.44	23.40	24.60	TRUE	24.08	1.40	0.36	-0.68	0.52	HIGH
				%True	43%					%HIGH	100%
				%False	57%					%LOW	0%

Group 8 @ 500 psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
Jun-71	17.89	13.04	8.19	17.50	TRUE	6.20	11.69	6.84	1.99	11.30	HIGH
Jun-72	20.60	14.5	8.40	17.50	TRUE	7.38	13.22	7.12	1.02	10.12	HIGH
Jun-73	16.39	14.74	13.09	17.50	FALSE	8.28	8.11	6.46	4.81	9.22	HIGH
Jun-74	16.39	14.74	13.09	17.50	FALSE	8.28	8.11	6.46	4.81	9.22	HIGH
Jun-75	15.65	14.84	14.03	17.50	FALSE	9.99	5.66	4.85	4.04	7.51	HIGH
Jun-76	15.65	14.84	14.03	17.50	FALSE	11.15	4.50	3.69	2.88	6.35	HIGH
Jun-77	16.37	15.47	14.57	17.50	FALSE	11.64	4.73	3.83	2.93	5.86	HIGH
Jun-78	16.35	15.62	14.89	17.50	FALSE	12.14	4.21	3.48	2.75	5.36	HIGH
Jun-79	16.45	15.80	15.15	17.50	FALSE	12.14	4.31	3.66	3.01	5.36	HIGH
Jun-80	16.45	15.80	15.15	17.50	FALSE	12.14	4.31	3.66	3.01	5.36	HIGH
Jun-82	16.45	15.80	15.15	17.50	FALSE	12.14	4.31	3.66	3.01	5.36	HIGH
Jun-85	16.45	15.80	15.15	17.50	FALSE	12.14	4.31	3.66	3.01	5.36	HIGH
Jun-86	16.45	15.80	15.15	17.50	FALSE	12.14	4.31	3.66	3.01	5.36	HIGH
Jun-87	17.62	16.55	15.48	17.50	TRUE	14.50	3.12	2.05	0.98	3.00	HIGH
Jun-88	17.62	16.55	15.48	17.50	TRUE	14.50	3.12	2.05	0.98	3.00	HIGH
				%True	27%					%HIGH	100%
				%False	73%					%LOW	0%

Table B-1.4 (Continued)

Rob.ED/C @500 psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
Apr-65	19.11	13.26	10.97	11.07	TRUE	2.17	16.94	11.09	8.80	8.90	LOW
Jun-66	15.37	13.26	11.91	11.07	FALSE	2.72	12.65	10.54	9.19	8.35	LOW
Jun-67	14.38	13.26	12.40	11.07	FALSE	3.18	11.20	10.08	9.22	7.89	LOW
Jun-68	14.27	13.26	12.47	11.07	FALSE	3.59	10.68	9.67	8.88	7.48	LOW
Jun-69	14.05	13.26	12.62	11.07	FALSE	4.00	10.05	9.26	8.62	7.07	LOW
Jun-70	14.08	13.26	12.59	11.07	FALSE	4.47	9.61	8.79	8.12	6.60	LOW
Jun-71	13.86	13.26	12.74	11.07	FALSE	5.24	8.62	8.02	7.50	5.83	LOW
Jun-72	13.74	13.26	12.84	11.07	FALSE	5.64	8.10	7.62	7.20	5.43	LOW
Jun-73	13.65	13.26	12.91	11.07	FALSE	6.08	7.57	7.18	6.83	4.99	LOW
Jun-74	13.61	13.26	12.94	11.07	FALSE	6.75	6.86	6.51	6.19	4.32	LOW
Jun-75	13.59	13.26	12.95	11.07	FALSE	7.45	6.14	5.81	5.50	3.62	LOW
Jun-76	13.56	13.26	12.98	11.07	FALSE	7.83	5.73	5.43	5.15	3.24	LOW
Jun-77	13.54	13.26	13.00	11.07	FALSE	8.39	5.15	4.87	4.61	2.68	LOW
Jun-78	13.55	13.26	12.99	11.07	FALSE	8.76	4.79	4.50	4.23	2.31	LOW
Jun-79	13.54	13.26	13.00	11.07	FALSE	9.09	4.45	4.17	3.91	1.98	LOW
Jun-80	13.52	13.26	13.01	11.07	FALSE	9.41	4.11	3.85	3.60	1.66	LOW
Jun-82	13.52	13.26	13.01	11.07	FALSE	9.87	3.65	3.39	3.14	1.20	LOW
Jun-85	13.66	13.26	12.88	11.07	FALSE	9.87	3.79	3.39	3.01	1.20	LOW
Jun-86	13.72	13.26	12.82	11.07	FALSE	9.87	3.85	3.39	2.95	1.20	LOW
Jun-87	13.76	13.26	12.77	11.07	FALSE	9.87	3.89	3.39	2.90	1.20	LOW
Jun-88	13.81	13.26	12.73	11.07	FALSE	10.36	3.45	2.90	2.37	0.71	LOW
				%True	5%					%HIGH	0%
				%False	95%					%LOW	100%

Rob.1G @ 500 psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	15.76	13.43	11.97	15.55	TRUE	2.36	13.40	11.07	9.61	13.19	HIGH
Jun-66	14.70	13.88	13.19	15.55	FALSE	2.95	11.75	10.93	10.24	12.60	HIGH
Jun-67	15.05	14.26	13.61	15.55	FALSE	3.60	11.45	10.66	10.01	11.95	HIGH
Jun-68	15.74	14.76	13.97	15.55	TRUE	4.06	11.68	10.70	9.91	11.49	HIGH
Jun-69	15.51	14.76	14.13	15.55	FALSE	4.59	10.92	10.17	9.54	10.96	HIGH
Jun-70	15.67	14.76	14.01	15.55	TRUE	3.56	12.11	11.20	10.45	11.99	HIGH
Jun-71	15.75	14.91	14.21	15.55	TRUE	5.90	9.85	9.01	8.31	9.65	HIGH
Jun-72	15.41	14.91	14.35	15.55	FALSE	6.48	8.93	8.43	7.87	9.07	HIGH
Jun-73	15.41	14.91	14.46	15.55	FALSE	7.25	8.16	7.66	7.21	8.30	HIGH
Jun-74	15.45	15.01	14.59	15.55	FALSE	7.99	7.46	7.02	6.60	7.56	HIGH
Jun-75	15.93	15.45	15.00	15.55	TRUE	8.67	7.26	6.78	6.33	6.88	HIGH
Jun-76	15.87	15.45	15.05	15.55	TRUE	9.33	6.54	6.12	5.72	6.22	HIGH
Jun-77	16.33	15.84	15.38	15.55	TRUE	9.89	6.44	5.95	5.49	5.66	LOW
Jun-78	16.29	15.84	15.42	15.55	TRUE	10.41	5.88	5.43	5.01	5.14	LOW
Jun-79	16.26	15.84	15.44	15.55	TRUE	11.03	5.23	4.81	4.41	4.52	LOW
Jun-80	16.22	15.84	15.47	15.55	TRUE	11.68	4.54	4.16	3.79	3.87	LOW
Jun-82	16.21	15.84	15.48	15.55	TRUE	12.81	3.40	3.03	2.67	2.74	LOW
Jun-85	16.40	16.01	15.62	15.55	FALSE	14.32	2.08	1.69	1.30	1.23	LOW
Jun-86	16.40	16.01	15.62	15.55	FALSE	14.32	2.08	1.69	1.30	1.23	LOW
Jun-87	16.40	16.01	15.62	15.55	FALSE	14.32	2.08	1.69	1.30	1.23	LOW
Jun-88	16.39	16.01	15.63	15.55	FALSE	14.32	2.07	1.69	1.31	1.23	LOW
				%True	52%					%HIGH	57%
				%False	48%					%LOW	43%

Table B-1.4 (Continued)

Rob 1H @500psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	7.54	6.84	6.28	4.19	FALSE	1.61	5.93	5.23	4.67	2.58	LOW
Jun-66	7.23	6.99	6.77	4.19	FALSE	2.02	5.21	4.97	4.75	2.17	LOW
Jun-67	7.89	7.43	7.03	4.19	FALSE	2.30	5.59	5.13	4.73	1.89	LOW
Jun-68	9.15	8.16	7.41	4.19	FALSE	2.53	6.62	5.63	4.88	1.66	LOW
Jun-69	10.75	8.99	7.88	4.19	FALSE	2.70	8.05	6.29	5.18	1.49	LOW
Jun-70	10.51	8.99	7.98	4.19	FALSE	2.85	7.66	6.14	5.13	1.34	LOW
Jun-71	10.53	8.99	7.97	4.19	FALSE	2.99	7.54	6.00	4.98	1.20	LOW
Jun-72	10.19	8.99	8.11	4.19	FALSE	3.17	7.02	5.82	4.94	1.02	LOW
Jun-73	11.25	8.99	7.6	4.19	FALSE	3.36	7.89	5.63	4.24	0.83	LOW
Jun-74	11.02	8.99	7.65	4.19	FALSE	3.57	7.45	5.42	4.08	0.62	LOW
Jun-75	10.71	8.99	7.76	4.19	FALSE	3.73	6.98	5.26	4.03	0.46	LOW
Jun-76	10.61	8.99	7.78	4.19	FALSE	3.85	6.76	5.14	3.93	0.34	LOW
Jun-77	10.52	8.99	7.81	4.19	FALSE	3.99	6.53	5.00	3.82	0.20	LOW
Jun-78	10.43	8.99	7.84	4.19	FALSE	4.08	6.35	4.91	3.76	0.11	LOW
Jun-79	10.43	8.99	7.84	4.19	FALSE	4.08	6.35	4.91	3.76	0.11	LOW
Jun-80	10.43	8.99	7.84	4.19	FALSE	4.18	6.25	4.81	3.66	0.01	LOW
Jun-82	10.43	8.99	7.84	4.19	FALSE	4.18	6.25	4.81	3.66	0.01	LOW
Jun-85	10.75	8.99	7.63	4.19	FALSE	4.18	6.57	4.81	3.45	0.01	LOW
Jun-86	10.75	8.99	7.63	4.19	FALSE	4.18	6.57	4.81	3.45	0.01	LOW
Jun-87	11.47	8.99	7.2	4.19	FALSE	4.18	7.29	4.81	3.02	0.01	LOW
Jun-88	11.58	8.99	7.12	4.19	FALSE	4.18	7.40	4.81	2.94	0.01	LOW
				%TRUE	0%					%HIGH	0%
				%FALSE	100%					%LOW	100%

Rob 1N @500psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	7.54	6.84	6.28	11.6	FALSE	1.91	5.63	4.93	4.37	9.69	HIGH
Jun-66	7.23	6.99	6.77	11.6	FALSE	2.44	4.79	4.55	4.33	9.16	HIGH
Jun-67	7.89	7.43	7.03	11.6	FALSE	2.85	5.04	4.58	4.18	8.75	HIGH
Jun-68	9.15	8.16	7.41	11.6	FALSE	3.27	5.88	4.89	4.14	8.33	HIGH
Jun-69	10.75	8.99	7.88	11.6	FALSE	3.67	7.08	5.32	4.21	7.93	HIGH
Jun-70	10.51	8.99	7.98	11.6	FALSE	4.35	6.16	4.64	3.63	7.25	HIGH
Jun-71	10.53	8.99	7.97	11.6	FALSE	4.78	5.75	4.21	3.19	6.82	HIGH
Jun-72	10.19	8.99	8.11	11.6	FALSE	5.26	4.93	3.73	2.85	6.34	HIGH
Jun-73	11.25	8.99	7.6	11.6	FALSE	5.79	5.46	3.20	1.81	5.81	HIGH
Jun-74	11.02	8.99	7.65	11.6	FALSE	6.59	4.43	2.40	1.06	5.01	HIGH
Jun-75	10.71	8.99	7.76	11.6	FALSE	7.03	3.68	1.96	0.73	4.57	HIGH
Jun-76	10.61	8.99	7.78	11.6	FALSE	7.49	3.12	1.50	0.29	4.11	HIGH
Jun-77	10.52	8.99	7.81	11.6	FALSE	7.94	2.58	1.05	-0.13	3.66	HIGH
Jun-78	10.43	8.99	7.84	11.6	FALSE	8.38	2.05	0.61	-0.54	3.22	HIGH
Jun-79	10.43	8.99	7.84	11.6	FALSE	8.86	1.57	0.13	-1.02	2.74	HIGH
Jun-80	10.43	8.99	7.84	11.6	FALSE	9.29	1.14	-0.30	-1.45	2.31	HIGH
Jun-82	10.43	8.99	7.84	11.6	FALSE	10.18	0.25	-1.19	-2.34	1.42	HIGH
Jun-85	10.75	8.99	7.63	11.6	FALSE	10.18	0.57	-1.19	-2.55	1.42	HIGH
Jun-86	10.75	8.99	7.63	11.6	FALSE	10.18	0.57	-1.19	-2.55	1.42	HIGH
Jun-87	11.47	8.99	7.2	11.6	FALSE	10.18	1.29	-1.19	-2.98	1.42	HIGH
Jun-88	11.58	8.99	7.12	11.6	FALSE	10.18	1.40	-1.19	-3.06	1.42	HIGH
				%TRUE	33%					%HIGH	29%
				%FALSE	67%					%LOW	71%

Table B-1.4 (Continued)

Rob 1 @500 psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	10.29	10.1	9.93	12.00	FALSE	1.12	9.17	8.98	8.81	10.88	HIGH
Jun-66	12.08	10.91	10.01	12.00	TRUE	1.63	10.45	9.28	8.38	10.37	HIGH
Jun-67	13.44	11.86	10.74	12.00	TRUE	2.20	11.24	9.66	8.54	9.80	HIGH
Jun-68	12.85	11.86	11.08	12.00	TRUE	2.46	10.39	9.40	8.62	9.54	HIGH
Jun-69	12.54	11.86	11.28	12.00	TRUE	2.90	9.64	8.96	8.38	9.10	HIGH
Jun-70	12.59	12.01	11.52	12.00	TRUE	3.50	9.09	8.51	8.02	8.50	LOW
Jun-71	12.84	12.31	11.84	12.00	TRUE	4.00	8.84	8.31	7.84	8.00	LOW
Jun-72	12.71	12.31	11.94	12.00	TRUE	4.50	8.21	7.81	7.44	7.50	LOW
Jun-73	12.64	12.31	12.01	12.00	FALSE	5.00	7.64	7.31	7.01	7.00	LOW
Jun-74	12.7	12.31	11.95	12.00	TRUE	5.00	7.70	7.31	6.95	7.00	LOW
Jun-75	12.65	12.31	11.98	12.00	TRUE	6.11	6.54	6.20	5.87	5.89	LOW
Jun-76	12.81	12.47	12.14	12.00	FALSE	6.62	6.19	5.85	5.52	5.38	LOW
Jun-77	12.77	12.47	12.17	12.00	FALSE	7.08	5.69	5.39	5.09	4.92	LOW
Jun-78	12.75	12.47	12.19	12.00	FALSE	7.65	5.10	4.82	4.54	4.35	LOW
Jun-79	12.87	12.59	12.32	12.00	FALSE	8.13	4.74	4.46	4.19	3.87	LOW
Jun-80	13.12	12.83	12.55	12.00	FALSE	8.69	4.43	4.14	3.86	3.31	LOW
Jun-82	13.16	12.87	12.59	12.00	FALSE	8.69	4.47	4.18	3.90	3.31	LOW
Jun-85	13.15	12.87	12.6	12.00	FALSE	10.72	2.43	2.15	1.88	1.28	LOW
Jun-86	13.13	12.87	12.61	12.00	FALSE	10.72	2.41	2.15	1.89	1.28	LOW
Jun-87	13.13	12.87	12.62	12.00	FALSE	10.78	2.35	2.09	1.84	1.22	LOW
Jun-88	13.12	12.87	12.63	12.00	FALSE	10.97	2.15	1.90	1.66	1.03	LOW
				%TRUE	43%					%HIGH	24%
				%FALSE	57%					%LOW	76%

RobGal1D @500psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	7.79	6.23	5.23	8.35	FALSE	1.81	5.98	4.42	3.42	6.54	HIGH
Jun-66	9.27	7.40	6.27	8.35	TRUE	2.17	7.10	5.23	4.10	6.18	HIGH
Jun-67	9.48	7.40	6.20	8.35	TRUE	2.62	6.86	4.78	3.58	5.73	HIGH
Jun-68	8.93	7.40	6.40	8.35	TRUE	3.02	5.91	4.38	3.38	5.33	HIGH
Jun-69	8.58	7.40	6.55	8.35	TRUE	3.34	5.24	4.06	3.21	5.01	HIGH
Jun-70	8.26	7.40	6.70	8.35	FALSE	3.74	4.52	3.66	2.96	4.61	HIGH
Jun-71	8.07	7.40	6.84	8.35	FALSE	4.15	3.92	3.25	2.69	4.20	HIGH
Jun-72	7.97	7.40	6.91	8.35	FALSE	4.60	3.37	2.80	2.31	3.75	HIGH
Jun-73	7.96	7.40	6.91	8.35	FALSE	5.08	2.88	2.32	1.83	3.27	HIGH
Jun-74	7.88	7.40	6.96	8.35	FALSE	5.08	2.80	2.32	1.88	3.27	HIGH
Jun-75	7.98	7.40	6.87	8.35	FALSE	5.92	2.06	1.48	0.95	2.43	HIGH
Jun-76	8.00	7.40	6.85	8.35	FALSE	6.25	1.75	1.15	0.60	2.10	HIGH
Jun-77	7.99	7.40	6.85	8.35	FALSE	6.59	1.40	0.81	0.26	1.76	HIGH
Jun-78	7.99	7.40	6.84	8.35	FALSE	6.90	1.09	0.50	-0.06	1.45	HIGH
Jun-79	8.11	7.50	6.92	8.35	FALSE	7.18	0.93	0.32	-0.26	1.17	HIGH
Jun-80	8.67	7.96	7.28	8.35	TRUE	7.40	1.27	0.56	-0.12	0.95	HIGH
Jun-82	9.31	8.44	7.62	8.35	TRUE	7.40	1.91	1.04	0.22	0.95	LOW
Jun-85	9.74	8.75	7.80	8.35	TRUE	8.06	1.68	0.69	-0.26	0.29	LOW
Jun-86	9.92	8.85	7.84	8.35	TRUE	8.07	1.85	0.78	-0.23	0.28	LOW
Jun-87	9.93	8.85	7.83	8.35	TRUE	8.07	1.86	0.78	-0.24	0.28	LOW
Jun-88	9.90	8.85	7.84	8.35	TRUE	8.15	1.75	0.70	-0.31	0.20	LOW
				%TRUE	48%					%HIGH	76%
				%FALSE	52%					%LOW	24%

Table B-1.4 (Continued)

Hash 1A @500 psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	10.85	8.45	6.05	4.79	FALSE	1.75	9.10	6.70	4.30	3.04	LOW
Jun-66	10.06	8.45	7.39	4.79	FALSE	2.17	7.89	6.28	5.22	2.62	LOW
Jun-67	14.86	10.10	8.24	4.79	FALSE	2.54	12.32	7.56	5.70	2.25	LOW
Jun-68	12.53	10.10	8.73	4.79	FALSE	2.90	9.63	7.20	5.83	1.89	LOW
Jun-69	11.74	10.10	9.02	4.79	FALSE	3.20	8.54	6.90	5.82	1.59	LOW
Jun-70	11.28	10.10	9.24	4.79	FALSE	3.50	7.78	6.60	5.74	1.29	LOW
Jun-71	11.06	10.10	9.36	4.79	FALSE	3.78	7.28	6.32	5.58	1.01	LOW
Jun-72	10.91	10.10	9.44	4.79	FALSE	4.08	6.83	6.02	5.36	0.71	LOW
Jun-73	10.77	10.10	9.52	4.79	FALSE	4.34	6.43	5.76	5.18	0.45	LOW
Jun-74	10.77	10.10	9.52	4.79	FALSE	4.34	6.43	5.76	5.18	0.45	LOW
Jun-75	10.71	10.10	9.57	4.79	FALSE	4.61	6.10	5.49	4.96	0.18	LOW
Jun-76	12.94	10.10	8.31	4.79	FALSE	4.66	8.28	5.44	3.65	0.13	LOW
Jun-77	14.13	10.10	7.83	4.79	FALSE	4.71	9.42	5.39	3.12	0.08	LOW
Jun-78	14.76	10.10	7.56	4.79	FALSE	4.75	10.01	5.35	2.81	0.04	LOW
Jun-79	15.03	10.10	7.39	4.79	FALSE	4.78	10.25	5.32	2.61	0.01	LOW
Jun-80	14.92	10.10	7.33	4.79	FALSE	4.79	10.13	5.31	2.54	0.00	LOW
Jun-82	14.92	10.10	7.33	4.79	FALSE	4.79	10.13	5.31	2.54	0.00	LOW
Jun-85	14.92	10.10	7.33	4.79	FALSE	4.79	10.13	5.31	2.54	0.00	LOW
Jun-86	14.92	10.10	7.33	4.79	FALSE	4.79	10.13	5.31	2.54	0.00	LOW
Jun-87	14.92	10.10	7.33	4.79	FALSE	4.79	10.13	5.31	2.54	0.00	LOW
Jun-88	14.92	10.10	7.33	4.79	FALSE	4.79	10.13	5.31	2.54	0.00	LOW
				%TRUE	0%					%HIGH	0%
				%FALSE	100%					%LOW	100%

Hash1B14 @ 500 psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	7.14	3.63	2.30	4.25	TRUE	1.28	5.86	2.35	1.02	2.97	HIGH
Jun-66	7.9	5.53	3.16	4.25	TRUE	1.70	6.20	3.83	1.46	2.55	LOW
Jun-67	9.28	5.53	3.99	4.25	TRUE	2.10	7.18	3.43	1.89	2.15	LOW
Jun-68	7.32	5.53	4.42	4.25	FALSE	2.44	4.88	3.09	1.98	1.81	LOW
Jun-69	7.52	5.53	4.52	4.25	FALSE	2.70	4.82	2.83	1.82	1.55	LOW
Jun-70	6.77	5.53	4.64	4.25	FALSE	2.91	3.86	2.62	1.73	1.34	LOW
Jun-71	6.47	5.53	4.79	4.25	FALSE	3.04	3.43	2.49	1.75	1.21	LOW
Jun-72	6.28	5.53	4.90	4.25	FALSE	3.19	3.09	2.34	1.71	1.06	LOW
Jun-73	6.18	5.53	4.96	4.25	FALSE	3.31	2.87	2.22	1.65	0.94	LOW
Jun-74	6.11	5.53	5.01	4.25	FALSE	3.31	2.80	2.22	1.70	0.94	LOW
Jun-75	6.09	5.53	5.02	4.25	FALSE	3.53	2.56	2.00	1.49	0.72	LOW
Jun-76	6.1	5.53	5.01	4.25	FALSE	3.60	2.50	1.93	1.41	0.65	LOW
Jun-77	6.15	5.53	4.96	4.25	FALSE	3.70	2.45	1.83	1.26	0.55	LOW
Jun-78	6.2	5.53	4.92	4.25	FALSE	3.78	2.42	1.75	1.14	0.47	LOW
Jun-79	6.27	5.53	4.84	4.25	FALSE	3.86	2.41	1.67	0.98	0.39	LOW
Jun-80	6.31	5.53	4.82	4.25	FALSE	3.96	2.35	1.57	0.86	0.29	LOW
Jun-82	6.31	5.53	4.82	4.25	FALSE	3.96	2.35	1.57	0.86	0.29	LOW
Jun-85	6.31	5.53	4.82	4.25	FALSE	4.24	2.07	1.29	0.58	0.01	LOW
Jun-86	6.31	5.53	4.82	4.25	FALSE	4.25	2.06	1.28	0.57	0.00	LOW
Jun-87	6.31	5.53	4.82	4.25	FALSE	4.26	2.05	1.27	0.56	-0.01	LOW
Jun-88	6.31	5.53	4.82	4.25	FALSE	4.26	2.05	1.27	0.56	-0.01	LOW
				%True	14%					%HIGH	5%
				%False	86%					%LOW	95%

Table B-1.4 (Continued)

Rob 1A @500 psi	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
Apr-65	13.62	11.94	10.75	7.70	FALSE	1.60	12.02	10.34	9.15	6.10	LOW
Jun-66	13.46	10.5	8.89	7.70	FALSE	1.98	11.48	8.52	6.91	5.72	LOW
Jun-67	11.38	10.5	9.79	7.70	FALSE	2.33	9.05	8.17	7.46	5.37	LOW
Jun-68	11.02	10.5	10.04	7.70	FALSE	2.69	8.33	7.81	7.35	5.01	LOW
Jun-69	10.89	10.5	10.15	7.70	FALSE	3.02	7.87	7.48	7.13	4.68	LOW
Jun-70	11	10.64	10.32	7.70	FALSE	3.38	7.62	7.26	6.94	4.32	LOW
Jun-71	10.92	10.64	10.38	7.70	FALSE	3.81	7.11	6.83	6.57	3.89	LOW
Jun-72	10.87	10.64	10.43	7.70	FALSE	4.22	6.65	6.42	6.21	3.48	LOW
Jun-73	10.83	10.64	10.46	7.70	FALSE	4.66	6.17	5.98	5.80	3.04	LOW
Jun-74	10.82	10.64	10.45	7.70	FALSE	5.08	5.74	5.56	5.37	2.62	LOW
Jun-75	10.97	10.76	10.56	7.70	FALSE	5.45	5.52	5.31	5.11	2.25	LOW
Jun-76	10.95	10.76	10.58	7.70	FALSE	5.78	5.17	4.98	4.80	1.92	LOW
Jun-77	10.93	10.76	10.6	7.70	FALSE	6.12	4.81	4.64	4.48	1.58	LOW
Jun-78	10.92	10.76	10.61	7.70	FALSE	6.45	4.47	4.31	4.16	1.25	LOW
Jun-79	10.92	10.76	10.61	7.70	FALSE	6.72	4.20	4.04	3.89	0.98	LOW
Jun-80	10.97	10.76	10.57	7.70	FALSE	6.94	4.03	3.82	3.63	0.76	LOW
Jun-82	11.11	10.76	10.43	7.70	FALSE	7.33	3.78	3.43	3.10	0.37	LOW
Jun-85	11.11	10.76	10.43	7.70	FALSE	7.33	3.78	3.43	3.10	0.37	LOW
Jun-86	11.11	10.76	10.43	7.70	FALSE	7.33	3.78	3.43	3.10	0.37	LOW
Jun-87	11.11	10.76	10.43	7.70	FALSE	7.33	3.78	3.43	3.10	0.37	LOW
Jun-88	11.96	10.76	9.68	7.70	FALSE	7.40	4.56	3.36	2.28	0.30	LOW
				%TRUE	0%					%HIGH	0%
				%FALSE	100%					%LOW	100%

Table B-1.5 Total field results for Glick Field from the Least Square method at 800 psi abandonment

<b>Total Field Results from Monte Carlo Simulation</b>											
@800 psi	EUR			Least Square method			ERR			ARR	BIAS
W/Group 8	P90	P50	P10	AUR	Logic	CUM	P90	P50	P10		
EUR until 4/65	165.26	182.83	200.56	206.92	FALSE	48.97	116.29	133.86	151.59	157.95	HIGH
EUR until 6/66	176.49	183.63	190.81	206.92	FALSE	62.00	114.49	121.63	128.81	144.92	HIGH
EUR until 6/67	182.92	188.59	194.19	211.12	FALSE	72.81	110.11	115.78	121.38	138.31	HIGH
EUR until 6/68	167.09	173.54	180.11	219.91	FALSE	78.95	88.14	94.59	101.16	140.96	HIGH
EUR until 6/69	168.34	173.95	179.00	219.91	FALSE	90.23	78.11	83.72	88.77	129.68	HIGH
EUR until 6/70	181.84	188.02	194.23	219.91	FALSE	98.93	82.91	89.09	95.30	120.98	HIGH
EUR until 6/71	200.00	206.98	213.51	219.91	FALSE	116.43	83.57	90.55	97.08	103.48	HIGH
EUR until 6/72	190.25	208.96	227.20	219.91	TRUE	132.32	57.93	76.64	94.88	87.59	HIGH
EUR until 6/73	204.97	210.28	215.88	219.91	FALSE	145.08	59.89	65.20	70.80	74.83	HIGH
EUR until 6/74	207.84	211.32	215.97	219.91	FALSE	153.19	54.65	58.13	62.78	66.72	HIGH
EUR until 6/75	209.77	212.54	215.89	219.91	FALSE	166.06	43.71	46.48	49.83	53.85	HIGH
EUR until 6/76	208.68	214.37	220.25	219.91	TRUE	175.37	33.31	39.00	44.88	44.54	HIGH
EUR until 6/77	214.51	215.43	220.60	219.91	TRUE	183.50	31.01	31.93	37.10	36.41	HIGH
EUR until 6/78	214.31	216.33	220.22	219.91	TRUE	190.98	23.33	25.35	29.24	28.93	HIGH
EUR until 6/79	213.25	216.16	219.93	219.91	TRUE	197.47	15.78	18.69	22.46	22.44	HIGH
EUR until 6/80	214.00	216.10	219.99	219.91	TRUE	199.91	14.09	16.19	20.08	20.00	HIGH
EUR until 6/82	211.97	215.73	219.97	219.91	TRUE	200.30	11.67	15.43	19.67	19.61	HIGH
				%TRUE	42%					%HIGH	100%
				%FALSE	58%					%LOW	0%

<b>Total Field without group 8 Results From Monte Carlo Simulation</b>											
@ 800 psi	EUR			Least Square method			ERR			ARR	BIAS
W/O Group 8	P90	P50	P10	AUR	Logic	CUM	P90	P50	P10		
EUR until 4/65	165.26	182.83	200.56	194.9	TRUE	48.97	116.29	133.86	151.59	145.93	HIGH
EUR until 6/66	176.49	183.63	190.81	194.9	FALSE	62.00	114.49	121.63	128.81	132.90	HIGH
EUR until 6/67	182.92	188.59	194.19	199.1	FALSE	75.47	107.45	113.12	118.72	123.63	HIGH
EUR until 6/68	167.09	173.54	180.11	207.89	FALSE	77.14	89.95	96.40	102.97	130.75	HIGH
EUR until 6/69	168.34	173.95	179.00	207.89	FALSE	87.31	81.03	86.64	91.69	120.58	HIGH
EUR until 6/70	181.84	188.02	194.23	207.89	FALSE	98.93	82.91	89.09	95.30	108.96	HIGH
EUR until 6/71	189.63	196.67	203.98	207.89	FALSE	110.23	79.40	86.44	93.75	97.66	HIGH
EUR until 6/72	179.43	198.07	216.26	207.89	TRUE	124.94	54.49	73.13	91.32	82.95	HIGH
EUR until 6/73	194.01	199.23	204.10	207.89	FALSE	136.80	57.21	62.43	67.30	71.09	HIGH
EUR until 6/74	196.55	200.05	203.99	207.89	FALSE	144.91	51.64	55.14	59.08	62.98	HIGH
EUR until 6/75	198.25	200.95	203.99	207.89	FALSE	156.07	42.18	44.88	47.92	51.82	HIGH
EUR until 6/76	197.04	202.64	208.57	207.89	TRUE	164.22	32.82	38.42	44.35	43.67	HIGH
EUR until 6/77	201.67	203.57	207.95	207.89	TRUE	171.86	29.81	31.71	36.09	36.03	HIGH
EUR until 6/78	200.47	204.49	208.31	207.89	TRUE	178.84	21.63	25.65	29.47	29.05	HIGH
EUR until 6/79	201.42	204.27	207.95	207.89	TRUE	185.33	16.09	18.94	22.62	22.56	HIGH
EUR until 6/80	200.20	204.19	208.04	207.89	TRUE	187.77	12.43	16.42	20.27	20.12	HIGH
EUR until 6/82	200.09	203.88	207.93	207.89	TRUE	188.16	11.93	15.72	19.77	19.73	HIGH
				%TRUE	47%					%UP	100%
				%FALSE	53%					%LOW	0%

Table B-1.6 Total field results for Glick Field from the High pressure method at 500 psi abandonment

**Total Field Results from Monte Carlo Simulation**

@800 psi W/Group 8	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	EUR	CUM	P10	P50	P90		
EUR until 4/65	198.93	183.77	167.65	208.92	FALSE	48.97	149.96	134.80	118.68	159.95	HIGH
EUR until 6/66	200.69	193.15	185.67	208.92	FALSE	62.00	138.69	131.15	123.67	146.92	HIGH
EUR until 6/67	208.38	200.63	193.30	213.12	FALSE	75.81	132.57	124.82	117.49	137.31	HIGH
EUR until 6/68	191.33	184.39	177.59	221.91	FALSE	78.95	112.38	105.44	98.64	142.96	HIGH
EUR until 6/69	216.91	208.24	198.35	221.91	FALSE	90.23	126.68	118.01	108.12	131.68	HIGH
EUR until 6/70	210.28	201.55	192.79	221.91	FALSE	98.93	111.35	102.62	93.86	122.98	HIGH
EUR until 6/71	227.99	220.65	212.75	221.91	TRUE	116.43	111.56	104.22	96.32	105.48	HIGH
EUR until 6/72	227.56	222.41	217.55	221.91	TRUE	132.32	95.24	90.09	85.23	89.59	LOW
EUR until 6/73	227.70	223.46	219.39	221.91	TRUE	145.08	82.62	78.38	74.31	76.83	LOW
EUR until 6/74	229.69	225.54	221.55	221.91	TRUE	153.19	76.50	72.35	68.36	68.72	LOW
EUR until 6/75	230.39	227.04	221.63	221.91	TRUE	166.06	64.33	60.98	55.57	55.85	LOW
EUR until 6/76	231.14	227.83	224.34	221.91	FALSE	175.37	55.77	52.46	48.97	46.54	LOW
EUR until 6/77	233.19	229.91	226.45	221.91	FALSE	183.50	49.69	46.41	42.95	38.41	LOW
EUR until 6/78	234.42	231.05	227.81	221.91	FALSE	190.98	43.44	40.07	36.83	30.93	LOW
EUR until 6/79	235.63	232.47	229.07	221.91	FALSE	197.47	38.16	35.00	31.60	24.44	LOW
EUR until 6/80	236.09	232.69	229.09	221.91	FALSE	199.91	36.18	32.78	29.18	22.00	LOW
EUR until 6/82	236.13	232.61	229.15	221.91	FALSE	200.30	35.83	32.31	28.85	21.61	LOW
				%TRUE	29%					%UP	41%
				%FALSE	71%					%LOW	18%

**Total Field without Group 8 Results From Monte Carlo Simulation**

@ 800 psi W/O Group 8	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	EUR	CUM	P10	P50	P90		
EUR until 4/65	198.93	183.77	167.65	196.78	TRUE	48.97	149.96	134.80	118.68	147.81	HIGH
EUR until 6/66	200.69	193.15	185.67	196.78	TRUE	62.00	138.69	131.15	123.67	134.78	HIGH
EUR until 6/67	208.38	200.63	193.30	200.98	TRUE	75.47	132.91	125.16	117.83	125.51	HIGH
EUR until 6/68	191.33	184.39	177.59	209.77	FALSE	77.14	114.19	107.25	100.45	132.63	HIGH
EUR until 6/69	216.91	208.24	198.35	209.77	TRUE	87.31	129.60	120.93	111.04	122.46	HIGH
EUR until 6/70	210.28	201.55	192.79	209.77	TRUE	98.93	111.35	102.62	93.86	110.84	HIGH
EUR until 6/71	217.64	210.34	202.44	209.77	TRUE	110.23	107.41	100.11	92.21	99.54	LOW
EUR until 6/72	215.93	211.15	206.54	209.77	TRUE	124.94	90.99	86.21	81.60	84.83	LOW
EUR until 6/73	216.11	212.07	208.11	209.77	TRUE	136.80	79.31	75.27	71.31	72.97	LOW
EUR until 6/74	218.16	214.06	209.18	209.77	TRUE	144.91	73.25	69.15	64.27	64.86	LOW
EUR until 6/75	218.88	215.58	212.16	209.77	FALSE	156.07	62.81	59.51	56.09	53.70	LOW
EUR until 6/76	219.63	216.29	212.94	209.77	FALSE	164.22	55.41	52.07	48.72	45.55	LOW
EUR until 6/77	221.33	217.95	214.61	209.77	FALSE	171.86	49.47	46.09	42.75	37.91	LOW
EUR until 6/78	222.32	219.05	215.83	209.77	FALSE	178.84	43.48	40.21	36.99	30.93	LOW
EUR until 6/79	223.62	220.32	216.96	209.77	FALSE	185.33	38.29	34.99	31.63	24.44	LOW
EUR until 6/80	223.95	220.59	217.07	209.77	FALSE	187.77	36.18	32.82	29.30	22.00	LOW
EUR until 6/82	223.93	220.58	217.21	209.77	FALSE	188.16	35.77	32.42	29.05	21.61	LOW
				%TRUE	53%					%UP	35%
				%FALSE	47%					%LOW	65%

Table B-1.7 Total field results for Glick Field from the Least Square method at 500 psi abandonment

W/ Group 8 @ 500 psi	Total Field Results from Monte Carlo Simulation										
	EUR			Least Square method			ERR			ARR	BIAS
	P90	P50	P10	AUR	Logic	CUM.	P90	P50	P10		
EUR until 6/65	209.72	228.21	247.19	257.75	FALSE	48.97	160.75	179.24	198.22	208.78	HIGH
EUR until 6/66	221.18	230.3	240.68	257.75	FALSE	62.00	159.18	168.30	178.68	195.75	HIGH
EUR until 6/67	227.78	237.98	247.71	263.69	FALSE	72.81	154.97	165.17	174.90	190.88	HIGH
EUR until 6/68	210.2	219.33	228.08	277.21	FALSE	78.95	131.25	140.38	149.13	198.26	HIGH
EUR until 6/69	210.57	216.73	223.24	277.21	FALSE	90.23	120.34	126.50	133.01	186.98	HIGH
EUR until 6/70	226.37	234.96	243.4	277.21	FALSE	98.93	127.44	136.03	144.47	178.28	HIGH
EUR until 6/71	229.58	241.51	253.36	277.21	FALSE	116.43	113.15	125.08	136.93	160.78	HIGH
EUR until 6/72	239.56	251.73	264.26	277.21	FALSE	132.32	107.24	119.41	131.94	144.89	HIGH
EUR until 6/73	246.03	252.36	258.52	277.21	FALSE	145.56	100.47	106.80	112.96	131.65	HIGH
EUR until 6/74	250.82	254.38	257.84	277.21	FALSE	153.67	97.15	100.71	104.17	123.54	HIGH
EUR until 6/75	249.81	253.21	259.89	277.21	FALSE	170.72	79.09	82.49	89.17	106.49	HIGH
EUR until 6/76	250.75	253.72	259.79	277.21	FALSE	187.02	63.73	66.70	72.77	90.19	HIGH
EUR until 6/77	254.1	257.39	260.72	277.21	FALSE	198.60	55.50	58.79	62.12	78.61	HIGH
EUR until 6/78	252.83	255.92	259.94	277.21	FALSE	208.73	44.11	47.20	51.22	68.49	HIGH
EUR until 6/79	255.19	257.98	260.8	277.21	FALSE	218.04	37.15	39.94	42.76	59.17	HIGH
EUR until 6/80	256.18	259.39	262.18	277.21	FALSE	227.15	29.03	32.24	35.03	50.06	HIGH
EUR until 6/82	256.06	259.3	262.19	277.21	FALSE	230.02	26.04	29.28	32.17	47.19	HIGH
EUR until 6/85	256.69	259.94	262.85	277.21	FALSE	242.95	13.74	16.99	19.90	34.26	HIGH
EUR until 6/86	257.55	260.78	263.95	277.21	FALSE	243.02	14.53	17.76	20.93	34.19	HIGH
EUR until 6/87	257.61	260.77	264.19	277.21	FALSE	245.45	12.16	15.32	18.74	31.76	HIGH
EUR until 6/88	258.39	262.33	266.29	277.21	FALSE	258.97	-0.58	3.36	7.32	18.24	HIGH
				%TRUE	0%					%UP	100%
				%FALSE	100%					%DOWN	0%

W/O Group 8 @ 500 psi	Total Field w/o group 8 Results from Monte Carlo Simulation										
	EUR			Least Square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM.	P10	P50	P90		
EUR until 6/65	247.27	228.52	209.35	240.30	TRUE	48.97	198.30	179.55	160.38	191.33	HIGH
EUR until 6/66	240.19	230.29	221.09	240.30	FALSE	62.00	178.19	168.29	159.09	178.30	HIGH
EUR until 6/67	248.27	237.73	227.65	246.24	TRUE	75.47	172.80	162.26	152.18	170.77	HIGH
EUR until 6/68	228.07	219.30	210.63	259.76	FALSE	77.14	150.93	142.16	133.49	182.62	HIGH
EUR until 6/69	223.09	216.74	210.53	259.76	FALSE	87.31	135.78	129.43	123.22	172.45	HIGH
EUR until 6/70	243.35	234.95	226.60	259.76	FALSE	98.93	144.42	136.02	127.67	160.83	HIGH
EUR until 6/71	253.90	241.42	229.28	259.76	FALSE	110.23	143.67	131.19	119.05	149.53	HIGH
EUR until 6/72	263.58	252.02	239.53	259.76	TRUE	124.94	138.64	127.08	114.59	134.82	HIGH
EUR until 6/73	258.74	252.24	245.99	259.76	FALSE	137.28	121.46	114.96	108.71	122.48	HIGH
EUR until 6/74	258.01	254.41	250.67	259.76	FALSE	145.39	112.62	109.02	105.28	114.37	HIGH
EUR until 6/75	256.79	253.27	249.65	259.76	FALSE	160.73	96.06	92.54	88.92	99.03	HIGH
EUR until 6/76	256.60	253.75	250.77	259.76	FALSE	175.87	80.73	77.87	74.89	83.89	HIGH
EUR until 6/77	260.86	257.41	254.10	259.76	TRUE	186.96	73.90	70.45	67.14	72.80	HIGH
EUR until 6/78	258.69	255.91	252.96	259.76	FALSE	196.59	62.10	59.32	56.38	63.18	HIGH
EUR until 6/79	260.88	258.04	254.89	259.76	TRUE	205.90	54.98	52.13	48.99	53.86	HIGH
EUR until 6/80	262.21	259.24	256.36	259.76	TRUE	215.01	47.20	44.23	41.35	44.75	HIGH
EUR until 6/82	262.23	259.25	256.31	259.76	TRUE	217.88	44.34	41.37	38.43	41.88	HIGH
EUR until 6/85	263.02	259.80	256.81	259.76	TRUE	230.81	32.21	28.99	25.99	28.95	LOW
EUR until 6/86	264.07	260.80	257.70	259.76	TRUE	230.88	33.18	29.92	26.81	28.88	LOW
EUR until 6/87	264.02	260.84	257.59	259.76	TRUE	230.95	33.07	29.89	26.64	28.81	LOW
EUR until 6/88	266.40	262.32	258.38	259.76	TRUE	244.47	21.93	17.85	13.91	15.29	LOW
				%TRUE	52%					%UP	81%
				%FALSE	48%					%DOWN	19%

Table B-1.8 Total field results for Glick Field from the High pressure method at 500 psi abandonment

W/ Group 8 @ 500 psi	Total Field Results from Monte Carlo Simulation										
	EUR			High Pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM.	P10	P50	P90		
EUR until 6/65	248.57	230.22	210.12	257.75	FALSE	48.97	199.60	181.25	161.15	208.78	HIGH
EUR until 6/66	247.84	235.72	223.29	257.75	FALSE	62.00	185.84	173.72	161.29	195.75	HIGH
EUR until 6/67	254.80	244.08	232.38	263.69	FALSE	72.81	181.99	171.27	159.57	190.88	HIGH
EUR until 6/68	233.88	224.40	215.35	277.21	FALSE	78.95	154.93	145.45	136.40	198.26	HIGH
EUR until 6/69	231.99	224.94	218.02	277.21	FALSE	90.23	141.76	134.71	127.79	186.98	HIGH
EUR until 6/70	257.70	245.84	234.95	277.21	FALSE	98.93	158.77	146.91	136.02	178.28	HIGH
EUR until 6/71	274.99	262.89	251.03	277.21	FALSE	116.43	158.56	146.46	134.60	160.78	HIGH
EUR until 6/72	286.29	274.56	263.45	277.21	TRUE	132.32	153.97	142.24	131.13	144.89	HIGH
EUR until 6/73	282.16	275.77	269.19	277.21	TRUE	145.56	136.60	130.21	123.63	131.65	HIGH
EUR until 6/74	281.57	276.19	270.96	277.21	TRUE	153.67	127.90	122.52	117.29	123.54	HIGH
EUR until 6/75	284.62	279.84	275.29	277.21	TRUE	170.72	113.90	109.12	104.57	106.49	LOW
EUR until 6/76	285.26	279.94	274.91	277.21	TRUE	181.67	103.59	98.27	93.24	95.54	LOW
EUR until 6/77	288.58	282.93	277.20	277.21	TRUE	192.66	95.92	90.27	84.54	84.55	LOW
EUR until 6/78	291.17	284.91	277.01	277.21	TRUE	202.47	88.70	82.44	74.54	74.74	LOW
EUR until 6/79	293.99	287.69	281.21	277.21	FALSE	211.55	82.44	76.14	69.66	65.66	LOW
EUR until 6/80	295.05	289.21	282.85	277.21	FALSE	220.62	74.43	68.59	62.23	56.59	LOW
EUR until 6/82	296.10	289.79	283.41	277.21	FALSE	223.49	72.61	66.30	59.92	53.72	LOW
EUR until 6/85	296.67	290.12	283.85	277.21	FALSE	236.42	60.25	53.70	47.43	40.79	LOW
EUR until 6/86	296.91	290.25	283.41	277.21	FALSE	236.49	60.42	53.76	46.92	40.72	LOW
EUR until 6/87	297.38	290.27	283.24	277.21	FALSE	238.92	58.46	51.35	44.32	38.29	LOW
EUR until 6/88	299.77	292.00	284.31	277.21	FALSE	252.44	47.33	39.56	31.87	24.77	LOW
				%TRUE	33%					%UP	48%
				%FALSE	67%					%DOWN	52%

W/O Group 8 @ 500 psi	Total Field without Group 8 Results from Monte Carlo Simulation										
	EUR			High Pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	CUM.	Logic	P10	P50	P90		
EUR until 6/65	248.57	230.22	210.12	240.30	48.97	TRUE	199.60	181.25	161.15	191.33	HIGH
EUR until 6/66	247.84	235.72	223.29	240.30	62.00	TRUE	185.84	173.72	161.29	178.30	HIGH
EUR until 6/67	254.80	244.08	232.38	246.24	71.47	TRUE	183.33	172.61	160.91	174.77	HIGH
EUR until 6/68	233.88	224.40	215.35	259.76	77.14	FALSE	156.74	147.26	138.21	182.62	HIGH
EUR until 6/69	231.99	224.94	218.02	259.76	87.31	FALSE	144.68	137.63	130.71	172.45	HIGH
EUR until 6/70	257.70	245.84	234.95	259.76	98.93	FALSE	158.77	146.91	136.02	160.83	HIGH
EUR until 6/71	260.94	249.85	239.08	259.76	110.23	TRUE	150.71	139.62	128.85	149.53	HIGH
EUR until 6/72	270.28	260.15	250.52	259.76	124.94	TRUE	145.34	135.21	125.58	134.82	LOW
EUR until 6/73	267.28	260.96	254.75	259.76	137.28	TRUE	130.00	123.68	117.47	122.48	LOW
EUR until 6/74	266.52	261.35	256.14	259.76	145.39	TRUE	121.13	115.96	110.75	114.37	LOW
EUR until 6/75	268.96	264.31	259.70	259.76	160.73	TRUE	108.23	103.58	98.97	99.03	LOW
EUR until 6/76	269.68	264.31	259.30	259.76	170.52	TRUE	99.16	93.79	88.78	89.24	LOW
EUR until 6/77	272.68	267.10	261.42	259.76	181.02	FALSE	91.66	86.08	80.40	78.74	LOW
EUR until 6/78	274.57	268.28	262.41	259.76	190.33	FALSE	84.24	77.95	72.08	69.43	LOW
EUR until 6/79	276.87	270.64	264.35	259.76	199.41	FALSE	77.46	71.23	64.94	60.35	LOW
EUR until 6/80	277.96	272.12	266.02	259.76	208.48	FALSE	69.48	63.64	57.54	51.28	LOW
EUR until 6/82	278.95	272.75	266.62	259.76	211.35	FALSE	67.60	61.40	55.27	48.41	LOW
EUR until 6/85	279.59	273.07	266.75	259.76	224.28	FALSE	55.31	48.79	42.47	35.48	LOW
EUR until 6/86	279.74	273.32	266.42	259.76	224.35	FALSE	55.39	48.97	42.07	35.41	LOW
EUR until 6/87	280.34	273.19	266.33	259.76	224.42	FALSE	55.92	48.77	41.91	35.34	LOW
EUR until 6/88	282.78	274.98	267.40	259.76	237.94	FALSE	44.84	37.04	29.46	21.82	LOW
				%TRUE	43%					%UP	33%
				%FALSE	57%					%DOWN	67%

## APPENDIX B-2

The following pages presents the accuracy ratio plots for the Glick Field from the Least Square method and the empirical High Pressure method at 500 psi and 800 psi abandonment pressures.

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Total Field without group 8 accuracy ratio plots from the High Pressure method at 500 psi abandonment pressure .....	158

Table B-2.1 Accuracy Ratio plots for groups and wells in Glick Field from the Least Square method @ 800 psi abandonment

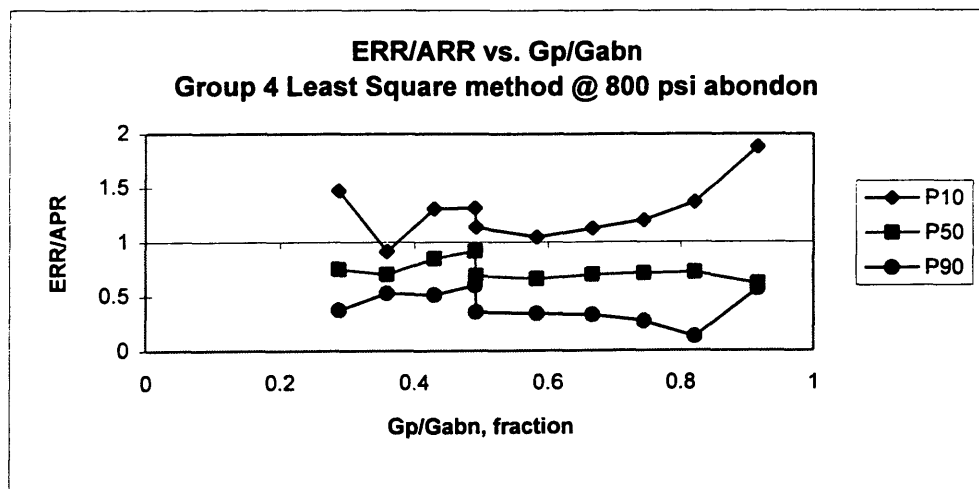
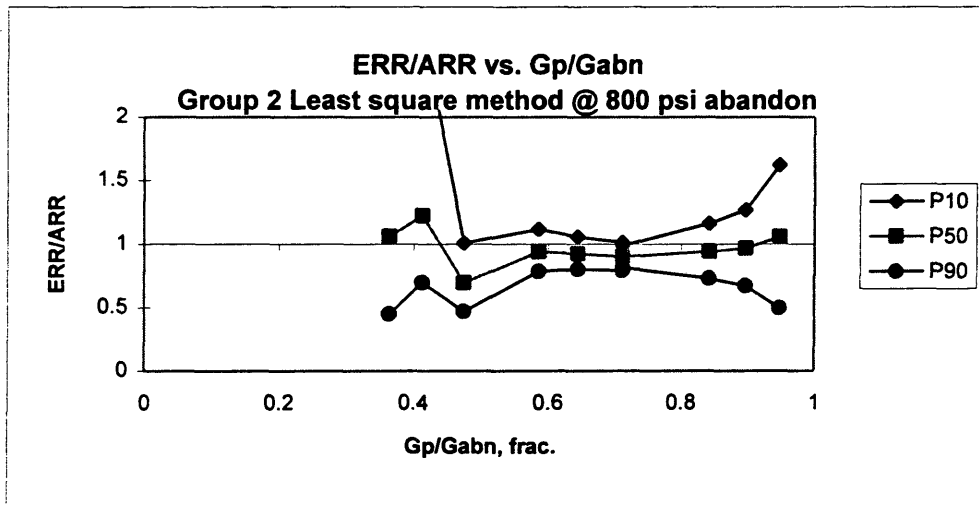
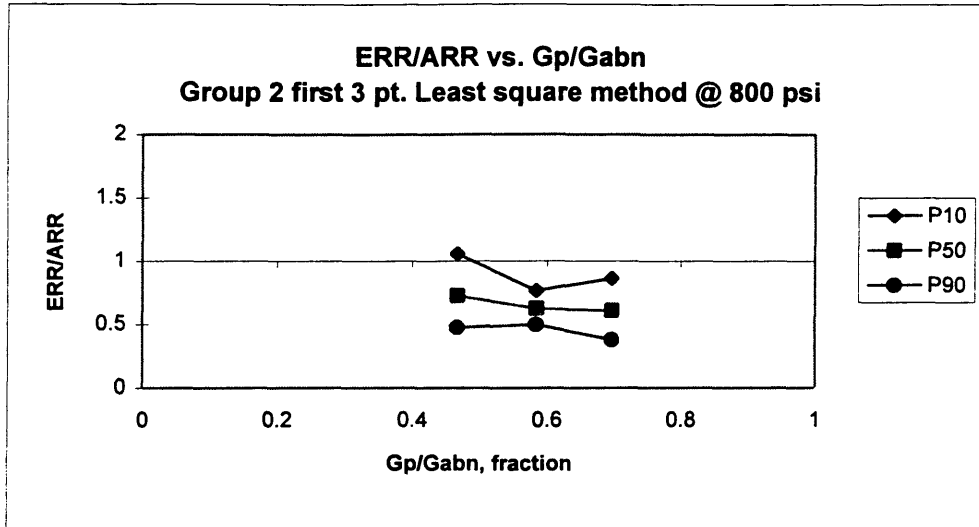


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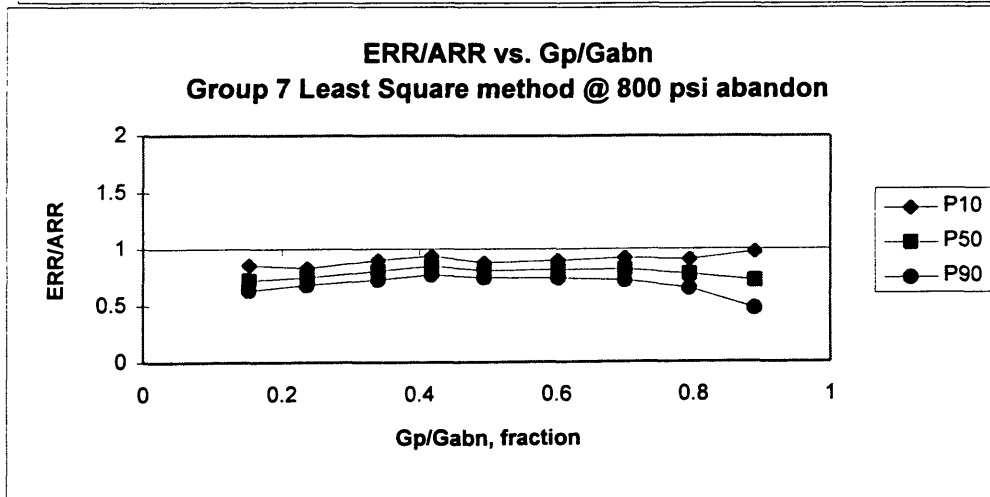
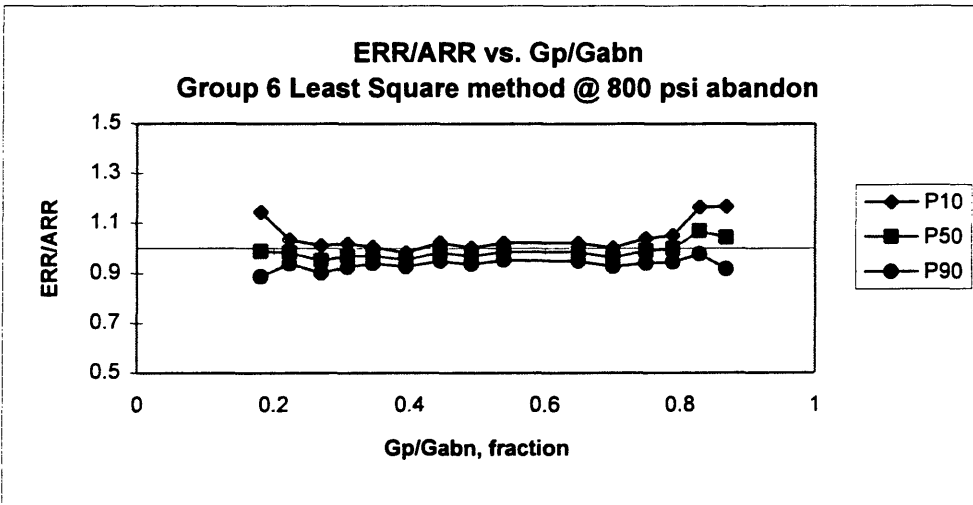
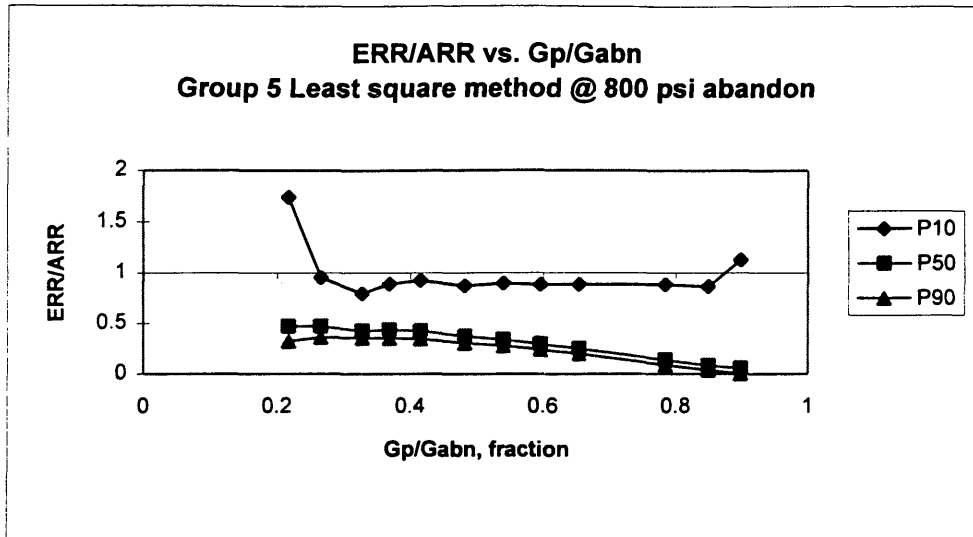


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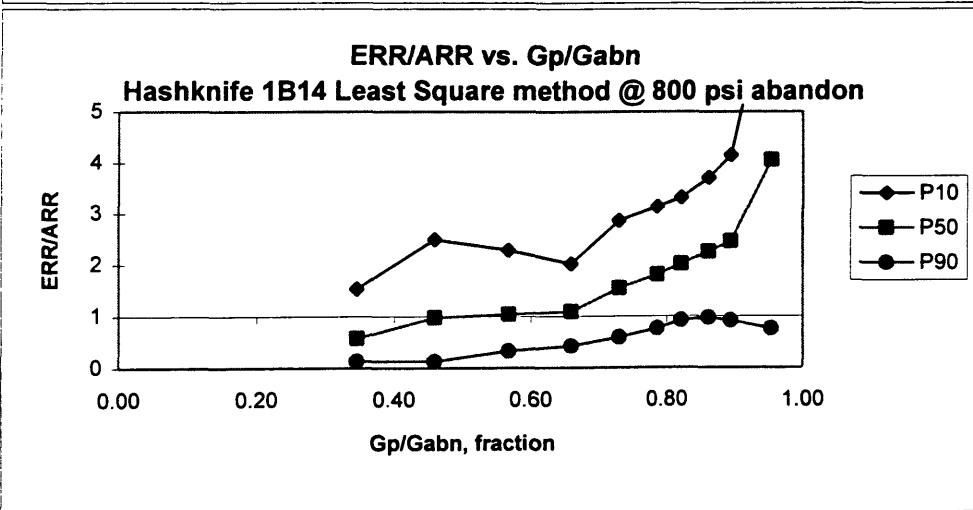
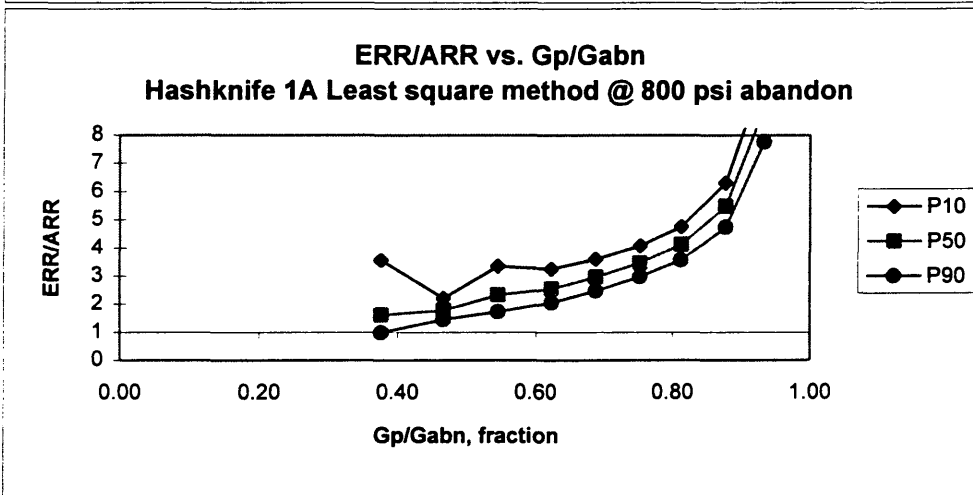
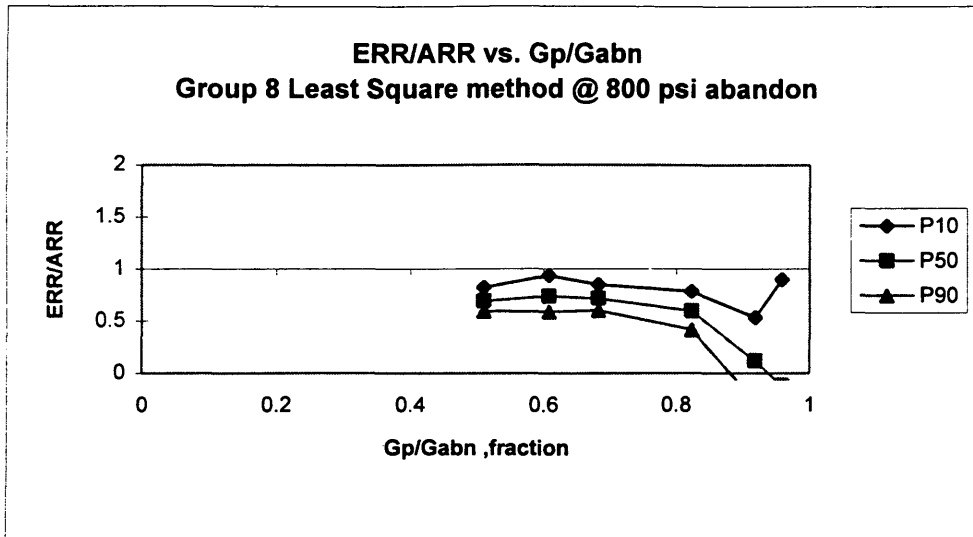


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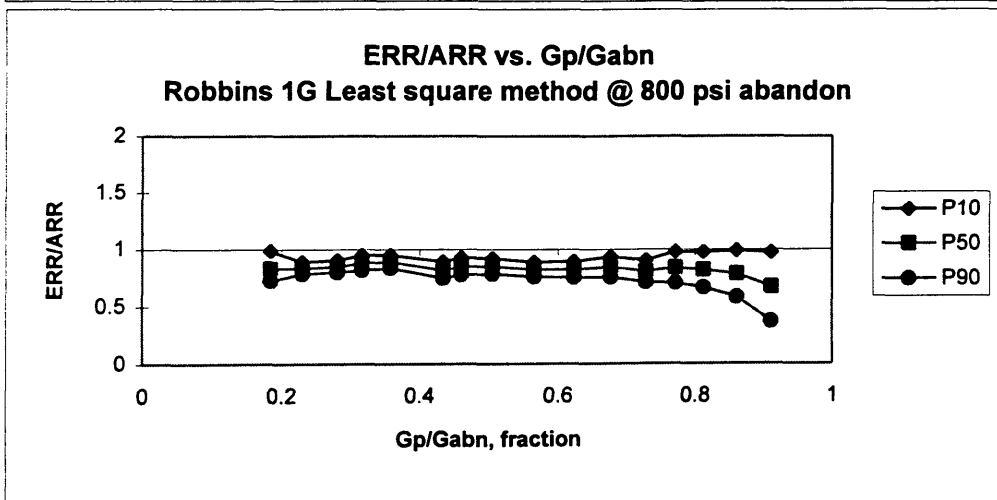
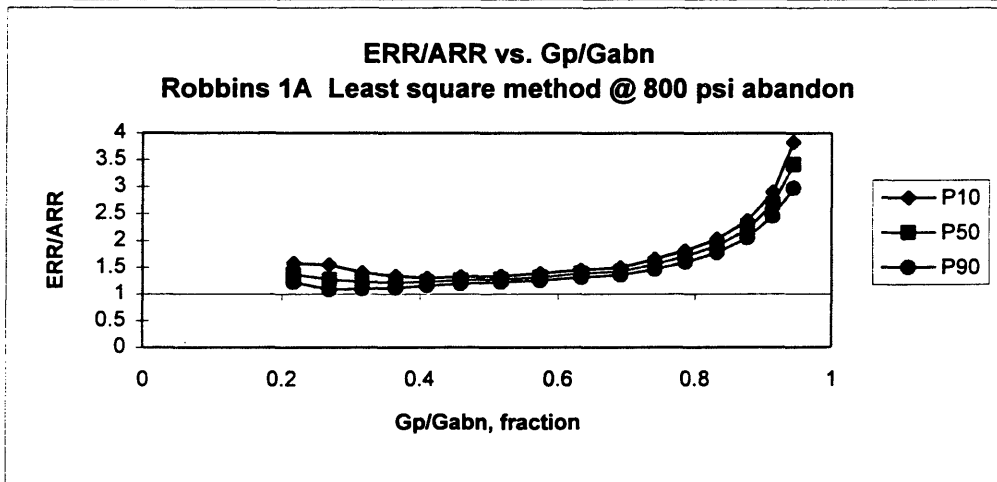
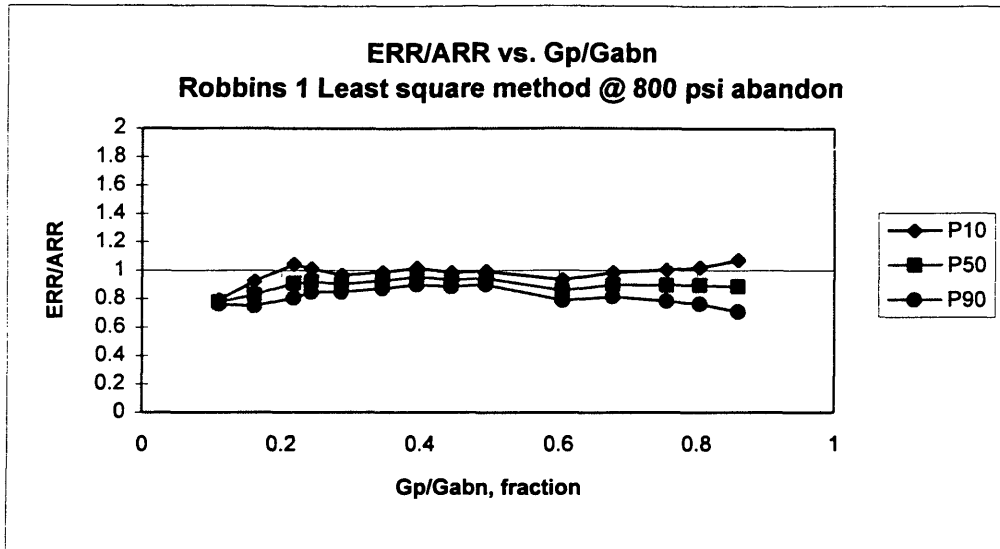


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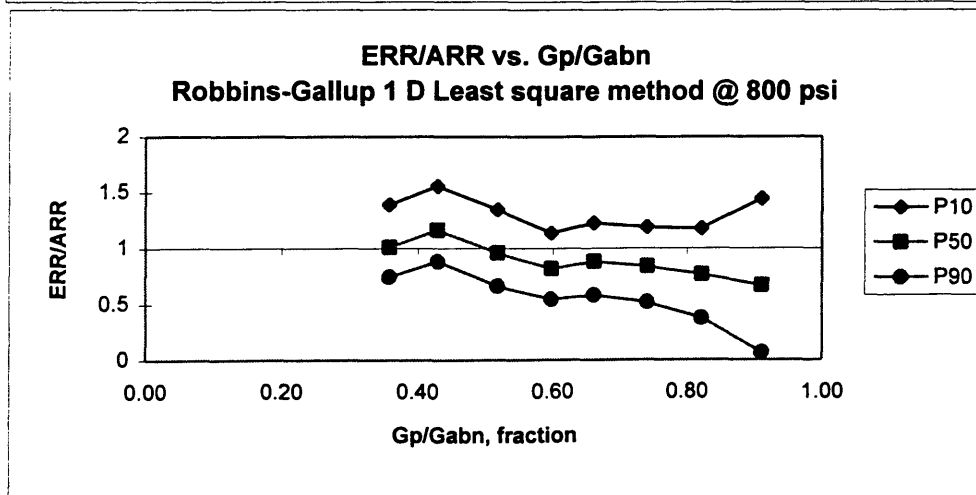
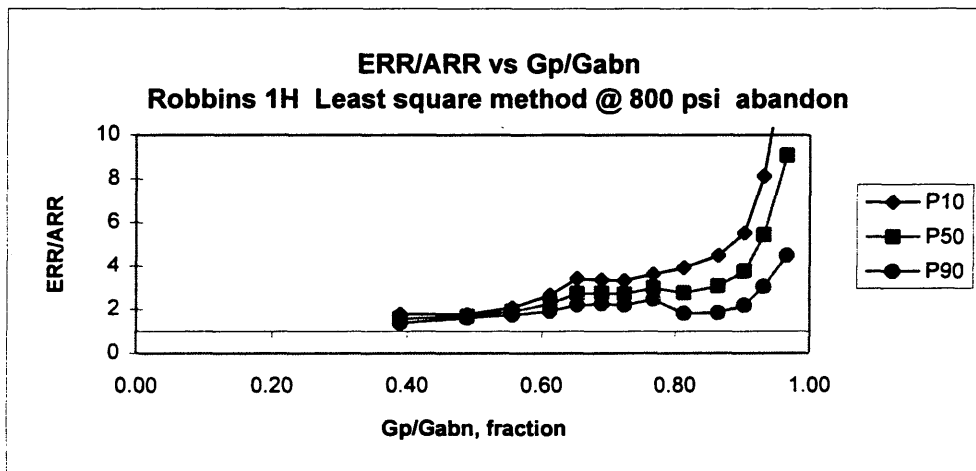
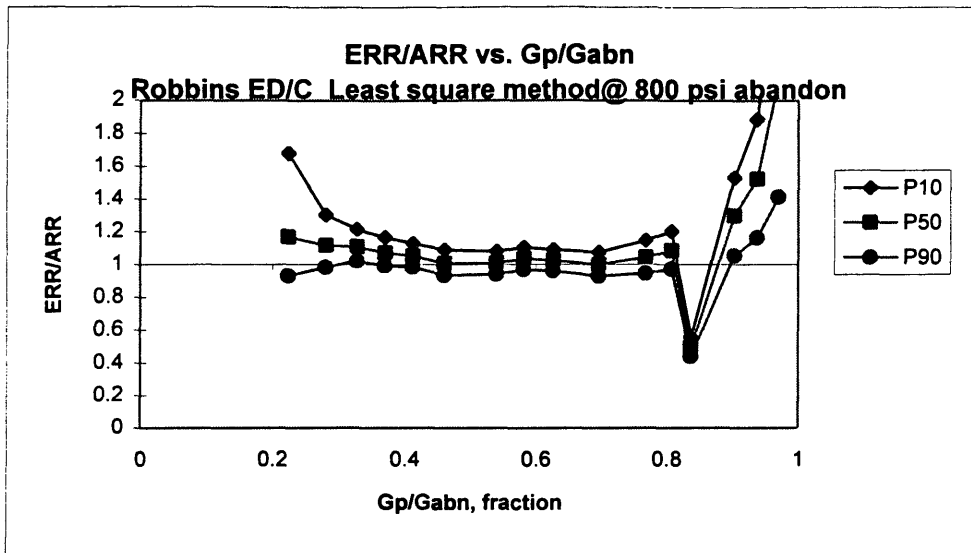


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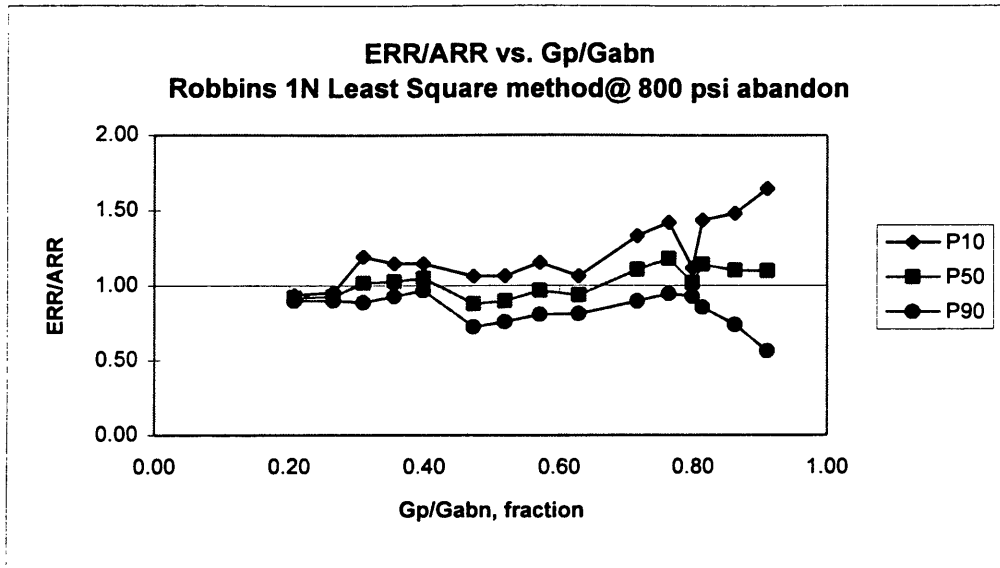


Table B-2.2 Accuracy Ratio plots for groups and wells in Glick Field from the High pressure method @ 800 psi abandonment

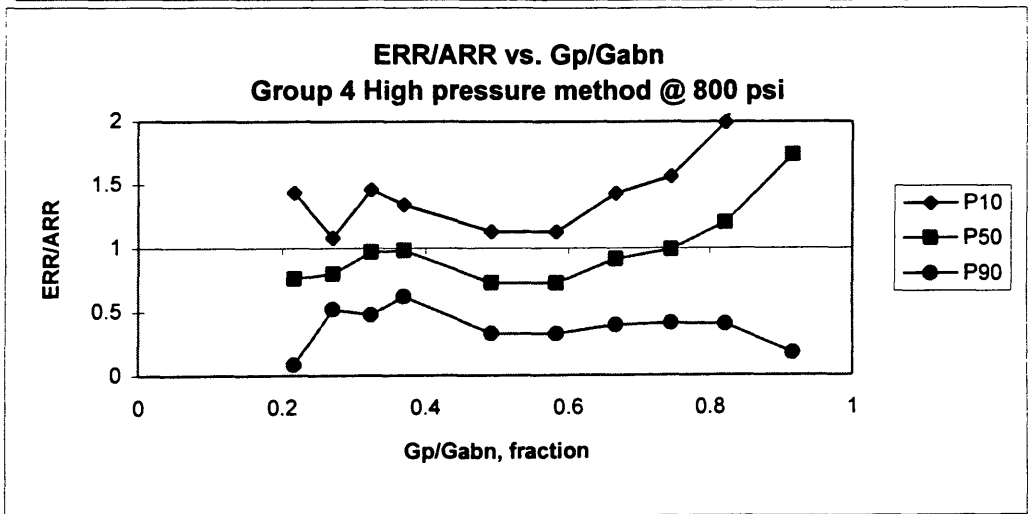
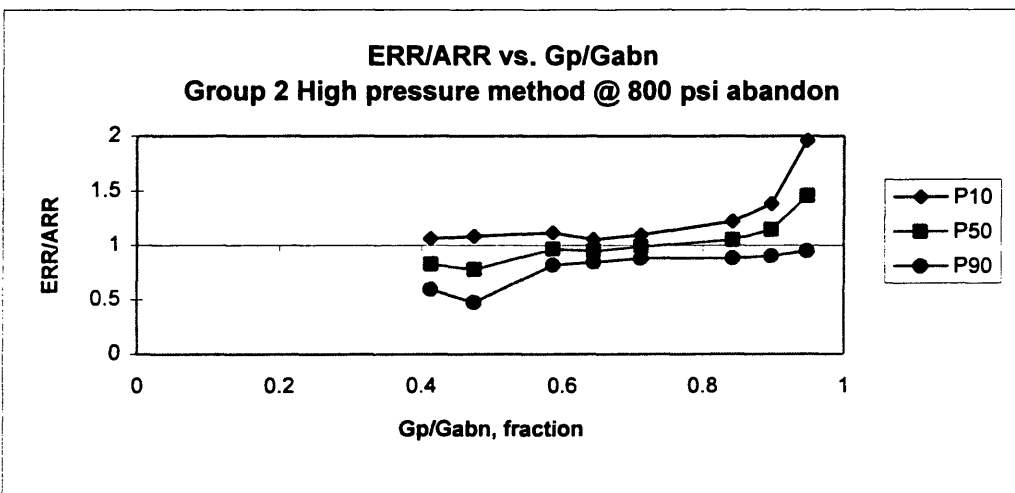
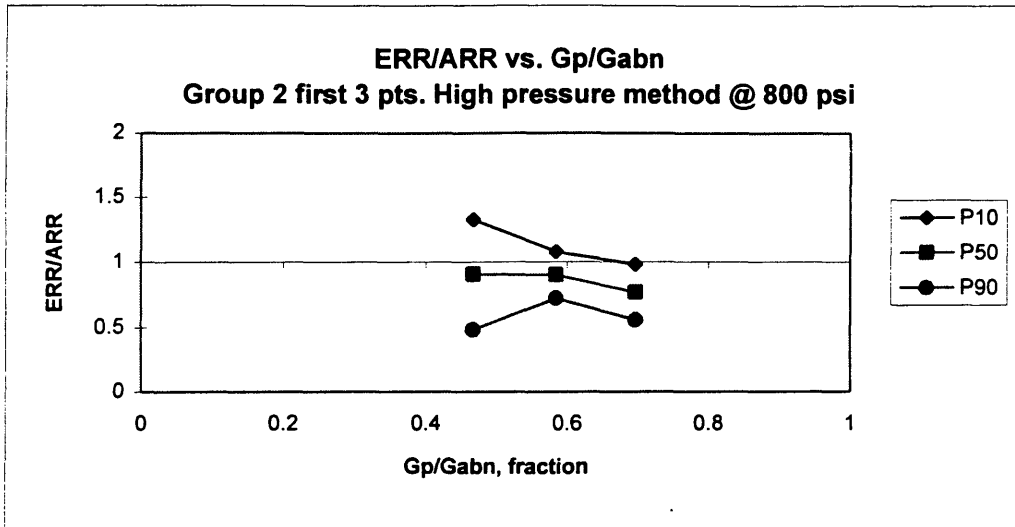


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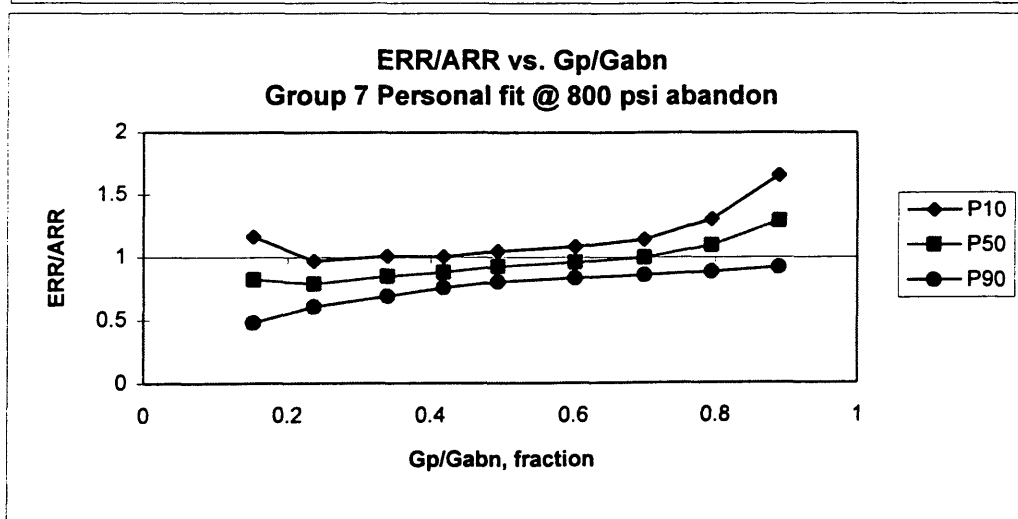
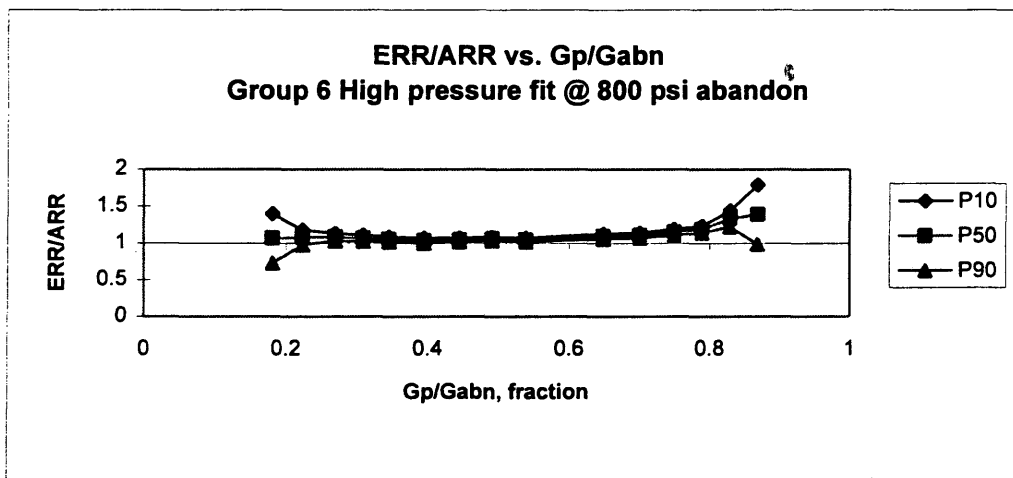
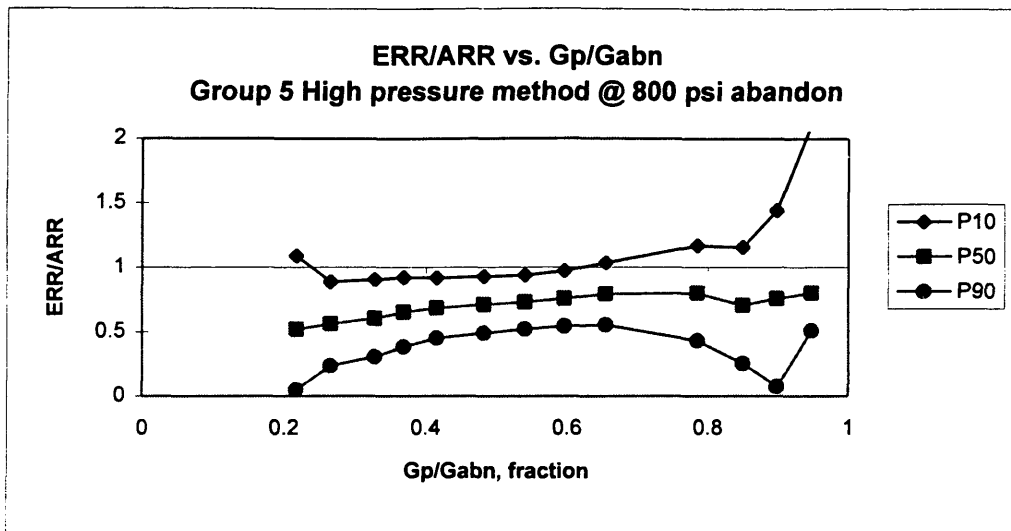


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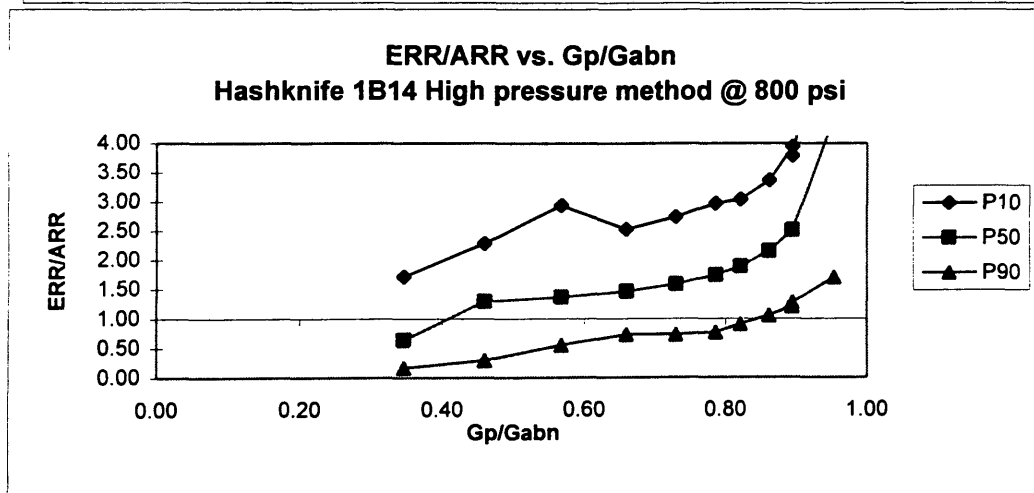
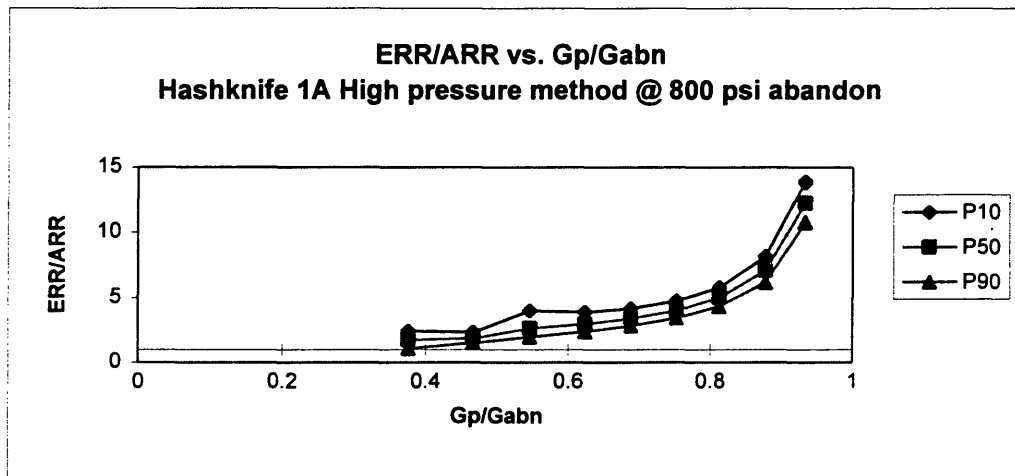
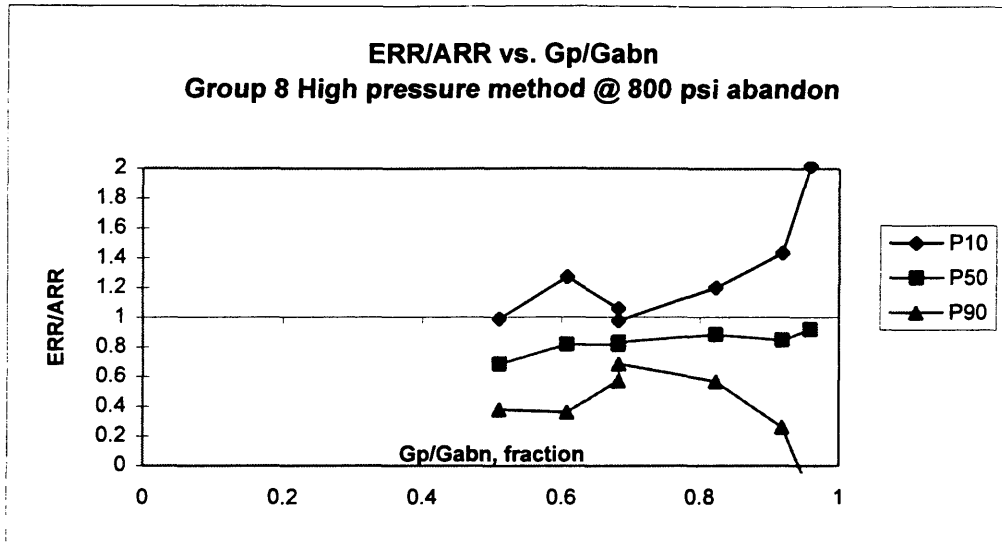


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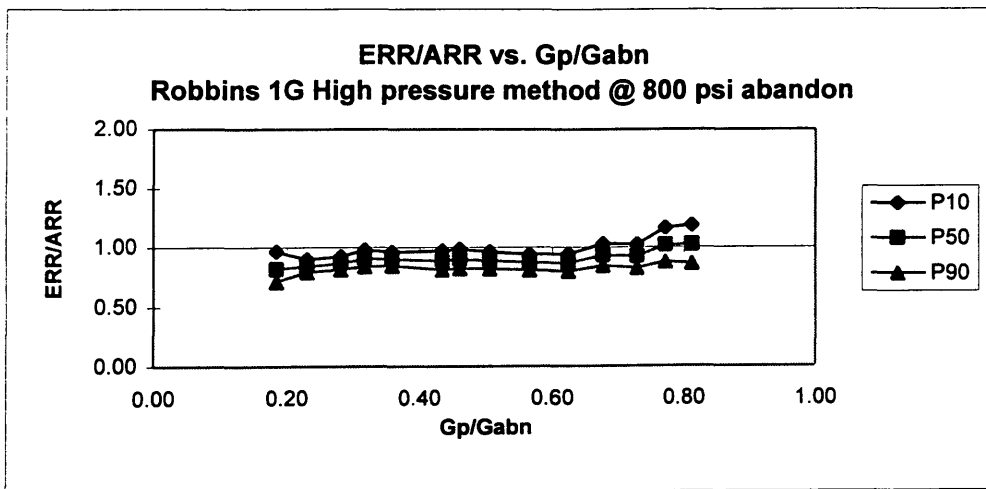
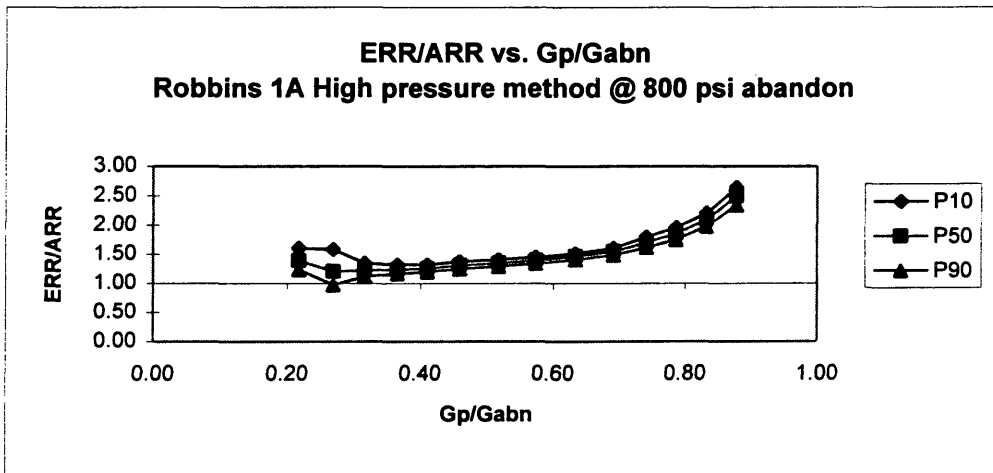
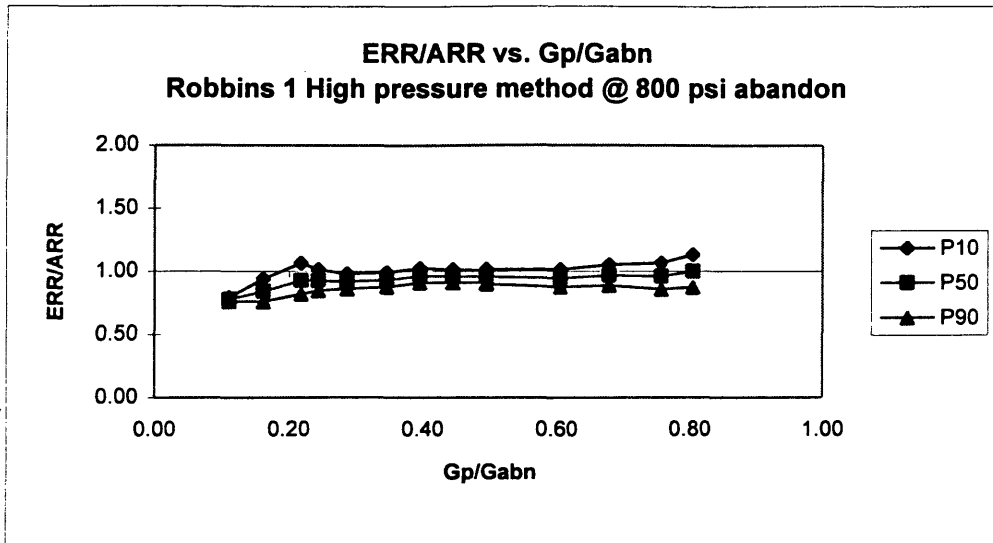


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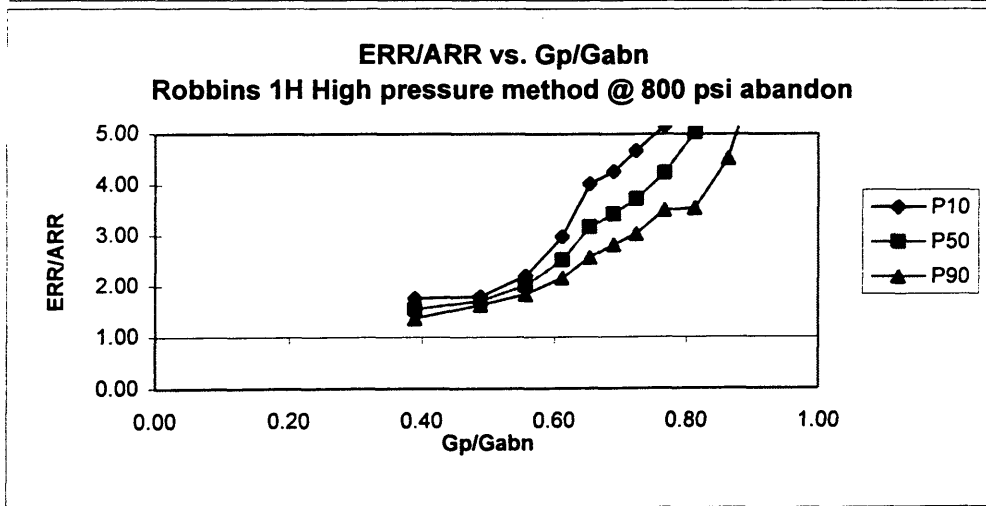
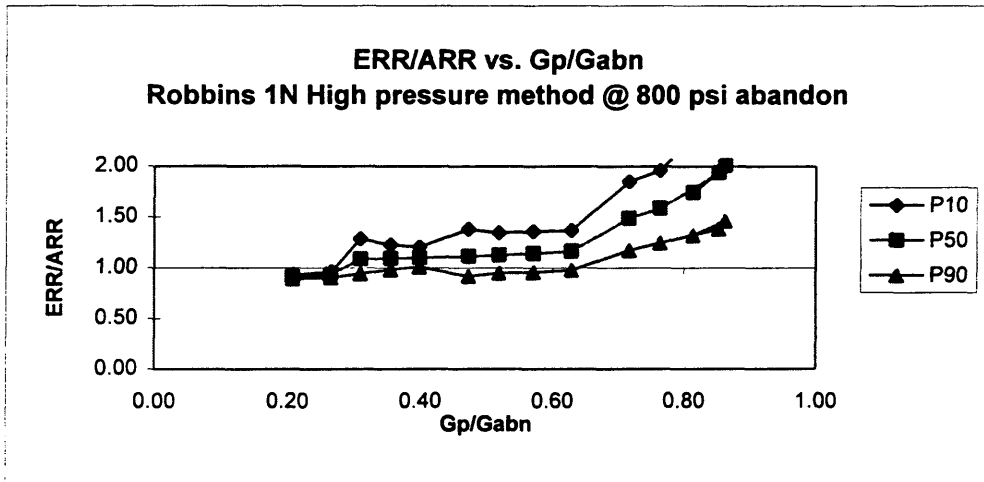
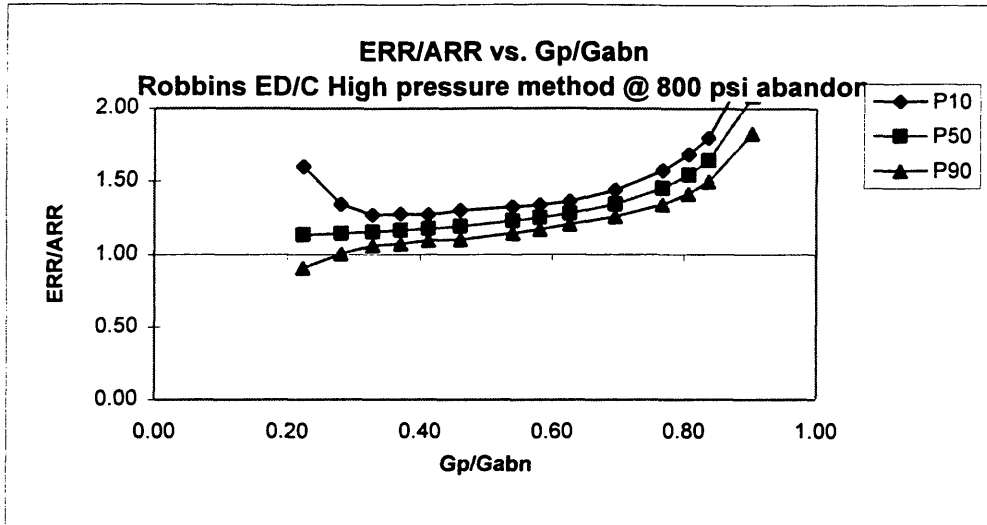


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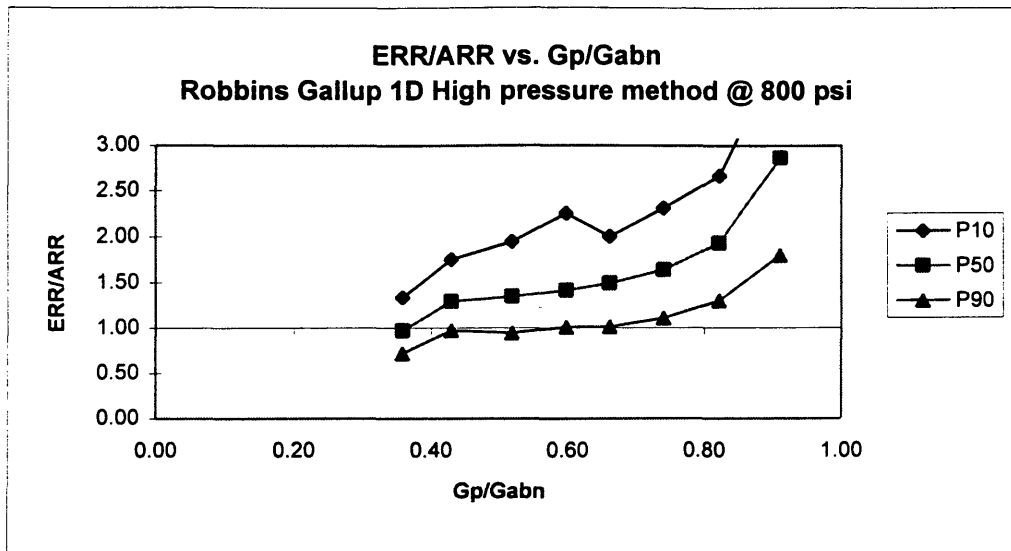


Table B-2.3 Accuracy Ratio plots for groups and wells in Glick Field from the Least Square method @ 500 psi abandonment

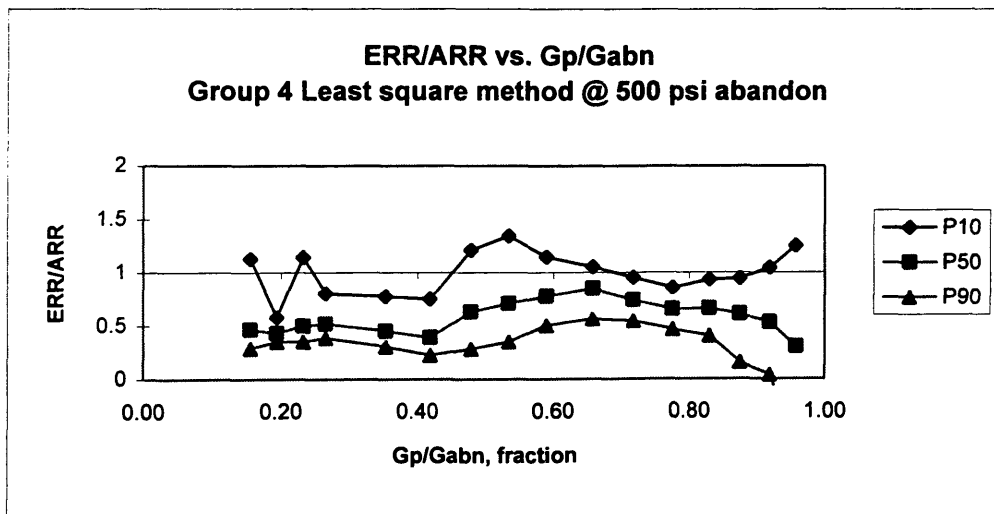
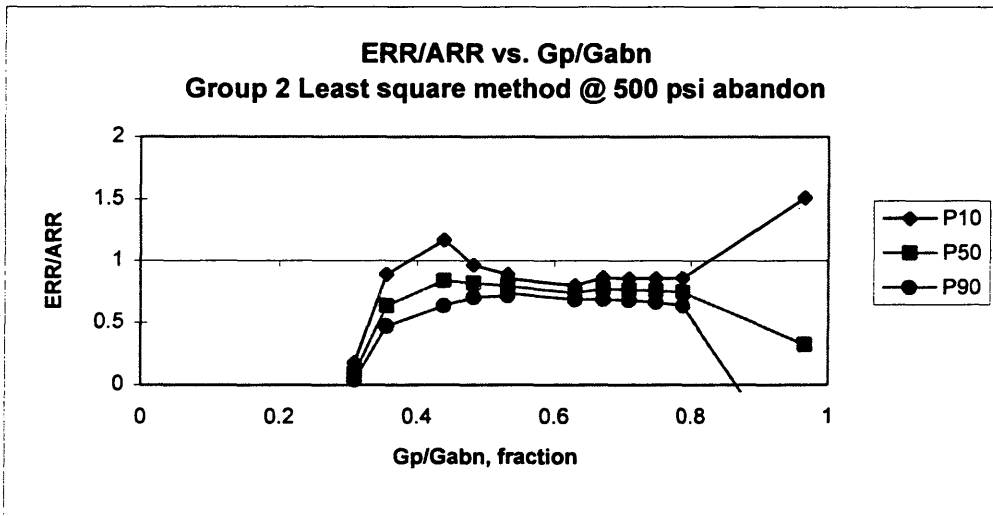
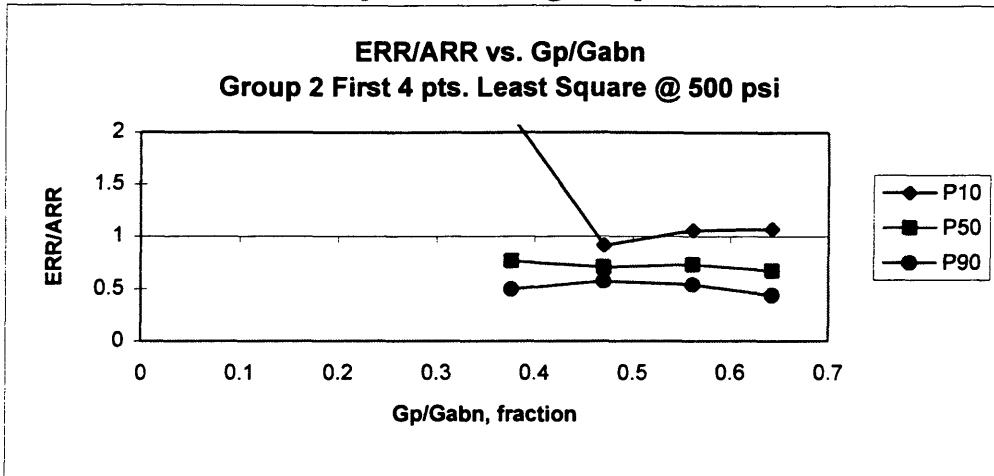


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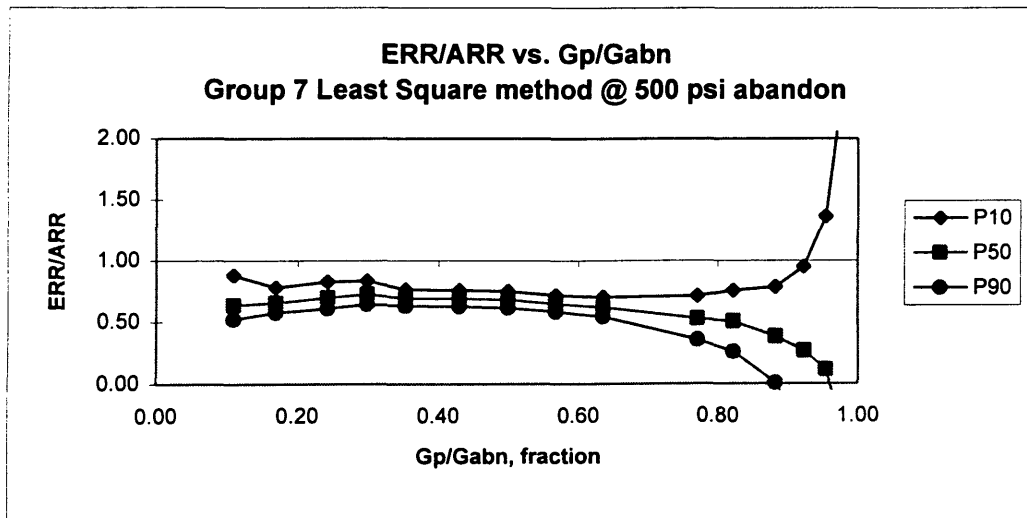
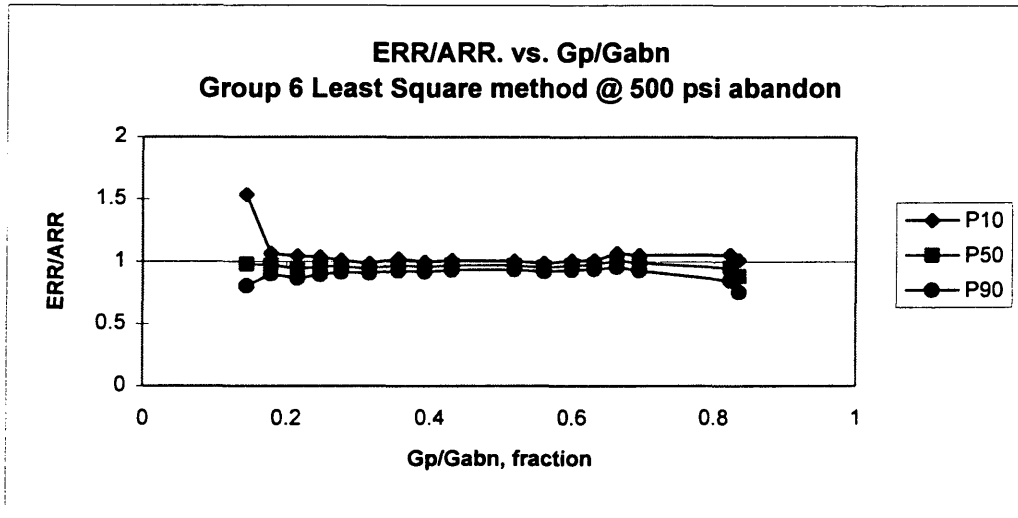
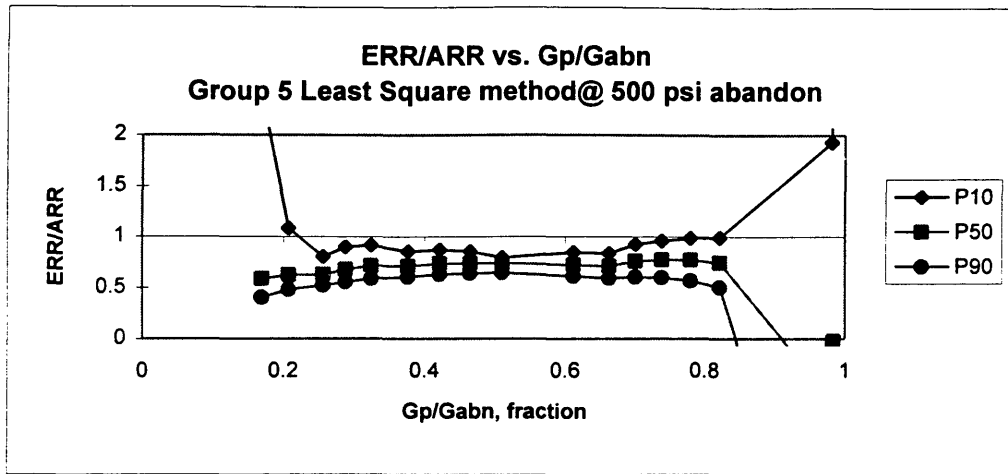


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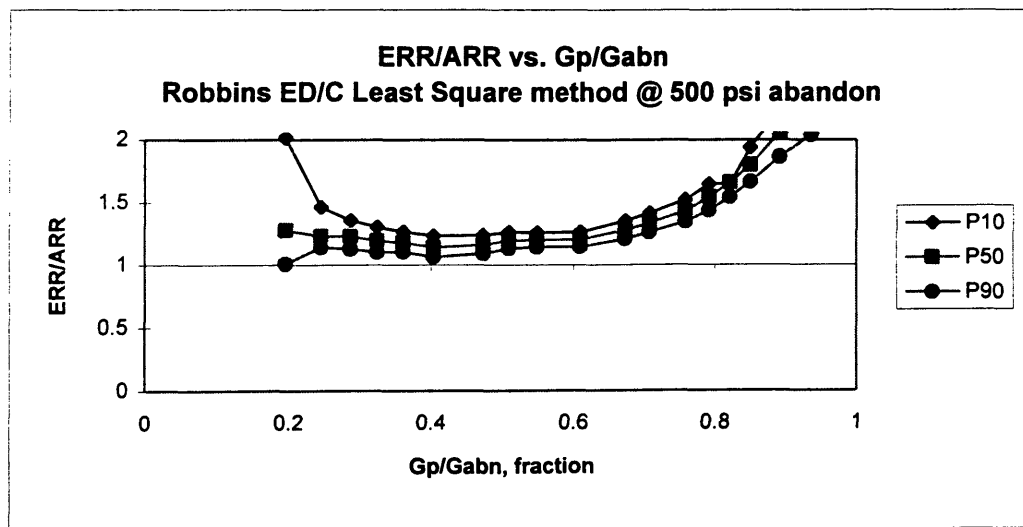
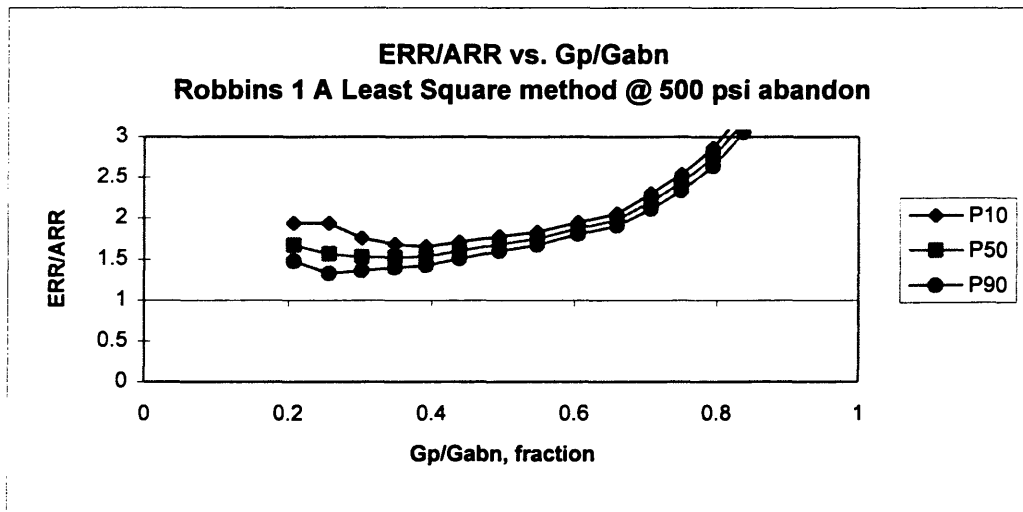
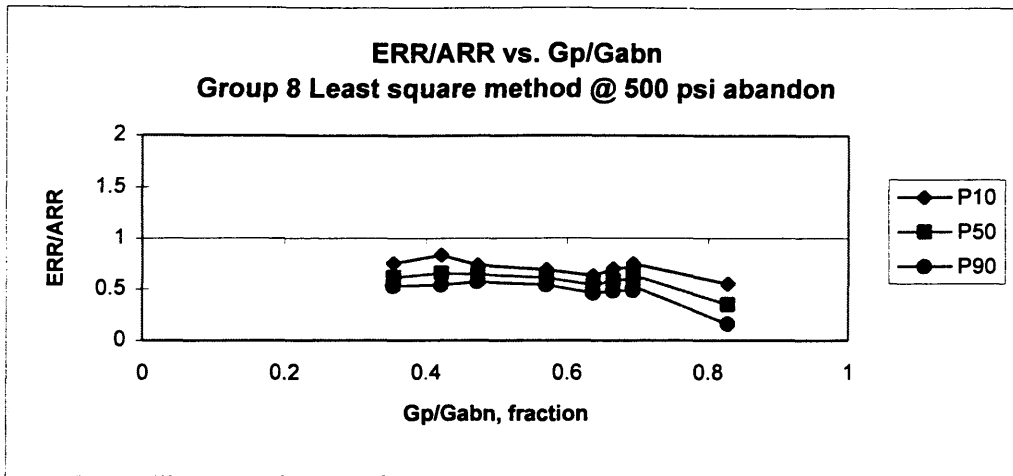


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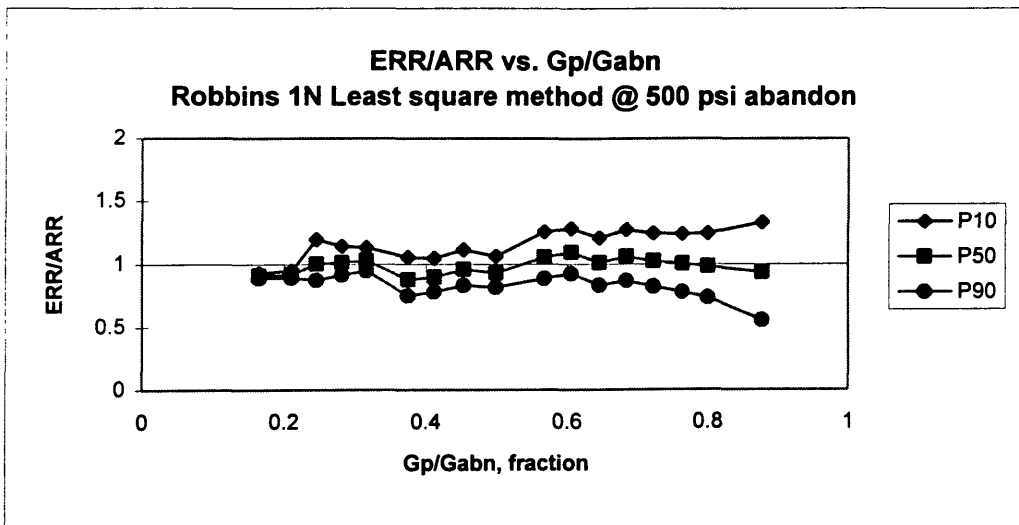
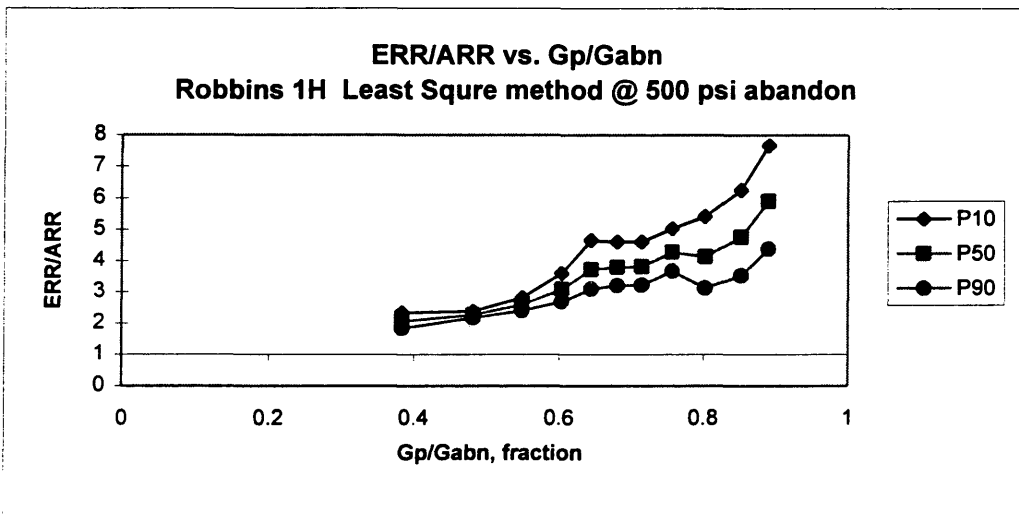
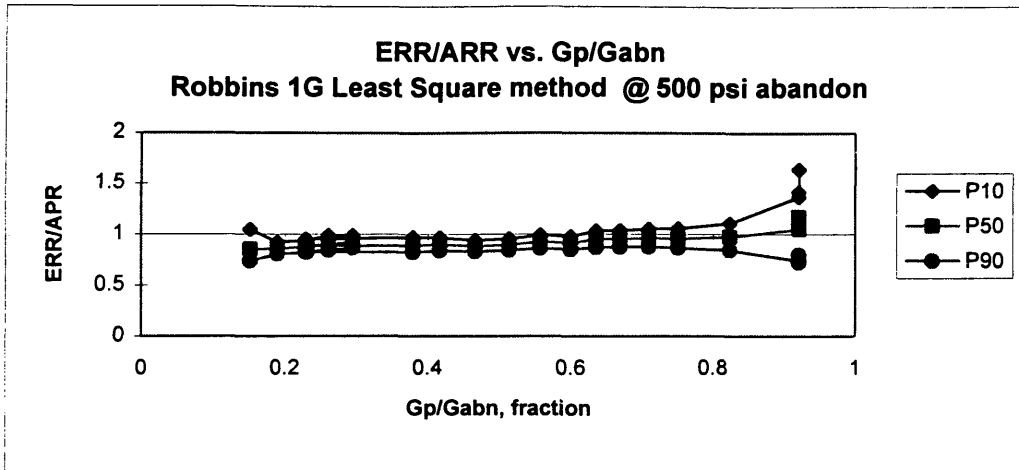


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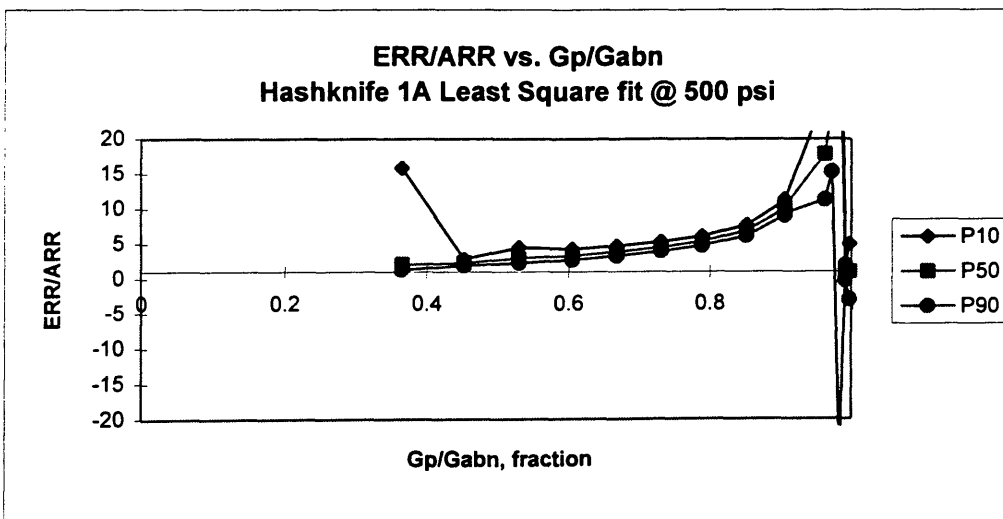
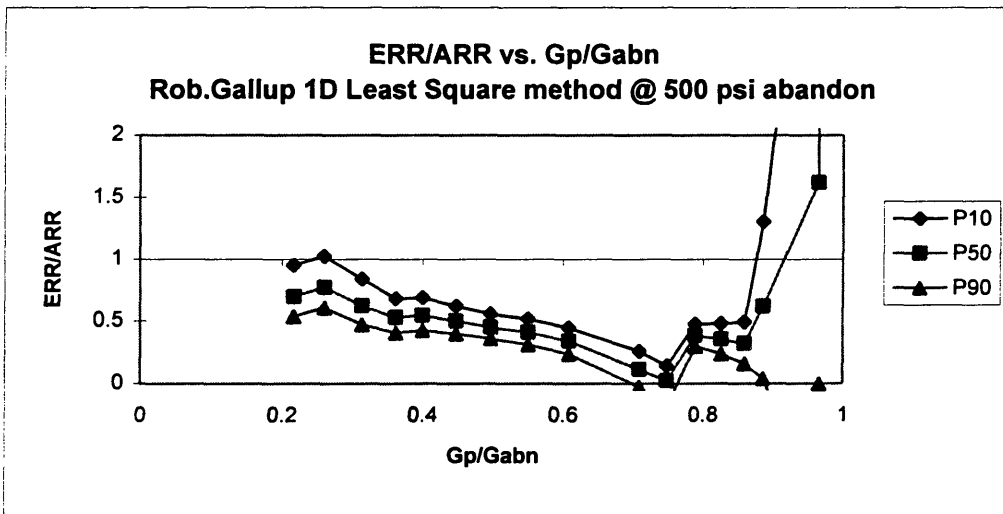
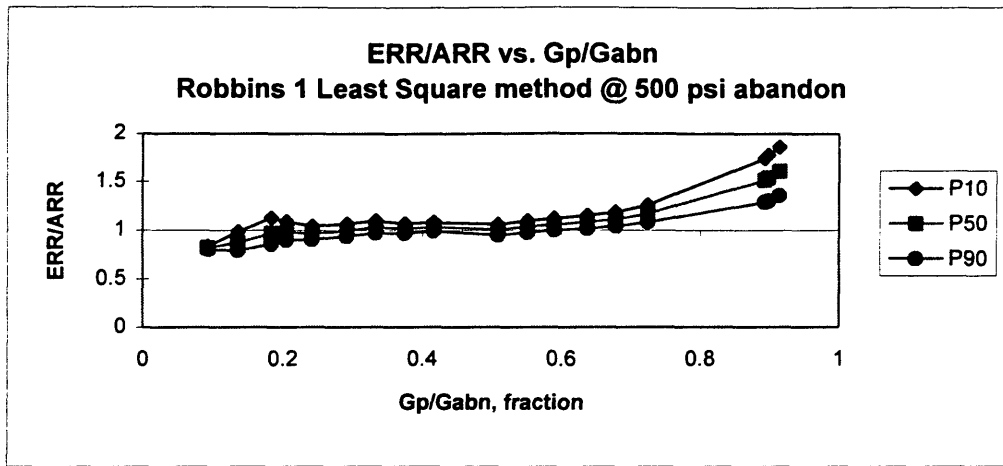


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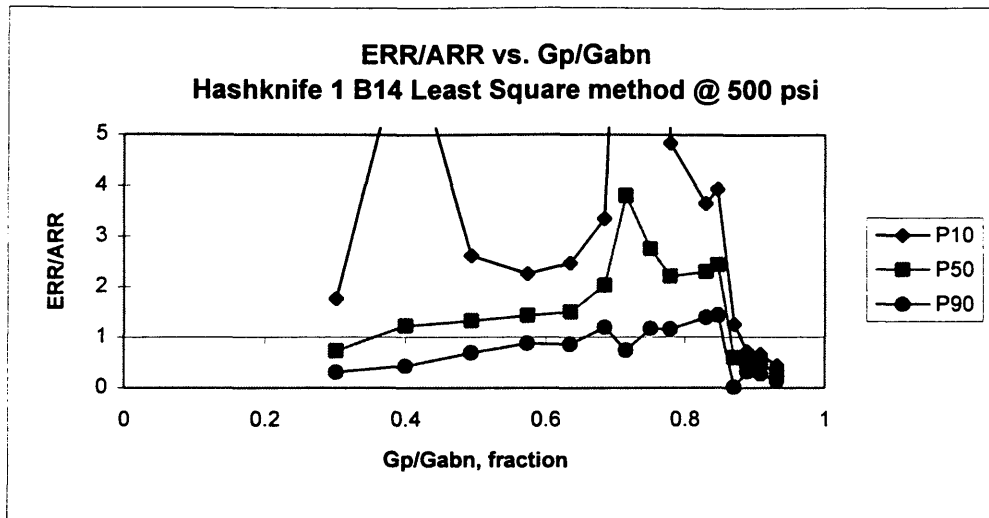


Table B-2.4 Accuracy Ratio plots for groups and wells in Glick Field from the High pressure method @ 500 psi abandonment

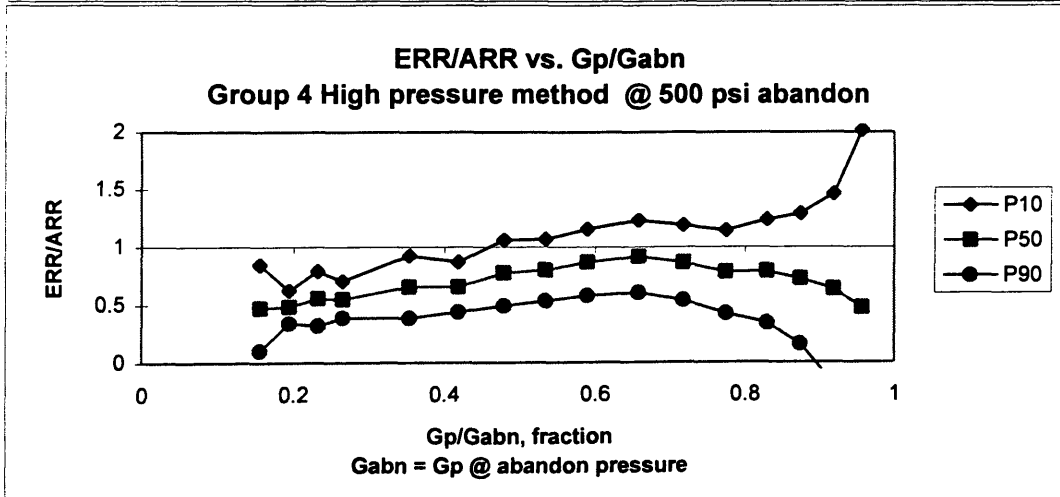
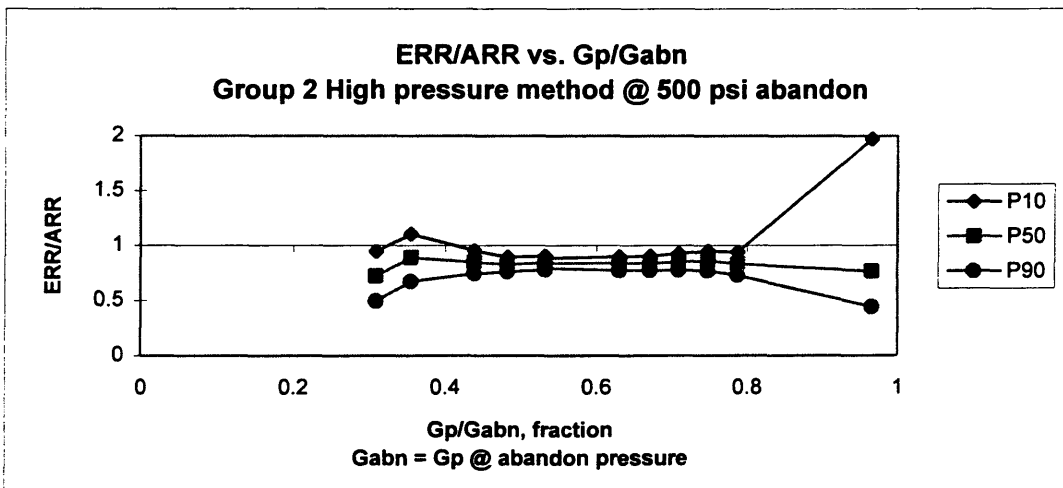
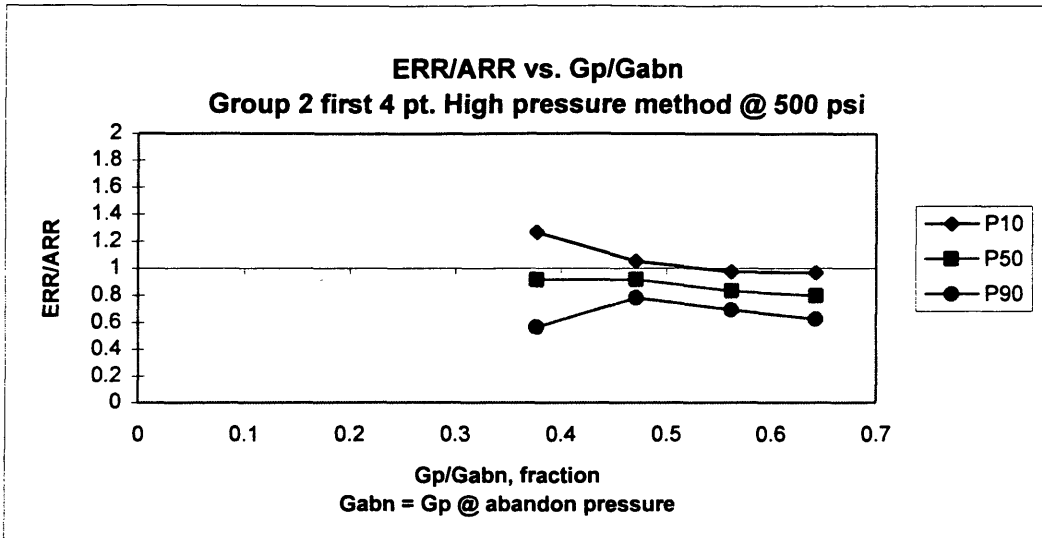


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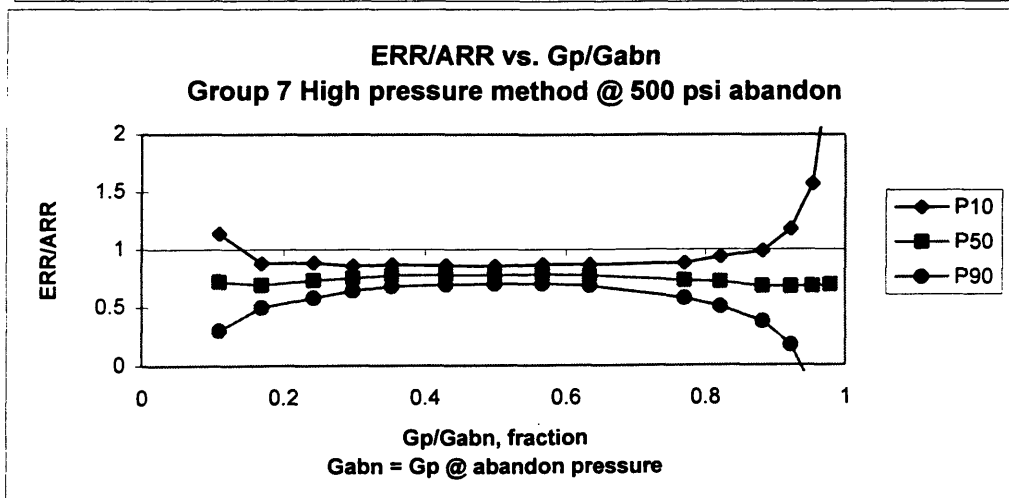
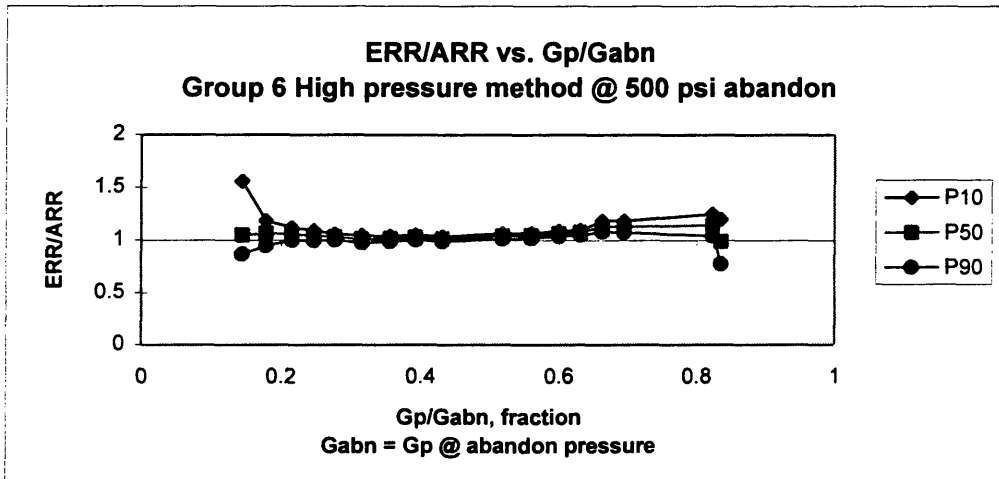
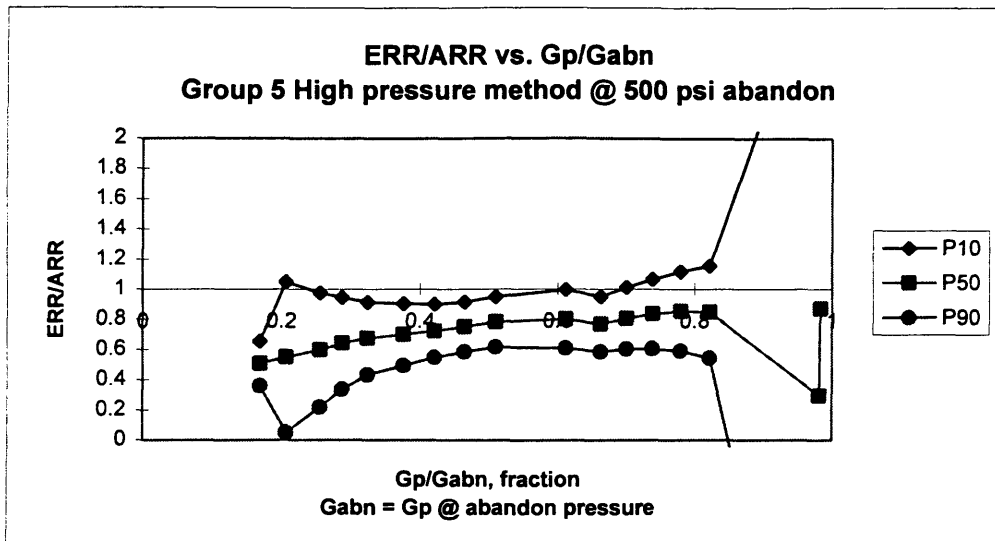


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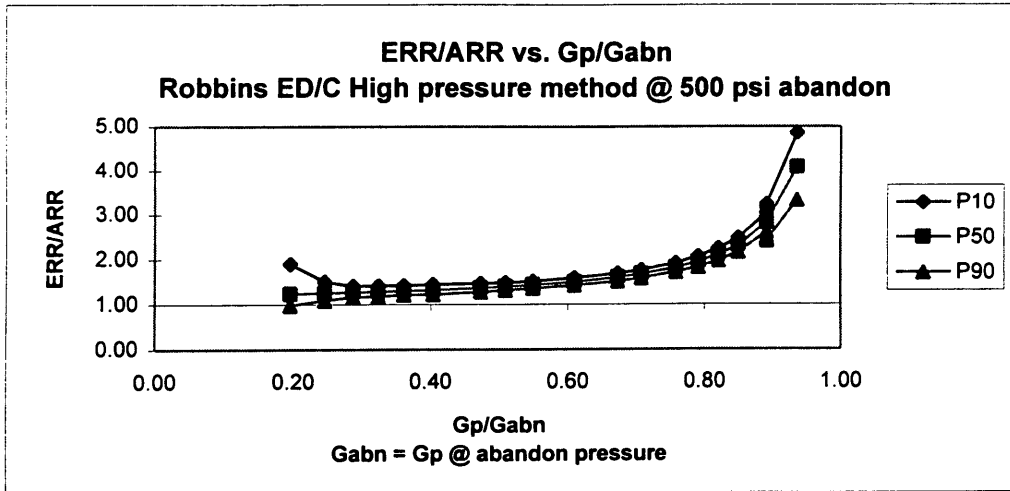
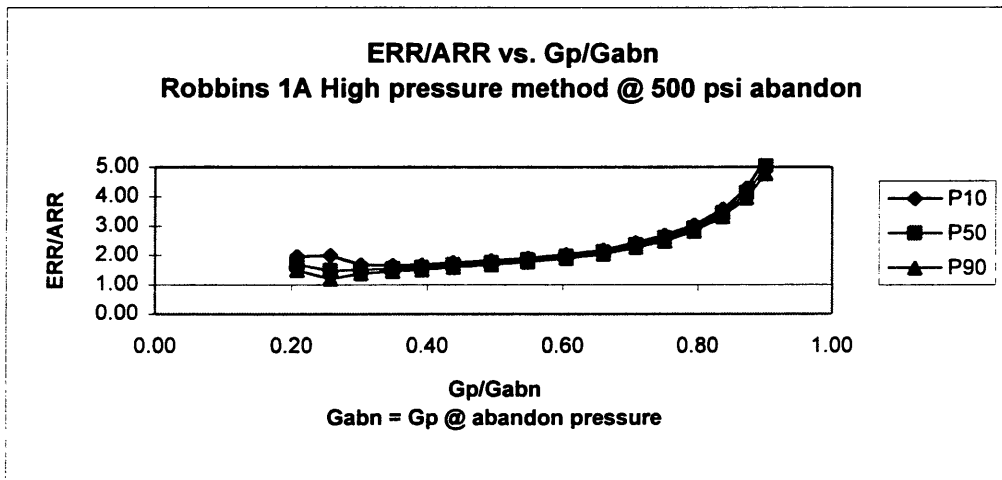
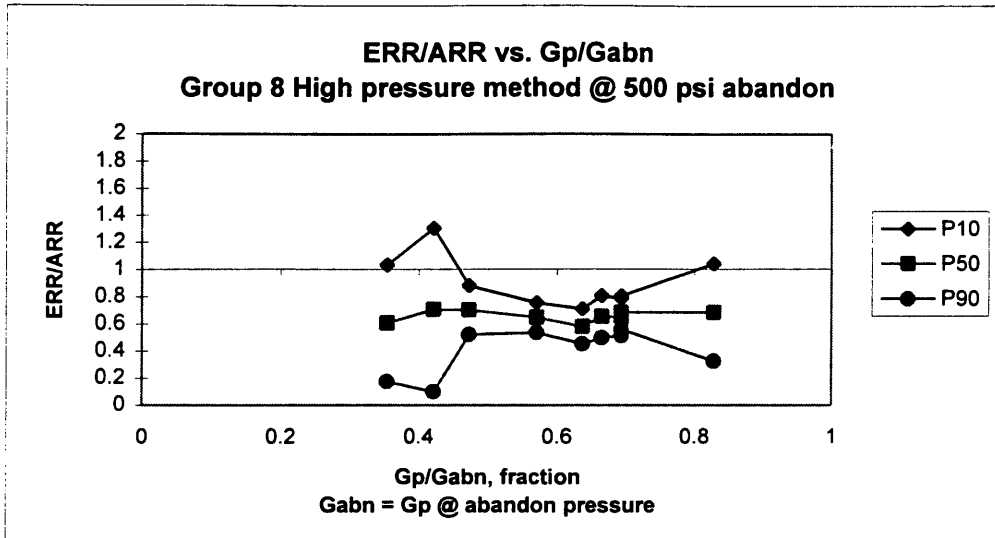


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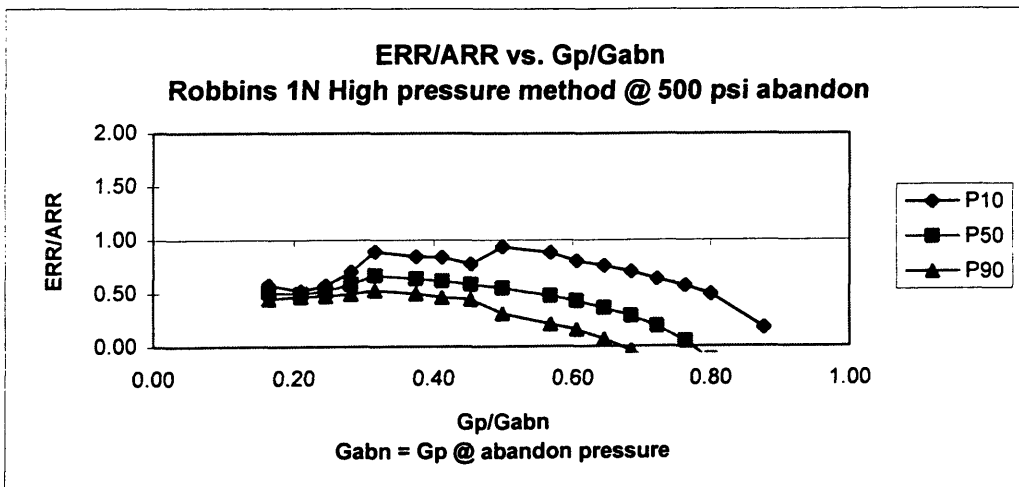
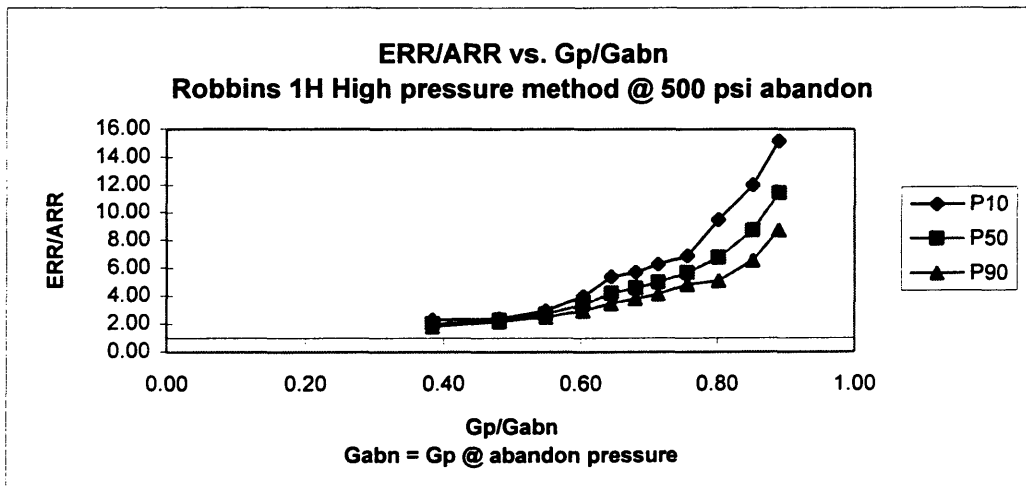
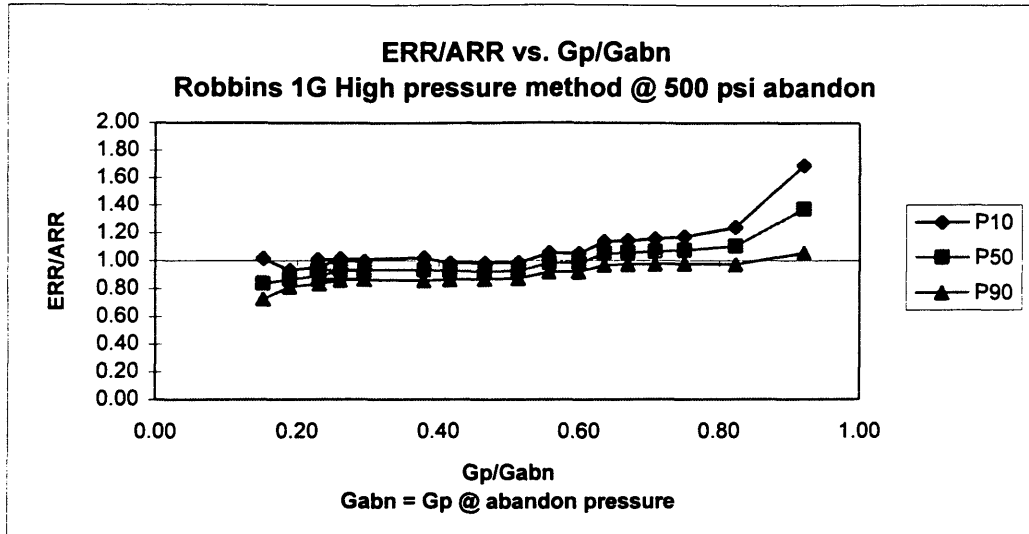


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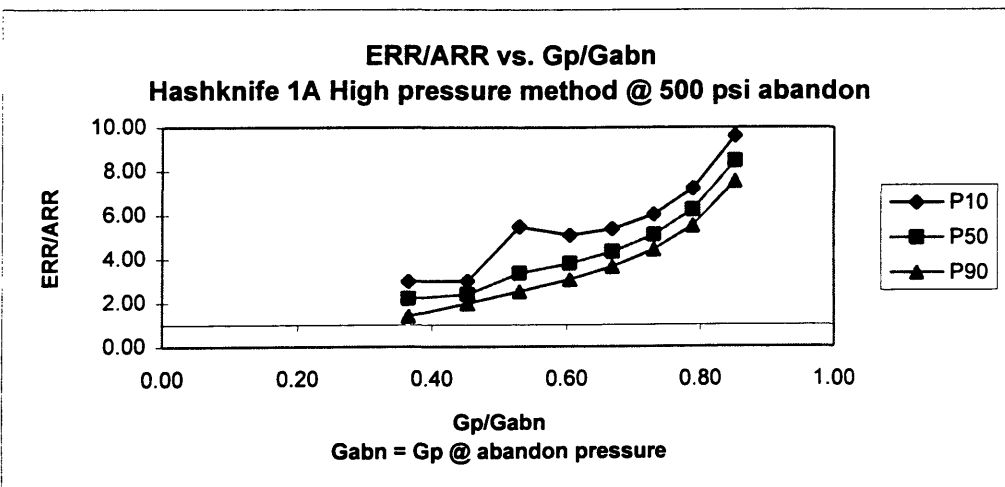
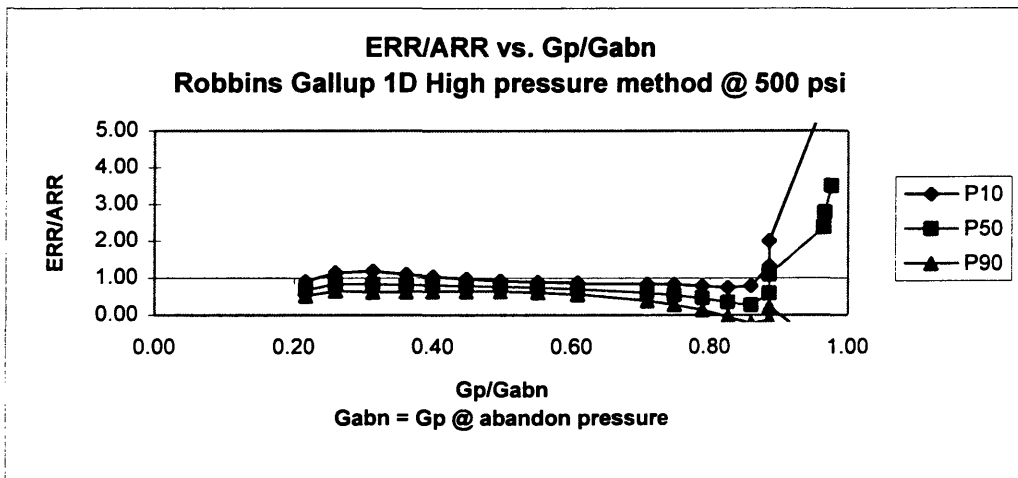
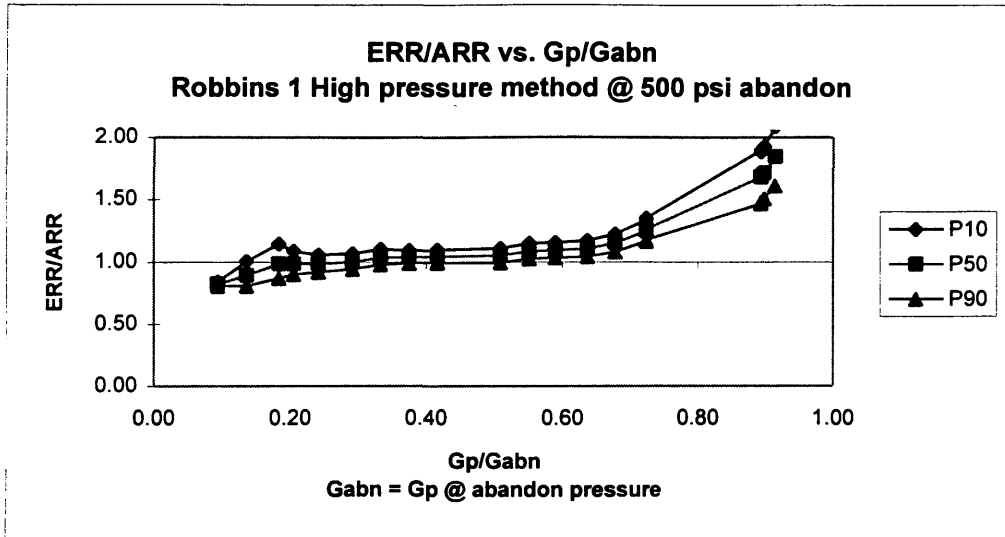


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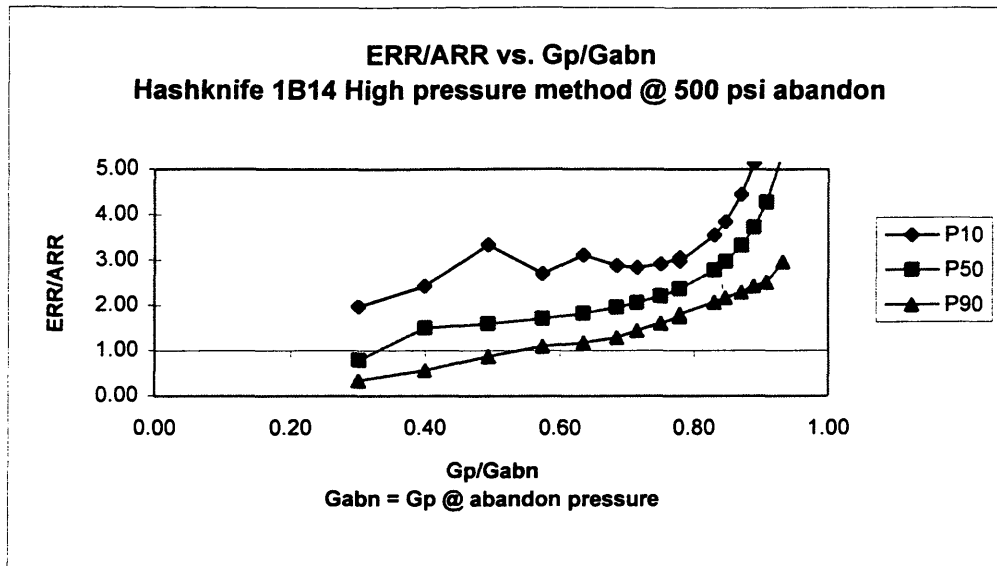


Figure B-2.5 The field total without group 8 accuracy ratio plots from the Least Square method at 800 psi abandonment

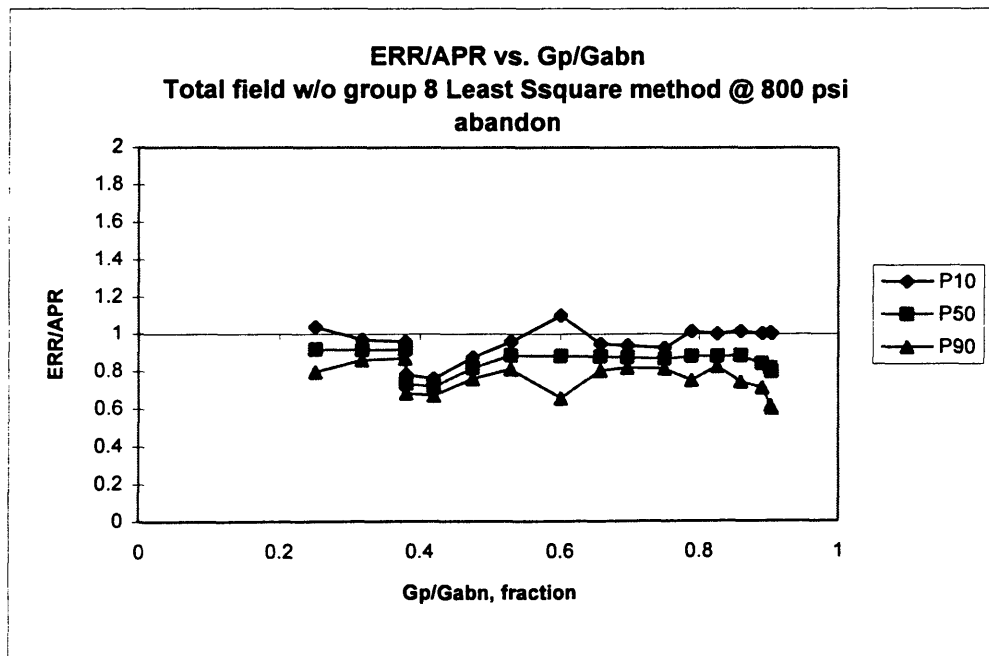
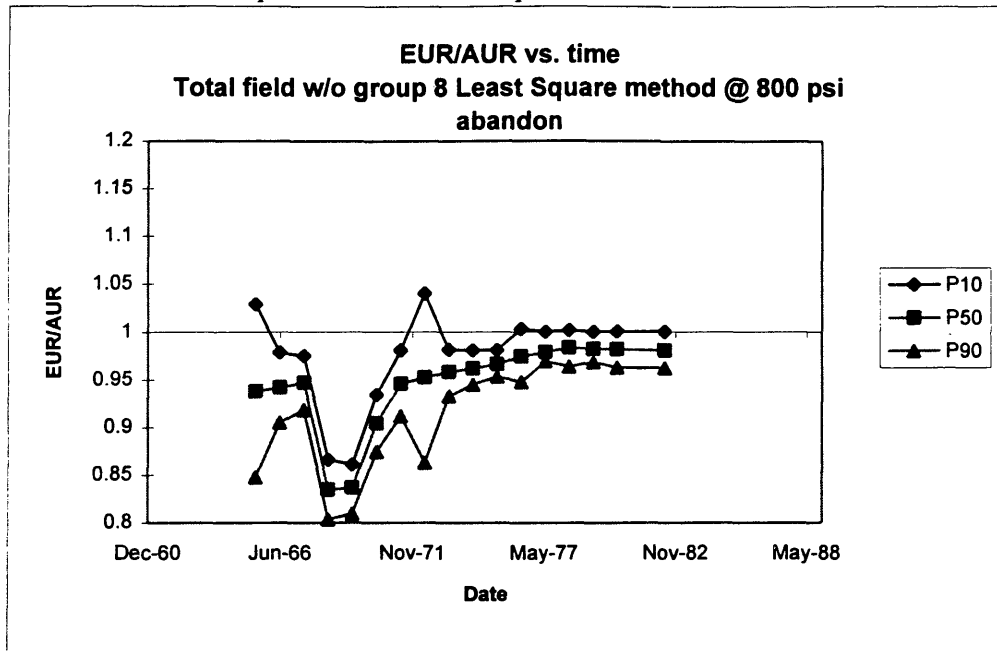




Figure B-2.7 The field total with group 8 accuracy ratio plots from the High pressure method at 800 psi abandonment

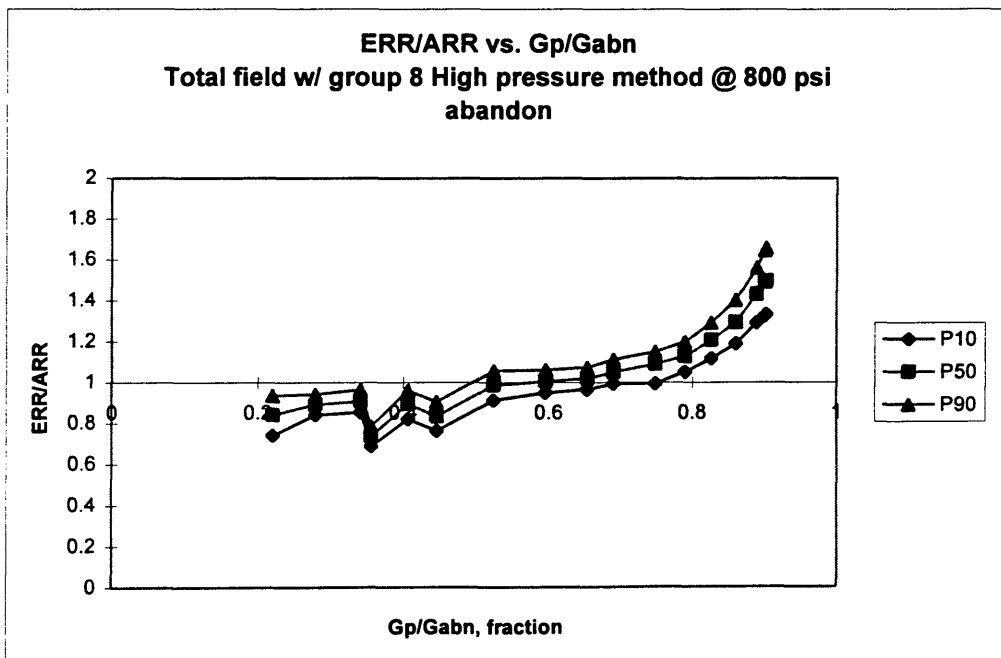
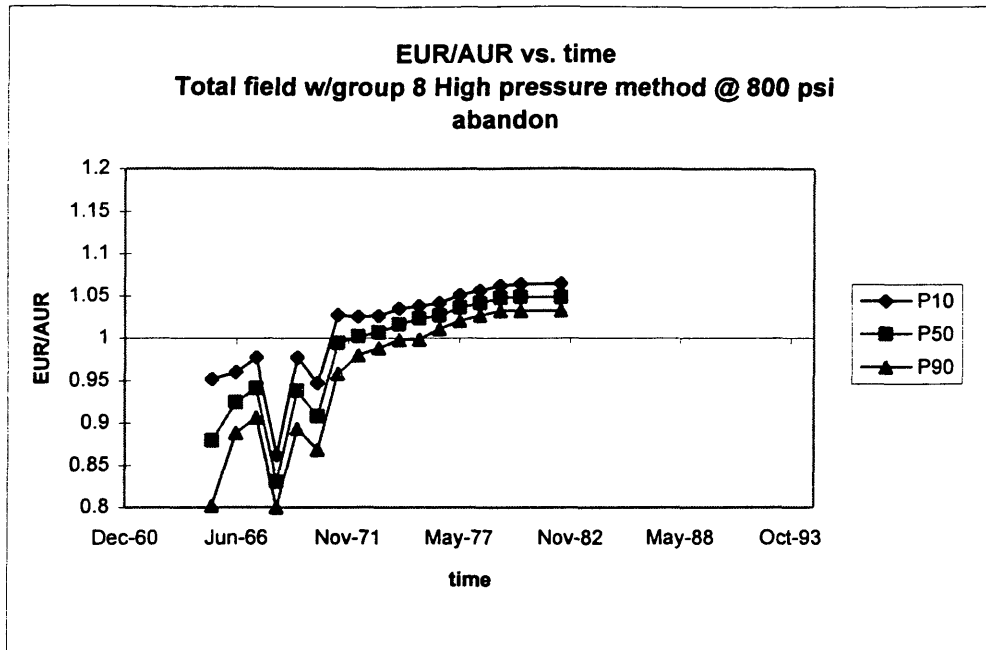


Figure B-2.8 The field total without group 8 accuracy ratio plots from the High pressure method at 800 psi abandonment

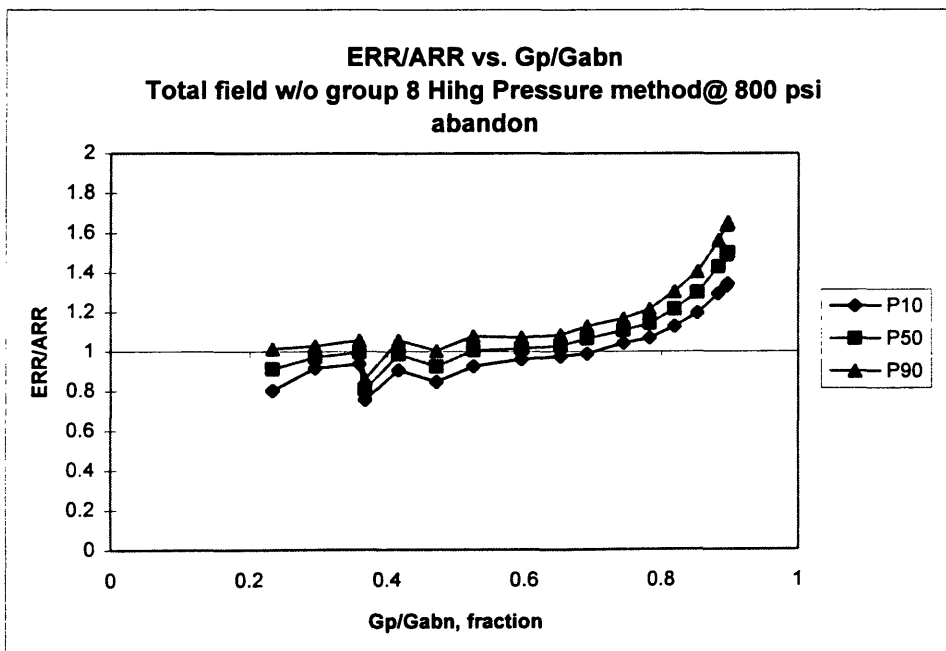
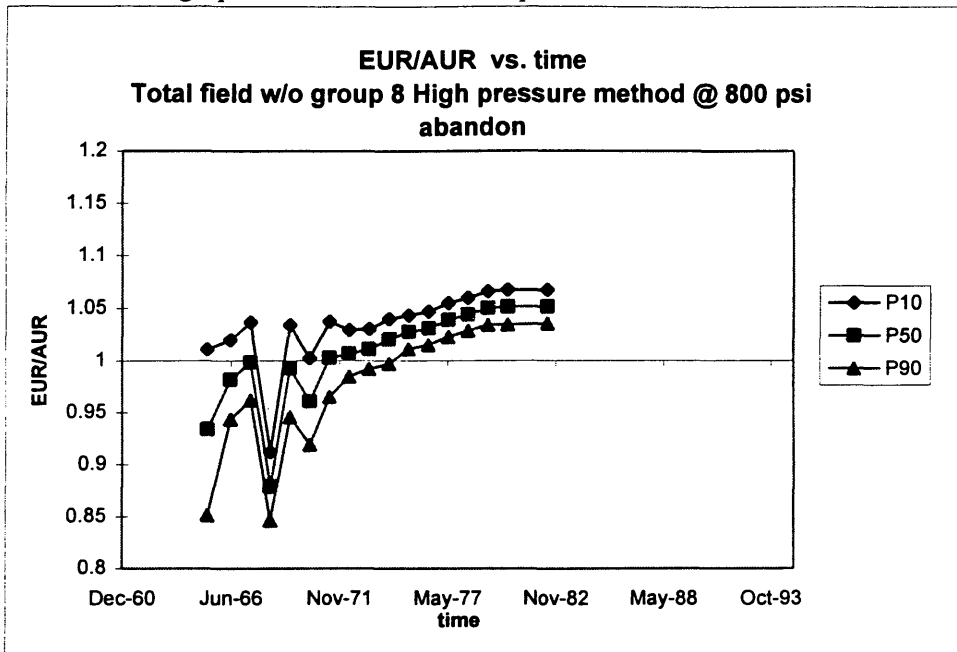


Figure B-2.9 The field total with group 8 accuracy ratio plots from the Least Square method at 500 psi abandonment

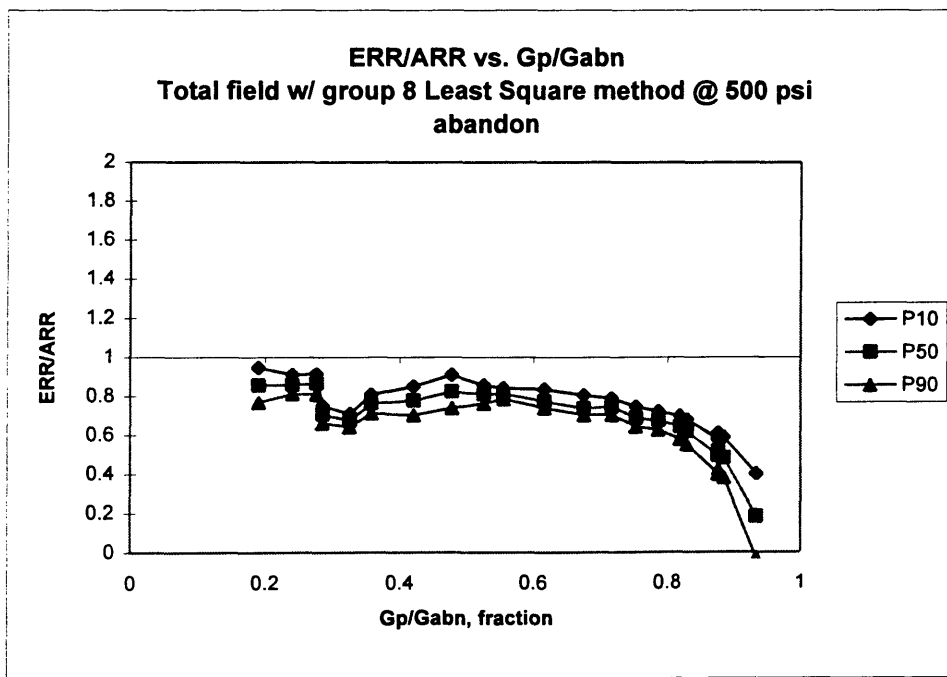
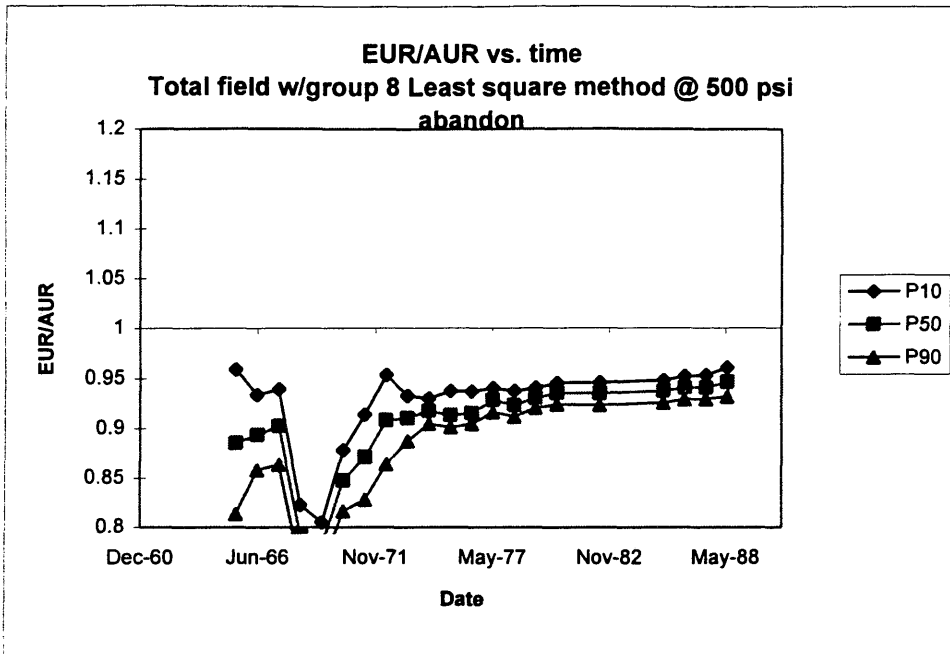


Figure B-2.10 The field total without group 8 accuracy ratio plots from the Least Square method at 500 psi abandonment

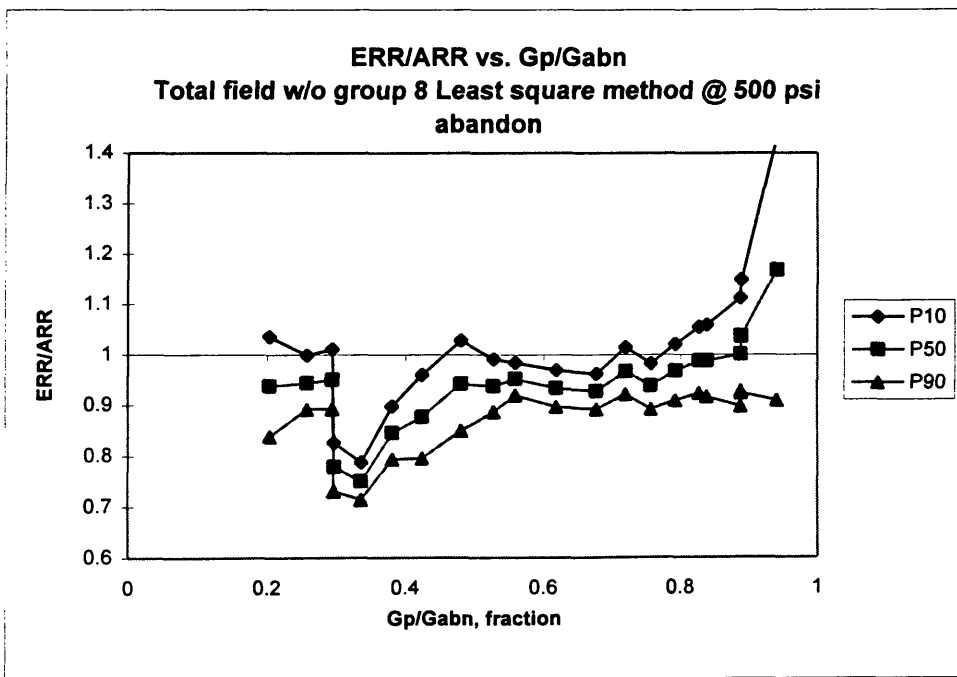
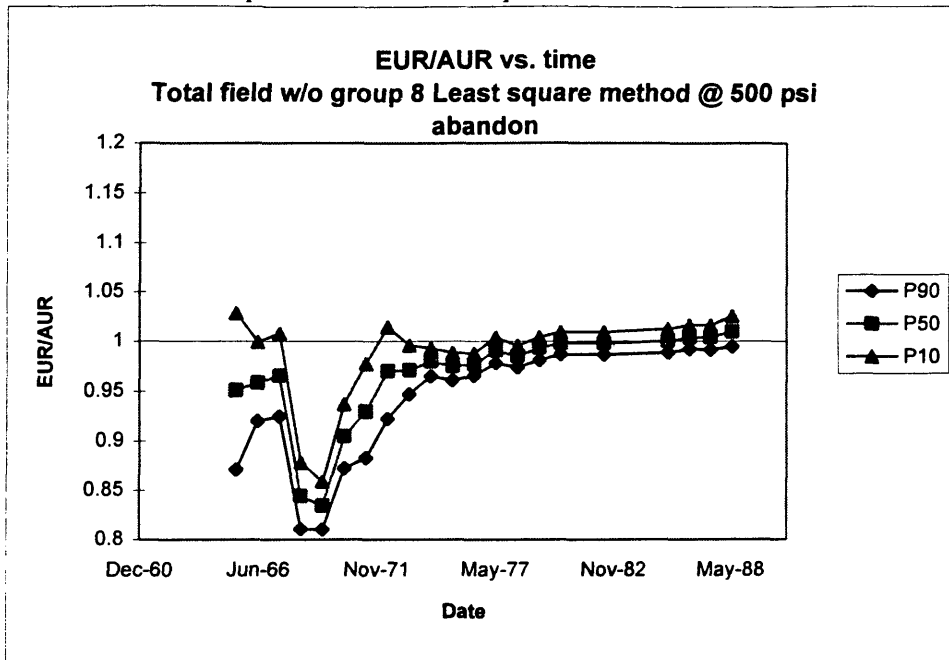


Figure B-2.11 The field total with group 8 accuracy ratio plots from the High pressure method at 500 psi abandonment

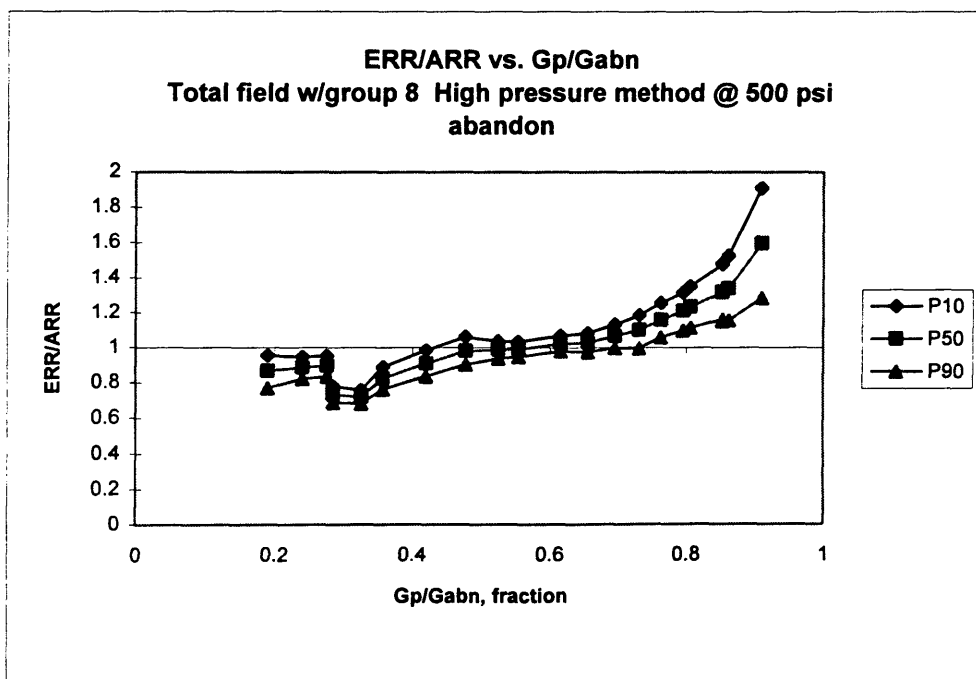
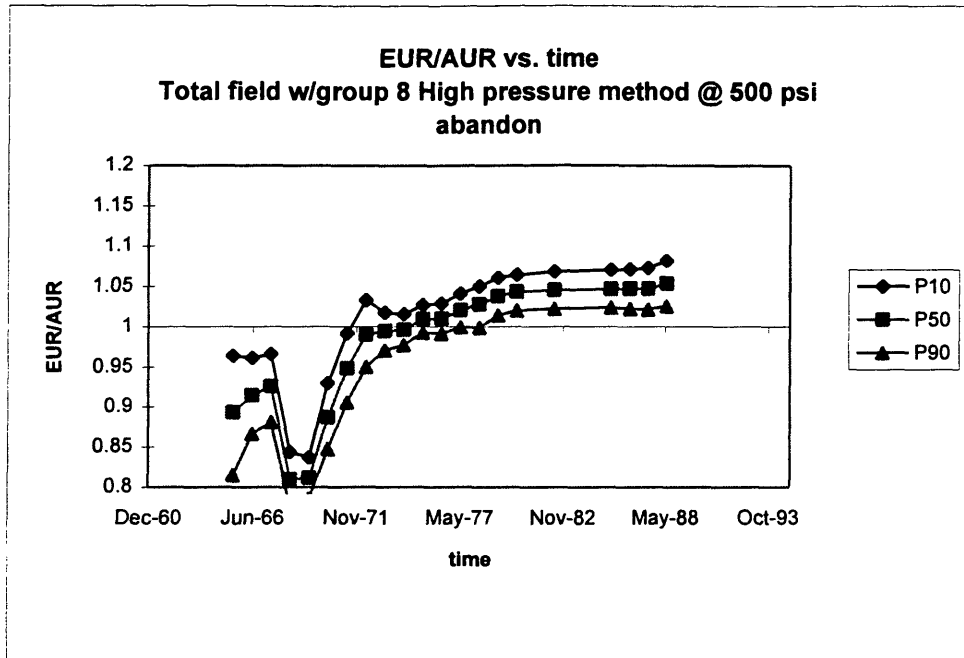
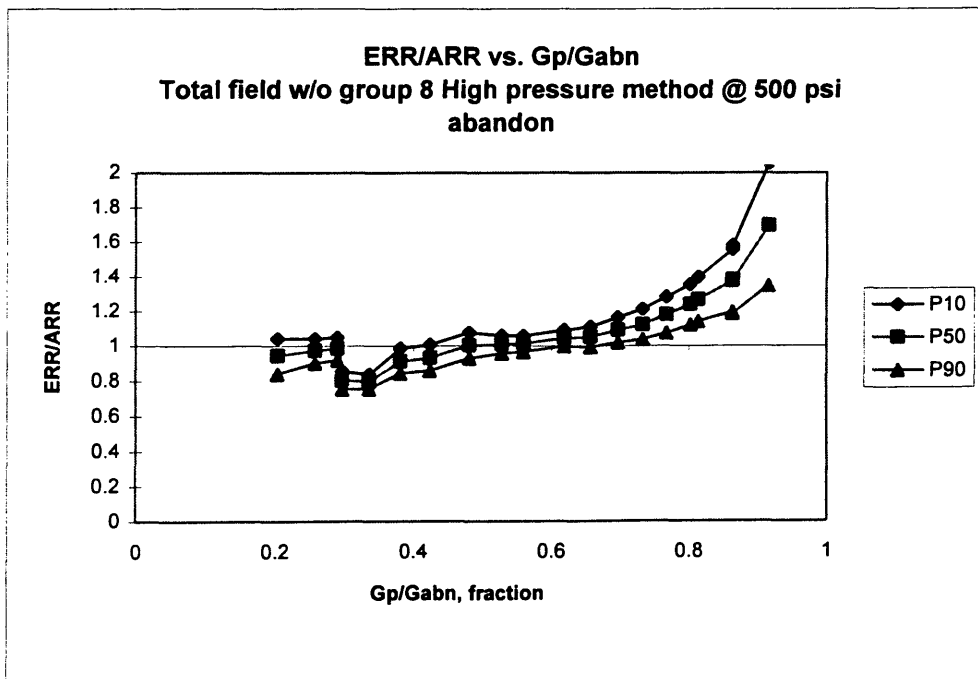
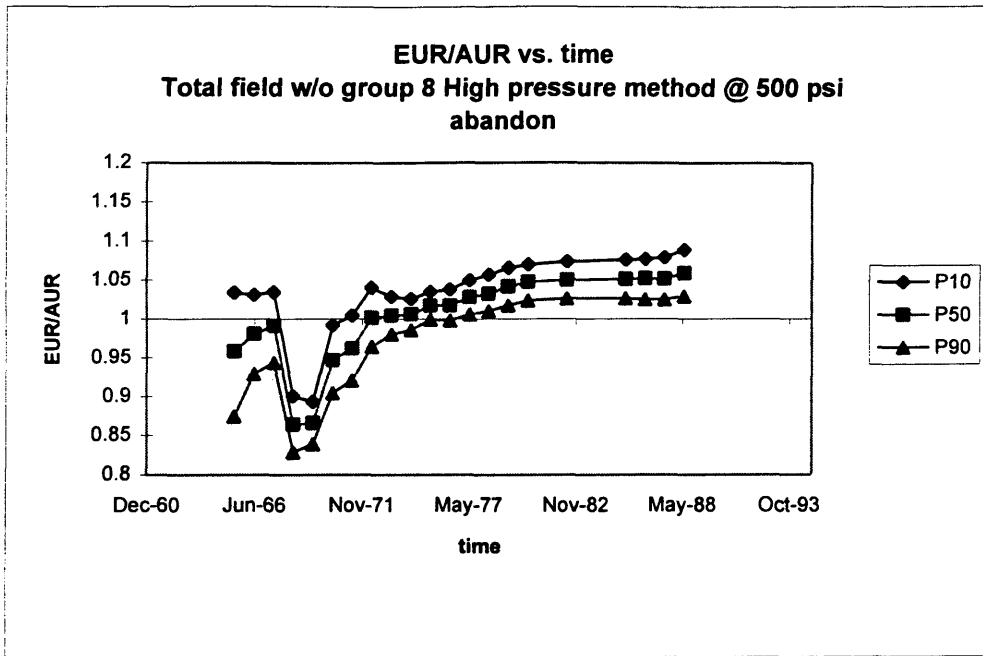


Figure B-2.12 The field total without group 8 accuracy ratio plots from the High pressure method at 500 psi abandonment



### APPENDIX B-3

The following pages present the residual plots for wells in the Glick Field from the Least Square method.

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Table B-3. Residual Plots for Groups and wells from Glick Field

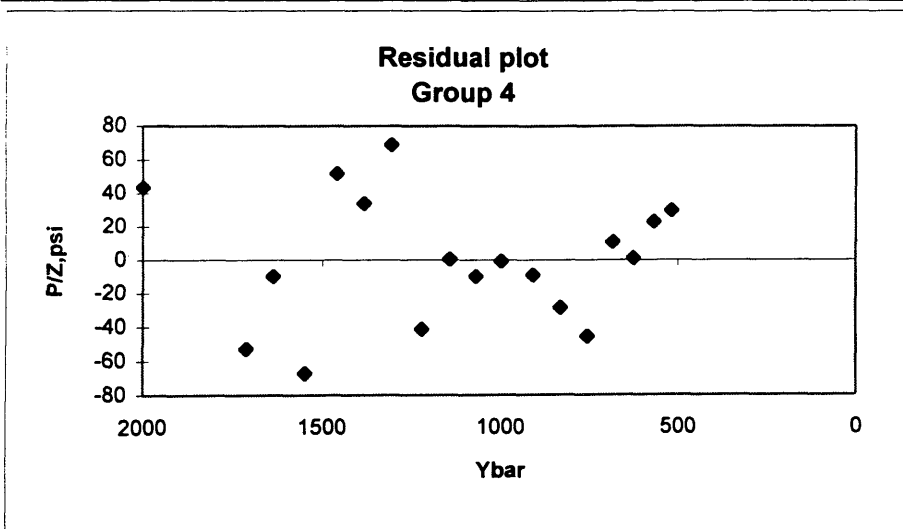
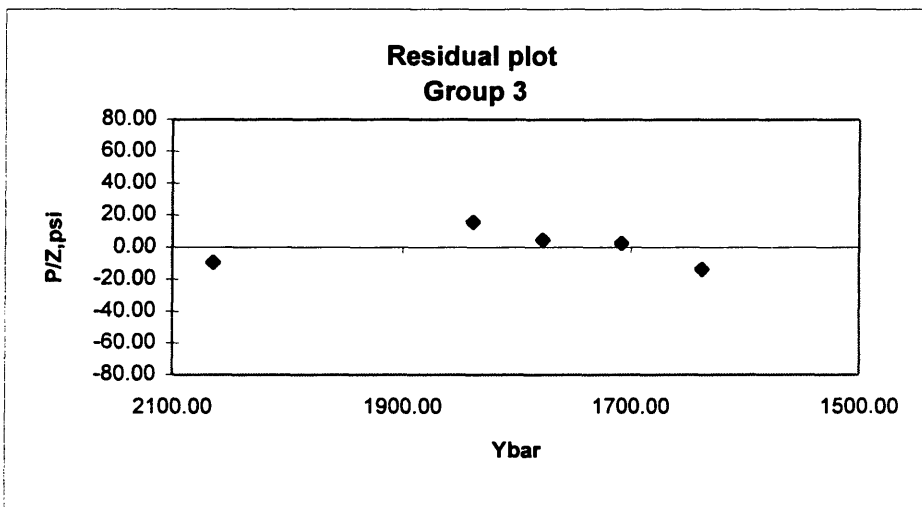
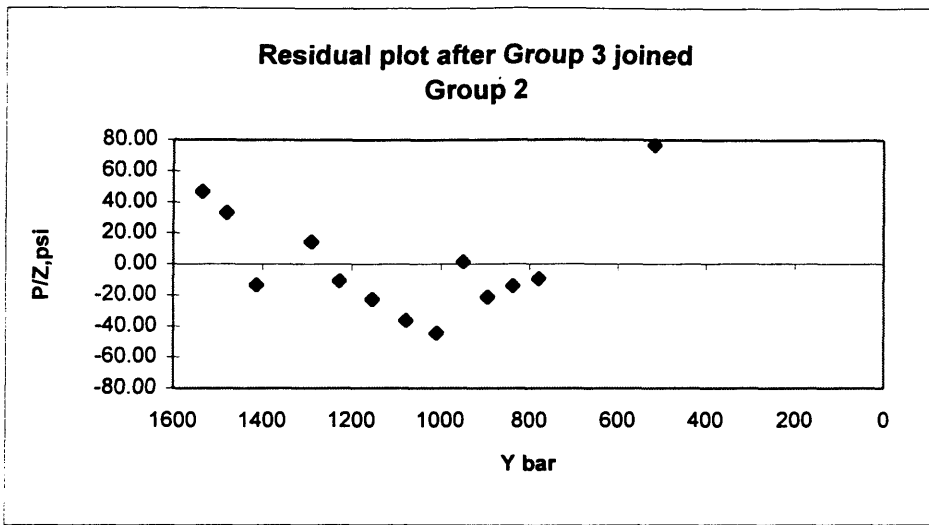


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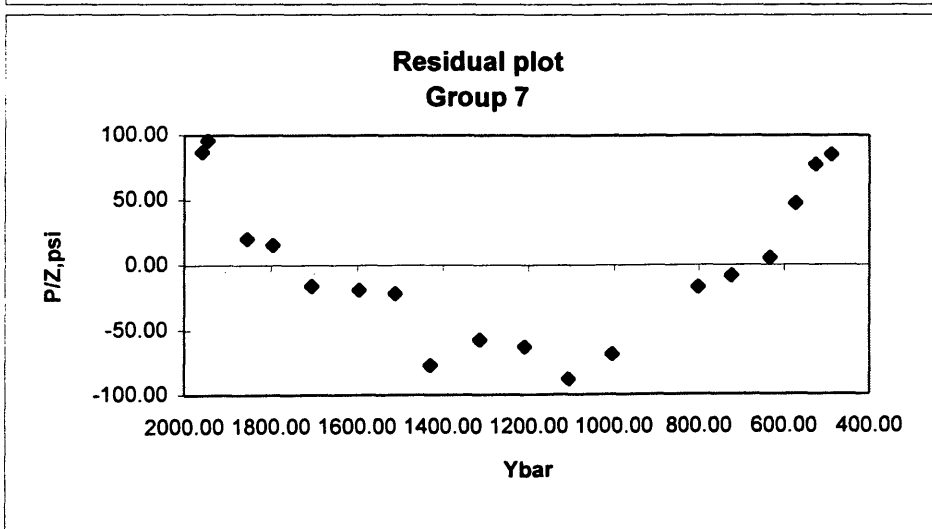
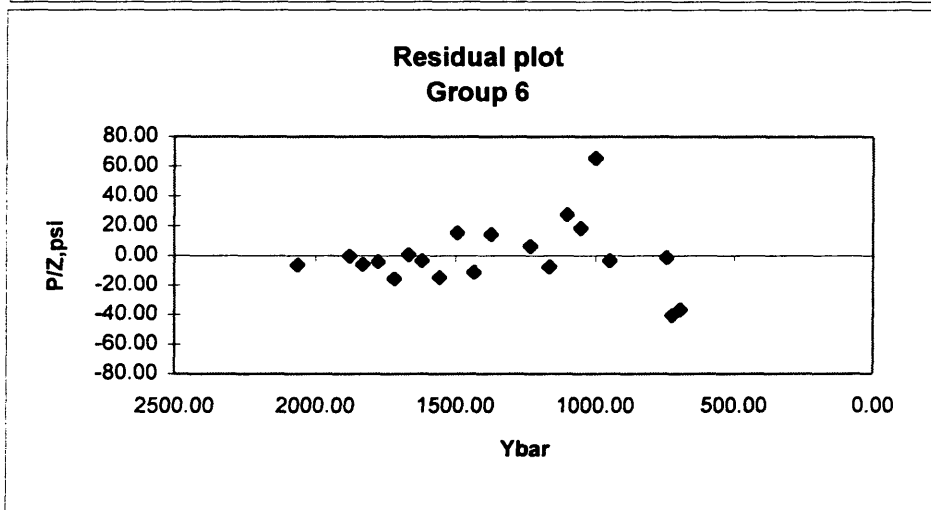
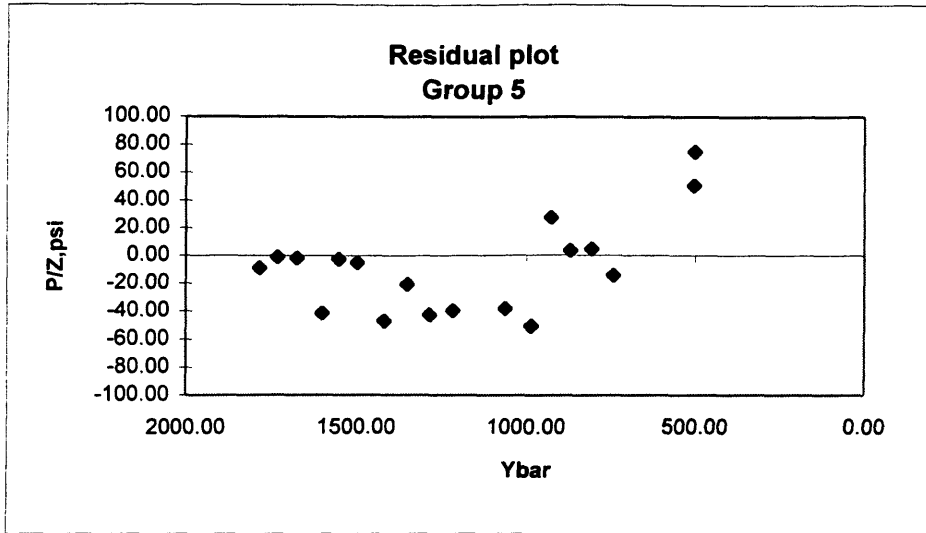


Table B-3. (Continued)

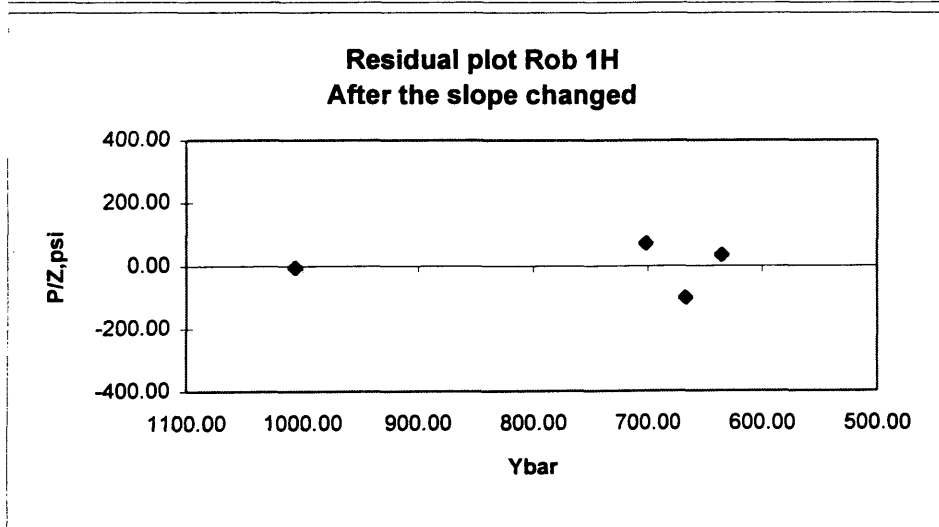
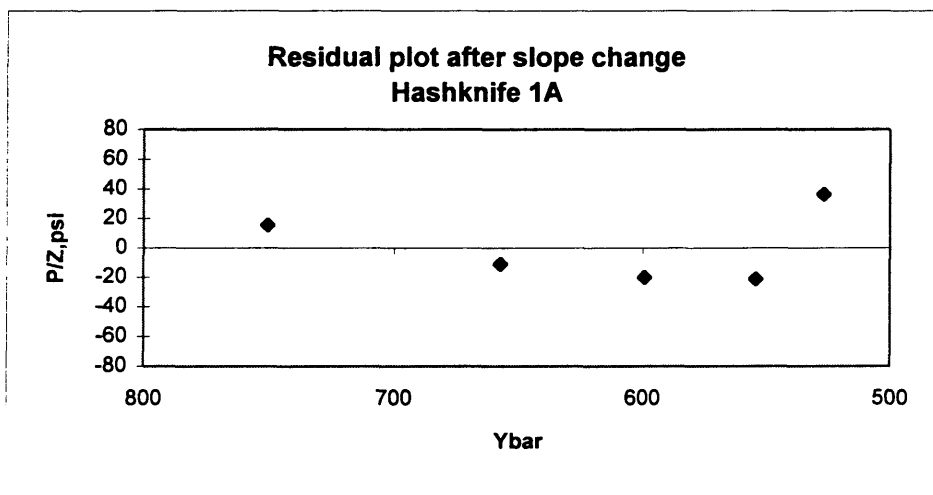
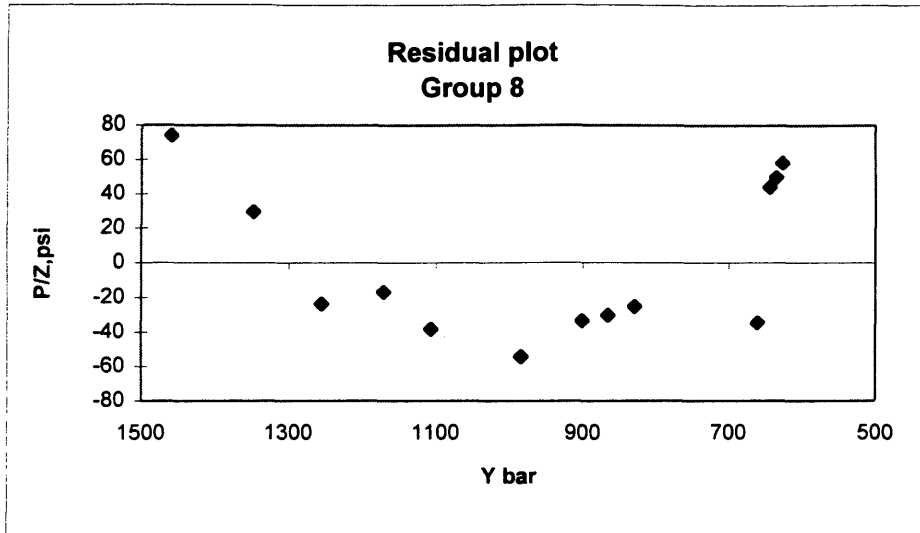


Table B-3. (Continued)

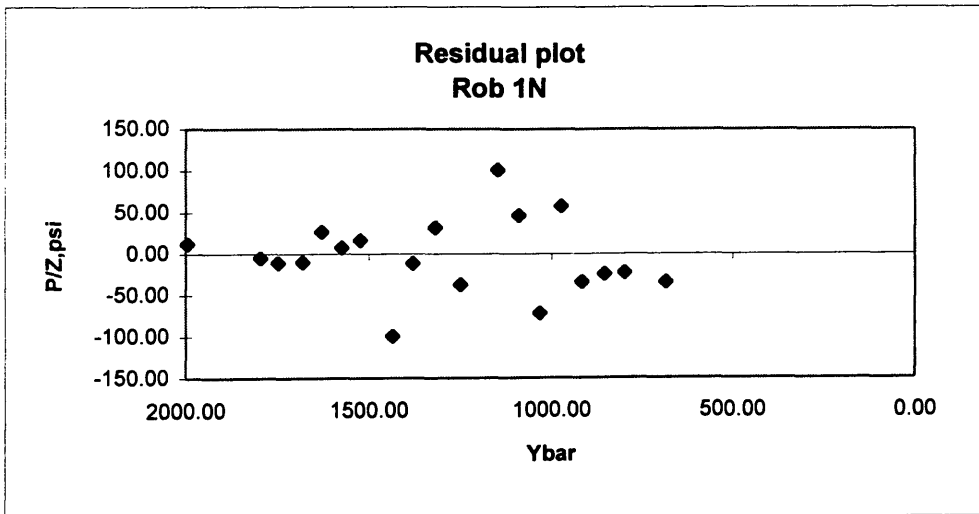
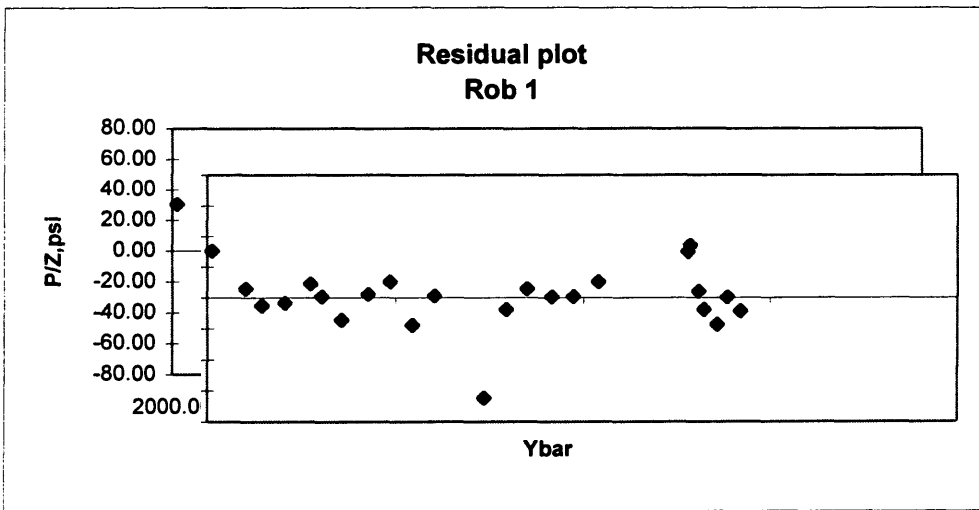
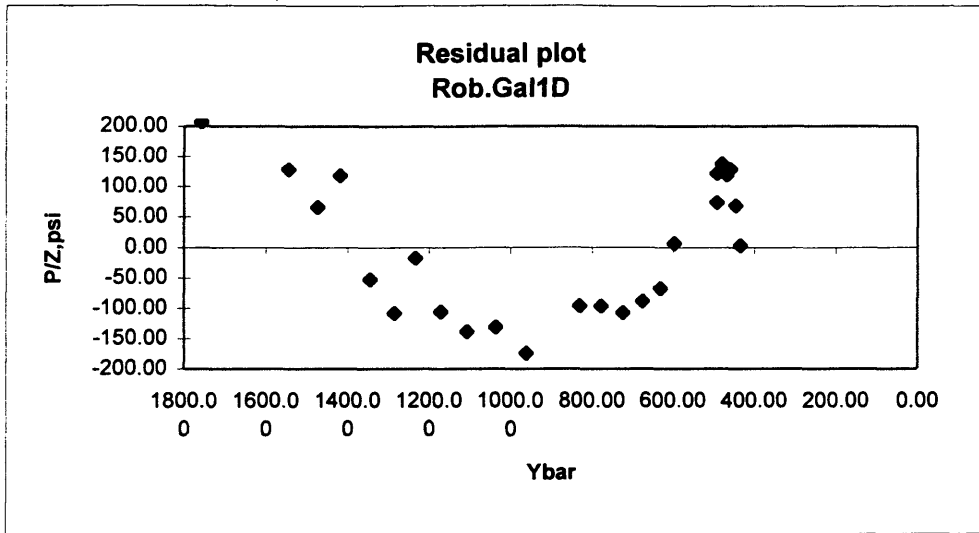


Table B-3. (Continued)

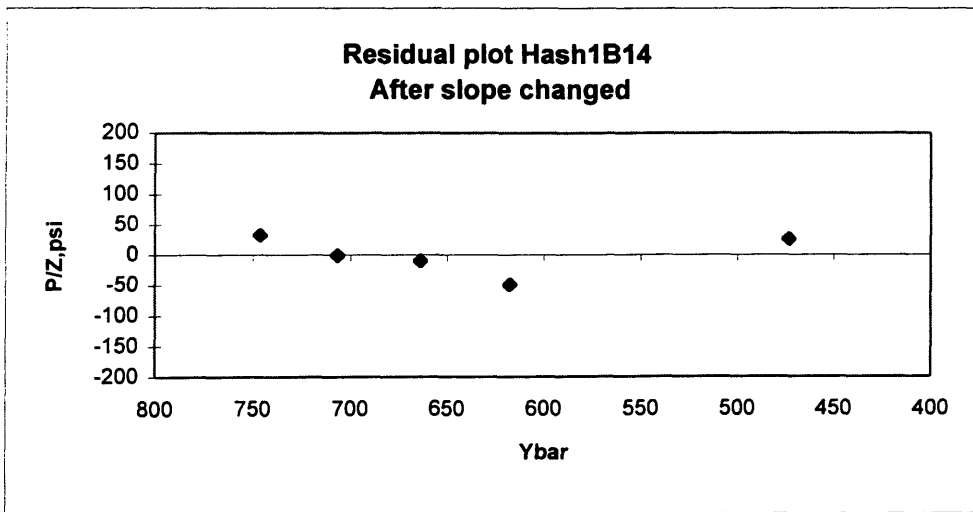
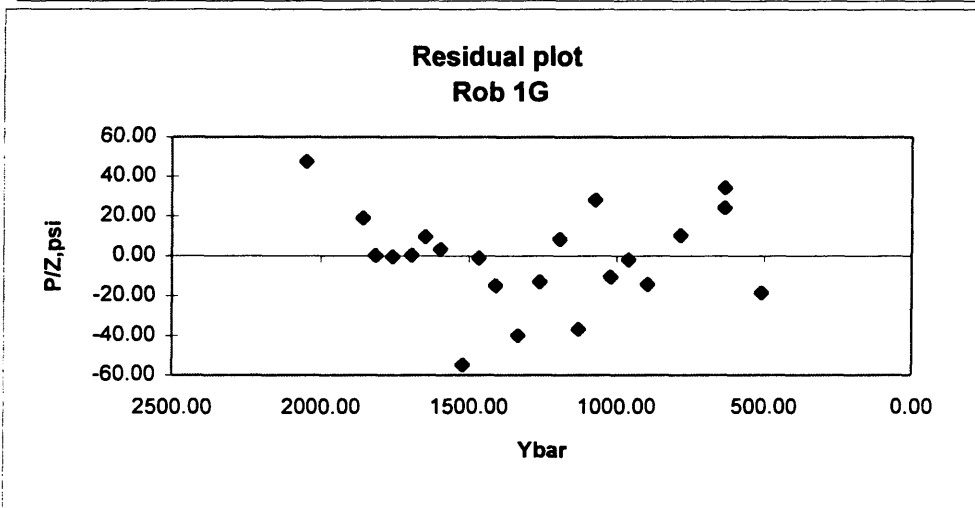
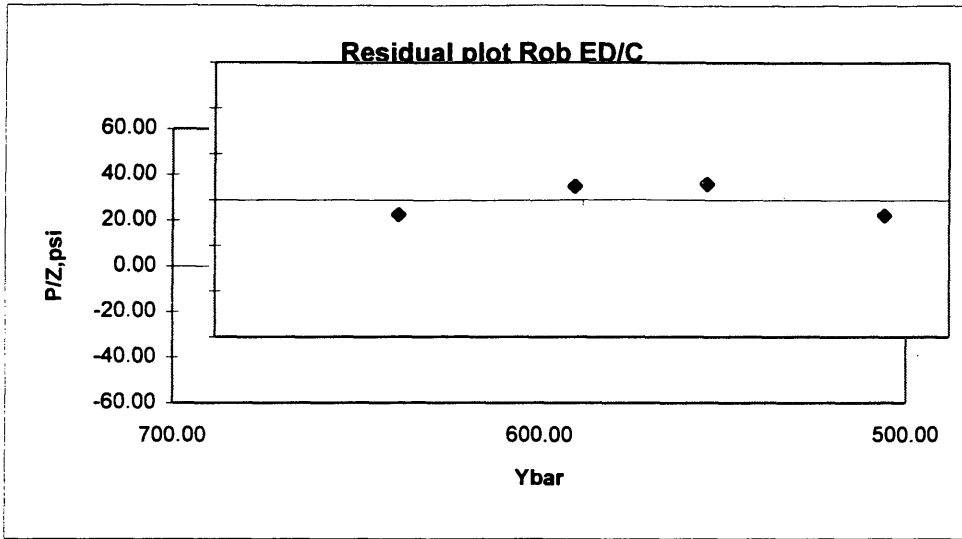
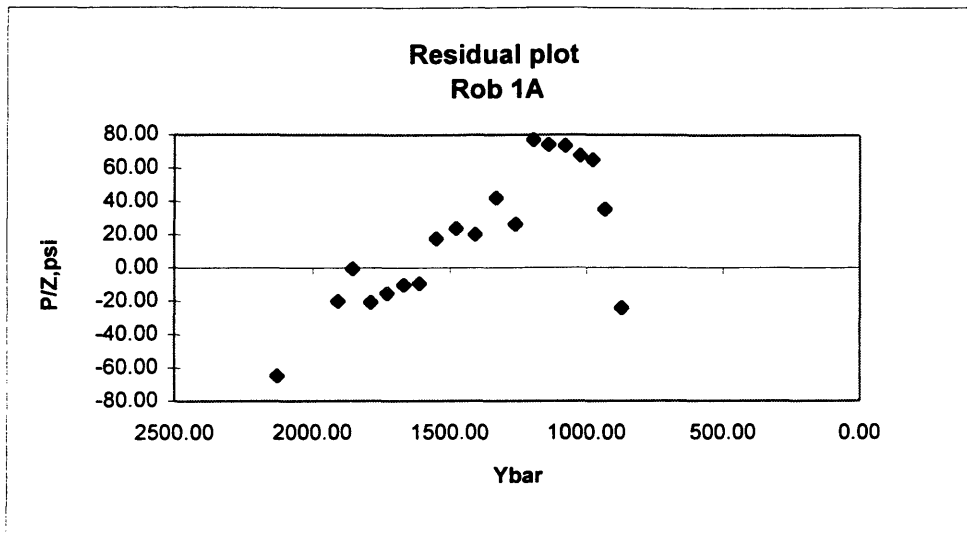


Table B-3. (Continued)



## APPENDIX C

The following pages present the statistical results, the accuracy ratio plots and the residual plots for the Texas Field from the Least Square and empirical High pressure method.

## APPENDIX C-1

The following pages present the statistical results for the Texas Field from the Least Square method and the empirical High Pressure method.

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Table C-1.1 Results for Texas Field wells from the Least Square method

Date	All data			Least Square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
8/1/79	3.449	1.211	0.672	1.986	TRUE	0.23	3.22	0.98	0.45	1.76	HIGH
12/20/79	1.605	1.226	1.027	1.986	FALSE	0.33	1.27	0.89	0.69	1.65	HIGH
6/27/80	1.315	1.146	1.006	1.986	FALSE	0.54	0.78	0.61	0.47	1.45	HIGH
12/6/80	1.717	1.343	1.066	1.986	FALSE	0.65	1.07	0.70	0.42	1.34	HIGH
6/10/81	1.813	1.456	1.178	1.986	FALSE	0.75	1.06	0.71	0.43	1.24	HIGH
12/21/81	1.955	1.575	1.276	1.986	FALSE	0.84	1.12	0.74	0.44	1.15	HIGH
6/15/82	2.13	1.699	1.362	1.986	TRUE	0.88	1.25	0.82	0.48	1.11	HIGH
1/2/83	2.352	1.831	1.434	1.986	TRUE	0.92	1.44	0.92	0.52	1.07	HIGH
6/21/83	2.487	1.929	1.505	1.986	TRUE	0.95	1.54	0.98	0.55	1.03	HIGH
1/11/84	2.421	1.929	1.541	1.986	TRUE	1.06	1.36	0.87	0.48	0.93	HIGH
6/16/84	2.448	1.977	1.596	1.986	TRUE	1.12	1.33	0.86	0.48	0.87	HIGH
1/7/85	2.388	1.966	1.617	1.986	TRUE	1.20	1.19	0.77	0.42	0.79	HIGH
7/19/85	2.387	1.989	1.653	1.986	TRUE	1.23	1.15	0.75	0.42	0.75	LOW
7/25/86	2.41	2.023	1.693	1.986	TRUE	1.31	1.10	0.72	0.39	0.68	LOW
12/4/86	2.428	2.052	1.728	1.986	TRUE	1.34	1.09	0.71	0.39	0.64	LOW
7/14/87	2.389	2.04	1.736	1.986	TRUE	1.42	0.96	0.62	0.31	0.56	LOW
12/28/87	2.332	2.004	1.742	1.986	TRUE	1.47	0.87	0.54	0.28	0.52	LOW
6/26/88	2.351	2.028	1.741	1.986	TRUE	1.51	0.85	0.52	0.24	0.48	LOW
1/23/89	2.306	1.997	1.72	1.986	TRUE	1.55	0.76	0.45	0.17	0.44	LOW
6/30/89	2.34	2.025	1.743	1.986	TRUE	1.57	0.77	0.45	0.17	0.42	LOW
2/5/90	2.319	2.019	1.748	1.986	TRUE	1.61	0.71	0.41	0.14	0.38	LOW
12/13/90	2.297	2.01	1.75	1.986	TRUE	1.64	0.66	0.37	0.11	0.35	LOW
6/4/91	2.327	2.034	1.767	1.986	TRUE	1.66	0.67	0.38	0.11	0.33	LOW
12/7/91	2.323	2.039	1.779	1.986	TRUE	1.68	0.65	0.36	0.10	0.31	LOW
6/8/93	2.315	2.04	1.778	1.986	TRUE	1.78	0.54	0.26	0.00	0.21	LOW
12/19/93	2.299	2.035	1.791	1.986	TRUE	1.83	0.47	0.21	-0.04	0.16	LOW
7/15/94	2.287	2.032	1.796	1.986	TRUE	1.89	0.40	0.14	-0.10	0.09	LOW
				%True	81%					%HIGH	44%
				%False	19%					%LOW	56%

Table C-1.1 (Continued)

Date	Pressure gauge only			Least Square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.prod	P10	P50	P90		
6/27/80	2.308	1.168	0.674	1.986	TRUE	0.54	1.77	0.63	0.14	1.45	HIGH
12/21/81	3.036	1.611	0.932	1.986	TRUE	0.84	2.20	0.77	0.10	1.15	HIGH
6/15/82	2.88	1.808	1.179	1.986	TRUE	0.88	2.00	0.93	0.30	1.11	HIGH
6/16/84	2.787	1.962	1.398	1.986	TRUE	1.12	1.67	0.84	0.28	0.87	HIGH
7/19/85	2.637	2.016	1.541	1.986	TRUE	1.23	1.40	0.78	0.31	0.75	LOW
7/25/86	2.59	2.069	1.646	1.986	TRUE	1.31	1.28	0.76	0.34	0.68	LOW
7/14/87	2.469	2.049	1.69	1.986	TRUE	1.42	1.04	0.62	0.27	0.56	LOW
6/26/88	2.473	2.082	1.742	1.986	TRUE	1.51	0.97	0.58	0.24	0.48	LOW
7/1/89	2.473	2.107	1.783	1.986	TRUE	1.57	0.90	0.54	0.21	0.42	LOW
6/26/90	2.471	2.125	1.816	1.986	TRUE	1.63	0.85	0.50	0.19	0.36	LOW
6/4/91	2.484	2.149	1.846	1.986	TRUE	1.66	0.83	0.49	0.19	0.33	LOW
6/8/93	2.444	2.132	1.848	1.986	TRUE	1.78	0.67	0.36	0.07	0.21	LOW
7/15/94	2.401	2.108	1.839	1.986	TRUE	1.89	0.51	0.22	-0.05	0.09	LOW
				%True	100%					%HIGH	31%
				%False	0%					%LOW	69%

Date	C&S data only			Least Square method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
12/12/78	2.500	1.180	0.700	1.990	TRUE	0.335	2.165	0.845	0.365	1.655	HIGH
8/1/79	2.050	1.520	1.170	1.990	TRUE	0.646	1.404	0.874	0.524	1.344	HIGH
12/6/80	1.870	1.580	1.350	1.990	FALSE	0.751	1.119	0.829	0.599	1.239	HIGH
6/10/81	2.630	1.910	1.430	1.990	TRUE	0.916	1.714	0.994	0.514	1.074	HIGH
1/2/83	2.740	2.060	1.580	1.990	TRUE	0.951	1.789	1.109	0.629	1.039	LOW
1/11/84	2.510	2.010	1.630	1.990	TRUE	1.060	1.450	0.950	0.570	0.930	LOW
1/7/85	2.360	1.980	1.670	1.990	TRUE	1.199	1.161	0.781	0.471	0.791	HIGH
12/23/85	2.400	2.050	1.740	1.990	TRUE	1.343	1.057	0.707	0.397	0.647	LOW
12/4/86	2.280	1.980	1.700	1.990	TRUE	1.466	0.814	0.514	0.234	0.524	HIGH
12/28/87	2.210	1.930	1.680	1.990	TRUE	1.546	0.664	0.384	0.134	0.444	HIGH
1/23/89	2.300	1.990	1.720	1.990	TRUE	1.571	0.729	0.419	0.149	0.419	LOW
2/5/90	2.270	1.990	1.730	1.990	TRUE	1.609	0.661	0.381	0.121	0.381	LOW
12/13/90	2.240	1.980	1.740	1.990	TRUE	1.640	0.600	0.340	0.100	0.350	HIGH
12/7/91	2.250	2.000	1.760	1.990	TRUE	1.675	0.575	0.325	0.085	0.315	LOW
1/14/93	2.230	1.990	1.770	1.990	TRUE	1.827	0.403	0.163	-0.057	0.163	LOW
				%TRUE	93%					%HIGH	53%
				%FALSE	7%					%LOW	47%

Table C-1.1 (Continued)

**TX 2** All data

Date	EUR			Least Square Method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
12/4/86	4.61	3.07	1.53	3.76	TRUE	0.30	4.31	2.77	1.23	3.47	HIGH
6/22/87	4.91	3.74	2.99	3.76	TRUE	0.68	4.22	3.05	2.31	3.08	HIGH
1/5/88	6.52	4.77	3.73	3.76	TRUE	0.95	5.57	3.82	2.78	2.81	LOW
6/13/88	5.07	4.22	3.59	3.76	TRUE	1.23	3.85	2.99	2.36	2.54	LOW
1/11/89	4.77	4.25	3.81	3.76	FALSE	1.57	3.20	2.68	2.24	2.19	LOW
6/19/89	4.44	4.06	3.72	3.76	TRUE	1.80	2.64	2.26	1.92	1.96	LOW
12/11/89	4.27	3.98	3.72	3.76	TRUE	2.06	2.22	1.93	1.66	1.70	LOW
7/10/90	4.12	3.86	3.60	3.76	TRUE	2.28	1.84	1.58	1.32	1.48	LOW
12/20/90	4.04	3.80	3.58	3.76	TRUE	2.47	1.57	1.33	1.11	1.29	LOW
6/11/91	3.96	3.73	3.52	3.76	TRUE	2.69	1.26	1.04	0.83	1.07	HIGH
12/19/91	3.89	3.68	3.47	3.76	TRUE	2.93	0.96	0.75	0.54	0.83	HIGH
7/20/92	3.88	3.68	3.49	3.76	TRUE	3.15	0.72	0.53	0.34	0.61	HIGH
1/12/93	3.86	3.68	3.50	3.76	TRUE	3.33	0.53	0.35	0.17	0.43	HIGH
6/8/93	3.86	3.69	3.52	3.76	TRUE	3.41	0.45	0.28	0.11	0.35	HIGH
1/3/94	3.85	3.69	3.53	3.76	TRUE	3.53	0.32	0.16	0.00	0.23	HIGH
				%True	93%					%HIGH	53%
				%False	7%					%LOW	47%

**TX 2** Pressure gauge only

Date	EUR			Least Square Method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
12/4/86	4.61	3.07	1.53	3.76	TRUE	0.30	4.31	2.77	1.23	3.47	HIGH
6/22/87	4.91	3.87	3.53	3.76	TRUE	0.68	4.22	3.19	2.85	3.08	LOW
6/13/88	4.08	3.88	3.69	3.76	TRUE	1.23	2.86	2.65	2.47	2.54	LOW
6/19/89	3.92	3.76	3.61	3.76	TRUE	1.80	2.11	1.96	1.81	1.96	LOW
7/10/90	3.82	3.68	3.54	3.76	TRUE	2.28	1.54	1.40	1.26	1.48	HIGH
6/11/91	3.80	3.68	3.58	3.76	TRUE	2.69	1.10	0.99	0.88	1.07	HIGH
7/20/92	3.81	3.71	3.60	3.76	TRUE	3.15	0.66	0.55	0.45	0.61	HIGH
6/8/93	3.83	3.73	3.63	3.76	TRUE	3.41	0.42	0.32	0.22	0.35	HIGH
7/21/94	3.83	3.74	3.64	3.76	TRUE	3.61	0.22	0.13	0.04	0.16	HIGH
				%True	100%					%HIGH	67%
				%False	0%					%LOW	33%

**TX 2** C&S data only

Date	EUR			Least Square Method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
12/11/89	3.79	3.57	3.38	3.76	TRUE	2.056	1.734	1.514	1.324	1.704	HIGH
12/20/90	3.62	3.54	3.46	3.76	FALSE	2.471	1.149	1.069	0.989	1.289	HIGH
12/19/91	3.57	3.5	3.42	3.76	FALSE	2.932	0.638	0.568	0.488	0.828	HIGH
1/12/93	3.68	3.56	3.45	3.76	FALSE	3.330	0.350	0.230	0.120	0.430	HIGH
1/3/94	3.72	3.6	3.49	3.76	FALSE	3.528	0.192	0.072	-0.038	0.232	HIGH
				%TRUE	20%					%HIGH	100%
				%FALSE	80%					%LOW	0%

Table C-1.1 (Continued)

TX 3

Date	All data			Least Square Method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
6/13/88	2.86	1.14	0.82	2.59	TRUE	0.27	2.59	0.87	0.55	2.32	HIGH
12/20/88	1.94	1.54	1.26	2.59	FALSE	0.50	1.44	1.04	0.76	2.09	HIGH
6/19/89	2.17	1.79	1.50	2.59	FALSE	0.80	1.37	0.99	0.69	1.79	HIGH
12/4/89	2.28	1.95	1.67	2.59	FALSE	1.02	1.27	0.93	0.65	1.57	HIGH
2/12/90	2.27	2.00	1.77	2.59	FALSE	1.13	1.13	0.87	0.64	1.46	HIGH
7/10/90	2.34	2.09	1.86	2.59	FALSE	1.33	1.01	0.76	0.52	1.26	HIGH
12/20/90	2.42	2.17	1.95	2.59	FALSE	1.54	0.87	0.63	0.41	1.05	HIGH
6/11/91	2.50	2.25	2.02	2.59	FALSE	1.75	0.75	0.50	0.27	0.84	HIGH
12/12/91	2.55	2.30	2.07	2.59	FALSE	1.92	0.63	0.38	0.15	0.67	HIGH
6/22/92	2.58	2.34	2.12	2.59	FALSE	2.05	0.53	0.29	0.06	0.54	HIGH
1/7/93	2.58	2.36	2.15	2.59	FALSE	2.21	0.37	0.15	-0.06	0.38	HIGH
6/8/93	2.60	2.38	2.18	2.59	TRUE	2.27	0.32	0.11	-0.10	0.32	HIGH
1/18/94	2.61	2.40	2.20	2.59	TRUE	2.38	0.23	0.02	-0.19	0.21	HIGH
				%True	<b>23%</b>					%HIGH	<b>100%</b>
				%False	<b>77%</b>					%LOW	<b>0%</b>

TX 3

Date	Pressure gauge only			Least Square Method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
6/11/91	2.76	2.53	2.33	2.59	TRUE	1.75	1.01	0.78	0.58	0.84	HIGH
6/22/92	2.59	2.52	2.44	2.59	TRUE	2.05	0.54	0.46	0.39	0.54	HIGH
6/8/93	2.56	2.52	2.45	2.59	FALSE	2.27	0.28	0.25	0.18	0.32	HIGH
7/21/94	2.58	2.52	2.46	2.59	FALSE	2.47	0.11	0.05	-0.01	0.12	HIGH
6/30/95	2.62	2.54	2.47	2.59	TRUE	2.59	0.03	-0.05	-0.13	0.00	HIGH
				%True	<b>60%</b>					%HIGH	<b>100%</b>
				%False	<b>40%</b>					%LOW	<b>0%</b>

TX 3

Date	C&S data only			Least Square Method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
6/13/88	2.86	1.34	0.82	2.56	TRUE	0.27	2.59	1.07	0.55	2.29	HIGH
12/20/88	1.94	1.54	1.26	2.56	FALSE	0.50	1.44	1.04	0.76	2.06	HIGH
12/4/89	2.44	1.96	1.59	2.56	FALSE	1.02	1.42	0.94	0.57	1.54	HIGH
2/12/90	2.34	2.02	1.75	2.56	FALSE	1.13	1.21	0.89	0.62	1.43	HIGH
12/20/90	2.47	2.16	1.90	2.56	FALSE	1.54	0.93	0.62	0.36	1.02	HIGH
12/12/91	2.57	2.28	2.02	2.56	TRUE	1.92	0.65	0.36	0.10	0.64	HIGH
1/7/93	2.58	2.33	2.10	2.56	TRUE	2.21	0.37	0.12	-0.11	0.35	HIGH
1/18/94	2.62	2.38	2.16	2.56	TRUE	2.38	0.24	0.00	-0.22	0.18	HIGH
				%True	<b>50%</b>					%HIGH	<b>100%</b>
				%False	<b>50%</b>					%LOW	<b>0%</b>

Table C-1.1 (Continued)

TX 4 All data											
Date	EUR			Least Square Method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
12/20/90	1.81	1.17	0.53	1.72	TRUE	0.22	1.58	0.94	0.30	1.50	HIGH
7/9/91	1.57	1.22	0.97	1.72	FALSE	0.46	1.12	0.76	0.51	1.26	HIGH
12/19/91	1.85	1.43	1.14	1.72	TRUE	0.66	1.19	0.77	0.48	1.06	HIGH
7/20/92	1.80	1.52	1.29	1.72	TRUE	0.88	0.92	0.64	0.41	0.84	HIGH
1/12/93	1.76	1.56	1.38	1.72	TRUE	1.11	0.65	0.45	0.27	0.61	HIGH
8/20/93	1.76	1.59	1.44	1.72	TRUE	1.30	0.46	0.30	0.14	0.42	HIGH
1/13/94	1.78	1.62	1.48	1.72	TRUE	1.42	0.36	0.21	0.07	0.30	HIGH
7/21/94	1.79	1.65	1.51	1.72	TRUE	1.53	0.26	0.12	-0.02	0.19	HIGH
6/23/95	1.81	1.67	1.54	1.72	TRUE	1.72	0.09	-0.05	-0.18	0.00	HIGH
				%True	<b>89%</b>					%HIGH	<b>100%</b>
				%False	<b>11%</b>					%LOW	<b>0%</b>

TX 4 Pressure gauge only											
Date	EUR			Least Square Method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
7/20/92	2.81	1.56	0.93	1.72	TRUE	0.88	1.93	0.68	0.05	0.84	HIGH
8/20/93	1.95	1.63	1.35	1.72	TRUE	1.30	0.65	0.33	0.05	0.42	HIGH
7/21/94	1.89	1.67	1.47	1.72	TRUE	1.53	0.35	0.14	-0.06	0.19	HIGH
6/23/95	1.85	1.69	1.54	1.72	TRUE	1.72	0.13	-0.03	-0.18	0.00	HIGH
				%True	<b>100%</b>					%HIGH	<b>100%</b>
				%False	<b>0%</b>					%LOW	<b>0%</b>

TX 4 C&S data only											
Date	EUR			Least Square Method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
12/19/91	3.060	1.480	0.840	1.720	TRUE	0.660	2.400	0.820	0.180	1.060	HIGH
1/12/93	1.870	1.560	1.290	1.720	TRUE	1.111	0.759	0.449	0.179	0.609	HIGH
1/13/94	1.850	1.630	1.430	1.720	TRUE	1.417	0.433	0.213	0.013	0.303	HIGH
				%True	<b>100%</b>					%HIGH	<b>100%</b>
				%False	<b>0%</b>					%LOW	<b>0%</b>

Table C-1.1 (Continued)

Date	All data			Least Square fit			ERR			ARR	BIAS
	EUR			AUR	Logic	Cum.	P10	P50	P90		
	P10	P50	P90								
8/2/77	10.26	8.05	2.54	5.83	TRUE	0.73	9.53	7.32	1.81	5.10	LOW
1/19/78	14.75	10.29	5.75	5.83	TRUE	1.01	13.74	9.28	4.74	4.82	LOW
12/12/78	9.68	7.75	5.41	5.83	TRUE	1.18	8.49	6.57	4.22	4.65	LOW
7/19/79	11.99	7.91	6.12	5.83	FALSE	1.40	10.59	6.51	4.72	4.43	LOW
12/24/79	8.51	6.39	5.17	5.83	TRUE	1.71	6.80	4.69	3.46	4.12	LOW
7/4/80	7.57	6.26	5.36	5.83	TRUE	2.02	5.55	4.25	3.34	3.81	LOW
1/28/81	6.62	5.69	4.98	5.83	TRUE	2.26	4.36	3.43	2.71	3.57	HIGH
7/25/81	6.25	5.55	4.96	5.83	TRUE	2.54	3.71	3.01	2.42	3.29	HIGH
1/26/82	6.06	5.49	5.00	5.83	TRUE	2.82	3.23	2.67	2.17	3.01	HIGH
7/16/82	5.98	5.50	5.06	5.83	TRUE	3.03	2.95	2.46	2.02	2.80	HIGH
1/1/83	6.24	5.70	5.22	5.83	TRUE	3.12	3.12	2.59	2.10	2.71	HIGH
7/2/83	6.31	5.80	5.32	5.83	TRUE	3.25	3.06	2.55	2.08	2.58	HIGH
2/4/84	6.23	5.77	5.33	5.83	TRUE	3.49	2.74	2.28	1.84	2.34	HIGH
12/12/84	6.22	5.79	5.38	5.83	TRUE	3.79	2.43	2.00	1.59	2.04	HIGH
5/1/85	6.23	5.82	5.43	5.83	TRUE	3.83	2.39	1.98	1.60	2.00	HIGH
1/6/86	6.39	5.94	5.51	5.83	TRUE	3.90	2.49	2.04	1.62	1.93	LOW
12/19/86	6.34	5.92	5.51	5.83	TRUE	4.11	2.23	1.80	1.40	1.72	LOW
7/14/87	6.31	5.91	5.52	5.83	TRUE	4.32	1.99	1.59	1.21	1.51	LOW
1/7/88	6.22	5.81	5.42	5.83	TRUE	4.44	1.78	1.37	0.98	1.39	HIGH
7/1/88	6.18	5.78	5.40	5.83	TRUE	4.61	1.56	1.17	0.79	1.22	HIGH
1/16/89	6.12	5.74	5.37	5.83	TRUE	4.77	1.35	0.97	0.60	1.06	HIGH
7/16/89	6.13	5.76	5.40	5.83	TRUE	4.88	1.25	0.88	0.52	0.95	HIGH
2/5/90	6.10	5.74	5.39	5.83	TRUE	5.01	1.10	0.74	0.39	0.82	HIGH
6/22/90	6.11	5.76	5.41	5.83	TRUE	5.10	1.01	0.66	0.31	0.73	HIGH
12/6/90	6.08	5.74	5.41	5.83	TRUE	5.21	0.87	0.53	0.19	0.62	HIGH
6/18/91	6.09	5.75	5.42	5.83	TRUE	5.33	0.75	0.42	0.09	0.50	HIGH
1/16/92	6.66	5.73	5.41	5.83	TRUE	5.46	1.21	0.28	-0.04	0.37	HIGH
6/29/92	6.66	5.74	5.42	5.83	TRUE	5.48	1.17	0.25	-0.06	0.35	HIGH
				True %	96%					%HIGH	68%
				False %	4%					%LOW	32%

Table C-1.1 (Continued)

Date	Pressure gauge only			Least Square fit			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	Cum.	P10	P50	P90		
1/19/78	30.21	18.02	7.98	5.83	FALSE	1.01	29.21	17.02	6.97	4.82	LOW
7/6/78	16.31	11.07	5.77	5.83	TRUE	1.14	15.17	9.93	4.64	4.69	LOW
12/12/78	12.58	9.20	5.58	5.83	TRUE	1.18	11.39	8.02	4.40	4.65	LOW
12/24/79	11.60	6.39	4.65	5.83	TRUE	1.71	9.89	4.68	2.94	4.12	LOW
7/4/80	8.39	6.21	4.99	5.83	TRUE	2.02	6.38	4.19	2.97	3.81	LOW
1/28/81	6.82	5.57	4.68	5.83	TRUE	2.26	4.55	3.30	2.42	3.57	HIGH
7/25/81	6.30	5.43	4.76	5.83	TRUE	2.54	3.76	2.90	2.22	3.29	HIGH
7/2/83	6.48	5.73	5.10	5.83	TRUE	3.25	3.23	2.48	1.85	2.58	HIGH
7/20/84	6.24	5.66	5.14	5.83	TRUE	3.67	2.56	1.99	1.47	2.16	HIGH
5/1/85	6.25	5.74	5.27	5.83	TRUE	3.83	2.42	1.90	1.43	2.00	HIGH
7/18/86	6.21	5.75	5.33	5.83	TRUE	4.00	2.21	1.75	1.32	1.83	HIGH
12/19/86	6.18	5.76	5.37	5.83	TRUE	4.11	2.07	1.65	1.25	1.72	HIGH
7/14/87	6.17	5.78	5.41	5.83	TRUE	4.32	1.86	1.47	1.09	1.51	HIGH
7/11/88	6.10	5.74	5.39	5.83	TRUE	4.61	1.49	1.13	0.78	1.22	HIGH
7/16/89	6.12	5.77	5.43	5.83	TRUE	4.88	1.24	0.89	0.56	0.95	HIGH
6/22/90	6.12	5.79	5.46	5.83	TRUE	5.10	1.02	0.69	0.36	0.73	HIGH
6/18/91	6.11	5.80	5.49	5.83	TRUE	5.33	0.78	0.46	0.15	0.50	HIGH
6/29/92	6.09	5.79	5.49	5.83	TRUE	5.48	0.61	0.31	0.01	0.35	HIGH
6/28/93	6.08	5.79	5.51	5.83	TRUE	5.67	0.41	0.12	-0.17	0.16	HIGH
				True %	95%					%HIGH	74%
				False %	5%					%LOW	26%

Date	C&S data only			Least Square fit			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
1/26/82	6.02	5.43	4.93	5.83	TRUE	2.823	3.197	2.607	2.107	3.007	HIGH
1/1/83	5.82	5.5	5.21	5.83	FALSE	3.034	2.786	2.466	2.176	2.796	HIGH
2/4/84	5.83	5.58	5.35	5.83	FALSE	3.489	2.341	2.091	1.861	2.341	HIGH
1/6/86	5.94	5.7	5.45	5.83	TRUE	3.791	2.149	1.909	1.659	2.039	HIGH
1/7/88	5.82	5.56	5.32	5.83	FALSE	4.442	1.378	1.118	0.878	1.388	HIGH
1/16/89	5.75	5.54	5.33	5.83	FALSE	4.767	0.983	0.773	0.563	1.063	HIGH
2/5/90	5.77	5.57	5.38	5.83	FALSE	5.007	0.763	0.563	0.373	0.823	HIGH
12/6/90	5.77	5.58	5.4	5.83	FALSE	5.211	0.559	0.369	0.189	0.619	HIGH
1/16/92	5.75	5.58	5.41	5.83	FALSE	5.456	0.294	0.124	-0.046	0.374	HIGH
1/20/93	5.75	5.59	5.43	5.83	FALSE	5.595	0.155	-0.005	-0.165	0.235	HIGH
1/18/94	5.78	5.61	5.45	5.83	FALSE	5.767	0.013	-0.157	-0.317	0.063	HIGH
				%TRUE	18%						100%
				%FALSE	82%						0%

Table C-1.2 Results for Texas Field well from the High pressure method

Date	All data			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
12/12/78	3.47	1.2	0.67	1.99	TRUE	0.11	3.24	0.97	0.44	1.88	HIGH
8/1/79	1.7	1.32	1.06	1.99	FALSE	0.23	1.37	0.99	0.73	1.76	HIGH
12/20/79	1.54	1.32	1.14	1.99	FALSE	0.33	1.00	0.78	0.60	1.66	HIGH
6/27/80	2.02	1.54	1.2	1.99	TRUE	0.54	1.37	0.89	0.55	1.45	HIGH
12/6/80	1.97	1.58	1.27	1.99	FALSE	0.65	1.22	0.83	0.52	1.34	HIGH
6/10/81	2.17	1.73	1.4	1.99	TRUE	0.75	1.33	0.89	0.56	1.24	HIGH
12/21/81	2.42	1.91	1.53	1.99	TRUE	0.84	1.54	1.03	0.65	1.15	HIGH
6/15/82	2.73	2.11	1.64	1.99	TRUE	0.88	1.81	1.19	0.72	1.11	LOW
1/2/83	2.71	2.11	1.64	1.99	TRUE	0.92	1.76	1.16	0.69	1.07	LOW
6/21/83	2.71	2.11	1.65	1.99	TRUE	0.95	1.65	1.05	0.59	1.04	LOW
1/11/84	2.64	2.11	1.69	1.99	TRUE	1.06	1.52	0.99	0.57	0.93	LOW
6/16/84	2.59	2.11	1.72	1.99	TRUE	1.12	1.39	0.91	0.52	0.87	LOW
1/7/85	2.54	2.11	1.75	1.99	TRUE	1.20	1.31	0.88	0.52	0.79	LOW
7/19/85	2.51	2.11	1.77	1.99	TRUE	1.23	1.20	0.80	0.46	0.76	LOW
12/23/85	2.49	2.11	1.78	1.99	TRUE	1.31	1.15	0.77	0.44	0.68	LOW
7/25/86	2.47	2.11	1.8	1.99	TRUE	1.34	1.05	0.69	0.38	0.65	LOW
12/4/86	2.44	2.11	1.81	1.99	TRUE	1.42	0.97	0.64	0.34	0.57	LOW
7/14/87	2.43	2.11	1.82	1.99	TRUE	1.47	0.92	0.60	0.31	0.52	LOW
12/28/87	2.42	2.11	1.83	1.99	TRUE	1.51	0.87	0.56	0.28	0.48	LOW
6/26/88	2.47	2.11	1.87	1.99	TRUE	1.55	0.90	0.54	0.30	0.44	LOW
1/23/89	2.46	2.11	1.88	1.99	TRUE	1.57	0.85	0.50	0.27	0.42	LOW
6/30/89	2.45	2.11	1.89	1.99	TRUE	1.61	0.81	0.47	0.25	0.38	LOW
7/1/89	2.47	2.18	1.91	1.99	TRUE	1.64	0.81	0.52	0.25	0.35	LOW
2/5/90	2.46	2.18	1.91	1.99	TRUE	1.66	0.78	0.50	0.23	0.33	LOW
6/26/90	2.45	2.18	1.92	1.99	TRUE	1.68	0.67	0.40	0.14	0.31	LOW
7/15/94	2.44	2.18	1.93	1.99	TRUE	1.78	0.61	0.35	0.10	0.21	LOW
6/30/95	2.44	2.18	1.94	1.99	TRUE	1.83	2.44	2.18	1.94	0.16	LOW
				%TRUE	89%					%HIGH	26%
				%FALSE	11%					%LOW	74%

Table C-1.2 (Continued)

Date	Pressure gauge only			High pressure method			ERR			ARR	BIAS
	EUR			AUR	Logic	CUM	P10	P50	P90		
	P10	P50	P90								
6/27/80	2.14	1.14	0.67	1.99	TRUE	0.54	1.60	0.60	0.13	1.45	HIGH
12/21/81	3.25	1.73	1.02	1.99	TRUE	0.84	2.41	0.89	0.18	1.15	HIGH
6/15/82	3	1.91	1.27	1.99	TRUE	0.88	2.12	1.03	0.39	1.11	HIGH
6/16/84	2.79	2.01	1.47	1.99	TRUE	1.12	1.67	0.89	0.35	0.87	LOW
7/19/85	2.57	2.01	1.47	1.99	TRUE	1.23	1.34	0.78	0.24	0.76	LOW
7/25/86	2.53	2.06	1.68	1.99	TRUE	1.31	1.22	0.75	0.37	0.68	LOW
7/14/87	2.44	2.06	1.73	1.99	TRUE	1.42	1.02	0.64	0.31	0.57	LOW
6/26/88	2.45	2.09	1.78	1.99	TRUE	1.51	0.94	0.58	0.27	0.48	LOW
7/1/89	2.44	2.11	1.82	1.99	TRUE	1.57	0.87	0.54	0.25	0.42	LOW
6/26/90	2.43	2.12	1.84	1.99	TRUE	1.63	0.80	0.49	0.21	0.36	LOW
6/4/91	2.48	2.18	1.9	1.99	TRUE	1.66	0.82	0.52	0.24	0.33	LOW
6/8/93	2.46	2.18	1.91	1.99	TRUE	1.78	0.68	0.40	0.13	0.21	LOW
7/15/94	2.45	2.18	1.92	1.99	TRUE	1.89	0.56	0.29	0.03	0.10	LOW
6/30/95	2.44	2.18	1.93	1.99	TRUE	1.99	0.45	0.19	-0.06	0.00	LOW
				%TRUE	100%					%HIGH	21%
				%FALSE	0%					%LOW	79%

Date	C&S data only			High pressure method			ERR			ARR	BIAS
	EUR			AUR	Logic	CUM	P10	P50	P90		
	P10	P50	P90								
12/20/79	2.540	1.190	0.720	1.990	TRUE	0.335	2.205	0.855	0.385	1.655	HIGH
12/6/80	2.000	1.500	1.160	1.990	TRUE	0.646	1.354	0.854	0.514	1.344	HIGH
6/10/81	1.820	1.550	1.330	1.990	FALSE	0.751	1.069	0.799	0.579	1.239	HIGH
1/2/83	2.940	2.120	1.580	1.990	TRUE	0.916	2.024	1.204	0.664	1.074	LOW
1/11/84	2.770	2.120	1.650	1.990	TRUE	0.951	1.819	1.169	0.699	1.039	LOW
1/7/85	2.620	2.120	1.730	1.990	TRUE	1.060	1.560	1.060	0.670	0.930	LOW
12/23/85	2.510	2.120	1.790	1.990	TRUE	1.199	1.311	0.921	0.591	0.791	LOW
12/4/86	2.470	2.120	1.820	1.990	TRUE	1.343	1.127	0.777	0.477	0.647	LOW
12/28/87	2.440	2.120	1.830	1.990	TRUE	1.466	0.974	0.654	0.364	0.524	LOW
1/23/89	2.420	2.120	1.850	1.990	TRUE	1.546	0.874	0.574	0.304	0.444	LOW
6/30/89	2.480	2.160	1.870	1.990	TRUE	1.571	0.909	0.589	0.299	0.419	LOW
2/5/90	2.460	2.160	1.890	1.990	TRUE	1.609	0.851	0.551	0.281	0.381	LOW
12/13/90	2.440	2.160	1.910	1.990	TRUE	1.640	0.800	0.520	0.270	0.350	LOW
12/7/91	2.430	2.160	1.920	1.990	TRUE	1.675	0.755	0.485	0.245	0.315	LOW
12/19/93	2.410	2.160	1.930	1.990	TRUE	1.827	0.583	0.333	0.103	0.163	LOW
				%TRUE	93%					%HIGH	20%
				%FALSE	7%					%LOW	80%

Table C-1.2 (Continued)

TX 2											
All data											
Date	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM.	P10	P50	P90		
12/4/86	4.34	2.92	1.5	3.76	TRUE	0.30	4.04	2.62	1.20	3.46	HIGH
6/22/87	4.58	3.56	2.88	3.76	TRUE	0.68	3.90	2.88	2.20	3.08	HIGH
1/5/88	4.12	3.75	3.43	3.76	TRUE	0.95	3.17	2.80	2.48	2.81	HIGH
6/13/88	3.99	3.8	3.62	3.76	TRUE	1.23	2.76	2.57	2.39	2.53	LOW
1/11/89	3.96	3.83	3.7	3.76	TRUE	1.57	2.39	2.26	2.13	2.19	LOW
6/19/89	3.97	3.83	3.69	3.76	TRUE	1.80	2.17	2.03	1.89	1.96	LOW
12/11/89	3.95	3.83	3.71	3.76	TRUE	2.06	1.89	1.77	1.65	1.70	LOW
7/10/90	3.96	3.83	3.7	3.76	TRUE	2.28	1.68	1.55	1.42	1.48	LOW
12/20/90	3.97	3.83	3.69	3.76	TRUE	2.47	1.50	1.36	1.22	1.29	LOW
6/11/91	3.96	3.83	3.7	3.76	TRUE	2.69	1.27	1.14	1.01	1.07	LOW
12/19/91	3.95	3.83	3.71	3.76	TRUE	2.93	1.02	0.90	0.78	0.83	LOW
7/20/92	3.94	3.83	3.71	3.76	TRUE	3.15	0.79	0.68	0.56	0.61	LOW
1/12/93	3.94	3.83	3.72	3.76	TRUE	3.33	0.61	0.50	0.39	0.43	LOW
6/8/93	3.94	3.83	3.72	3.76	TRUE	3.41	0.53	0.42	0.31	0.35	LOW
1/3/94	3.94	3.83	3.72	3.76	TRUE	3.53	0.41	0.30	0.19	0.23	LOW
				%True	<b>100%</b>					% HIGH	<b>20%</b>
				%False	<b>0%</b>					%LOW	<b>80%</b>

TX 2											
Pressure gauge only											
Date	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM.	P10	P50	P90		
12/4/86	4.34	2.92	1.5	3.76	TRUE	0.30	4.04	2.62	1.20	3.46	HIGH
6/22/87	4.58	3.56	2.88	3.76	TRUE	0.68	3.90	2.88	2.20	3.08	HIGH
6/13/88	4.12	3.75	3.43	3.76	TRUE	1.23	2.89	2.52	2.20	2.53	HIGH
6/19/89	3.99	3.8	3.62	3.76	TRUE	1.80	2.19	2.00	1.82	1.96	LOW
7/10/90	3.96	3.8	3.65	3.76	TRUE	2.28	1.68	1.52	1.37	1.48	LOW
6/11/91	3.94	3.8	3.66	3.76	TRUE	2.69	1.25	1.11	0.97	1.07	LOW
7/20/92	3.91	3.8	3.69	3.76	TRUE	3.15	0.76	0.65	0.54	0.61	LOW
6/8/93	3.9	3.8	3.69	3.76	TRUE	3.41	0.49	0.39	0.28	0.35	LOW
7/21/94	3.9	3.8	3.7	3.76	TRUE	3.61	0.29	0.19	0.09	0.15	LOW
6/23/95	3.89	3.8	3.7	3.76	TRUE	3.76	0.13	0.04	-0.06	0.00	LOW
				%True	<b>100%</b>					% HIGH	<b>30%</b>
				%False	<b>0%</b>					%LOW	<b>70%</b>

TX 2											
C&S data only											
Date	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM.	P10	P50	P90		
12/11/89	3.78	3.56	3.37	3.76	TRUE	2.056	1.724	1.504	1.314	1.704	HIGH
12/20/90	3.65	3.56	3.48	3.76	FALSE	2.471	1.179	1.089	1.009	1.289	HIGH
12/19/91	3.64	3.56	3.49	3.76	FALSE	2.932	0.708	0.628	0.558	0.828	HIGH
1/12/93	3.76	3.64	3.52	3.76	FALSE	3.330	0.430	0.310	0.190	0.430	HIGH
1/3/94	3.79	3.67	3.55	3.76	TRUE	3.528	0.262	0.142	0.022	0.232	HIGH
				%True	<b>40%</b>					% HIGH	<b>100%</b>
				%False	<b>60%</b>					%LOW	<b>0%</b>

Table C-1.2 (Continued)

TX 3

Date	All data			High pressure method			ERR			ARR	BIAS
	EUR			AUR	Logic	CUM	P10	P50	P90		
	P10	P50	P90								
6/13/88	3.120	2.100	1.080	2.590	TRUE	0.268	2.852	1.832	0.812	2.322	HIGH
12/20/88	3.850	2.230	1.800	2.590	TRUE	0.499	3.351	1.731	1.301	2.091	HIGH
6/19/89	3.360	2.220	1.930	2.590	TRUE	0.805	2.555	1.415	1.125	1.785	HIGH
12/4/89	3.110	2.220	2.040	2.590	TRUE	1.019	2.091	1.201	1.021	1.571	HIGH
2/12/90	2.940	2.500	2.140	2.590	TRUE	1.134	1.806	1.366	1.006	1.456	HIGH
7/10/90	2.880	2.500	2.170	2.590	TRUE	1.334	1.546	1.166	0.836	1.256	HIGH
12/20/90	2.840	2.500	2.200	2.590	TRUE	1.543	1.297	0.957	0.657	1.047	HIGH
6/11/91	2.830	2.500	2.200	2.590	TRUE	1.750	1.080	0.750	0.450	0.840	HIGH
12/12/91	2.810	2.500	2.220	2.590	TRUE	1.922	0.888	0.578	0.298	0.668	HIGH
6/22/92	2.790	2.500	2.230	2.590	TRUE	2.052	0.738	0.448	0.178	0.538	HIGH
1/7/93	2.760	2.500	2.250	2.590	TRUE	2.206	0.554	0.294	0.044	0.384	HIGH
6/8/93	2.750	2.500	2.260	2.590	TRUE	2.272	0.478	0.228	-0.012	0.318	HIGH
1/18/94	2.740	2.500	2.270	2.590	TRUE	2.384	0.356	0.116	-0.114	0.206	HIGH
7/21/94	2.740	2.500	2.270	2.590	TRUE	2.468	0.272	0.032	-0.198	0.122	HIGH
6/30/95	2.740	2.500	2.270	2.590	TRUE	2.590	0.150	-0.090	-0.320	0.000	HIGH
				%TRUE	<b>100%</b>					%HIGH	<b>100%</b>
				%FALSE	<b>0%</b>					%LOW	<b>0%</b>

TX 3

Date	Pressure gauge only			High pressure method			ERR			ARR	BIAS
	EUR			AUR	Logic	CUM	P10	P50	P90		
	P10	P50	P90								
6/11/91	2.780	2.540	2.330	2.590	TRUE	1.750	1.030	0.790	0.580	0.840	HIGH
6/22/92	2.630	2.540	2.460	2.590	TRUE	2.052	0.578	0.488	0.408	0.538	HIGH
6/8/93	2.600	2.540	2.490	2.590	TRUE	2.272	0.328	0.268	0.218	0.318	HIGH
7/21/94	2.610	2.540	2.480	2.590	TRUE	2.468	0.142	0.072	0.012	0.122	HIGH
6/30/95	2.620	2.540	2.470	2.590	TRUE	2.590	0.030	-0.050	-0.120	0.000	HIGH
				%TRUE	<b>100%</b>					%HIGH	<b>100%</b>
				%FALSE	<b>0%</b>					%LOW	<b>0%</b>

TX 3

Date	C&S data only			High pressure method			ERR			ARR	BIAS
	EUR			AUR	Logic	CUM	P10	P50	P90		
	P10	P50	P90								
6/13/88	2.45	1.25	0.78	2.56	FALSE	0.268	2.182	0.982	0.512	2.292	HIGH
12/20/88	1.89	1.52	1.25	2.56	FALSE	0.499	1.391	1.021	0.751	2.061	HIGH
12/4/89	2.46	1.99	1.63	2.56	FALSE	1.019	1.441	0.971	0.611	1.541	HIGH
2/12/90	2.3	2.00	1.74	2.56	FALSE	1.134	1.166	0.866	0.606	1.426	HIGH
12/20/90	2.55	2.25	1.98	2.56	FALSE	1.543	1.007	0.707	0.437	1.017	HIGH
12/12/91	2.66	2.38	2.12	2.56	TRUE	1.922	0.738	0.458	0.198	0.638	HIGH
1/7/93	2.63	2.4	2.17	2.56	TRUE	2.206	0.424	0.194	-0.036	0.354	HIGH
1/18/94	2.7	2.47	2.26	2.56	TRUE	2.384	0.316	0.086	-0.124	0.176	HIGH
				%TRUE	<b>38%</b>					%HIGH	<b>100%</b>
				%FALSE	<b>63%</b>					%LOW	<b>0%</b>

Table C-1.2 (Continued)

TX 4											
All data											
Date	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
12/20/90	2.5	1.35	0.62	1.72	TRUE	0.223	2.28	1.13	0.40	1.50	HIGH
7/9/91	2.41	1.37	1.25	1.72	TRUE	0.458	1.95	0.91	0.79	1.26	HIGH
12/19/91	2.24	1.37	1.3	1.72	TRUE	0.660	1.58	0.71	0.64	1.06	HIGH
7/20/92	2.03	1.68	1.4	1.72	TRUE	0.882	1.15	0.80	0.52	0.84	HIGH
1/12/93	1.92	1.68	1.47	1.72	TRUE	1.111	0.81	0.57	0.36	0.61	HIGH
8/20/93	1.87	1.68	1.51	1.72	TRUE	1.298	0.57	0.38	0.21	0.42	HIGH
1/13/94	1.84	1.68	1.53	1.72	TRUE	1.417	0.42	0.26	0.11	0.30	HIGH
7/21/94	1.82	1.68	1.54	1.72	TRUE	1.533	0.29	0.15	0.01	0.19	HIGH
6/23/95	1.82	1.68	1.55	1.72	TRUE	1.720	0.10	-0.04	-0.17	0.00	HIGH
				%TRUE	100%					% HIGH	100%
				%FALSE	0%					% LOW	0%

TX 4											
Pressure gauge only											
Date	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
7/20/92	3.17	1.69	0.99	1.72	TRUE	0.882	2.29	0.81	0.11	0.84	HIGH
8/20/93	2.03	1.69	1.41	1.72	TRUE	1.298	0.73	0.39	0.11	0.42	HIGH
7/21/94	1.91	1.69	1.49	1.72	TRUE	1.533	0.38	0.16	-0.04	0.19	HIGH
6/23/95	1.85	1.69	1.54	1.72	TRUE	1.720	0.13	-0.03	-0.18	0.00	HIGH
				%TRUE	100%					% HIGH	100%
				%FALSE	0%					% LOW	0%

TX 4											
C&S data only											
Date	EUR			AUR	Logic	CUM	ERR			ARR	BIAS
	P10	P50	P90				P10	P50	P90		
12/19/91	2.95	1.47	0.85	1.72	TRUE	0.660	2.290	0.810	0.190	1.060	HIGH
1/12/93	1.86	1.56	1.3	1.72	TRUE	1.111	0.749	0.449	0.189	0.609	HIGH
1/13/94	1.88	1.66	1.47	1.72	TRUE	1.417	0.463	0.243	0.053	0.303	HIGH
				%TRUE	100%					% HIGH	100%
				%FALSE	0%					% LOW	0%

Table C-1.2 (Continued)

TX 5

Date	All data			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM	P10	P50	P90		
4/24/77	10.230	5.830	1.420	5.830	TRUE	1.403	8.827	4.427	0.017	4.427	LOW
1/19/78	7.520	5.830	3.930	5.830	TRUE	1.706	5.814	4.124	2.224	4.124	LOW
12/12/78	7.320	5.830	4.890	5.830	TRUE	2.016	5.304	3.814	2.874	3.814	LOW
7/19/79	6.710	5.830	5.320	5.830	TRUE	2.538	4.172	3.292	2.782	3.292	LOW
7/4/80	6.450	5.830	5.320	5.830	TRUE	2.823	3.627	3.007	2.497	3.007	LOW
1/28/81	6.340	5.830	5.400	5.830	TRUE	3.034	3.306	2.796	2.366	2.796	LOW
1/26/82	6.270	5.830	5.450	5.830	TRUE	3.116	3.154	2.714	2.334	2.714	LOW
1/1/83	6.290	5.920	5.490	5.830	TRUE	3.248	3.042	2.672	2.242	2.582	LOW
2/4/84	6.320	5.920	5.540	5.830	TRUE	3.489	2.831	2.431	2.051	2.341	LOW
5/1/85	6.280	5.920	5.580	5.830	TRUE	3.791	2.489	2.129	1.789	2.039	LOW
1/6/86	6.250	5.920	5.600	5.830	TRUE	3.833	2.417	2.087	1.767	1.997	LOW
12/19/86	6.260	5.920	5.590	5.830	TRUE	4.112	2.148	1.808	1.478	1.718	LOW
7/14/87	6.240	5.920	5.610	5.830	TRUE	4.315	1.925	1.605	1.295	1.515	LOW
1/7/88	6.230	5.920	5.620	5.830	TRUE	4.442	1.788	1.478	1.178	1.388	LOW
1/16/89	6.230	5.920	5.610	5.830	TRUE	4.613	1.617	1.307	0.997	1.217	LOW
2/5/90	6.220	5.920	5.630	5.830	TRUE	4.767	1.453	1.153	0.863	1.063	LOW
6/22/90	6.210	5.920	5.630	5.830	TRUE	4.877	1.333	1.043	0.753	0.953	LOW
12/6/90	6.200	5.920	5.640	5.830	TRUE	5.100	1.100	0.820	0.540	0.730	LOW
6/18/91	6.200	5.920	5.640	5.830	TRUE	5.211	0.989	0.709	0.429	0.619	LOW
1/16/92	6.190	5.920	5.650	5.830	TRUE	5.334	0.856	0.586	0.316	0.496	LOW
6/29/92	6.190	5.920	5.650	5.830	TRUE	5.483	0.707	0.437	0.167	0.347	LOW
1/20/93	6.180	5.920	5.660	5.830	TRUE	5.595	0.585	0.325	0.065	0.235	LOW
6/28/93	6.170	5.920	5.660	5.830	TRUE	5.674	0.496	0.246	-0.014	0.156	LOW
				%TRUE	100%					%HIGH	100%
				%FALSE	0%					%LOW	0%

Table C-1.2 (Continued)

TX 5 Pressure gauge only											
Date	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM.	P10	P50	P90		
1/19/78	4.650	3.050	2.180	5.830	FALSE	1.137	4.650	3.050	2.180	5.830	HIGH
7/6/78	3.460	3.060	2.730	5.830	FALSE	1.183	3.460	3.060	2.730	5.830	HIGH
12/24/79	4.650	3.960	3.440	5.830	FALSE	1.706	4.650	3.960	3.440	5.830	HIGH
7/4/80	6.130	4.990	4.210	5.830	TRUE	2.016	4.424	3.284	2.504	4.124	HIGH
1/28/81	5.670	4.990	4.450	5.830	FALSE	2.263	3.654	2.974	2.434	3.814	HIGH
7/25/81	5.470	4.900	4.580	5.830	FALSE	2.538	3.207	2.637	2.317	3.567	HIGH
7/2/83	6.390	5.710	5.150	5.830	TRUE	3.248	3.852	3.172	2.612	3.292	HIGH
7/20/84	6.210	5.750	5.260	5.830	TRUE	3.670	2.962	2.502	2.012	2.582	HIGH
5/1/85	6.150	5.740	5.260	5.830	TRUE	3.833	2.480	2.070	1.590	2.160	HIGH
7/18/86	6.100	5.750	5.300	5.830	TRUE	4.002	2.267	1.917	1.467	1.997	HIGH
12/19/86	6.060	5.710	5.370	5.830	TRUE	4.112	2.058	1.708	1.368	1.828	HIGH
7/14/87	6.040	5.710	5.390	5.830	TRUE	4.315	1.928	1.598	1.278	1.718	HIGH
7/11/88	6.010	5.710	5.410	5.830	TRUE	4.613	1.695	1.395	1.095	1.515	HIGH
7/16/89	6.090	5.790	5.500	5.830	TRUE	4.877	1.477	1.177	0.887	1.217	HIGH
6/22/90	6.080	5.790	5.510	5.830	TRUE	5.100	1.203	0.913	0.633	0.953	HIGH
6/18/91	6.080	5.810	5.540	5.830	TRUE	5.334	0.980	0.710	0.440	0.730	HIGH
6/29/92	6.070	5.810	5.550	5.830	TRUE	5.483	0.736	0.476	0.216	0.496	HIGH
6/28/93	6.060	5.810	5.560	5.830	TRUE	5.674	0.577	0.327	0.077	0.347	HIGH
6/10/94	6.070	5.830	5.590	5.830	TRUE	5.830	0.396	0.156	-0.084	0.156	LOW
				%TRUE	74%					%HIGH	95%
				%FALSE	26%					%LOW	5%

TX 5 C&S data only											
Date	EUR			High pressure method			ERR			ARR	BIAS
	P10	P50	P90	AUR	Logic	CUM.	P10	P50	P90		
1/26/82	5.92	5.35	4.88	5.83	TRUE	2.823	3.097	2.527	2.057	3.007	HIGH
7/16/82	5.79	5.48	5.19	5.83	FALSE	3.034	2.756	2.446	2.156	2.796	HIGH
2/4/84	5.86	5.82	5.39	5.83	TRUE	3.489	2.371	2.331	1.901	2.341	HIGH
12/12/84	6.07	5.82	5.58	5.83	TRUE	3.791	2.279	2.029	1.789	2.039	HIGH
1/7/88	6.09	5.82	5.56	5.83	TRUE	4.442	1.648	1.378	1.118	1.388	HIGH
1/16/89	6.05	5.82	5.6	5.83	TRUE	4.767	1.283	1.053	0.833	1.063	HIGH
2/5/90	6.03	5.82	5.61	5.83	TRUE	5.007	1.023	0.813	0.603	0.823	HIGH
12/6/90	6.01	5.82	5.63	5.83	TRUE	5.211	0.799	0.609	0.419	0.619	HIGH
1/16/92	6	5.82	5.64	5.83	TRUE	5.456	0.544	0.364	0.184	0.374	HIGH
1/20/93	5.98	5.82	5.65	5.83	TRUE	5.595	0.385	0.225	0.055	0.235	HIGH
1/18/94	5.99	5.82	5.65	5.83	TRUE	5.767	0.223	0.053	-0.117	0.063	HIGH
				%TRUE	91%						100%
				%FALSE	9%						0%

## APPENDIX C-2

The following pages presents the accuracy ratio plots for the Texas Field from the Least Square method and the empirical High Pressure method.

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Table C-2.1 The accuracy ratio plots for Texas Field wells from the High pressure method

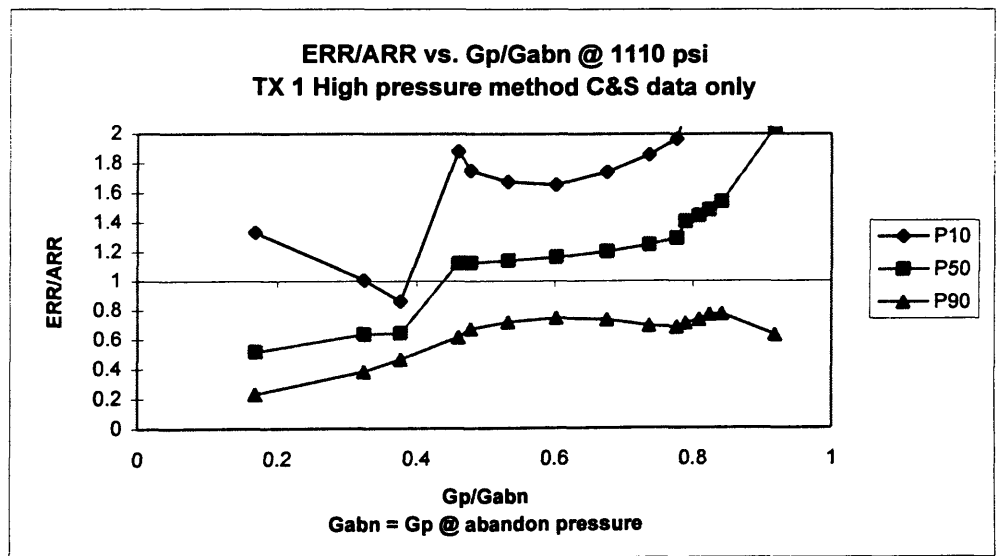
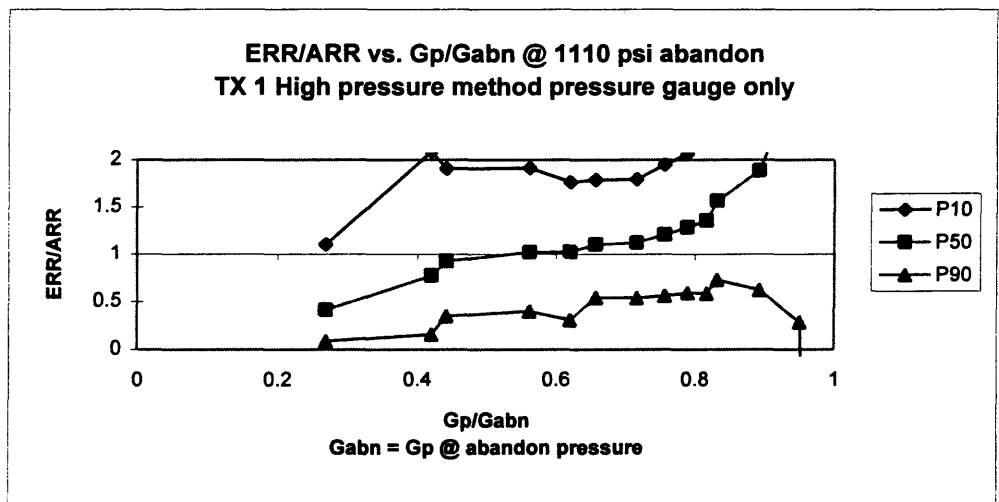
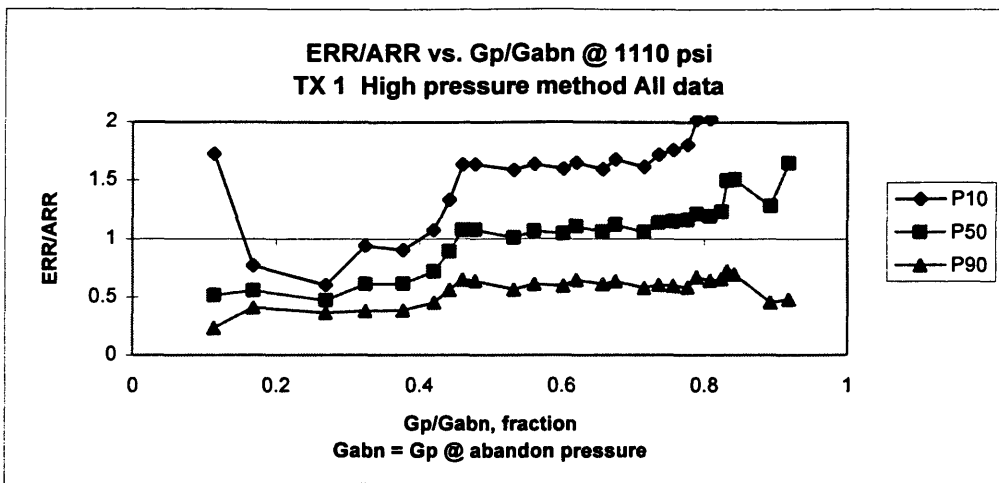


Table C-2.1 (Continued)

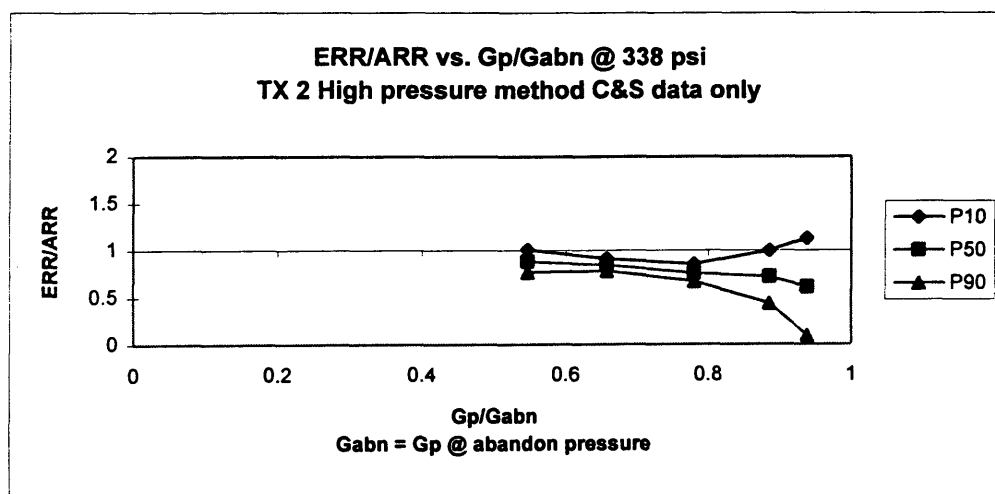
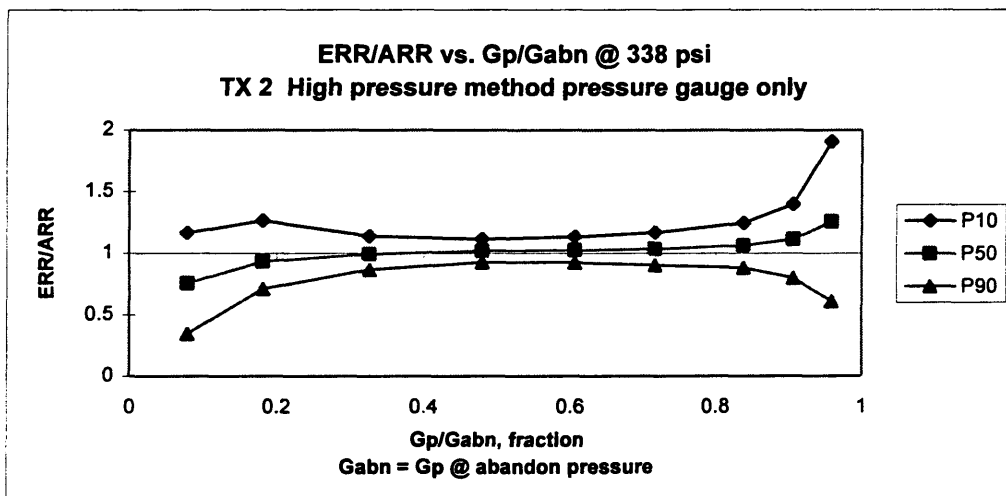
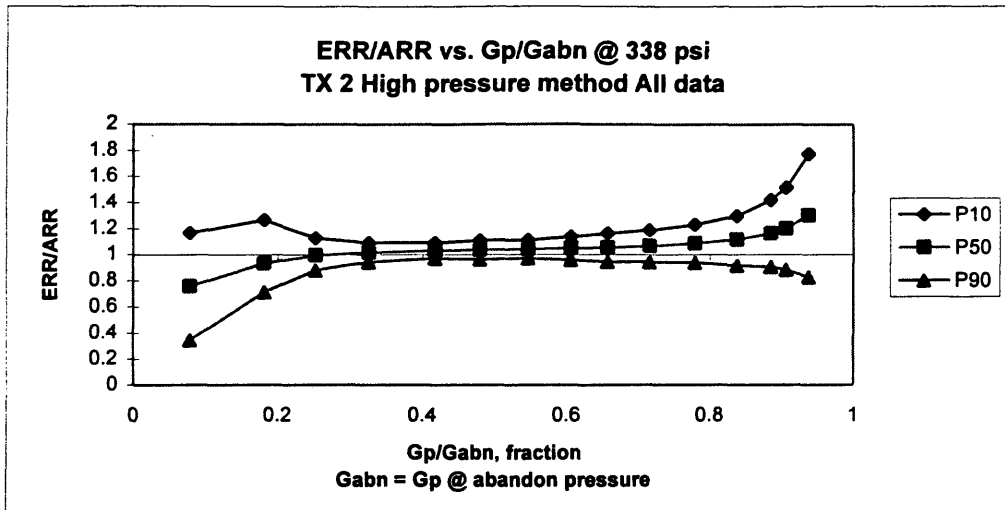


Table C-2.1 (Continued)

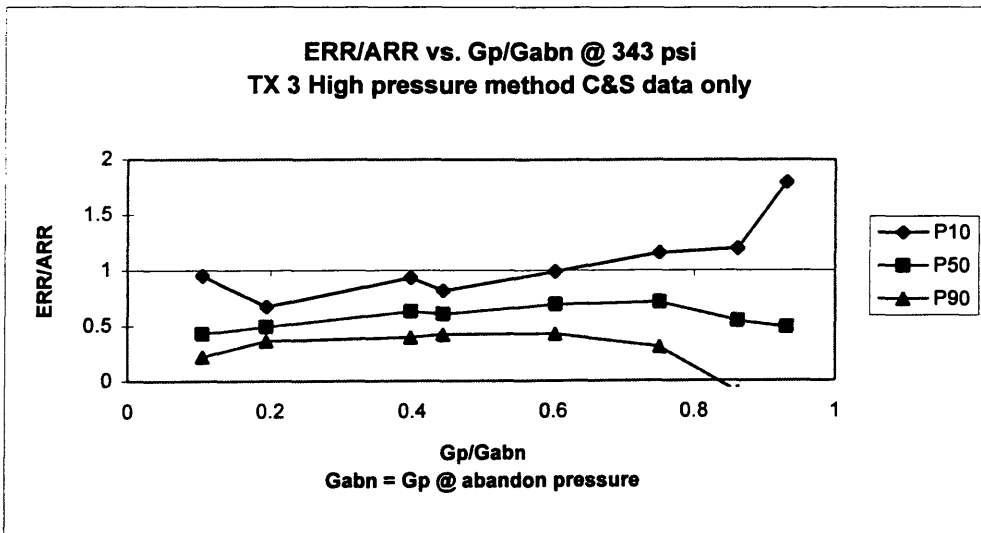
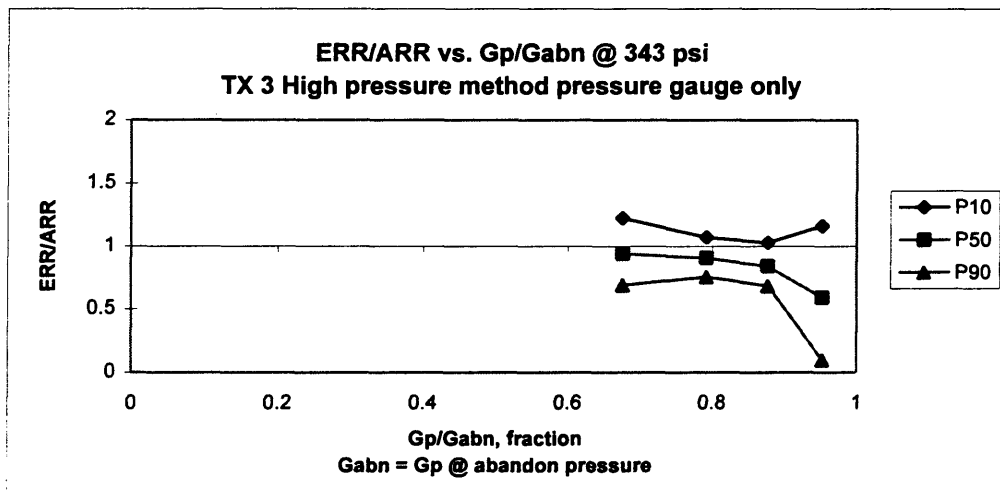
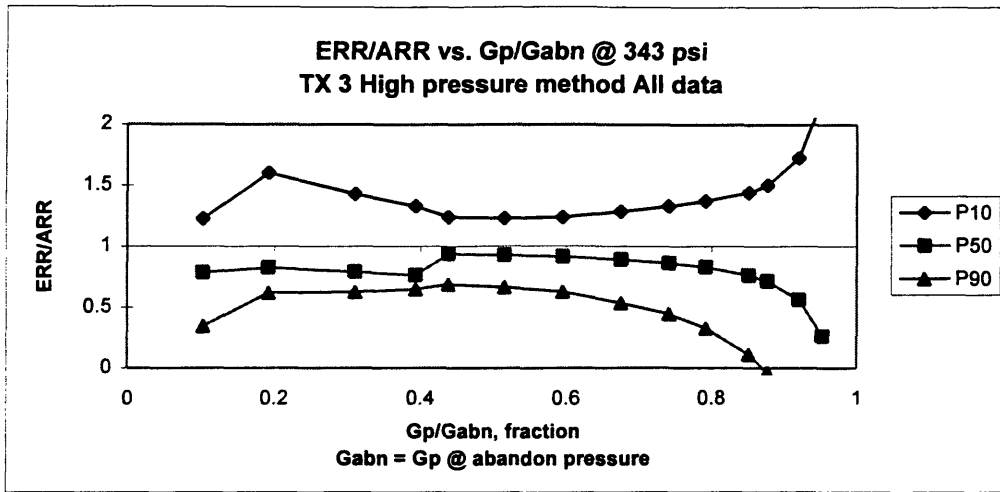


Table C-2.1 (Continued)

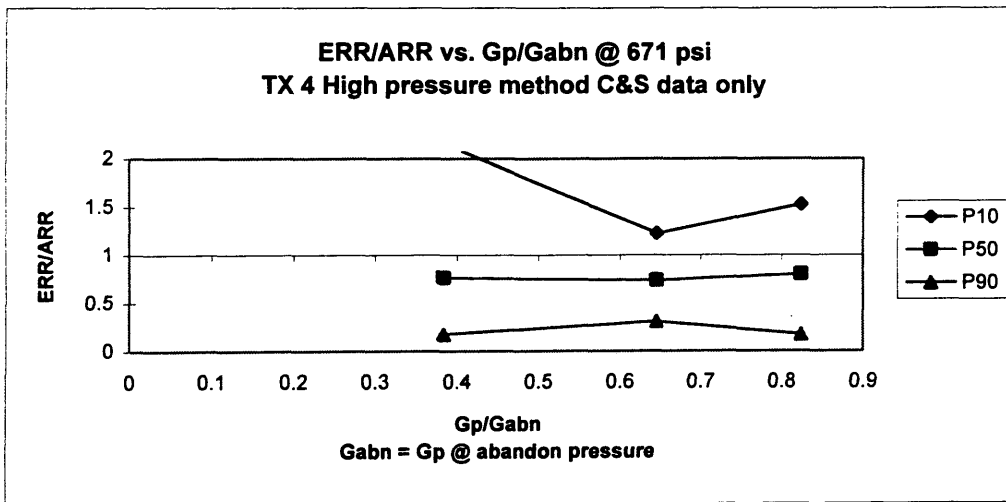
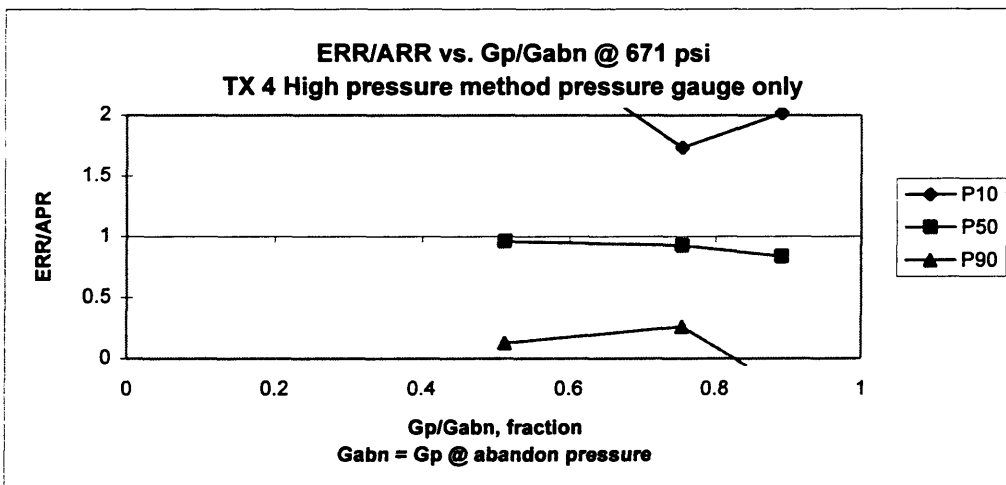
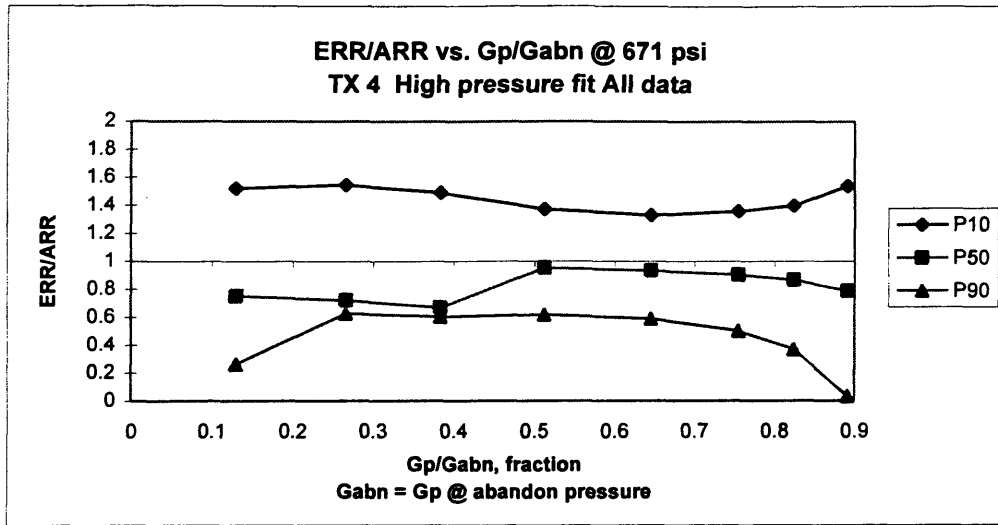


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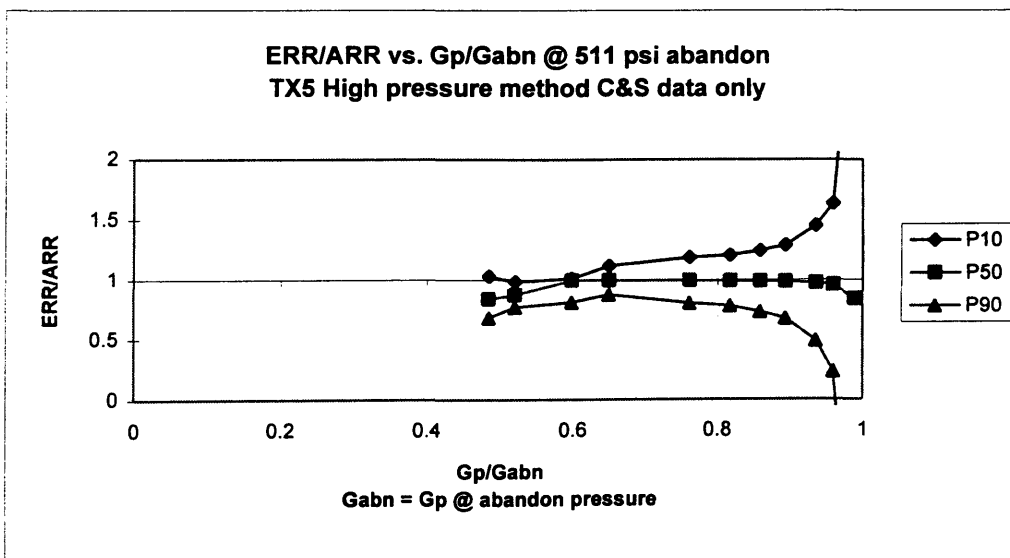
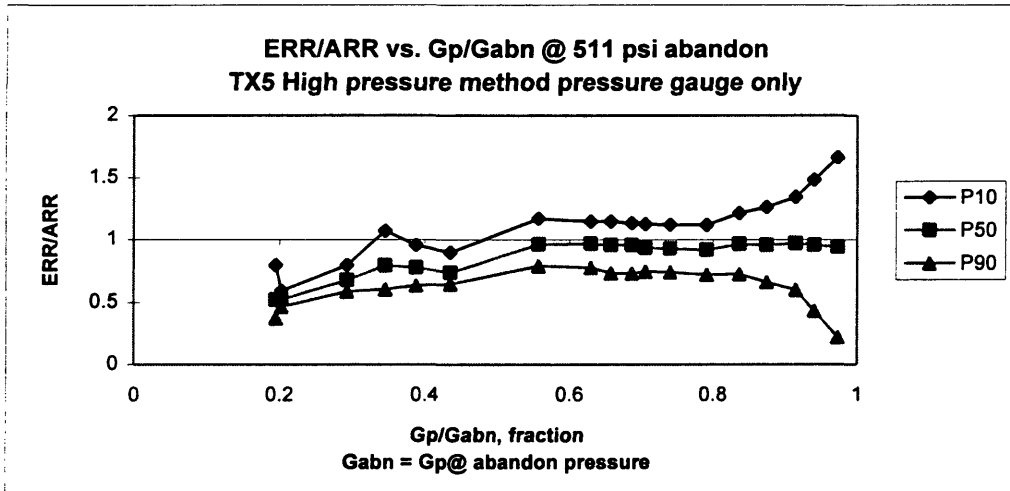
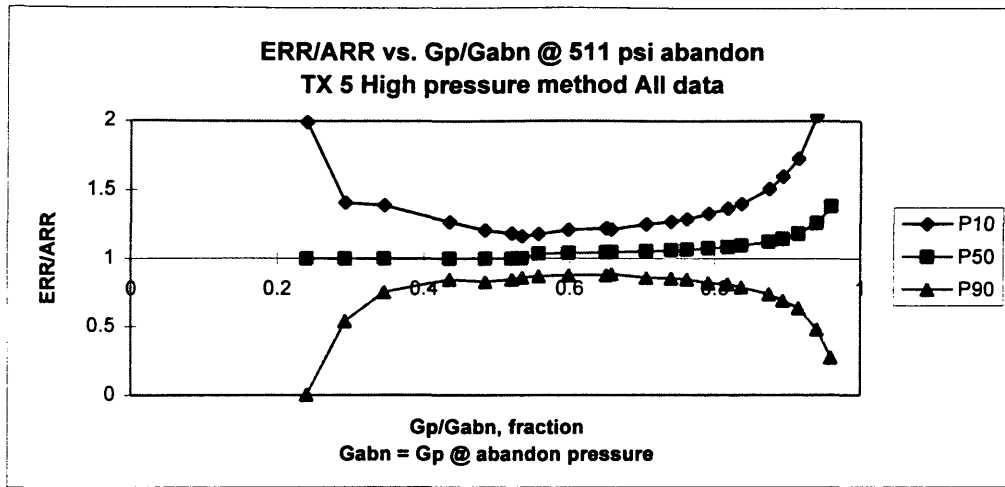


Table C-2.2 The accuracy ratio plots for Texas Field wells from the Least Square method

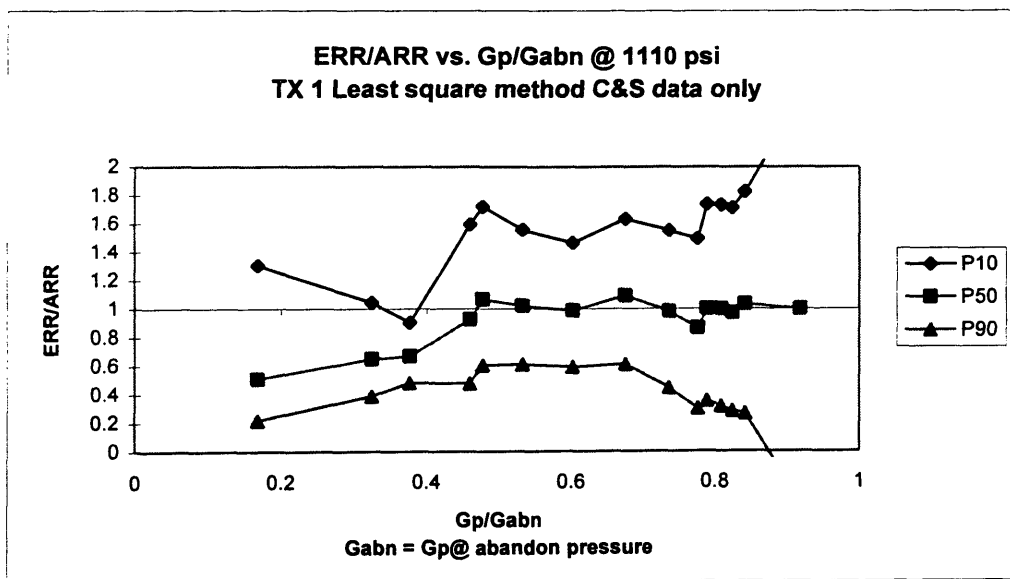
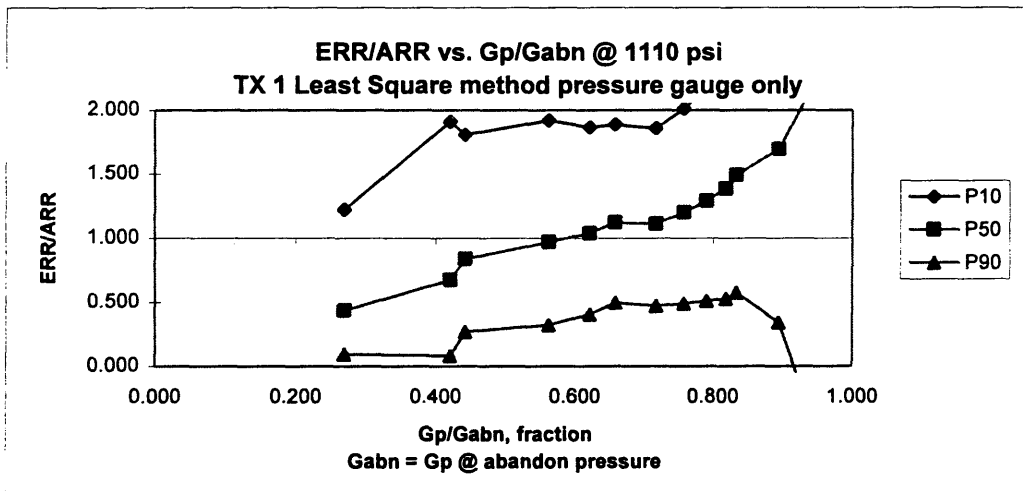
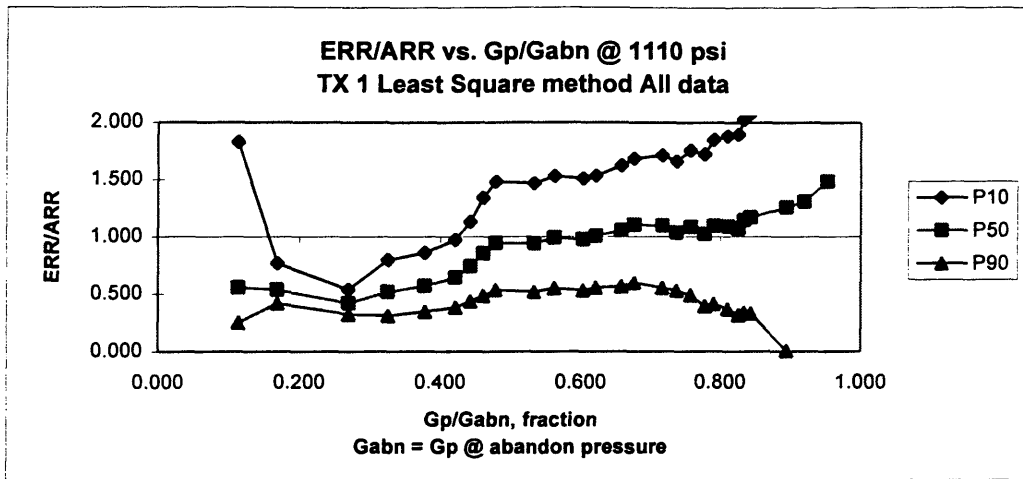


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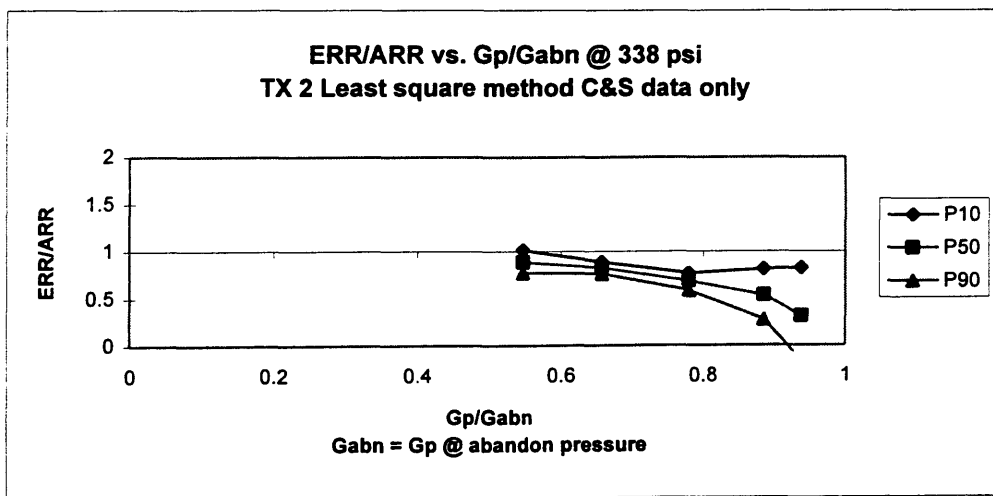
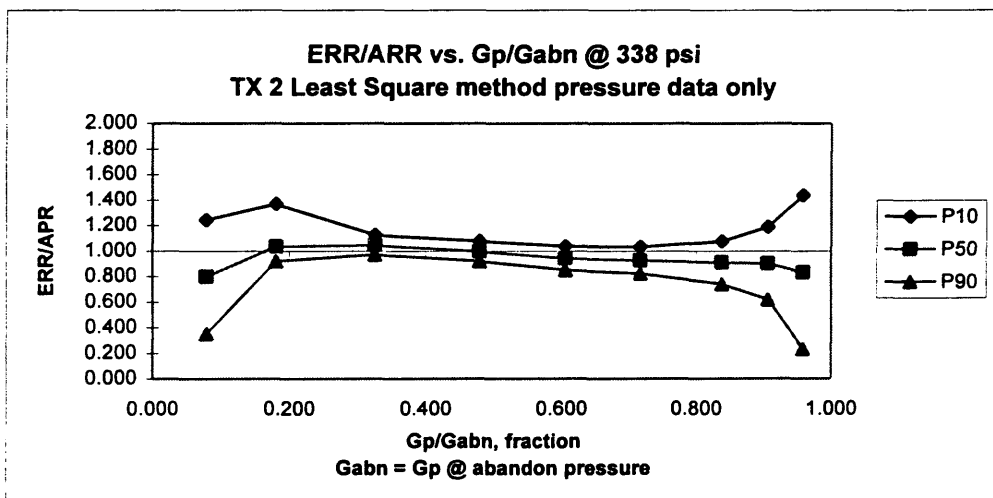
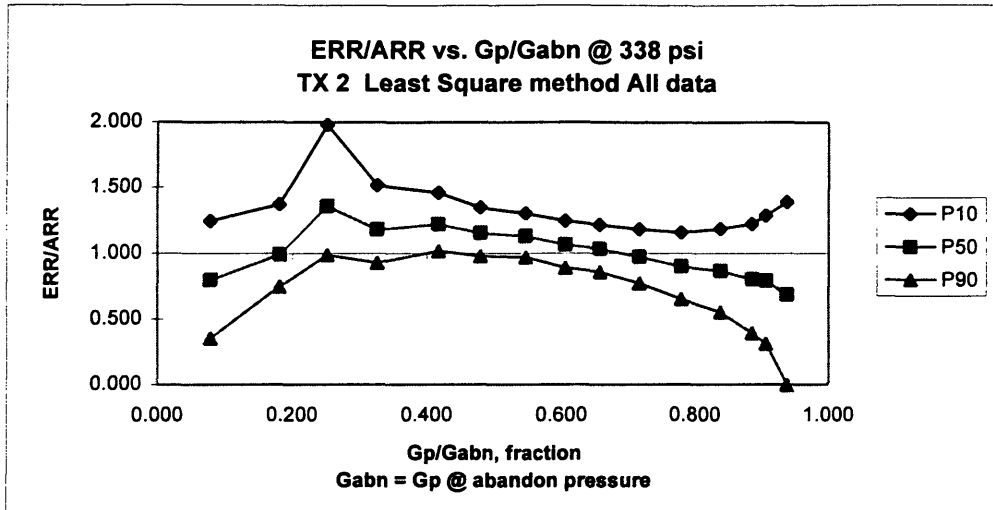


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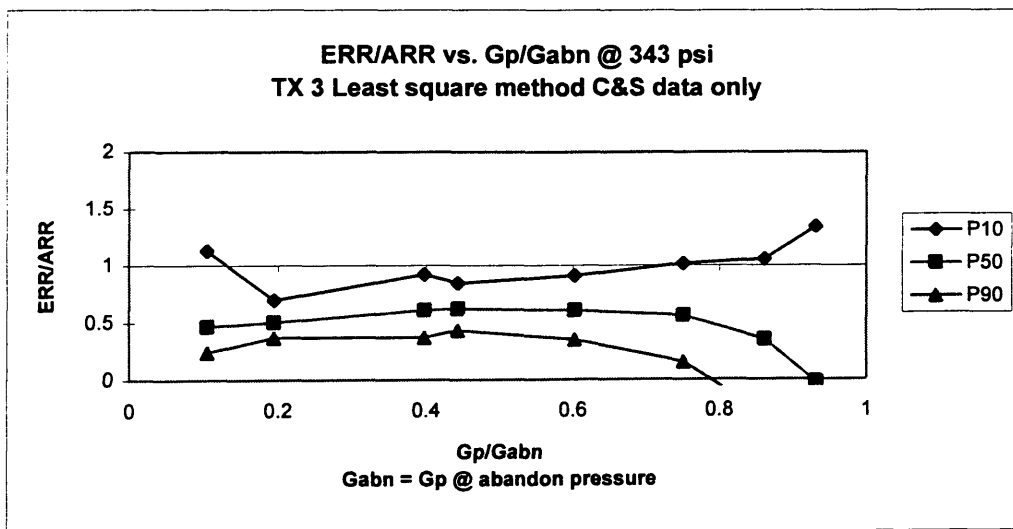
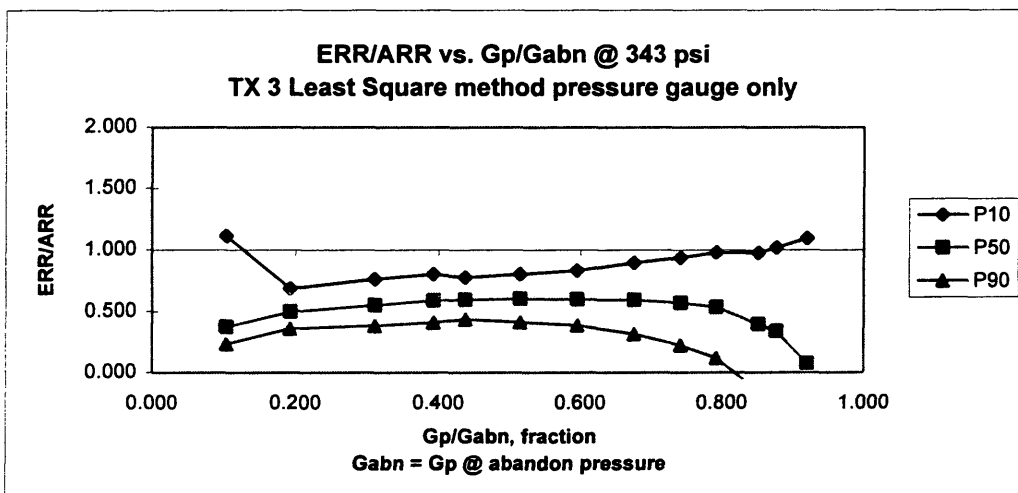
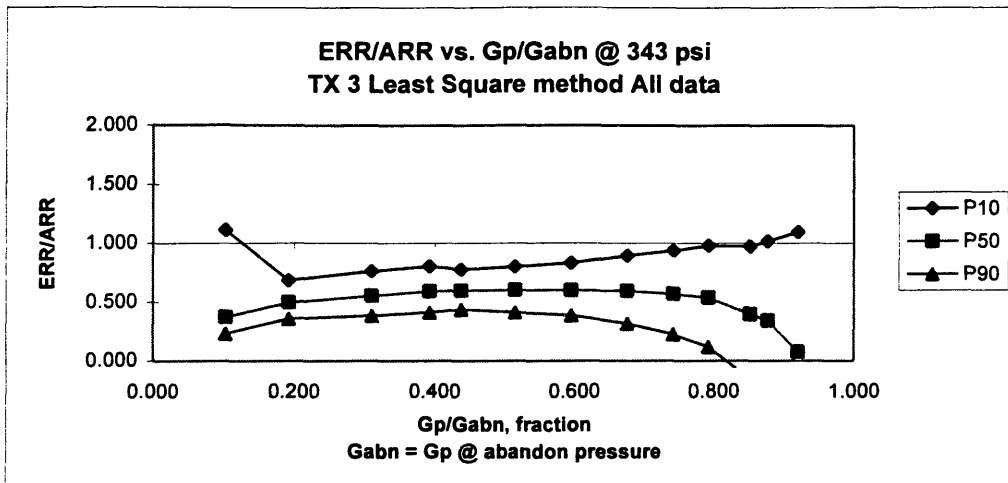


Table C-2.2 (Continued)

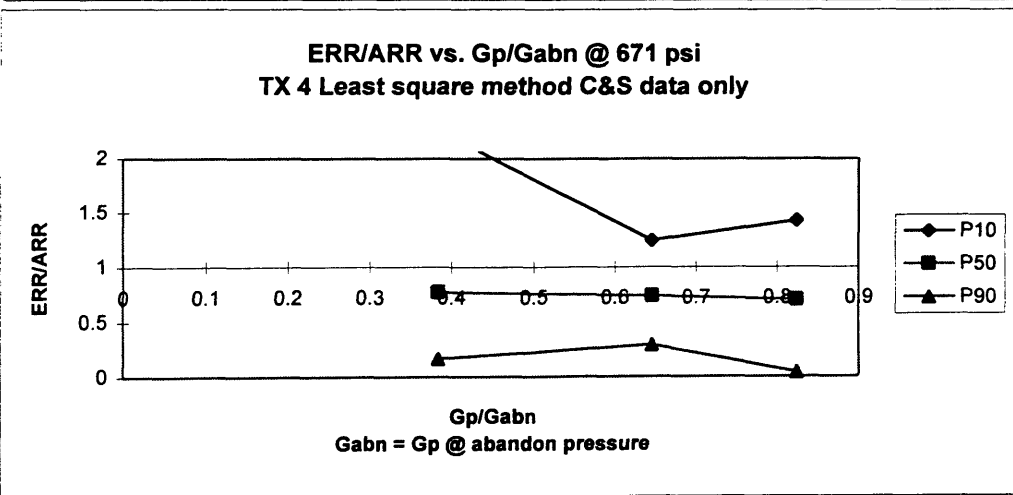
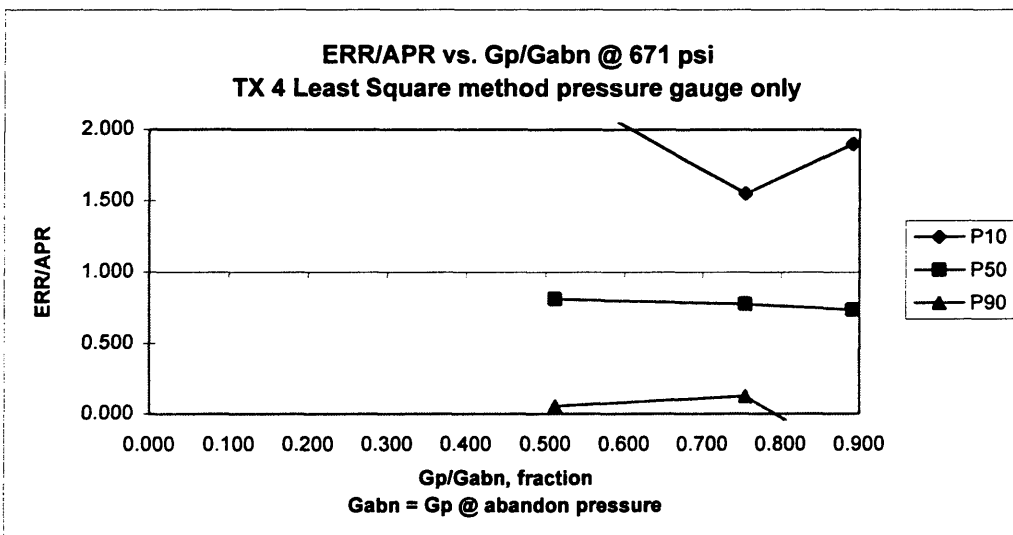
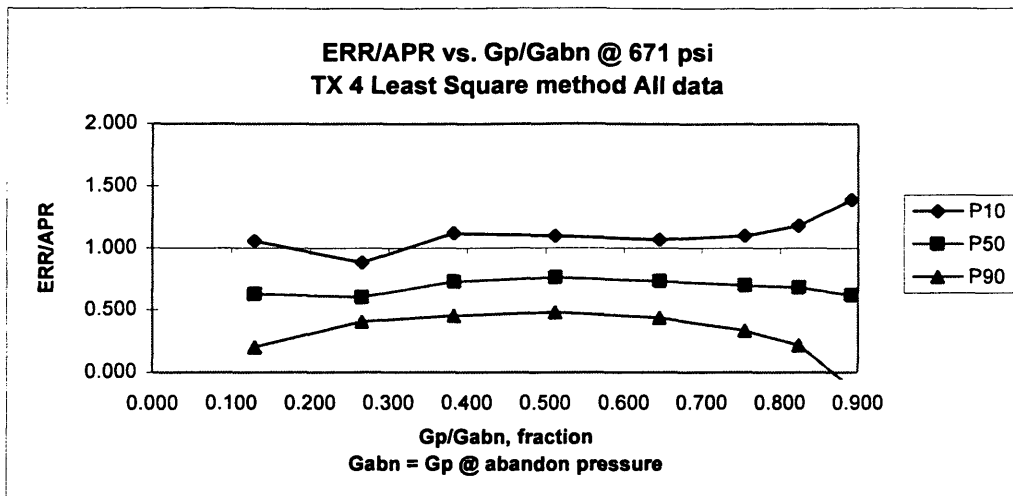
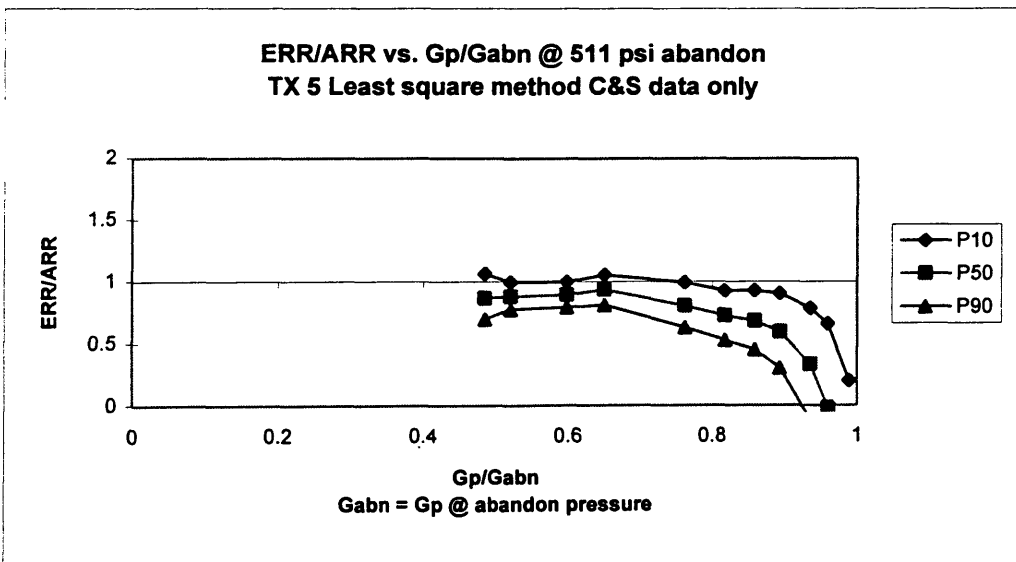
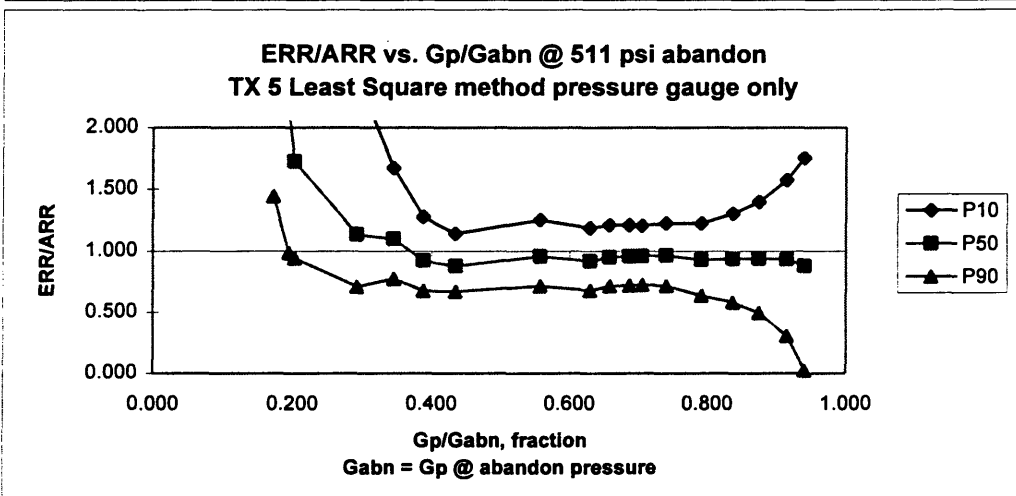
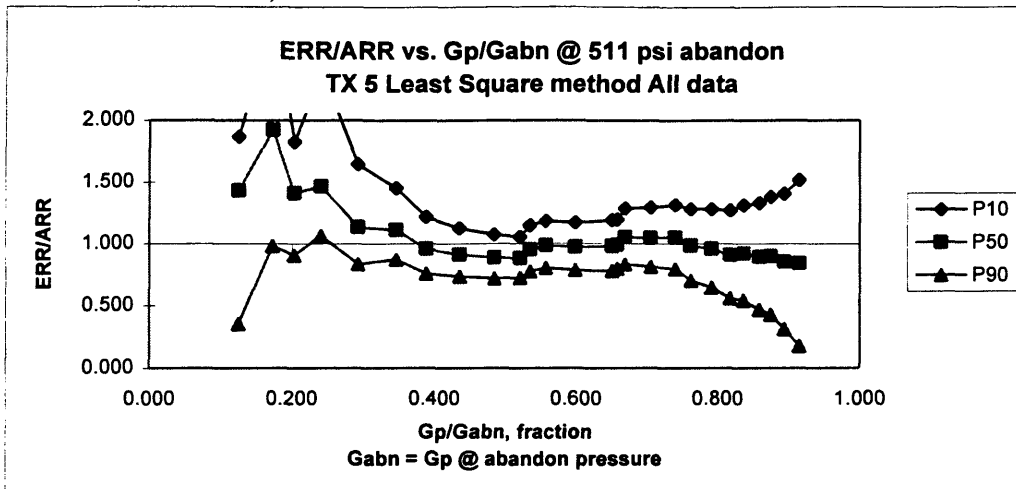


Table C-2.2 (Continued)



### APPENDIX C-3

The following pages present the residual plots for wells in the Texas Field from the Least Square method.

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Well TX1 residual plots .....	198
Well TX2 residual plots .....	199
Well TX3 residual plots .....	200
Well TX4 residual plots .....	201
Well TX5 residual plots .....	202

Table C-3. Residual Plots for Texas wells

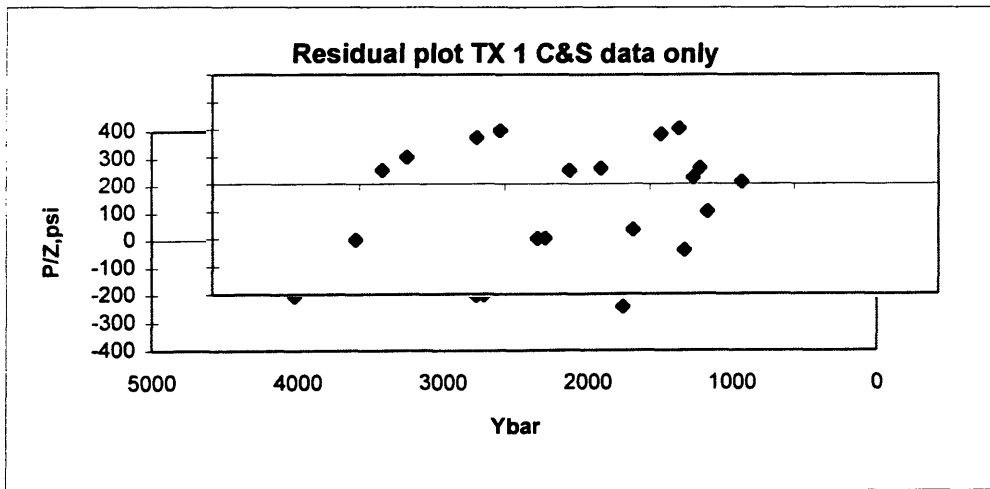
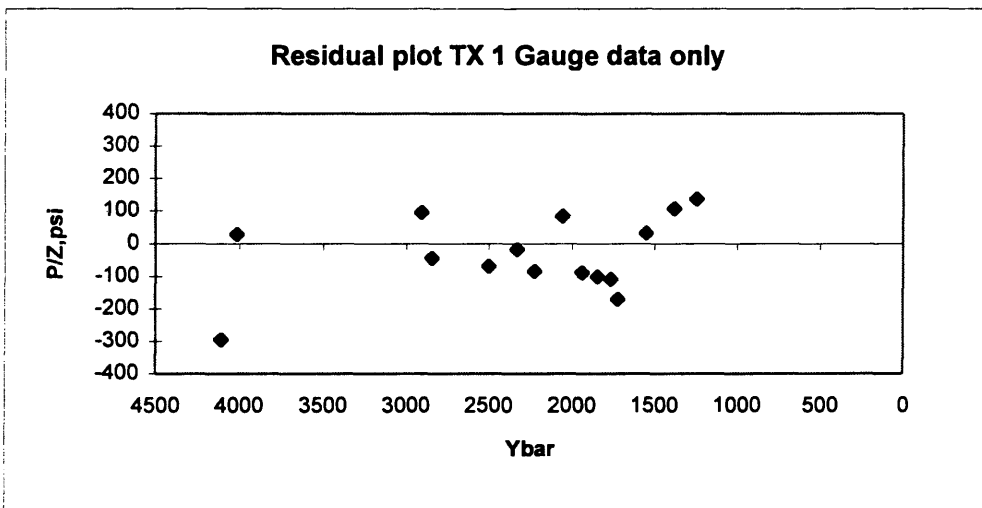
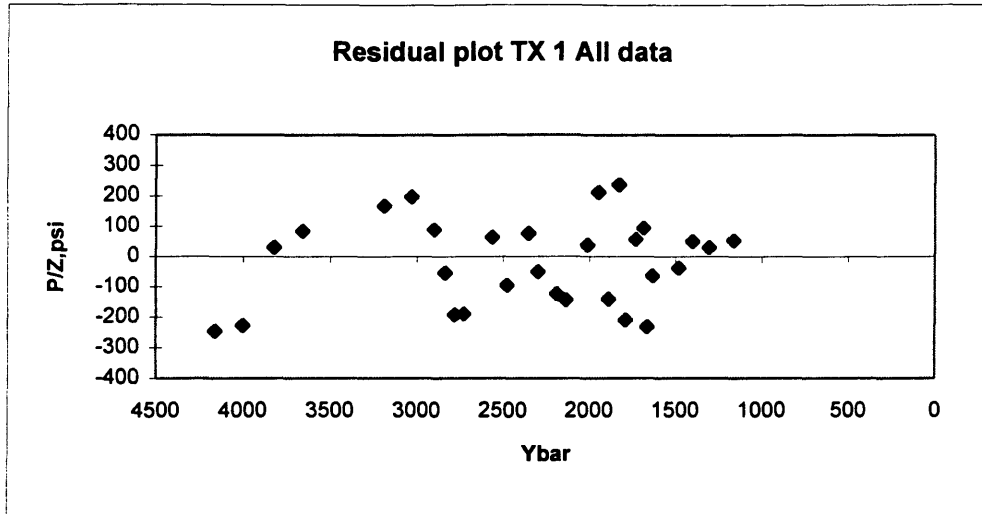


Table C.3 (Continued)

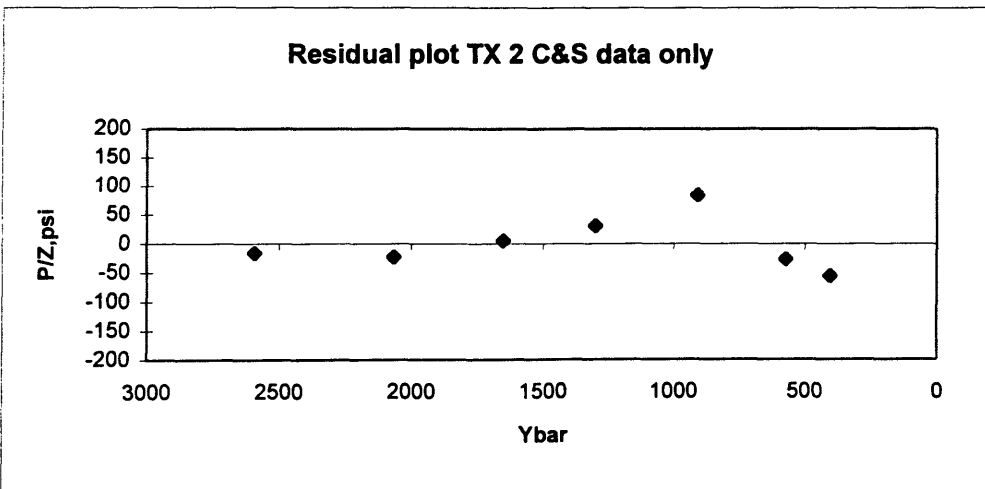
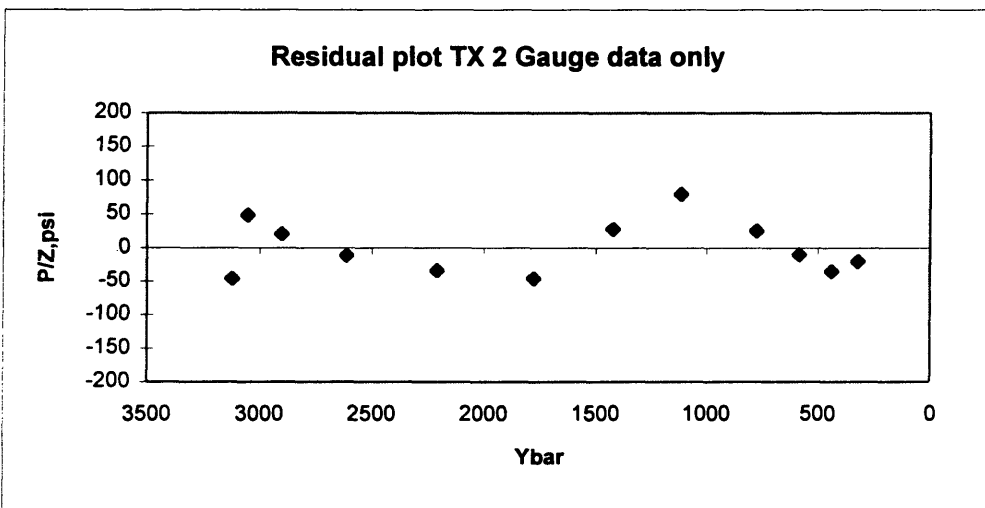
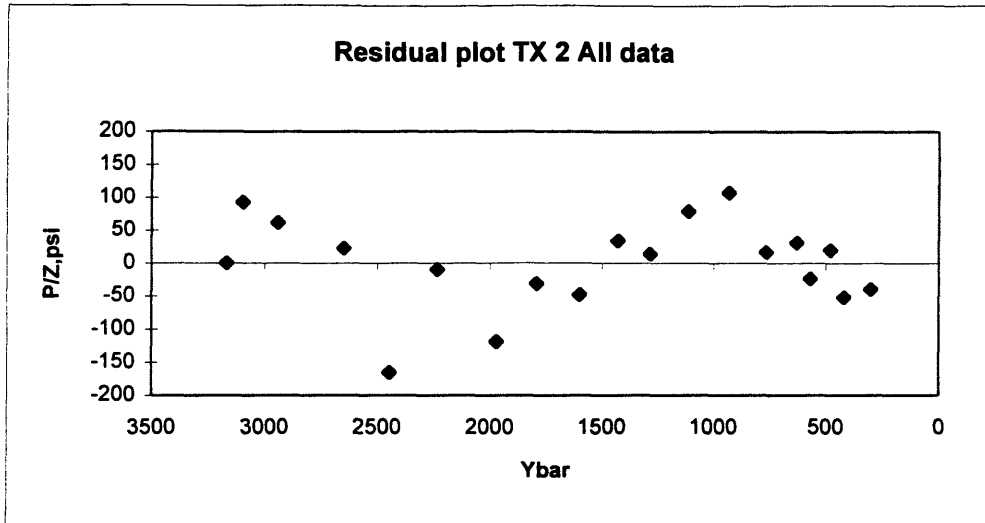


Table C.3 (Continued)

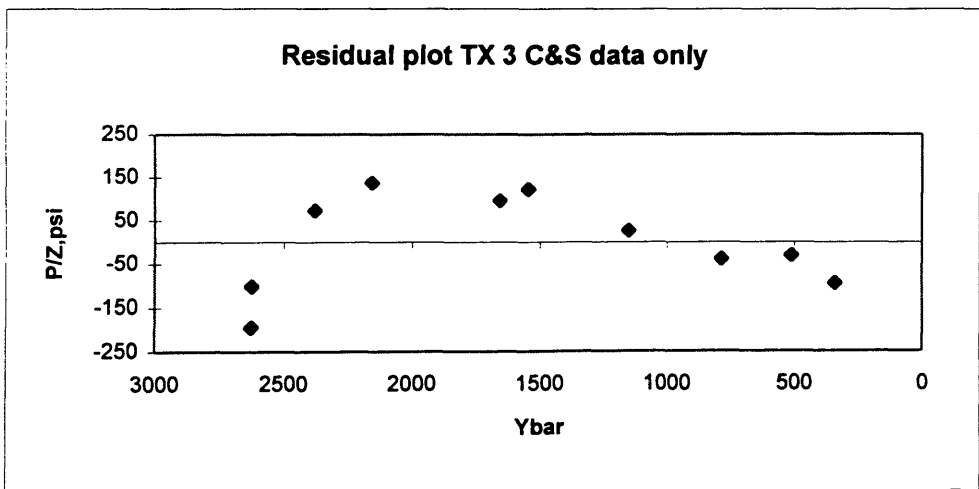
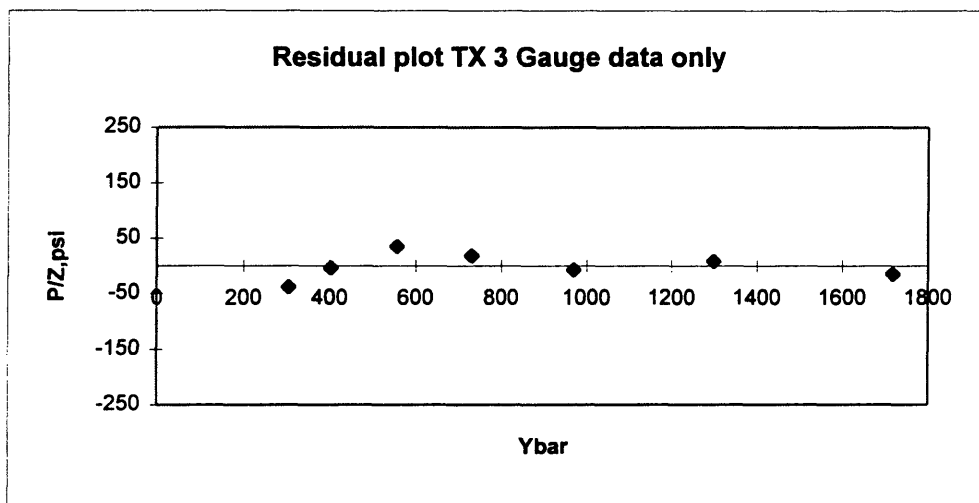
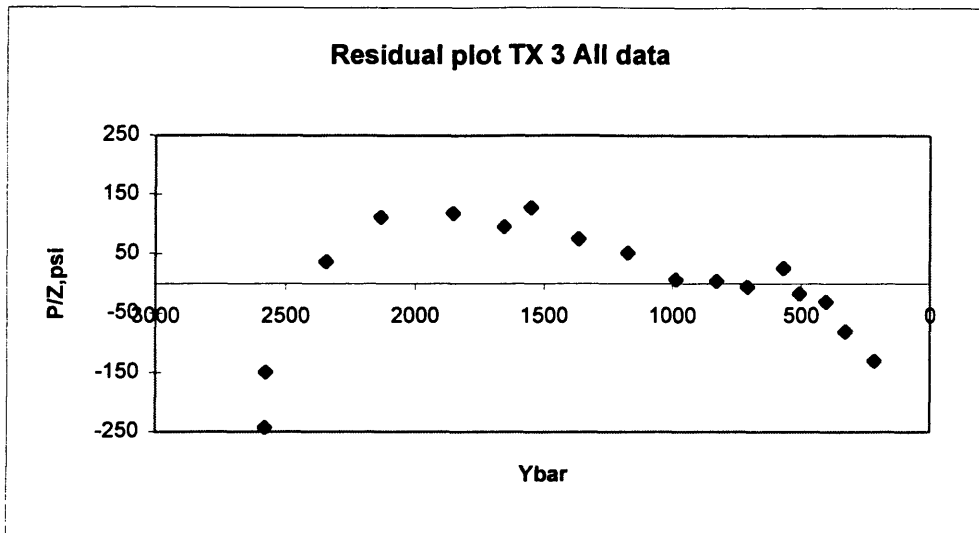


Table C.3 (Continued)

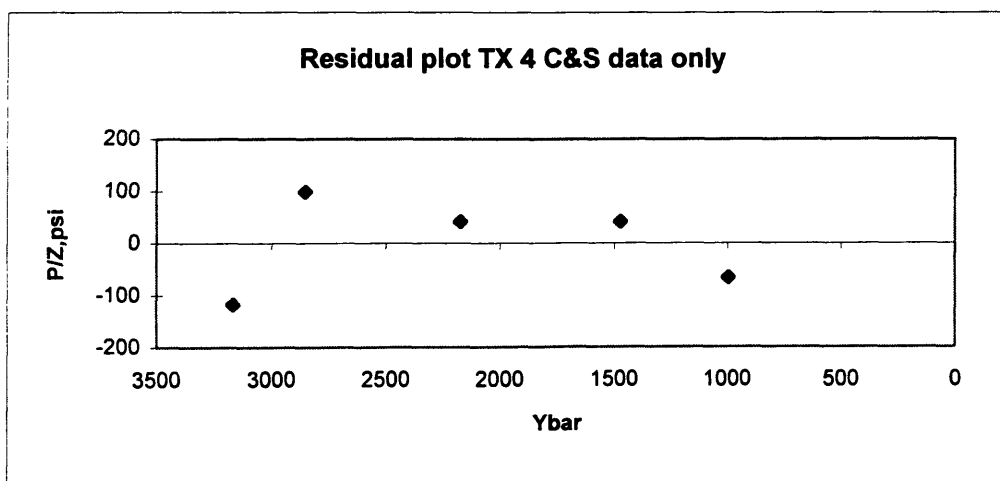
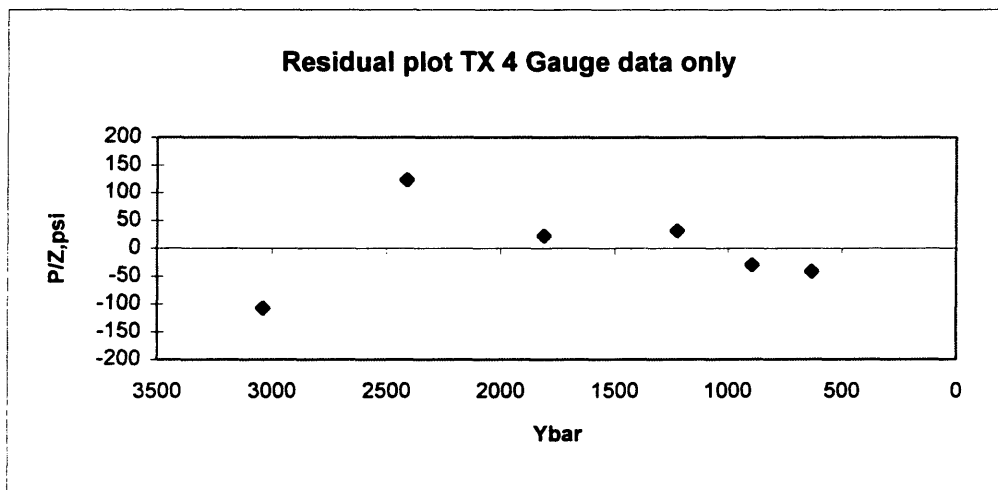
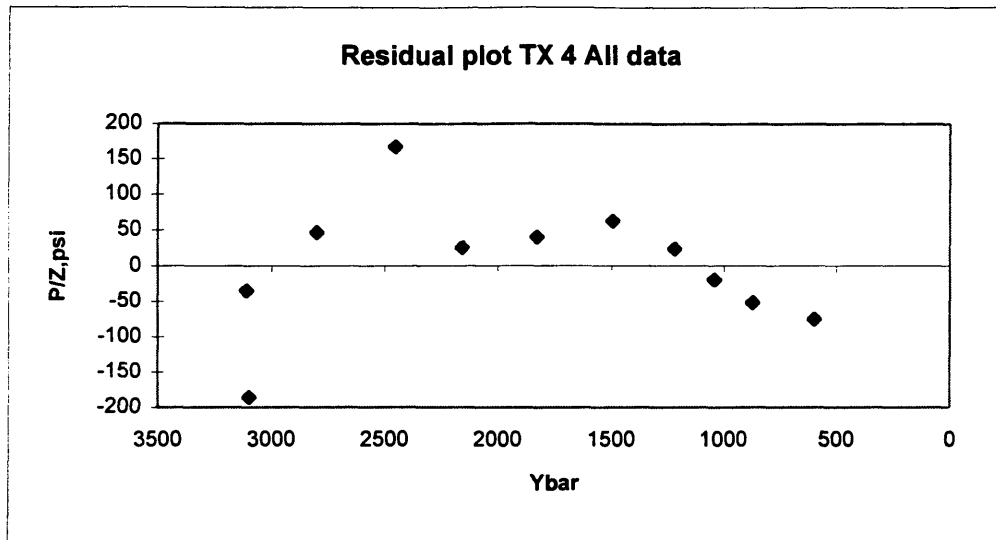


Table C.3 (Continued)

