A STUDY OF HILLJE AND SOUTH HILLJE OIL FIELDS, WHARTON COUNTY, TEXAS

A Thesis

Presented to

Graduate Council of the

University of Houston

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

by

Kenneth L. Parker

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FOREWORD

Appreciation is extended to the following persons for their assistance in obtaining data used in this report and for their advice and criticism of the text; Mr. E. J. Baragy, Mr. Herbert Von Ziff, Mr. Charles Sample, Mr. Joe N. Parks, and Mr. J. F. Freel.

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A STUDY OF HILLJE AND SOUTH HILLJE OIL FIELDS, WHARTON COUNTY, TEXAS

CHAPTER I

INTRODUCTION

Oil has been produced from the Hillje Field since September 10, 1939 when the Texas Company Number 1 Peters was completed for an initial production of fourteen barrels of oil per day. On March 23, 1945 the South Hillje Field was discovered with the successful completion of Sam G. Harrison's Number 1 Mauritz. These two fields, located in the so called "Golden Lane" of the Texas Gulf Coast, have produced a combined total of 1,561,322 barrels of oil, 5,547 barrels of condensate, and 1,433,807 thousand cubic feet of gas from the time of their discovery through 1947.

Hillje Field is situated six miles south of the Hillje Townsite in Wharton County, Texas. Producing wells are located in the following surveys; L. P. Ogden A-534, A-535, and A-539, Morris and Cummings A-276, and E. T. R. R. A-192. Approximately eight hundred and forty acres are productive.

South Hillje Field, also in Wharton County, is eight miles south of the Hillje Townsite and two miles south and slightly east of Hillje Field. Wells of the South Hillje

Field are located in the following surveys; Morris and Cummings A-277 and A-280 and L. L. Miller A-527 and A-529. Approximately five hundred and twenty acres are productive.

Geographic location of the Hillje area is shown in Plate 1.

The area surrounding these fields has been one of prolific oil production and new fields are still being found in the area. Hillje and South Hillje have geologic characteristics typical of these fields and those which may be expected to be found in the future. For this reason they were chosen for a detailed study.

Data from electric well logs, paleontological logs, and well completion cards were used in preparing the maps and text of this report. The data from the electric well logs and paleontological logs were used in drawing the structural contour maps, isopachous maps, and in preparing a type section of the area. Data from well completion cards were used in preparing the production history of the fields.

Electric well logs were obtained from all of the wells in the Hillje Field and from about half of the wells in the South Hillje Field. The major operator in South Hillje Field, Sam G. Harrison, has not yet released the logs from a number of his wells. Data on these wells were estimated. Paleontological logs were obtained on only a few wells but these are considered to be representative of the

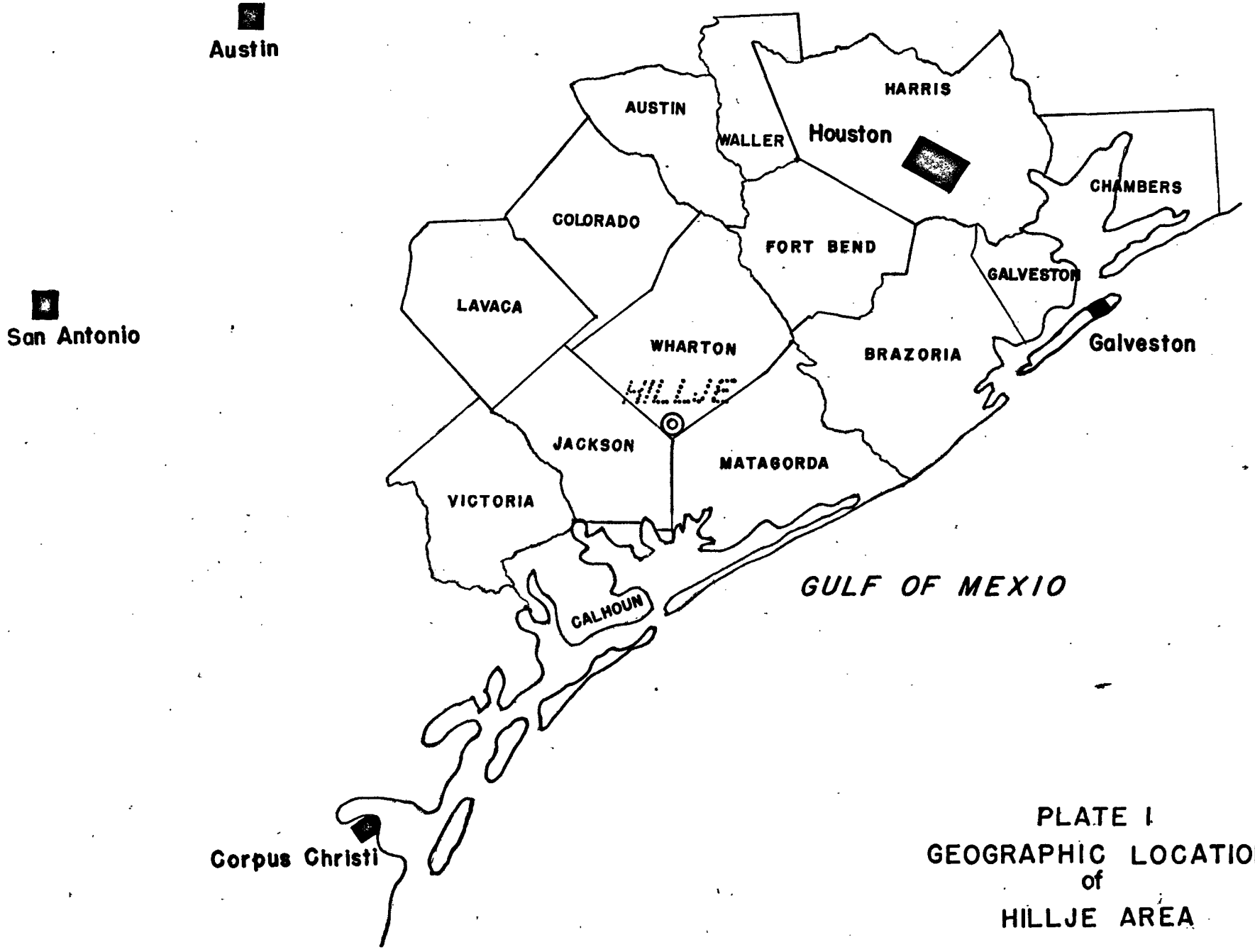

PLATE I
GEOGRAPHIC LOCATION
of
HILLJE AREA

area. Completion cards were obtained on all except a few wells.

A compilation of the data taken from the electric well logs and well completion cards is shown in Charts I and II.

CHAPTER II

TOPOGRAPHY AND PHYSIOGRAPHY

The Hillje area lies on the Beaumont Plain in the Post-Fleming of the Texas Gulf Coast.

> The Post-Fleming area is shown to be divided into four units - Recent, Beaumont, Lissie, and Willis - each of which is represented by a formation and a physiographic division. The Recent deposits occupy the river valleys and occur along the coast line as beach and delta deposits. The Beaumont formation covers the Beaumont Plain, the Lissie formation covers the Lissie Plain, and the Willis formation holds up the ridges of the hilly, cuesta-like belt between the Lissie and Fleming areas.[1]

The Goliad formation, belonging to the Willis division of the Post-Fleming area as referred to by Doering[2], is exposed by a cut in the Lavaca River approximately thirty miles northwest of the Hillje area. The Lagerto Formation (Fleming Group) outcrops in Lavaca County, approximately forty miles northwest of the Hillje area. Plate II, "Topography and Areal Geology of Hillje Area", is a compilation of data taken from the United States Geologic Survey topographic map and the United States Geologic Survey map of Texas.

The Beaumont Plain is a young, depositional plain with very little relief. It has a regional slope of about

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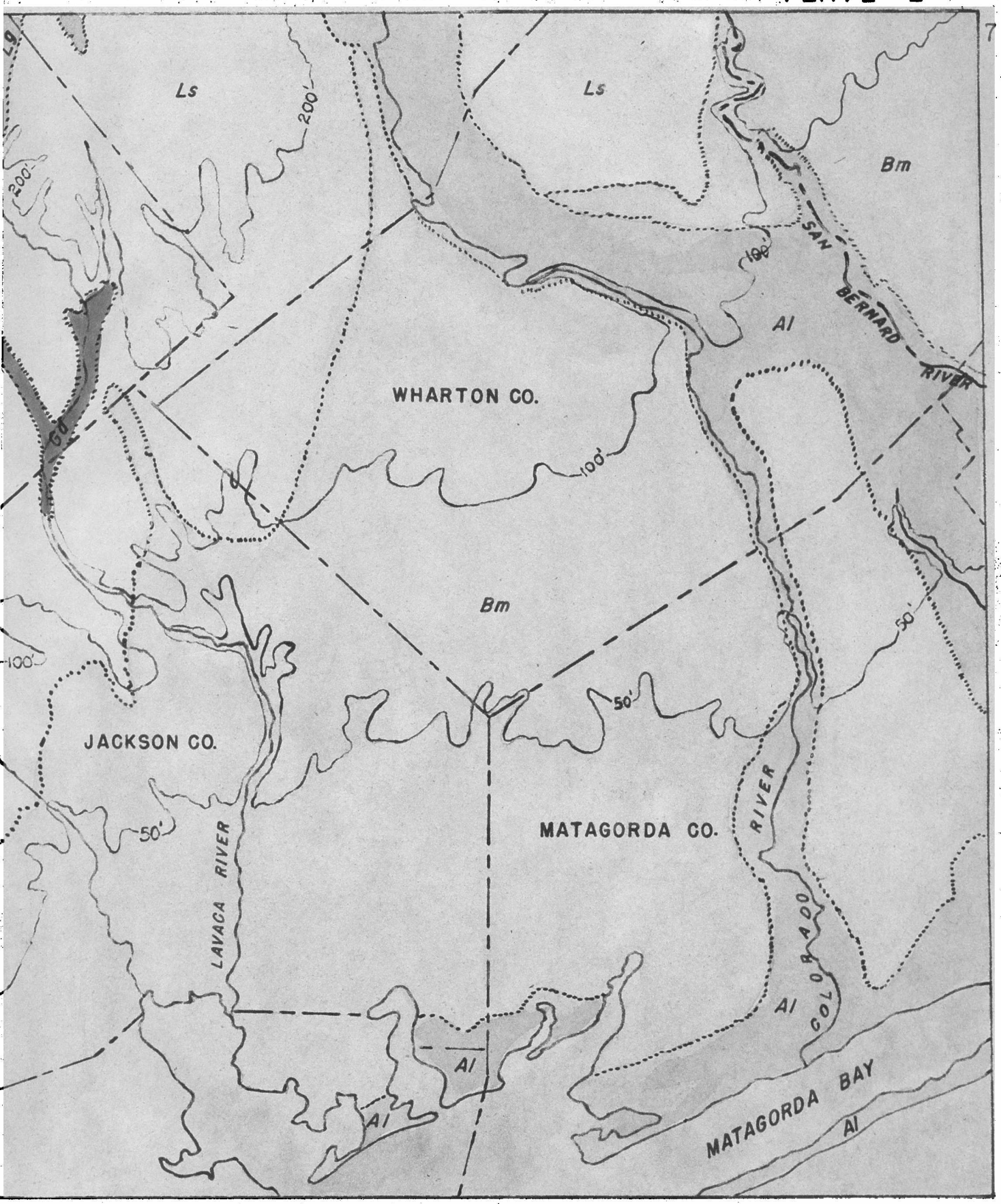
[1] Doering, John, "Post-Fleming Outcrops of the Texas Gulf Coast", Bulletin of American Association of Petroleum Geologists, Volume 19, Number 5, May 1935, pp. 651-88.

[2] Ibid., p. 5.

two feet per mile, and in the Hillje area this slope is to the southeast. The plain is dissected by consequent streams and elevations in the Hillje and South Hillje fields vary between sixty and eighty-five feet.

The Beaumont formation is a dark clay containing some sandy lenses. The vegetation of the Hillje area is typical of that found on the Beaumont Plain.

PLATE 2



TOPOGRAPHY AND AREAL GEOLOGY OF HILLJE AREA

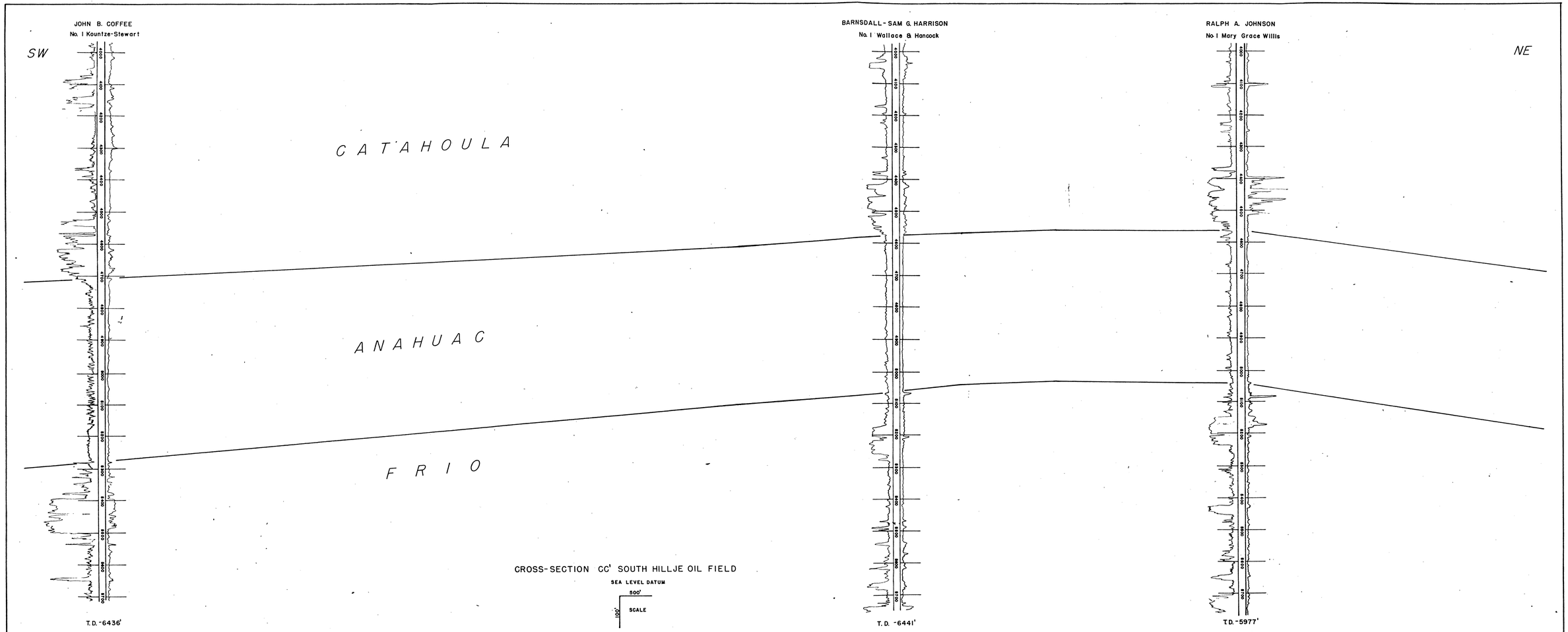
KEY: Al ALLUVIUM Bm BEAUMONT Ls LISSIE Go GOLIAD Lg LAGARTO

CHAPTER III

STRATIGRAPHY

No subsurface differentiation has been made in the unconsolidated sands and clays of the Recent, Beaumont, and Lissie formations of the Quaternary Period or in the Willis and Goliad formations of the Pliocene epoch of the Tertiary Period.

The divisions of the Miocene epoch of the Tertiary period shown in Plate 3, were made on differences in the lithology of the formations as noted on well logs of the area. The formations which make up this epoch, the Lagarto, the Oakville, and the Catahoula are also sands and clays. Interfaces between the Pliocene and the Lagarto and the Lagarto and the Oakville were established entirely by lithological differences noted in well cuttings. The sands at the base of the Oakville are widespread and their interface with the clays or shales of the upper Catahoula is recognisable on most of the electric well logs of the area. A regional blanket sand, two hundred to two hundred and fifty feet thick, forms the lower Catahoula. It forms the base of of the Miocene and is sometimes referred to as the Basal Miocene Sand. This sand, broken by thin shale streaks, is easily recognisable on all of the electric well logs of the area. It lies unconformably on the marine wedge, the Anahuac



CROSS-SECTION CC' SOUTH HILLJE OIL FIELD

SEA LEVEL DATUM

500'
100'
SCALE

formation.

The marine Anahuac formation forms the Upper Oligocene in this area. This formation is confined to the subsurface, not being recognized at the surface. It is divided into three zones based on the fossil foraminiferia found. The upper part is the Discorbis zone, a fossiliferous shale marked by the sudden appearance of the foraminifera, Discorbis nomada. The middle part is the Heterostegina zone. It is a greenish grey, brittle shale, the top of which is recognized by the Heterostegina texana. The lower part is the Marginulina zone, a dark, olive-green and greenish grey, brittle, fossiliferous shale marked by the Marginulina idiomorpha and Marginulina vaginata.

Directly below the Anahuac formation are the Marginulina sands. These are shaley sands and soft, clean, fine-grained sands interbedded with shale lenses. These sands may form the lower part of the Anahuac formation but for the purposes of this report have been included in the Frio formation, the Middle Oligocene of this area. Most of the production in Hillje and South Hillje Fields has been from these sands. Underlying the Marginulina sands is a blanket sand, one hundred to one hundred and fifty feet thick, which covers the entire area. This sand, easily recognizable on all of the electric well logs used in this study, is composed of coarse frosted-grained particles and interbedded with thin shale lenses. It is sometimes called the "Crets" sand based on

correlation with sands in the Greta Field, Refugio County.

Below this sand the Frio changes to blue and green brittle shales interbedded with numerous sand bodies of various thickness. The total thickness of the Frio formation in this area is approximately 2,200 to 3,000 feet.

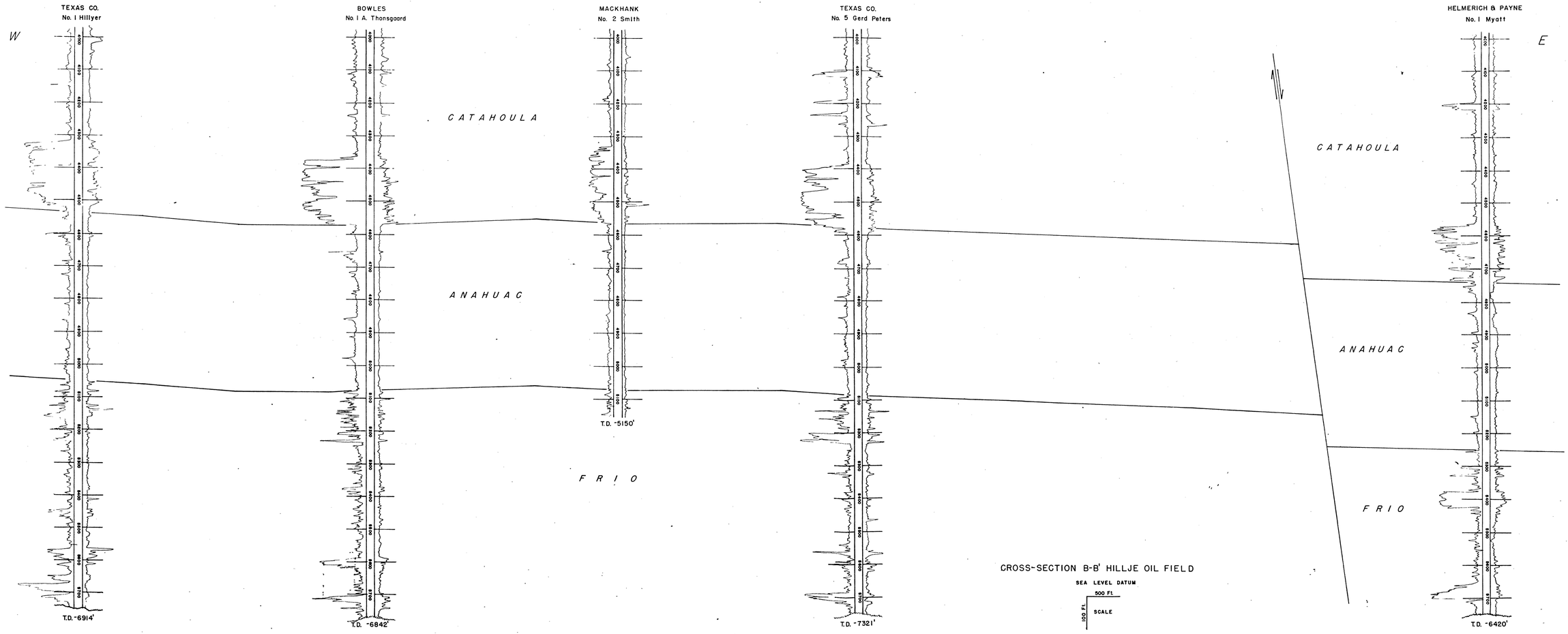
The Lower Oligocene is represented by the Vicksburg formation consisting of grey, dark grey, brownish grey and lignitic shales. This formation has been penetrated in only a very few wells in this area and no estimate of its thickness is made.

CHAPTER V

STRUCTURE

Hillje and South Hillje Fields are anticlinal structures of low relief. They are both closely allied with, and structurally dependent on the faulting of the area. Their structural relation with other fields of South Wharton County is shown in Plate 4. Plate 4 is a structural contour map drawn on the top of the Frio formation. This map shows the numerous normal faults with strikes parallel to the strike of the regional dip of the area and with the downthrown side to the southeast. These faults are representative of a portion of the area known as the Frio flexure of the Gulf Coast Geosyncline. The regional dip of the Frio formation increases rapidly to the southeast of this area, while the younger formations thicken accordingly toward the center of the geosyncline.

These faults are thought to have originated and grown concurrently with deposition in the geosyncline. As the sediments were laid down they achieved thicknesses where ruptures were necessary to relieve the stress of their own weight. These ruptures occured on planes making angles with the bedding of approximately forty-five degrees. Due to the unconsolidated nature of the sediments involved



CROSS-SECTION B-B' HILLJE OIL FIELD

SEA LEVEL DATUM

SCALE 500 Ft. / 100 Ft.

these ruptures were not well defined planes at the time of their origin but as additional sediments were deposited above them there were movements along these zones of weakness to offset the additional strain caused by their weight. Movement on these faults increased with depth, due to the increased overload.

As the downthrown, or coastward, side of these faults moved down a similar set of conditions to those which originally caused these faults, but in an opposite direction, was set up in the younger overlying sediments. Stresses were set up in these sediments by the slumpage into the downthrown side of the faults. These stresses were relieved by subsidiary normal faults, downthrown away from the center of the geosyncline, on one or more rupture planes. According to E. J. Beragy these subsidiary faults may be traced on the surface and accurate predictions made on the locations of subsurface faults in this area. It may be said that this slumpage is at least partially responsible for all of the producing areas shown in Plate 4.

On Plate 4 there is shown three major down to the coast normal faults striking northeast-southwest. The southernmost of these is Fault A which crosses the Withers-Hagnet Field. Good control on this fault was found both to the east and west of Withers Field and in the Nash Field located six miles south of El Campo. In the Nash Field a change of

strike was noted on this fault and accounts for its extension and correlation with the fault to the south of South Hillje Field. The fault in this area as well as the other faults cutting the immediate area of Hillje and South Hillje Fields will be discussed later. Another major fault noted on Plate 4 is the down to the coast normal fault, Fault B striking northeast-southwest which terminates the Louise Field to the southwest and the South El Campo Field to the northeast. There is good subsurface control along the entire length of this fault. Good control is also found for the most northwesterly fault, Fault A, shown on this map. This fault terminates the Wirt Franklin gas production approximately one mile south of Louise and extends to the northeast.

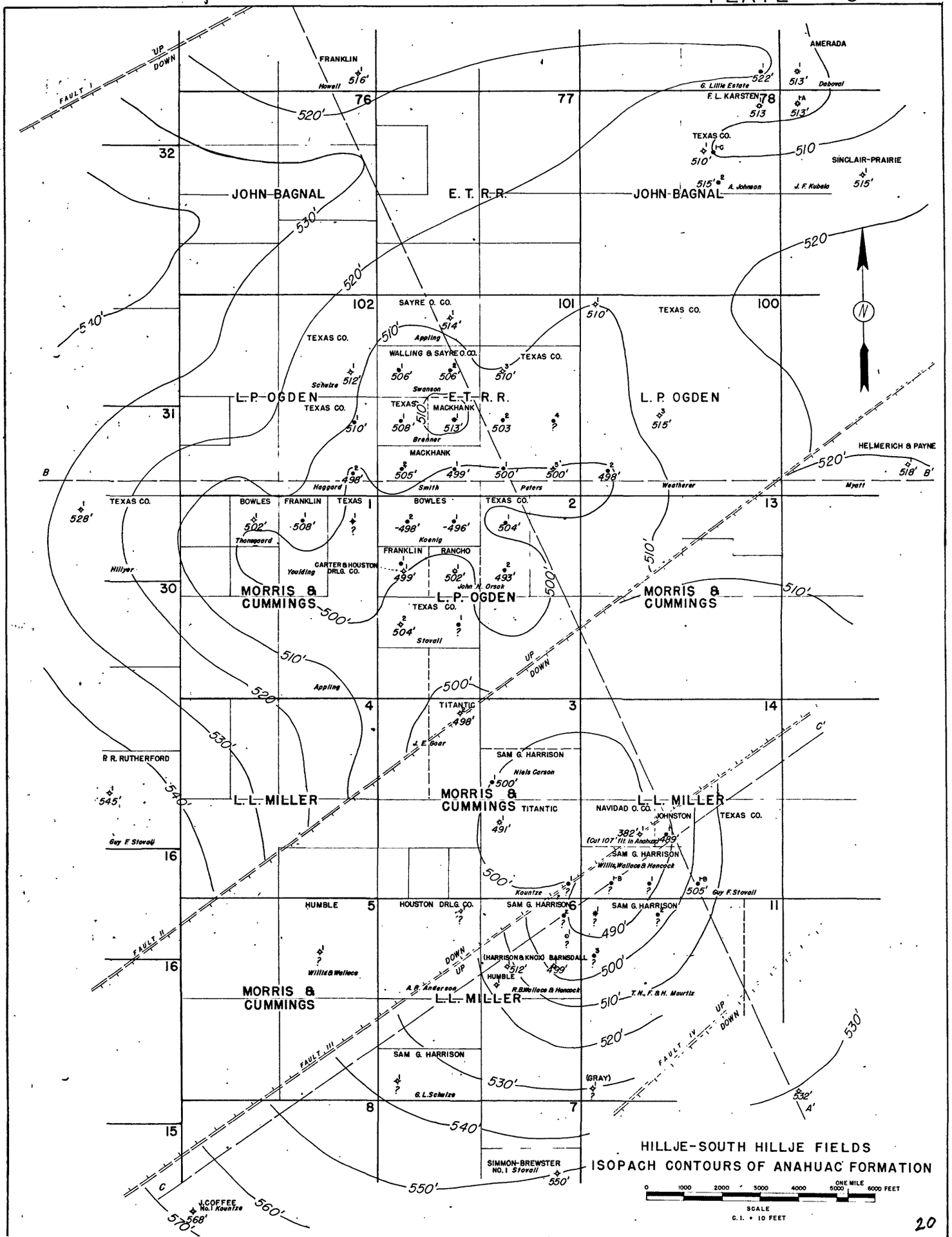
Other faulting shown on Plate 4 is the normal fault, Fault E, terminating the Withers production to the south and the down to north normal fault, Fault D, forming a graben through the center of the Withers Field. This fault is a subsidiary to the down to the coast fault which crosses Withers Field.

Plate 4 shows the faulting and structure of the area as accurately as the available subsurface control would allow.

HILLJE FIELD

Rinehart's Texas Gulf Coast Oil describes the structure of the Hillje Field as follows:

> Ovate anticline which may overlie deepseated dome. Fault down to the southeast terminates production to


FRANKLIN
Howell
AMERADA
G. Lillie Estate
F. L. KARSTEN
Dabaval
TEXAS CO.
SINCLAIR-PRAIRIE
A. Johnson
J. F. Kubela
JOHN-BAGNAL
E. T. R.R.
JOHN-BAGNAL
SAYRE O. CO.
TEXAS CO.
WALLING & SAYRE O. CO.
Appling
Schulze
Swanson
L. P. OGDEN
E. T. R.R.
L. P. OGDEN
MACKHANK
Brenner
HELMERICH & PAYNE
Haggard
Smith
Peters
Weatherer
Myatt
BOWLES
FRANKLIN
TEXAS
Thonegaard
Hillyer
Youlding
CARTER & HOUSTON DRLG. CO.
Koenig
FRANKLIN
RANCHO
John R. Orsak
MORRIS & CUMMINGS
L. P. OGDEN
MORRIS & CUMMINGS
Stovall
TITANTIC
J. E. Goar
SAM G. HARRISON
Niels Carson
R. R. RUTHERFORD
L. L. MILLER
MORRIS & CUMMINGS
TITANTIC
NAVIDAD O. CO.
L. L. MILLER
JOHNSTON
TEXAS CO.
Guy F. Stovall
SAM G. HARRISON
Willis, Wallace & Hancock
Kountze
Guy F. Stovall
HUMBLE
HOUSTON DRLG. CO.
SAM G. HARRISON
SAM G. HARRISON
Willis & Wallace
(HARRISON & KNOX) BARNSDALL
HUMBLE
A. R. Anderson
R. B. Wallace & Hancock
T. N. F. & H. Mourtiz
MORRIS & CUMMINGS
L. L. MILLER
SAM G. HARRISON
G. L. Schulze
(GRAY)
SIMMON-BREWSTER NO. 1 Stovall
J. COFFEE No. 1 Kountze
FAULT I
FAULT II
FAULT III
FAULT IV
UP
DOWN
HILLJE-SOUTH HILLJE FIELDS
ISOPACH CONTOURS OF ANAHUAC FORMATION
SCALE
C.I. = 10 FEET
ONE MILE
0 1000 2000 3000 4000 5000 6000 FEET

the southeast terminates production to the northwest.[3]

From observations made, no reason to suspect a deepseated dome is apparent other than the fact that some of the structures of this region have been ascribed to that origin.

Plate 6 and Plate 7 are structural contour maps of Hillje and South Hillje Fields. Plate 6 is drawn at the top of the Frio Formation and Plate 7 at the base of the Miocene.

The structure of Hillje Field is very similar at both horizons, as might be expected. The structure is slightly more pronounced on the top of the Frio formation. The same is true of the structure of the South Hillje Field. This difference may be accounted for by a slight thinning of the Anahuac formation over the crests of these structures. This thinning is illustrated in Plate 8 which is an isopachous map of the Anahuac formation.

Definition of the anticlinal closure of Hillje Field is best shown by the -5000' contour on Plate 6. It is roughly ovate with its long axis running north-south. The symmetry of this ovate shape is broken by an opening to the west toward Louise Field.

The twenty foot contour interval of Plate 6 shows a maximum closure of sixty feet between Hillje Field and the Texas Company Number 1 Hillyer which is on the eastern edge of the Louise Field structure. A more correct estimate of

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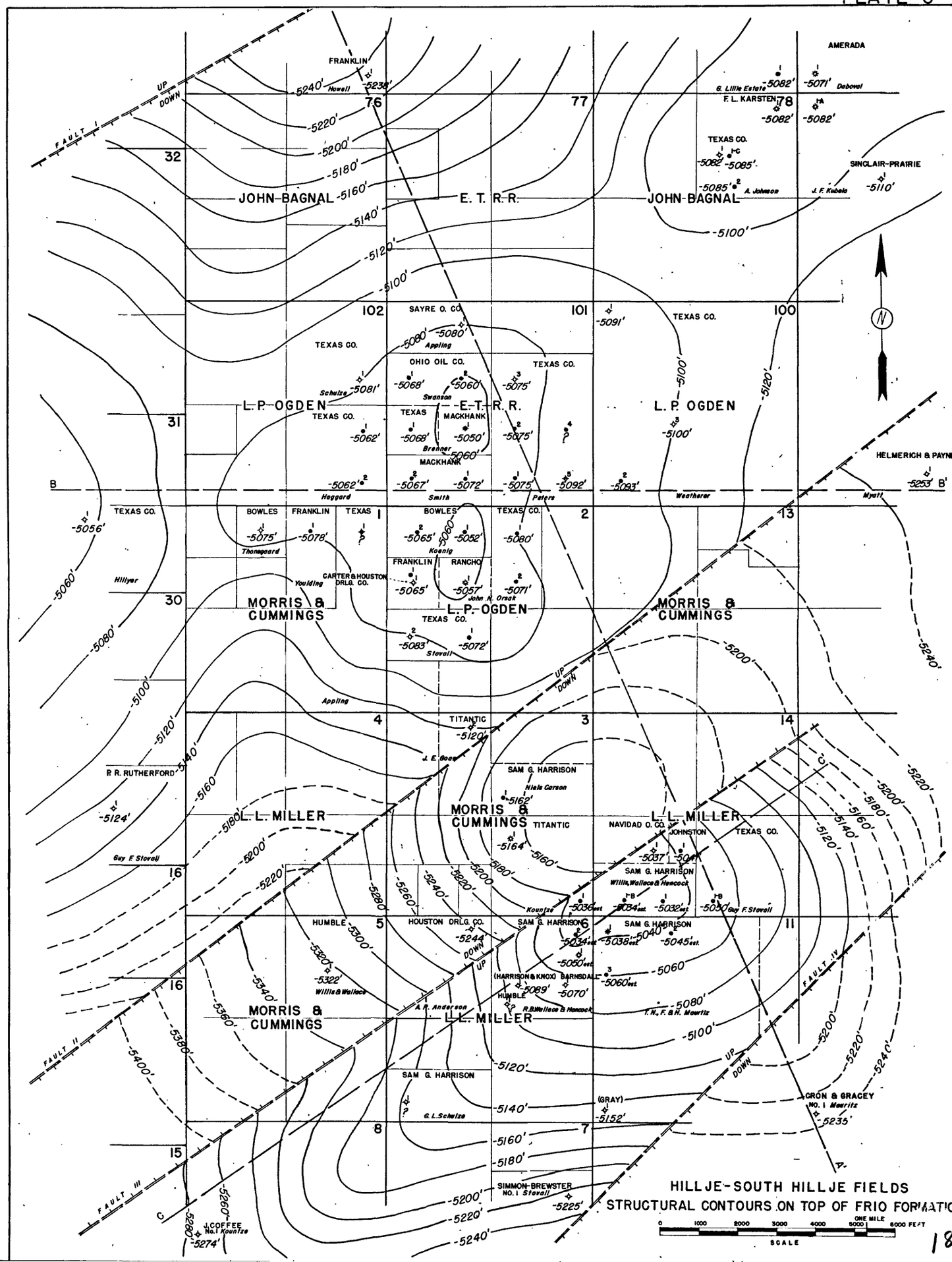
[3] Rinehart's Texas Gulf Coast Oil Report for 1948.

PLATE 6


HILLJE-SOUTH HILLJE FIELDS
STRUCTURAL CONTOURS ON TOP OF FRIO FORMATION
SCALE
0 1000 2000 3000 4000 5000 6000 FEET
ONE MILE
JOHN-BAGNAL
E. T. R. R.
L. P. OGDEN
MORRIS & CUMMINGS
L. L. MILLER
TEXAS CO.
OHIO OIL CO.
SAYRE O. CO.
AMERADA
SINCLAIR-PRAIRIE
HELMERICH & PAYNE
F. L. KARSTEN
SAM G. HARRISON
HUMBLE
HOUSTON DRLG. CO.
TITANTIC
NAVIDAD O. CO.
JOHNSTON
(HARRISON & KNOX) BARNSDALL
(GRAY)
CRON & GRACEY
SIMMON-BREWSTER
J. COFFEE
FRANKLIN
BOWLES
RANCHO
MACKHANK
P. R. RUTHERFORD
FAULT I
FAULT II
FAULT III
FAULT IV
UP
DOWN
A
A'
B
B'
C
C'
N

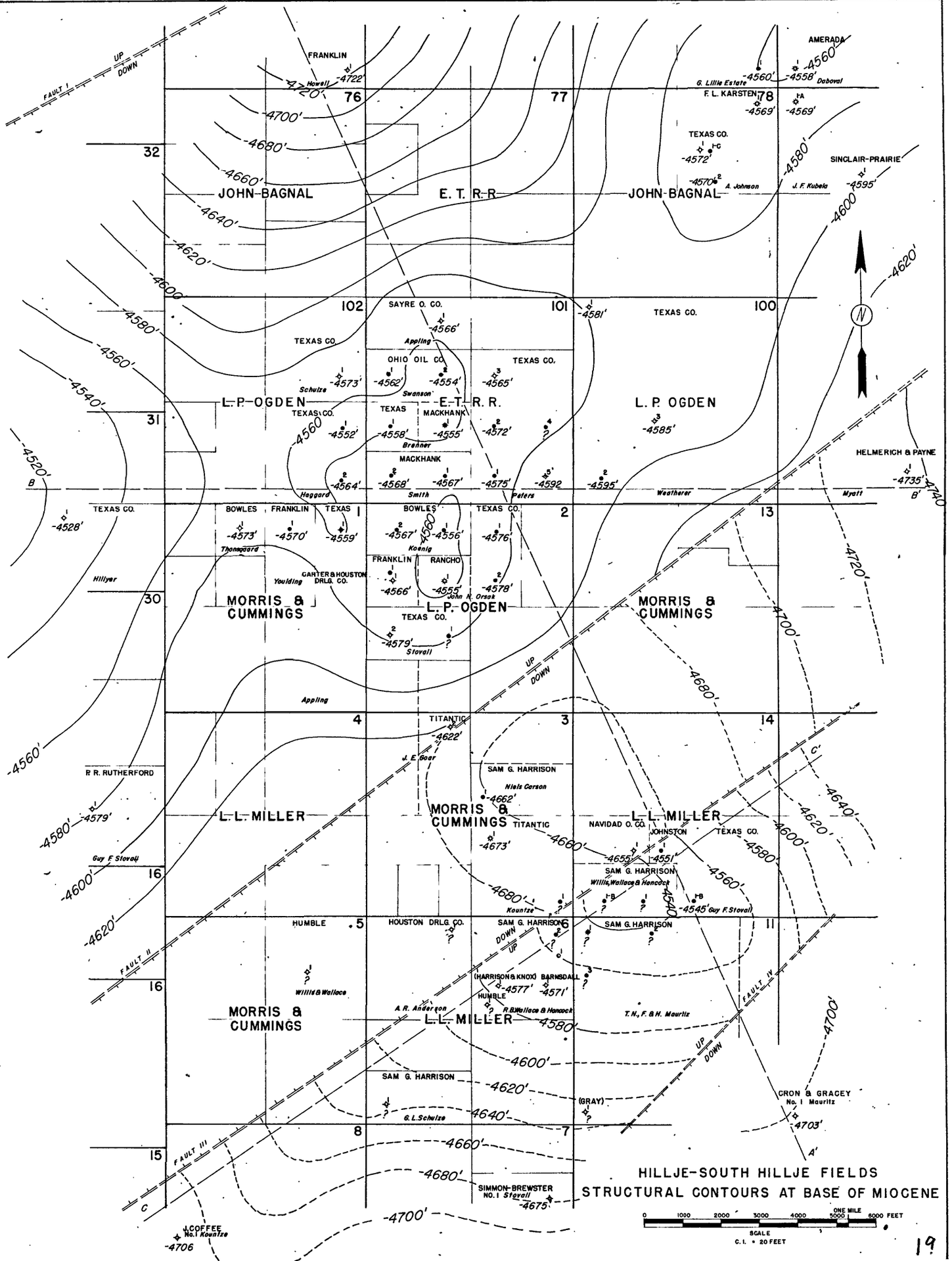

FAULT I
UP
DOWN
FRANKLIN
Howell
-4722'
-4720'
AMERADA
-4560'
-4558'
Doboval
G. Lillie Estate
F. L. KARSTEN
-4569'
-4569'
TEXAS CO.
-4572'
SINCLAIR-PRAIRIE
-4595'
-4570'
A. Johnson
J. F. Kubela
JOHN-BAGNAL
E. T. R.R.
JOHN-BAGNAL
76
77
78
32
-4700'
-4680'
-4660'
-4640'
-4620'
-4600'
-4580'
-4560'
-4540'
-4520'
-4600'
-4580'
102
SAYRE O. CO.
-4566'
Appling
101
-4581'
TEXAS CO.
100
TEXAS CO.
OHIO OIL CO.
TEXAS CO.
-4573'
-4562'
-4554'
-4565'
Schulze
Swanson
L. P. OGDEN
E. T. R. R.
L. P. OGDEN
31
TEXAS CO.
TEXAS
MACKHANK
-4552'
-4558'
-4555'
-4572'
-4585'
Brehmer
MACKHANK
-4564'
-4568'
-4567'
-4575'
-4592'
-4595'
Haggard
Smith
Peters
Weatherer
Myatt
HELMERICH & PAYNE
-4735'
B
B'
TEXAS CO.
-4528'
BOWLES
FRANKLIN
TEXAS
1
BOWLES
TEXAS CO.
2
13
-4573'
-4570'
-4559'
-4567'
-4556'
-4576'
Thonsgaard
Koenig
FRANKLIN
RANCHO
GARTER & HOUSTON DRLG. CO.
Youlding
-4566'
-4555'
-4578'
John R. Orsak
Hillyer
30
MORRIS & CUMMINGS
L. P. OGDEN
TEXAS CO.
MORRIS & CUMMINGS
-4579'
Stovall
Appling
UP
DOWN
4
TITANTIC
3
14
-4622'
J. E. Goar
SAM G. HARRISON
Niels Carson
-4662'
R. R. RUTHERFORD
-4579'
L. L. MILLER
MORRIS & CUMMINGS
TITANTIC
L. L. MILLER
NAVIDAD O. CO.
JOHNSTON
TEXAS CO.
-4673'
-4655'
-4551'
Guy F. Stovall
16
SAM G. HARRISON
Willis, Wallace & Hancock
-4545'
Guy F. Stovall
Kountze
HUMBLE
5
HOUSTON DRLG. CO.
SAM G. HARRISON
6
SAM G. HARRISON
11
DOWN
UP
FAULT II
16
(HARRISON & KNOX) BARNSDALL
-4577'
-4571'
Willis & Wallace
HUMBLE
A. R. Anderson
R. B. Wallace & Hancock
T. N., F. & H. Mauritz
MORRIS & CUMMINGS
L. L. MILLER
-4580'
FAULT IV
-4600'
UP
DOWN
SAM G. HARRISON
-4620'
(GRAY)
CRON & GRACEY
No. 1 Mauritz
-4703'
A'
G. L. Schulze
-4640'
8
7
15
FAULT III
-4660'
-4680'
SIMMON-BREWSTER
NO. 1 Stovall
-4675'
C
-4700'
J. COFFEE
No. 1 Kountze
-4706
HILLJE-SOUTH HILLJE FIELDS
STRUCTURAL CONTOURS AT BASE OF MIOCENE
0 1000 2000 3000 4000 5000 6000 FEET
ONE MILE
SCALE
C. I. = 20 FEET

PLATE 4

SOUTH WHARTON COUNTY

STRUCTURAL CONTOURS ON TOP OF FRIO FORMATION

SCALE 1000 0 2000 4000 6000 8000 10,000 Feet — One Mile

this closure is approximately thirty feet. This closure is shown in Plate 9, "Cross Section of Hillje Field", as well as the closure to the east of the field.

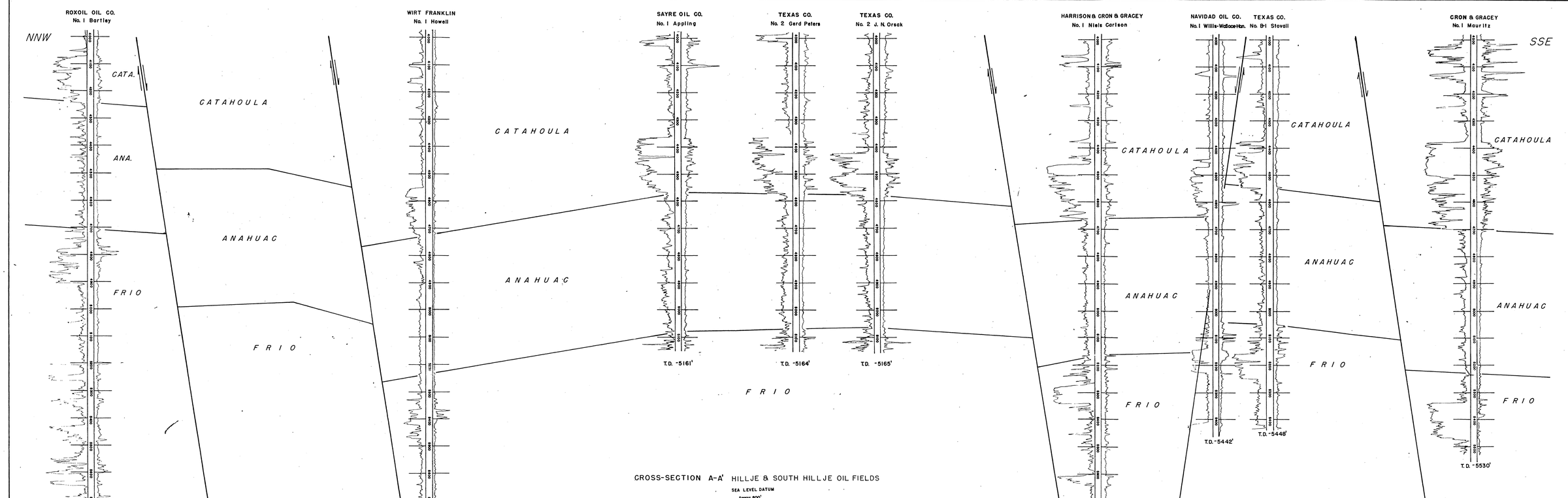
Closure at Frio depth to the north, south, and east of Hillje Field is more than one hundred feet. Plate 5, "Cross Section of Hillje and South Hillje Fields", shows the north and south closure of Hillje Field.

Fault I, a normal down to the coast fault striking northeast-southwest, at Frio depth is approximately one and a half miles northwest of the nearest producing well of Hillje Field, the Ohio Oil Company Number 1 Swanson. It can be seen that this fault does not terminate the production of the field as suggested by Rinehart's. However slumpage into this fault is believed to have caused the north dip which accounts for the closure to the north of the field.

Fault I is a good illustration of the fact that the throw of faults in this area increase with depth. In the Daboval Field this fault was encountered in the Anahuac formation with a throw of approximately one hundred feet. The fault cut the Wirt Franklin Number 1 Minnie Howell deep in the Frio formation with a throw of almost six hundred feet.

SOUTH HILLJE FIELD

Rinehart's describes the structure of South Hillje Field as follows:



CROSS-SECTION A-A' HILLJE & SOUTH HILLJE OIL FIELDS

SEA LEVEL DATUM
Approx. 800'

SCALE
1000'

Anticlinal structure on upthrown side of reverse fault separating area from Hillje Field on the North.[4]

The "reverse fault" referred to is Fault III shown on Plates 6, 7, and 8. This is not actually a reverse fault but rather a normal fault with its downthrown side in a reverse direction to that which would be normally expected, that is, down to the north. It is believed that this fault is one which represents the subsidiary faults previous discussed. It was, in part, on the strength of this belief that Fault II was located.

Fault III terminates the major part of the producing area of the South Hillje Field to the northwest. This area is included in the anticlinal structure on the upthrown side of this fault.

Closure of approximately one hundred feet to the southeast of the field is shown on Plate 5. More than two hundred feet of closure both to the northeast and southwest is shown on Plate 10, "Cross Section of South Hillje Field."

There are two wells from which production has been obtained, the Titantic Number 1 Gear and the Sam C. Harrison Number 1 Hells Carlson, located in the graben formed by Faults II and III which are included in South Hillje Field. These wells were another reason for the location of Fault II. Without the presence of Fault II no explanation for accumulation of oil in the vicinity of these

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[4]Minehart's Texas Gulf Coast Oil Report for 1948.

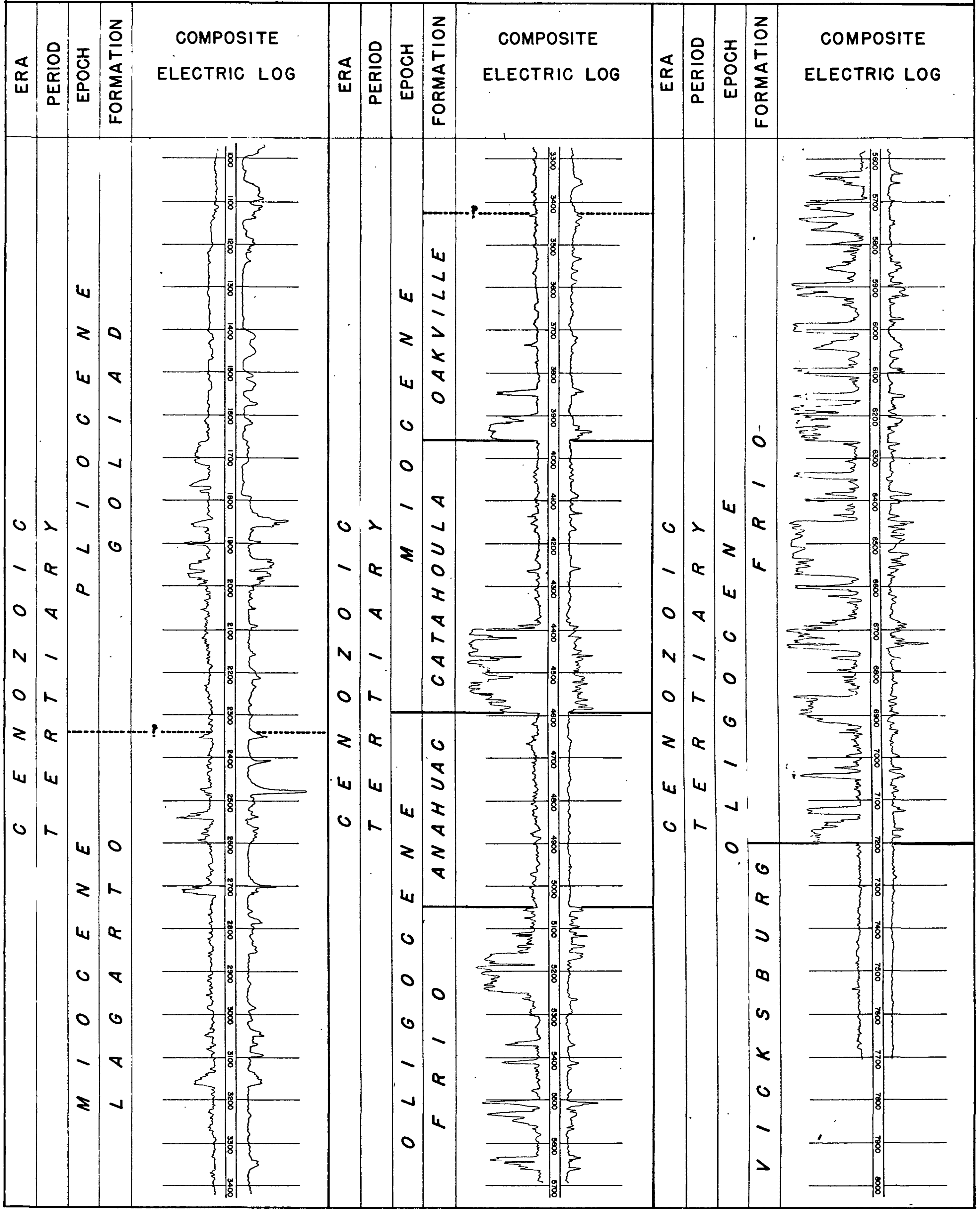
wells can be made. The wells are approximately one hundred feet structurally lower than the lowest producing well of Hillje Field. The presence of Fault II was also based on correlation with a fault located south of Louise Field to the southwest.

Fault III cut the Navidad Number 1 Willis, Wallace, and Hancock in the Anahuac formation with a throw of slightly more than one hundred feet.

Fault IV was located south of the South Hillje Field in correlation with the fault which cuts Withers and Nash Fields. Its presence also explains a sudden increase in thickness of the Basal Miocene Sand noted on the electric well log of the Cron and Creecy Number 1 Maurita.

PLATE 3

TYPE SECTION COMPOSITE ELECTRIC LOG HILLJE & SO. HILLJE AREAS



CHAPTER V

PRODUCTION HISTORY

The production history of the fields was prepared from data taken from well completion cards, as noted in the introduction. Thicknesses of pay sands were estimated from electric well logs and the description of the lithology of these sands was taken from driller's logs. This history is not complete due to the fact that some information related to the production of the fields has not yet been released. This is especially true in the South Hillje Field.

HILLJE FIELD

The producing sands in this field are all in the Marginula sands, with one exception. The pay zones are thin sands ranging from two to five feet in thickness. They are gray, medium-hard, fine-grained, clean and shaly sands. There are no wells in this field in which multiple completions were made.

The discovery well, The Texas Company Number 1 Peters, was completed September 10, 1939. This well had an initial potential flow of twenty-four barrels of 25° Baume gravity oil per day on a 7/64" choke from a five foot sand body at a subsea depth of -5135'. This well was acidized with 5,000 gallons of acid and recompleted on March 3, 1940.

Upon recompletion the well had an initial potential flow of sixty-nine barrels of oil per day on a 1/8" choke from the same sand body.

The gas-oil ratio of the discovery well was 2,900 to 1. This ratio was considerably higher than those of the subsequent oil wells in the field. These ratios range from two hundred and fifty to four hundred to one. Permitted gas-oil ratio of the field is 5,000 to 1.

The casing record of the discovery well is typical of those of the subsequent wells. 16" casing was set to a depth of -619', 10-3/4" casing was set from -619' to -1073', and 5-1/2" was set from -1073' to -5214'. The 5-1/2" casing was perforated in the pay zone by a Lane Wells Perforating Gun.

The first well completed as a gas well in the Hillje Field was the Texas Company Number 1 Appling on February 13, 1941. This well had an initial potential of 1,440,000 cubic feet of gas per day from 1-1/2 feet of sand at a subsea depth of -5132'.

The only well not producing from the Marginulina Sands in Hillje Field is the Texas Company Number 2 Weatherer, completed December 13, 1944. Discovery of deeper Frio pay zones in the Daboval Field, located northwest of the Hillje Field, led to the drilling of this well. It was completed in six feet of sand in the Frio formation at a subsea depth

of -6,651' with an initial potential of fifty-two barrels of oil per day. 40° Baume gravity oil is produced from this zone as compared with 25° Baume gravity oil from the Marginulina sands. This well, drilled to a subsea depth of -7,413', is the deepest well in the Hillje Field, and the only well to penetrate the Vicksburg formation.

As the present time there are twenty-one producing wells in the Hillje Field, eighteen oil wells and three gas wells. Well spacing in the field is forty acres. Outlet for the oil produced in Hillje Field, and also South Hillje Field, is the Texas Company Pipeline.

Although all of the wells flowed at the time of their completion, many of the wells of Hillje Field are now on gas lifts.

SOUTH HILLJE FIELD

Marginula sands, similar to those of the Hillje Field, account for most of the production of the South Hillje Field. From available information only one well, the Sam G. Harrison Number B-1 Willis, Wallace, and Hancock, was completed in another zone. This well was completed in an upper Frio sand body at a subsea depth of -5,404'.

Although the Sam G. Harrison Number 1 Mauritz is considered to be the discovery well for South Hillje Field, oil and gas were produced for a short time from two wells completed five years prior to its completion. These wells are the

Sam C. Harrison Number 1 Neils Carlson and the Titantic Number 1 Fountze.

The Sam C. Harrison Number 1 Maurits was completed in six feet of sand at a subsea depth of -5150' with an initial potential flow of two barrels of oil per day through a 3/16" choke. The gas-oil ratio of this well, 500,000 to 1, was a great deal higher than those of subsequent oil wells.

Wells completed as gas wells in South Hilljo Field have all been shut-in.

Casing records for wells of the South Hilljo Field are similar to those of Hilljo Field.

The gravity of the oil produced in South Hilljo Field varies from 27° Baume to 33° Baume.

At the present time there are ten producing wells in South Hilljo Field, seven oil wells and three gas wells. Well spacing in South Hilljo Field is forty acres.

CHAPTER VI

CONCLUSION

Hilljo and South Hilljo Fields are typical of the numerous small oil fields found in the Frio flexure trend in the Texas Gulf Coast. Characteristics of Hilljo and South Hilljo Fields which are shared by other fields in this trend are; the low relief nature of their structure, the dependency of their structure on faulting, and that the major part of their production comes from sand stringers in the Marginulina sand.

Other fields in South Wharton County of approximately the same economic importance as the Hilljo and South Hilljo Fields which share these characteristics are the Louise Field, the Dotoval Field, the Mach Field, and the South El Campo Field.

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APPENDIX

CHART I PRODUCTION DATA

HILLJE FIELD

WELL	DATE COMPLETED	TOTAL DEPTH	INITIAL PRODUCTION
BOWLES			
No. 1 Koenig	9/29/40	-5156'	128 bopd 1/8" ck
No. 2 Koenig	10/21/40	-5157'	85 bopd 1/8" ck
No. 1 A. Thonsgaard	5/ 6/41	-6848'	Dry and abandoned
CARTER & HOUSTON DRLG. CO.			
No. 1 Orsak	12/16/40	-5155'	41 bopd 1/8" ck
WIRT FRANKLIN			
No. 1 Minnie Howell		-7202'	Dry and abandoned
No. 1 Orsak	10/27/45	-5145'	115 bopd 11/64" ck
No. 1 Youlding	7/14/46	-5148'	136 bopd 12/64" ck
HELMERICH & PAYNE			
No. 1 Myatt		-6420'	Dry and abandoned
MACKHANK			
No. 1 Brenner	?	-5151'	?
No. 1 Smith	12/19/40	-5154'	85 bopd 1/8" ck
No. 2 Smith	?	-5150'	?
OHIO OIL COMPANY			
No. 1 Swanson	9/24/40	-5145'	81 bopd 1/8" ck
No. 2 Swanson	10/17/40	-5151'	81 bopd 1/8" ck
RANCHO OIL COMPANY			
No. 1 Orsak	2/25/41	-5152'	1184 mcfgpd
SAYRE OIL COMPANY			
No. 1 Appling	4/ 8/41	-5158'	Dry and abandoned
THE TEXAS COMPANY			
No. 1 Appling	2/13/41	-5150'	1440 mcfgpd 12/64" ck
No. 1 Brenner	6/29/40	-5150'	85 bopd 1/8" ck
No. 1 Haggard	8/12/40	-5154'	62 bopd 1/8" ck
No. 2 Haggard	8/31/40	-5154'	82 bopd 1/8" ck

WELL	DATE COMPLETED	TOTAL DEPTH	INITIAL PRODUCTION
THE TEXAS COMPANY			
No. 1 Hillyer	3/27/44	-6918'	Dry and abondoned
No. 1 Johnson	?	-5302'	?
No. 1 Orsak	9/25/40	-5158'	89 bopd 1/8" ck
No. 2 Orsak	7/ 2/41	-5158'	28 bopd 5/64" ck
No. 1 Peters	9/10/39	-5215'	14 bopd 7 /64" ck
(Well acidized-Recompleted)	3/29/40		69 bopd 1/8" ck
No. 2 Peters	9/ 7/40	-5155'	86 bopd 1/8" ck
No. 3 Peters	11/18/40	-6170'	Dry and abandoned
No. 4 Peters	8/6/41	-5152'	76 bopd 1 /8" ck
No. 5 Peters	2/24/45	-7315'	Dry and abandoned
No. 1 Schulze	10/28/40	-5154'	Dry and abandoned
No. 1 Stovall	2/ 7/42	-5161'	42 bopd 42 bswpd ½" ck
No. 2 Stovall	3/24/46	-5191'	Dry and abandoned
No. 1 Weatherer	4/ 1/37	-6435'	Dry and abandoned
No. 2 Weatherer	12/23/44	-7413'	52 bopd 1 /8" ck
No. 3 Weatherer	4/ 1/45	-7487'	Junked and abandoned
	SOUTH HILLJE FIELD		
BARNSDALL-HARRISON			
No. 1 Wallace & Hancock	7/23/41	-7166'	Dry and abandoned
JOHN B. COFFEE			
No. 1 Kountze	8/9/ 48	-6438'	Dry and abandoned
CRON & GRACEY			
No. 1 Mauritz	6/10/39	-5525'	Dry and abandoned
GRAY			
No. Z-1 Mauritz	11/23/44	-6437'	Dry and abandoned
SAM. G. HARRISON			
No. 1 Carlson	2/26/40	-6432'	?
No. 1 Kountze	8/21/46	-5484'	?

WELL	DATE COMPLETED	TOTAL DEPTH	INITIAL PRODUCTION
SAM G. HARRISON			
No. 1 Mauritz	3/23/45	-7439'	2 bopd 3/16" ck
No. 2 Mauritz	6/19/45	-6456'	Shut-in gas well
No. 3 Mauritz	4/19/46	-5165'	50 bopd 3/32" ck
No. 1 Wallace & Hancock	6/ 4/45	-5387'	Shut-in gas well
No. 1 Willis, Wallace & Han.		-5387'	Shut-in gas well
No. B-1 "	11/6/45	-6438'	160 bopd 1/8" ck
HARRISON & KNOX			
No. 1 Wallace & Hancock	6/ 6/43	-5544'	Dry and abandoned
HOUSTON DRILLING COMPANY			
No. 1 Anderson	7/2 /45	-6441'	Dry and abandoned
HUMBLE			
No. 1 Hancock	10/27/38	-5607'	Dry and abandoned
No. 1 G. P. Willis	4/16/40	-6931'	Dry and abandoned
RALPH A. JOHNSON			
No. 1 Willis, Wallace & Han.	5/7/46	-5976'	69 bopd 6/64" ck
NAVIDAD OIL COMPANY			
No. 1 Willis, Wallace & Han.	10/20/46	-5442'	?
P. R. RUTHERFORD			
No. 1 Stovall	12/19/46	-7247'	Dry and abandoned
JAY SIMMONS			
No. 1 Stovall	4/ 6/42	-7196'	Dry and abandoned
THE TEXAS COMPANY			
No. B-1 Stovall	9/27/46	-5445'	57 bopd 11/64" c k
TITANIC			
No. 2 Goar	7/18/40	-5751'	?
No. 1 Kountze	7/19/40	-5743'	Dry and abandoned

CHART II SUB-SURFACE DATA

HILLJE FIELD

WELL	TOP OF FRIO	BASE OF MIOCENE	ANAHUAC THICKNESS
BOWLES			
No. 1 Koenig	-5052'	-4556'	496'
No. 2 Koenig	-5065'	-4567'	498'
No. 1 A. Thonsgaard	-5075'	-4573'	502'
CARTER & HOUSTON DRLG. CO.			
No. 1 Orsak	?	?	?
WIRT FRANKLIN			
No. 1 Minnie Howell	-5238'	-4722'	516'
No. 1 Orsak	-5065'	-4566'	499'
No. 1 Youlding	-5078'	-4570'	508'
HELMERICH & PAYNE			
No. 1 Myatt	-5253'	-4735'	518'
MACKHANK			
No. 1 Brenner	-5068'	-4555'	513'
No. 1 Smith	-5072'	-4567'	505'
No. 2 Smith	-5067'	-4568'	499'
OHIO OIL COMPANY			
No. 1 Swanson	-5068'	-4562'	506'
No. 2 Swanson	-5060'	-4554'	506'
RANCHO OIL COMPANY			
No. 1 Orsak	-5057'	-4555'	502'
SAYRE OIL COMPANY			
No. 1 Appling	-5080'	-4566'	514'
THE TEXAS COMPANY			
No. 1 Appling	?	-4559'	?
No. 1 Brenner	-5066'	-4558'	508'
No. 1 Haggard	-5062'	-4552'	510'
No. 2 Haggard	-5062'	-4564'	498'

WELL	TOP OF F"IO	BASE OF MIOCENE	ANAHUAC THICKNESS
THE TEXAS COMPANY			
No. 1 Killyer	-5056'	-4528'	528'
No. 1 Johnson	-5082'	-4572'	510'
No. 1 Orsak	-5080'	-4576'	504'
No. 2 Orsak	-5071'	-4578'	493'
No. 1 Peters	-5075'	-4575'	500'
No. 2 Peters	-5075'	-4572'	509'
No. 3 Peters	-5075'	-4565'	510'
No. 4 Peters	?	?	?
No. 5 Peters	-5092'	-4592'	500'
No. 1 Schultze	-5081'	-4573'	512'
No. 1 Stovall	-5072'	-4553'(?)	519'(?)
No. 2 Stovall	-5083'	-4579'	504'
No. 1 Weatherer	-5091'	-4581'	510'
No. 2 Weatherer	-5093'	-4595'	498'
No. 3 Weatherer	-5100'	-4585'	515'
	SOUTH HILLS FIELD		
BARNSDALL-HARRISON			
No. 1 Wallace & Hancock	-5070'	-4571'	499'
JOHN B. COFFER			
No. 1 Kountze	-5274'	-4706'	568'
CRON & GRACEY			
No. 1 Mauritz	-5235'	-4703'	532'
GRAY			
No. Z-1 Mauritz	?	?	?
SAM G. HARRISON			
No. 1 Carlson	-5162'	-4662'	500'
No. 1 Kountze	-5036' est.	?	?

WELL	TOP OF FRIO	BASE OF MIOCENE	ANAHUAC THICKNESS	
SAM G. HARRISON				
No. 1 Mauritz	-5033' est.	?	?	
No. 2 Mauritz	-5045' est.	?	?	
No. 3 Mauritz	-5060' est.	?	?	
No. 1 Wallace & Hancock	-5050' est.	?	?	
No. 1 Willis, Wallace & Han.	-5032' est.	?	?	
No. B-1 "	-5034' est.	?	?	
HARRISON & KNOX				
No. 1 Wallace & Hancock	-5089'	-4577'	512'	
HOUSTON DRILLING COMPANY				
No. 1 Anderson	-5247'	?	?	
HUMBLE				
No. 1 Hancock	- ?	?	?	
No. 1 G. P. Willis	-5322'	?	?	
RALPH A. JOHNSON				
NO. 1 Willis, Wallace & Han.	-5040'	-4551'	489'	
NAVIDAD OIL COMPANY				
No. 1 Willis, Wallace & Han.	-5037'	-4655'	382'	(Cut fault in Anahuac)
P. R. RUTHERFORD				
No. 1 Stovall	-5124'	-4579'	545'	
JAY SIMMONS				
No. 1 Stovall	-5225'	-4675'	550'	
THE TEXAS COMPANY				
No. B-1 Stovall	-5050'	-4545'	505'	
TITANIC				
No. 2 Geer	-5120'	-4622'	498'	
No. 1 Kountze	-5164'	-4673'	491'	