THE UNIVERSITY OF TEXAS PUBLICATION

No. 5116: August 15, 1951

OCCURRENCE OF OIL AND GAS IN NORTHEAST TEXAS

Edited by
Frank A. Herald

Bureau of Economic Geology
John T. Lonsdale, Director

PUBLISHED BY THE UNIVERSITY TWICE A MONTH. ENTERED AS SECOND-CLASS MATTER ON MARCH 12, 1913, AT THE POST OFFICE AT AUSTIN, TEXAS, UNDER THE ACT OF AUGUST 24, 1912

QAe5510

The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston

Cultivated mind is the guardian genius of Democracy, and while guided and controlled by virtue, the noblest attribute of man. It is the only dictator that freemen acknowledge, and the only security which freemen desire.

Mirabeau B. Lamar

OCCURRENCE OF OIL AND GAS IN NORTHEAST TEXAS

Compiled by
BUREAU OF ECONOMIC GEOLOGY, THE UNIVERSITY OF TEXAS
in cooperation with
EAST TEXAS GEOLOGICAL SOCIETY

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Coke
Nacogdoches

It is axiomatic that men responsible for finding and producing oil and gas need to know more about the conditions of nature at the places where oil and gas have been found and produced. Definite data pertaining to the known occurrences need to be more readily available to men currently carrying the major responsibilities, and, more important, the data need to be readily available to more people, particularly to those who in the future will carry the major responsibilities. Ready availability of basic data leads to formulation and testing of new ideas and to new applications of old ideas. Constructive speculation is likely to be stifled where accumulated knowledge is not readily accessible for use in checking new ideas. It is important to the future of the oil industry that data concerning known occurrences be preserved, and, furthermore, that those data be so readily accessible as to be extensively used.

To assist in meeting the needs for ready availability of data concerning the occurrence of oil and gas in Texas, the Bureau of Economic Geology of The University of Texas has undertaken a project for the compilation and publication of a series of volumes designed to present as many of the essential data as practicable under the circumstances and to so present the data that they are conveniently usable. The aim is to present the available facts in such manner that the compilation will be of maximum service as a source for basic data.

It appears that the most practical method for assembling the data for this project is by contributions from a very large number of individuals, each of whom is in a position to present authoritatively his portion of the whole. Presentation of the needed data requires the liberal cooperation of the petroleum geologists and operators of the State.

Apparently the best method of enlisting the required cooperative efforts is through organized geological societies. The State was divided into eight parts, as indicated on the next following page, in accordance with a plan providing that a geological society in each of the eight regions would assume responsibility for compilation of the data pertaining to its region. According to the plan, committees of a society in each region would design regional papers, select the authors for the regional papers, select the authors for the field papers and edit all papers for accuracy and completeness.

In this project, the primary units of presentation are field papers. The fact that the reservoir is the basic unit in nature is recognized in the design of the field papers. To accomplish maximum utility, to assist in getting comparable data for the many fields and to facilitate state-wide summarizations, an effort is made to standardize the contents and arrangement of the field papers to the greatest extent feasible without forfeiting meager data where only meager data are available and without any limitations on presentation of significant data in addition to the generally established minimum. Although there are none in this volume, regional papers of various sorts are contemplated for inclusion in future similar volumes. Standardization of regional papers is not anticipated.

This volume is the first in the planned series. The authors are to be heartily congratulated on contributing so liberally to the usable knowledge pertaining to the occurrence of oil and gas in Texas. In the preparation of their papers, the authors have generally followed quite closely a check-list which was developed after extensive correspondence and consultation with committee members throughout the State. That check-list and our suggestions to authors of field papers are presented in the appendix at the back of this volume. The authors have been guided by a group of papers generously prepared for such usage by nine authors and circulated in a progress report.

In the compilation of this volume, it was the aim (apparently accomplished) to include a paper on every commercial occurrence of oil and/or gas discovered in Northeast Texas prior to January 25, 1950. Several occurrences which were definitely not commercial are treated in this volume, primarily because of their prior treatment in technical publications and trade journals.

This volume contains 135 field papers by 69 authors. The elasticity of the word "field" serves well in this usage. In the extreme case, one field paper treats fourteen units, each of which would rank as a "field" as the word is used generally in this volume.

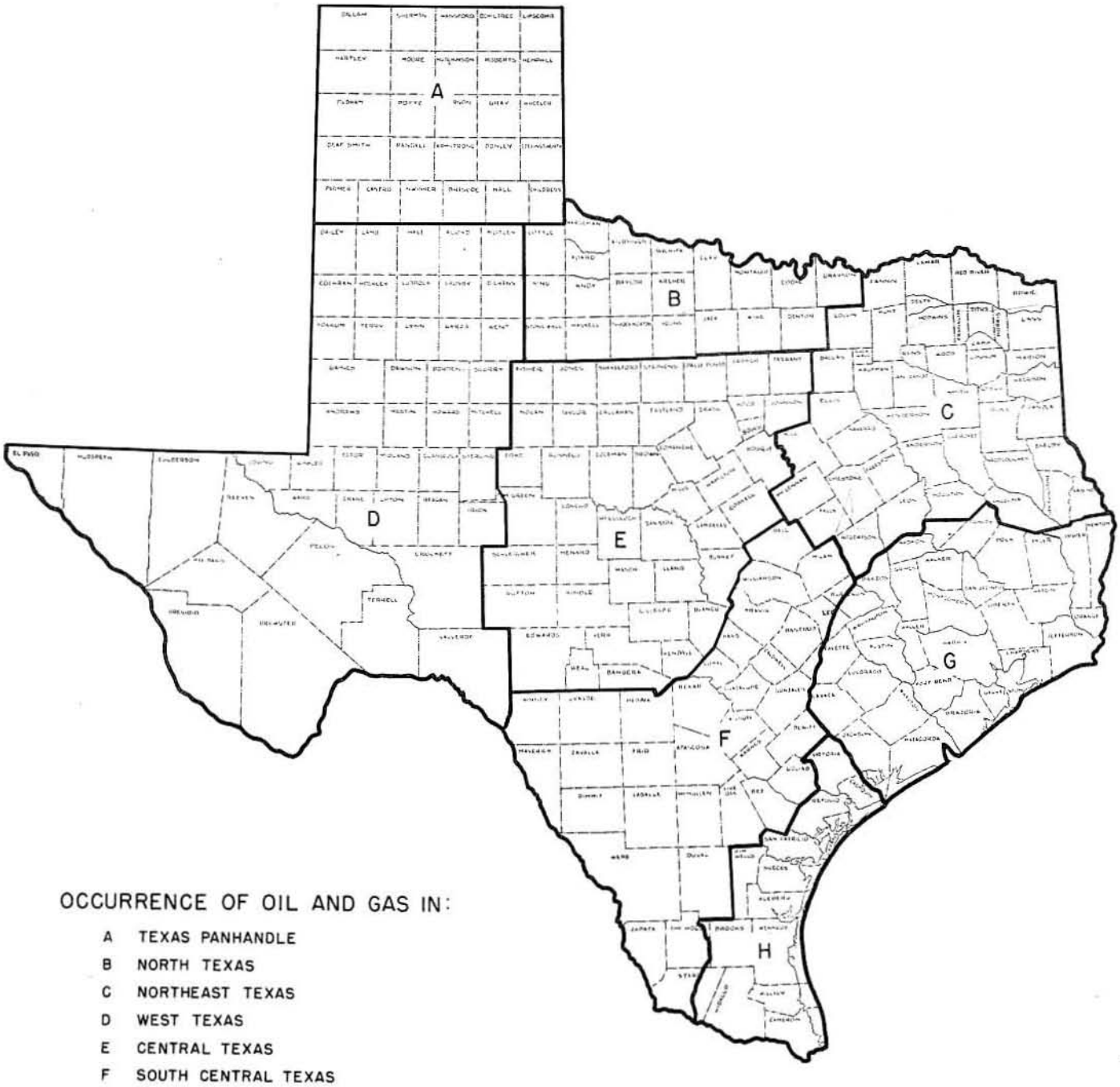
Many of the fields in Northeast Texas have been known by more than one name, and, in a few cases, a name has been applied to one field for awhile and then to another field later. Laxity in the use of names has resulted in considerable confusion in the published records. The authors of the following papers have given special attention to overcoming these confusions and have endeavored to make such presentations as will assist in properly using old records and as will serve in avoiding additions to the confusions. While the authors have not mentioned all names which have been used in designating fields, it is believed that all names which are likely to occasion confusion have been mentioned and are appropriately listed in the index to this volume.

While plans have not been fixed for supplementing or revising this volume, it appears probable that there will be supplementation and revision in due course. It is hoped that readers will notify the Bureau of Economic Geology, University Station, Box B, Austin, Texas, of needed corrections and available desirable additions and will freely offer suggestions. Unpublished or inadequately published data pertaining to early operations will be especially helpful in accomplishing the purposes of this project. It is anticipated that a file will be opened for each field as needed so that suggestions will be considered if and when supplementation or revision is undertaken.

Frank A. Herald
Project Supervisor

April 1951

TENTATIVE BOUNDARIES OF AREAS FOR PLANNED PUBLICATIONS



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- C NORTHEAST TEXAS
- D WEST TEXAS
- E CENTRAL TEXAS
- F SOUTH CENTRAL TEXAS
- G UPPER GULF COAST OF TEXAS
- H LOWER GULF COAST OF TEXAS



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ALBA FIELD
Wood County, Texas

E. R. KEMP and A. J. DAVIS
District Geologist and Junior Geologist, respectively, Sinclair Oil & Gas Co., Tyler, Texas
May 3, 1950

LOCATION

The Alba field is in the immediate vicinity of the town of Alba, in southwest Wood County. So far as developed to date, it is mainly within and to the eastward and northeastward of the townsite. The boundary of the field has not yet been determined. Development now in progress may extend the limits to include considerable area surrounding the town.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Geophysical exploration led to the drilling of several dry holes which confirmed a structural high and found slight oil showings in the sub-Clarksville sand. Subsurface methods then led to the location of the discovery well.

DISCOVERY

Sub-Clarksville sand: May 15, 1948; Billy Bridewell and F. R. Jackson #1 G. K. McKenzie.

ELEVATION OF SURFACE

At well locations: Highest, 474 ft.; lowest, 409 feet.

SURFACE FORMATION

All rocks at the surface within the area of the field are in the Wilcox group of the Eocene series.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

A dry hole at the south edge of the Alba townsite was drilled to the total depth of 9,000 feet and reached the oldest stratigraphic horizon penetrated to date within the probable future extent of the field. The oldest horizon penetrated in that well is 160 feet below the top of the Travis Peak formation.

NATURE OF TRAP

Sub-Clarksville sand: The reservoir rock is convexly folded over a dome which is probably due to deep-seated salt movement. While convex folding appears to be the primary trap-forming factor, it is recognized that facies change in the reservoir rock on the northwest flank of the dome is also a controlling factor. Termination due to faulting may be a secondary factor locally.

THICKNESS OF RESERVOIR ROCK

Sub-Clarksville sand: Average, 21 feet.

PRODUCTIVE AREA

Sub-Clarksville sand and Field: 1,000 acres. Further development may increase this estimate by as much as 750 acres.

LITHOLOGY OF RESERVOIR ROCK

Sub-Clarksville sand: Fine- to medium-grained, ashy, argillaceous, slightly porous to porous sand with irregular oil staining.

CONTINUITY OF RESERVOIR ROCK

Sub-Clarksville sand: This reservoir is productive in many fields flanking the East Texas basin in a north-south belt from northern Wood County to northern Houston County.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Sub-Clarksville sand	Feet
No free gas cap	
Elevation of top of oil	-3,498-
Elevation of bottom of oil	-3,746+
Relief	248+

The above figures represent the highest and lowest elevations of oil in wells completed to date. It appears likely that further development will show that the oil column extends both higher and lower than proven to date. Water at -3,810 in the dry hole near the east boundary of the area covered by the accompanying map proves that oil does not extend down to that elevation.

CHARACTER OF OIL

Sub-Clarksville sand: Gravity, A.P.I., 15.2°.

WATER PRODUCTION

Sub-Clarksville sand: None.

ACID TREATMENT

Sub-Clarksville sand: This reservoir does not yield to acid treatment.

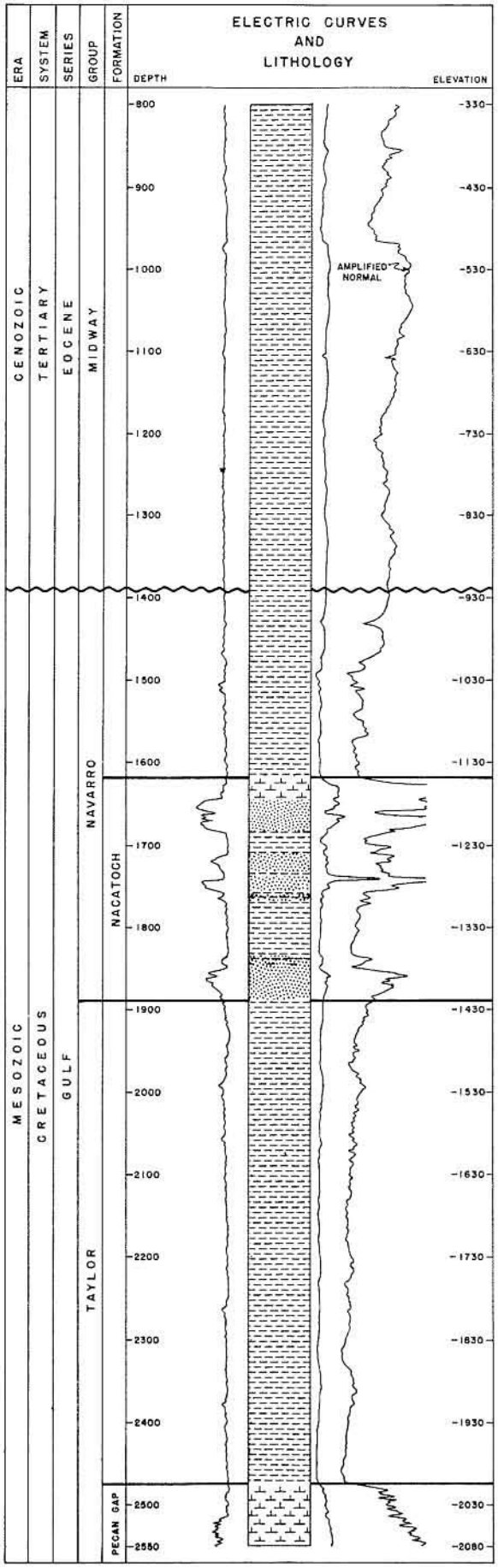
PRODUCTION HISTORY

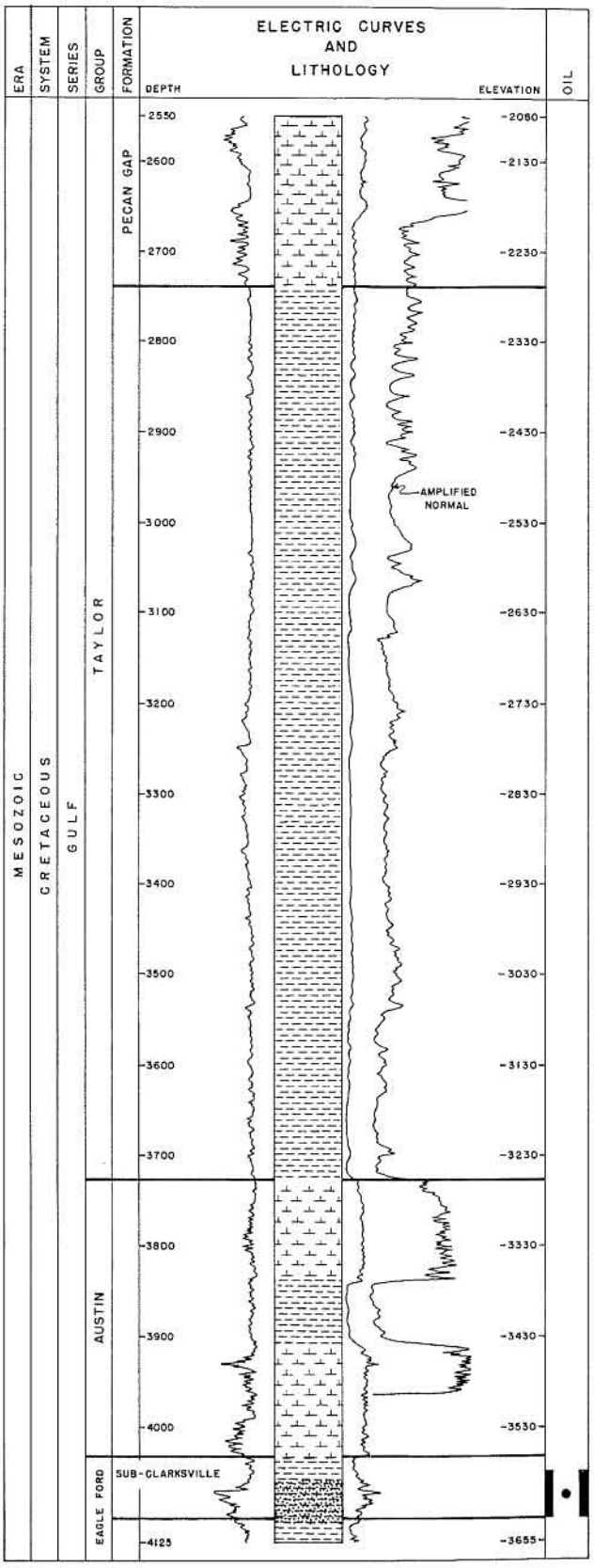
Sub-Clarksville sand and Field total:

	WELLS PRODUCING at end of year		OIL PRODUCTION (barrels)	
Year	Flowing	Pumping	Yearly	Cumulative
1948	1	8	33,307	33,307
1949	1	18	55,347	88,654

ALBA FIELD, Wood County, Texas

TYPE SECTION OF ROCKS PENETRATED

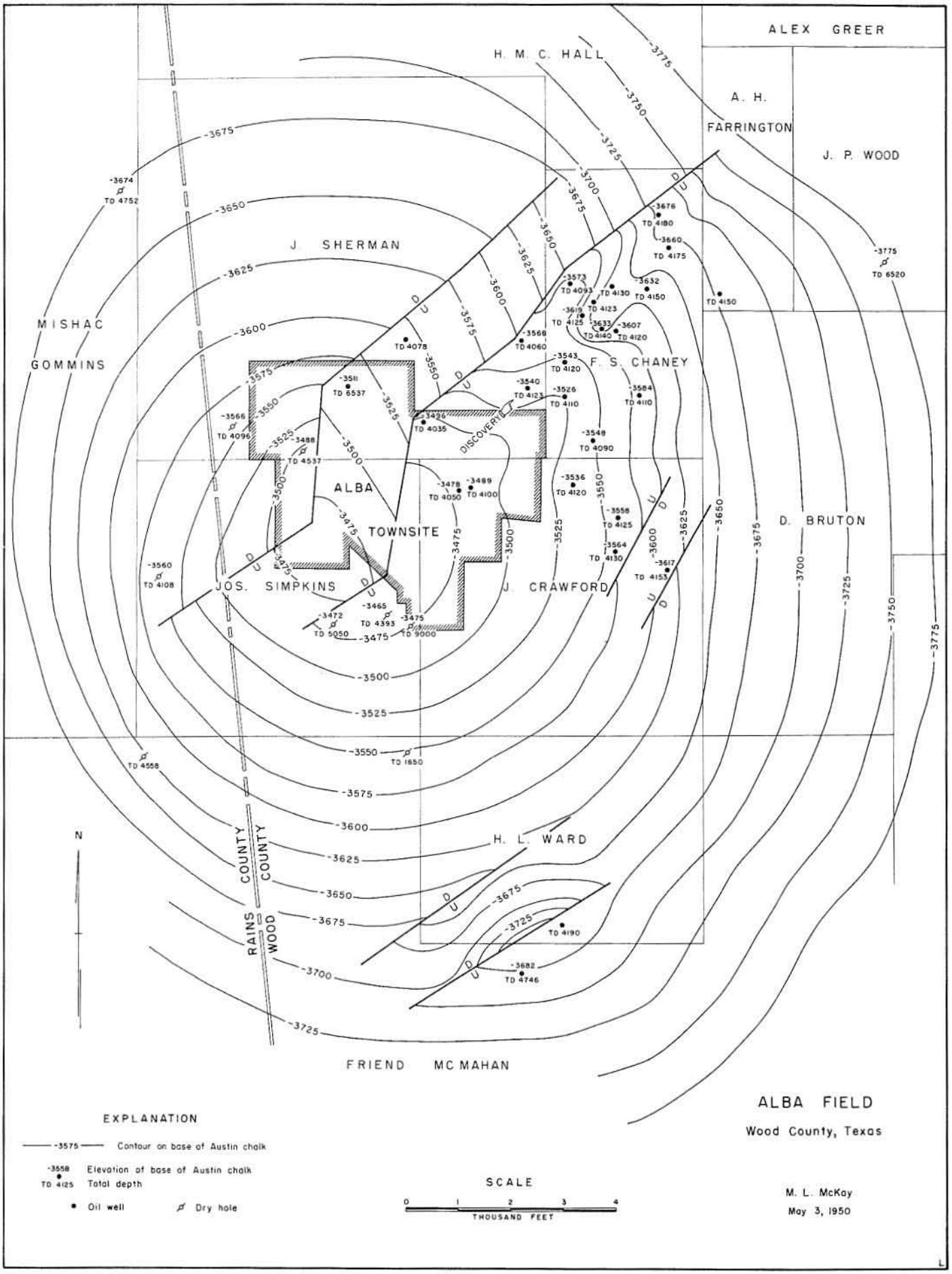




EXPLANATION

Shale | Chalk | Shaly sand | Sand

● Oil production


ALEX GREER
H. M. C. HALL
A. H. FARRINGTON
J. P. WOOD
J SHERMAN
MISHAC GOMMINS
F. S. CHANEY
D. BRUTON
ALBA TOWNSITE
DISCOVERY
JOS. SIMPKINS
J. CRAWFORD
H. L. WARD
COUNTY
RAINS
WOOD
FRIEND
MC MAHAN
N
EXPLANATION
-3575 Contour on base of Austin chalk
-3558 Elevation of base of Austin chalk
TD 4125 Total depth
Oil well
Dry hole
SCALE
0 1 2 3 4
THOUSAND FEET
ALBA FIELD
Wood County, Texas
M. L. McKay
May 3, 1950

APPLEBY FIELD
Nacogdoches County, Texas

G. C. CLARK
District Geologist, Stanolind Oil & Gas Company, Tyler, Texas
March 17, 1950

LOCATION

The one well which occasioned the naming of this field was in the east central part of Nacogdoches County, 7 miles northeast of Nacogdoches, the county seat.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Reflection seismic work led to the leasing of a 5,000 acre block by The Texas Co. late in 1941.

DISCOVERY

Upper Travis Peak: April 27, 1943;
The Texas Co. #1 G. W. Strahan.

ELEVATION OF SURFACE

447 feet.

SURFACE FORMATIONS

The Reklaw and Queen City formations outcrop in the immediate vicinity of the well, which commenced drilling at about the contact of these formations.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

690 feet below top of Travis Peak.

STRUCTURE

Probably monoclinal flattening of regional southwest dip.

NATURE OF TRAP

Upper Travis Peak: Possibly stratigraphic.

PRODUCTIVE AREA

Upper Travis Peak: One well.

THICKNESS OF RESERVOIR ROCK

Upper Travis Peak: Effective, 10 feet; perforated, 50 feet.

LITHOLOGY OF RESERVOIR ROCK

Upper Travis Peak: Quartzitic sandstone.

ACID TREATMENT

Upper Travis Peak: 3,000 gallons.

CONTINUITY OF RESERVOIR ROCK

Upper Travis Peak: This reservoir is in a zone containing lenses of thin-bedded sandstone, which zone is continuous throughout northeast Texas. The particular lens which produced in the one well here is probably quite local.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

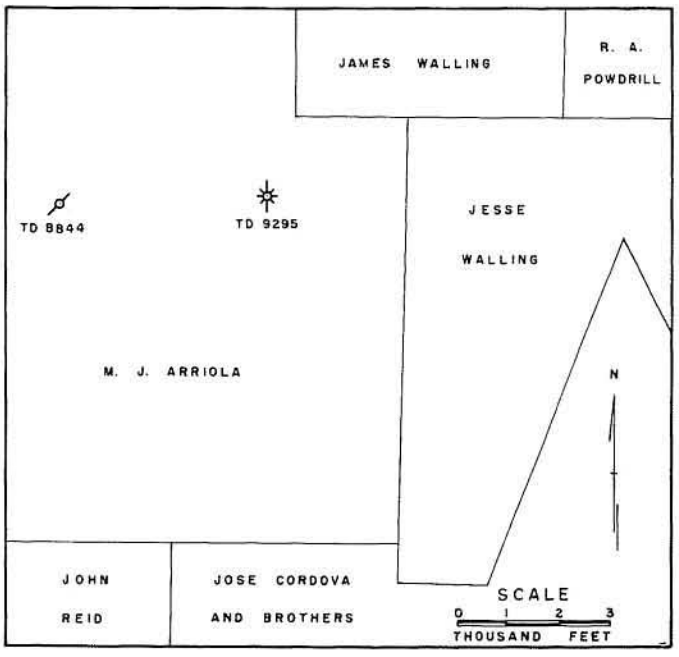
Upper Travis Peak	Feet
Elevation of top of gas and condensate	-8,163
Elevation of bottom of gas and condensate	-8,213
Relief	50

The above figures represent location of casing perforations and probably include more section than was actually productive.

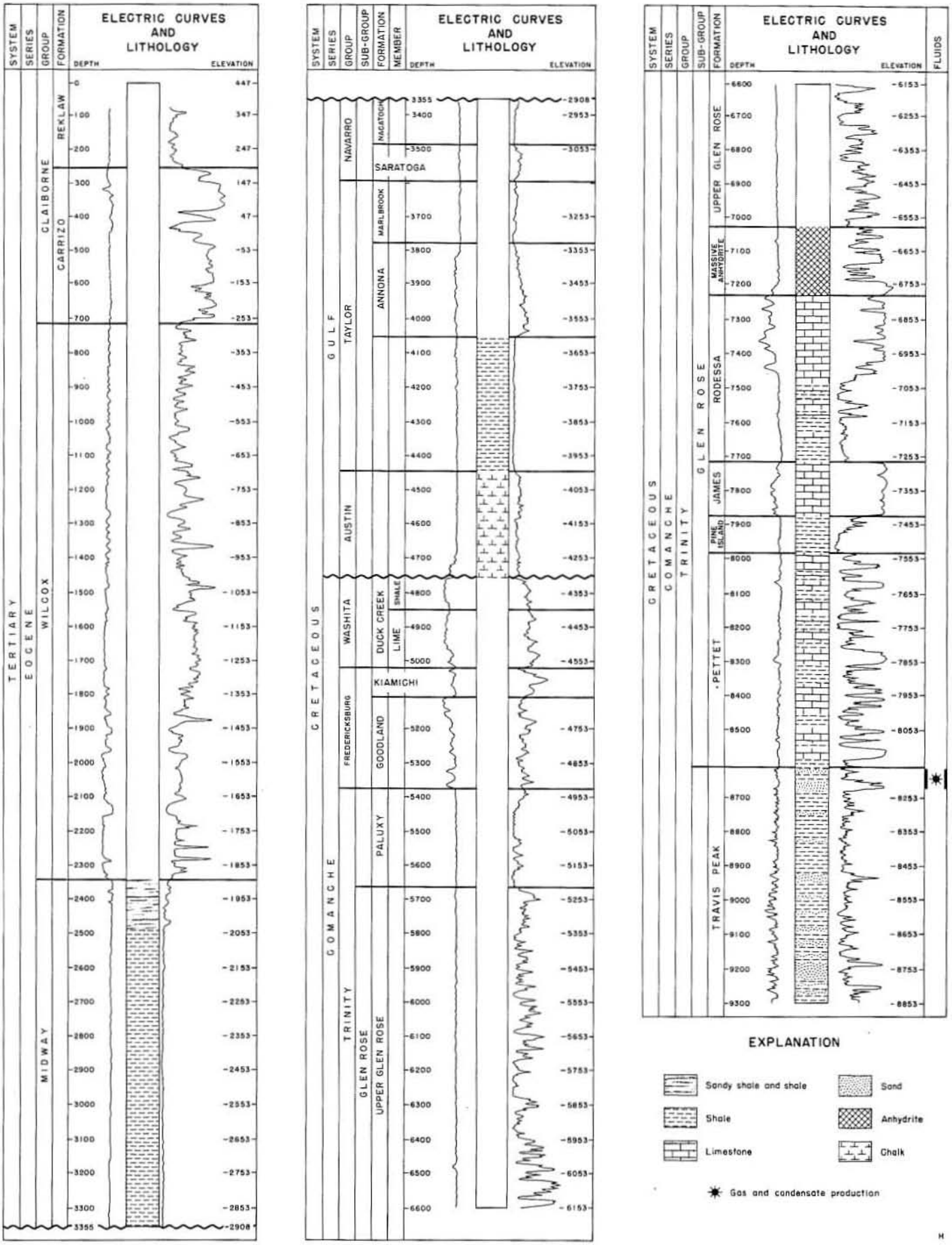
PRODUCTION HISTORY

After having been plugged back from a total depth of 9,295 feet, the well was completed on April 27, 1943 with initial daily capacity of 425 Mcf of gas and 28 barrels of 51.7° gravity condensate. It was plugged and abandoned four months later. Evidently the quantity produced was very small, for the writer has been unable to find any record of it in the periodicals where such quantities generally are reported.

Within a year after the discovery well was abandoned, The Texas Co. #1 A. W. Pruitt, about 4,000 feet westward, was drilled to a total depth of 8,844 feet without finding commercial production.



TYPE SECTION OF ROCKS PENETRATED



ASHTON FIELD
Shelby County, Texas

G. C. CLARK
District Geologist, Stanolind Oil & Gas Company, Tyler, Texas
March 17, 1950

LOCATION

Northeast Shelby County, 7 miles south of Logansport, Louisiana.

FIELD NAME

The name Pickering, which had prior application to a nearby field, has been used in designating this area about as much as has the name Ashton. In its 1942 Year Book, National Oil Scouts & Landmen's Association reported the completion of A. E. McKiernan #1 Pickering Lumber Co. on October 11, 1941 as the discovery of the Ashton field. It appears that there has been no production at Pickering since about 1925 (?) and none at Ashton since 1942. It is believed that with this information, the reader will be able to avoid confusion in correlating data from the several usual sources.

The name Dawton has been used in designating this field, but, so far as the writer knows, this name has not been used in technical publications.

METHODS OF EXPLORATION LEADING TO DISCOVERY

It appears that random drilling led to the discovery of production in the Nacatoch sand reported below. Apparently this discovery occasioned the first designation of the area by a field name. The earlier production from the Paluxy evidently did not appear sufficiently promising to warrant recognition as a discovery. The well which produced for a short time from the Paluxy was drilled as a part of a program following a geophysical survey.

DISCOVERIES

Nacatoch: October 10, 1941; A. E. McKiernan #1 Pickering Lumber Co. Initial daily potential, 30 barrels of oil and 90 barrels of salt water. Perforated, 1,475 to 1,510 feet. Total depth, 3,345 feet in Trinity.

Paluxy: December 3, 1928; Gulf Producing Co. #1 Pickering Lumber Co. Initial daily potential, 52 barrels of oil and 4,000 Mcf of gas. Perforated, 3,250 to 3,260 feet. Total depth, 3,440 feet in Trinity.

STRUCTURE

Nose off south flank of Joaquin-Logansport structure.

NATURE OF TRAPS

Stratigraphic for both reservoirs.

PRODUCTIVE AREA

One well for each reservoir.

LITHOLOGY OF RESERVOIR ROCKS

Nacatoch: Fine, light, shaly sand.
Paluxy: Fine- to medium-grained gray sand.

CONTINUITY AND THICKNESSES OF RESERVOIR ROCKS

Nacatoch: Widespread regionally. Locally, its thickness is less than 35 feet with less than 10 feet productive.

Paluxy: Widely distributed throughout the north half of the northeast Texas district. Locally, it is in lenses not exceeding 10 feet in thickness. Its occurrence in Shelby County is so erratic that it is not considered as a potential reservoir for that county.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

	Nacatoch	Paluxy
Elevation of top of oil, feet	-1,219	-3,004
Elevation of bottom of oil, feet	-1,254	-3,014
Relief, feet	35	10

As to each reservoir, the above figures represent conditions in the one well where the reservoir was productive of a small quantity of oil. Some gas was produced with the oil from the Paluxy reservoir.

CHARACTER OF OIL

Nacatoch: Gravity, A. P. I., 39.8°
Paluxy: Gravity, A. P. I., 38.5°

PRODUCTION HISTORY

Nacatoch: One well produced by pumping a total of 797 barrels of oil during the latter part of 1941 and 204 barrels during the first four months of 1942. The well was plugged and abandoned on September 9, 1942 after having produced a total of only 1,001 barrels of oil.

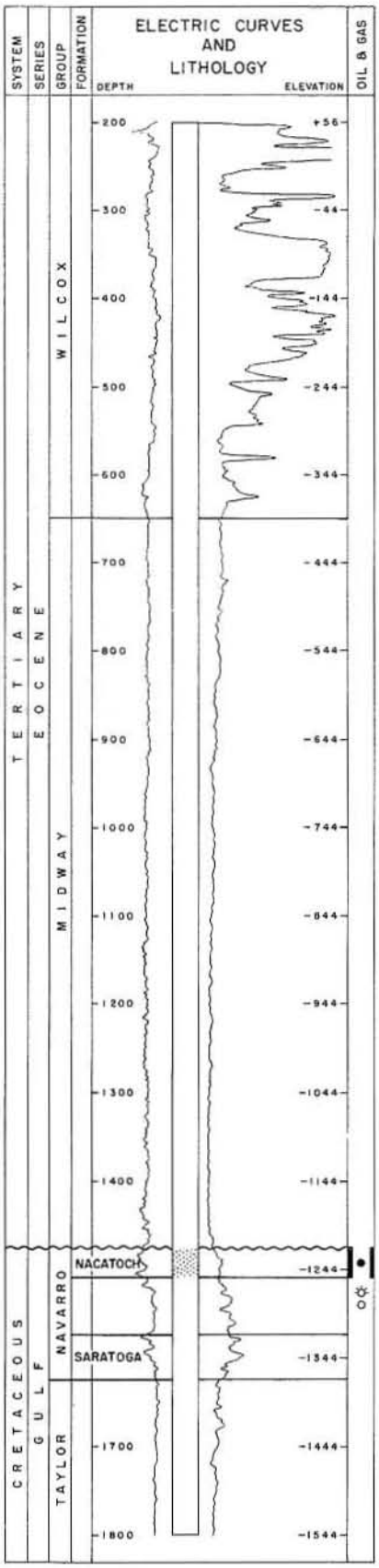
Paluxy: The writer has not determined the quantity of oil produced by the one well completed in this reservoir. The well was completed on December 3, 1928. The production was by pumping and it is evident that the total quantity produced before abandonment in 1931 was small, probably only a few hundred barrels.

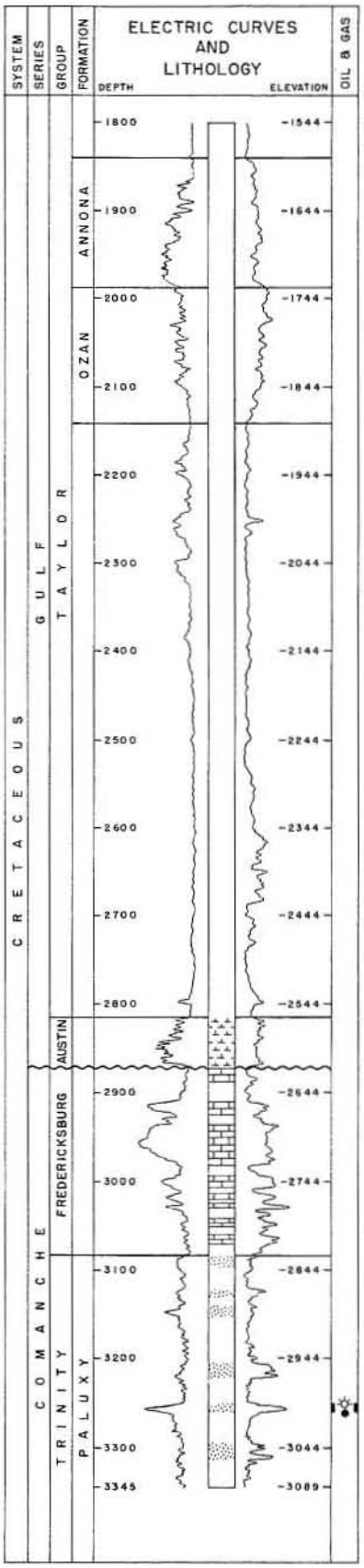
TYPE SECTION OF ROCKS PENETRATED

SURFACE FORMATION: Wilcox

ELEVATION OF SURFACE: 256 feet (Nacatoch well) and 246 feet (Paluxy well)

OLDEST HORIZON PENETRATED: About 360 feet below top of Trinity Group

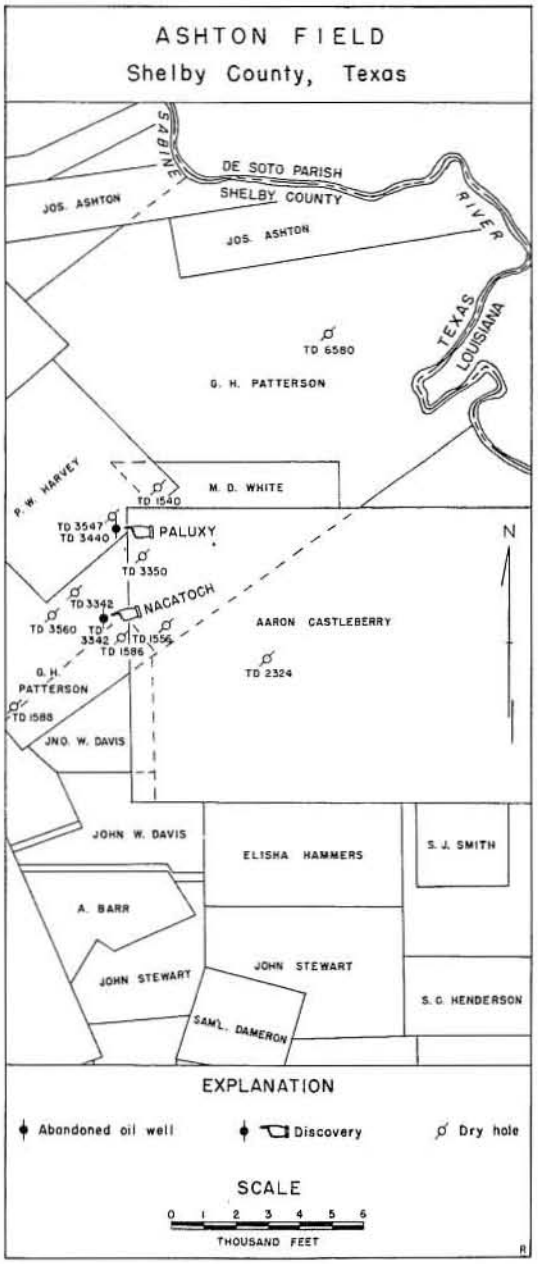




EXPLANATION

Sand | Chalk | Limestone

● Oil production ○ Show of oil ☼ Show of gas



BARRON FIELD
Limestone County, Texas

DONALD T. GIBSON
Geologist, Stanolind Oil & Gas Company, Tyler, Texas
June 10, 1949

LOCATION

The Barron field is 2½ miles southwest of Groesbeck, county seat of Limestone County. It is in the zone of the Luling-Mexia-Talco fault system.

FIELD NAMES

This field has been designated by the names Barron, Groesbeck, South Groesbeck, West Groesbeck and North Thornton. The names most commonly used in publications are Barron and South Groesbeck. Barron was first applied when there was production from the Nacatoch sand. At that time, the name South Groesbeck was in current use in designating a nearby field. Both fields became inactive. Subsequent to the discovery of production in the Pettet lime in 1939, the name South Groesbeck has been commonly applied to this field although the name had prior application to a nearby field. The Railroad Commission of Texas designates the field by the name Groesbeck. Certain periodical publications have consistently used the name Barron. It appears that the name Barron has not been applied to any other field in the region.

NACATOCH SAND

Some gas was produced from the Nacatoch sand long prior to the discovery of the Pettet lime reservoir. However, that production was of minor importance and the reservoir has long since been depleted. Due to lack of sufficient date, this reservoir is not further recognized in this paper except that it is included in the accompanying stratigraphic section.

METHODS OF EXPLORATION LEADING TO DISCOVERY

The field is on a well known structure first mapped on surface geology in 1905. The initial Pettet test was drilled as a result of favorable surface geology as mapped on the Midway and subsurface information from numerous shallow tests in the area. On August 25, 1939, Murray Samuel commenced the drilling of the well which resulted in the discovery of the Pettet reservoir on November 25, 1939.

DISCOVERY

Pettet lime: November 25, 1939;
Murray Samuel #1 C. Barron

NATURE OF TRAP

Pettet lime: Convex trap on a faulted anticline.

PRODUCTIVE AREA

Pettet lime: 600± acres.

THICKNESS OF RESERVOIR ROCK

	Feet		
	Min.	Max.	Avg.
Pettet lime			
From top to bottom	135	160	139
Net produtive	15	30	20

LITHOLOGY OF RESERVOIR ROCK

Pettet lime: Limestone, oolitic, gray and tan, fossiliferous.

Shale partings: In each of the wells completed in this lime there are three major correlative shale partings dividing the Pettet into four zones, each of which contains several 1-foot shale partings. The lower zone carries water throughout the field.

CONTINUITY OF RESERVOIR ROCK

Pettet lime: The reservoir is a portion of a limestone known to be continuous at least 7 miles southwest along strike, approximately 5 miles updip to the west, 5 miles to the north, and the eastward downdip limit is unknown. Although there is a limestone at or near the same stratigraphic position beyond these limits, continuity of porosity is doubtful due to variable positions of shale partings within the reservoir.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Pettet lime:	Feet	
	Oct., 1939	Aug., 1948
Elevation of top of gas	-5,126	-5,126
Elevation of bottom of gas	-5,270	-5,140
Relief	144	14

CHARACTER OF CONDENSATE

Pettet lime:

	Max.	Min.	Wtd. avg.
Gravity, A.P.I. @ 60°F.	60°	42°	58°

CHARACTER OF GAS

Pettet lime: Dry gas with less than 1 barrel of condensate per Mcf of gas. No analysis is available.

WATER PRODUCTION

Pettet lime: At present, three wells have been abandoned due to water encroachment, but no figure is available as to the amount of salt water produced from the reservoir. However, water encroachment is of such magnitude that it is estimated that it will be necessary to abandon the field by 1950.

ACID TREATMENT

Pettet lime: A majority of the wells were acidized moderately with 3,000-4,000 gallons. This practice was variable depending upon the operator.

SELECTED REFERENCES

Carter, D. V., Hackbusch, F. M., and Williams, D. C. (1940) Development and production in east and east-central Texas for 1939: Amer. Inst. Min. Met. Eng., Petr. Dev. Tech., pp. 411, 412, 413, 414. (The field name is indicated as "Barron" in this and subsequent corresponding annual publications.)

Denton, F. R., and Trowbridge, R. M. (1941) Developments in east Texas during 1940: Amer. Assoc. Petr. Geol., Bull., vol. 25, p. 1087. (Field designated as South Groesbeck.)

Denton, F. R., and Trowbridge, R. M. (1942) Developments in east Texas during 1941: Amer. Assoc. Petr. Geol., Bull., vol. 26, p. 1055. (Field designated as South Groesbeck.)

Ley, H. A., and Willson, K. M. (1935) Gas fields in northeast Texas embayment: Amer. Assoc. Petr. Geol., Geology of Natural Gas, pp. 675, 676. (Field designated as Barron.)

McClellan, H. J., and Wendlandt, E. A. (1940) Developments in east Texas during 1939: Amer. Assoc. Petr. Geol., Bull., vol. 24, p. 1067. (Field designated as South Groesbeck.)

In order to avoid confusion, the writer cites the following references where "South Groesbeck" applies to a Limestone County, Texas, field other than that treated in this paper.

Lahee, F. H. (1929) Oil and gas fields of the Mexia and Tehuacana fault zones, Texas: Amer. Assoc. Petr. Geol., Structure of Typical American Oil Fields, vol. 1, pp. 309, 339, 340.

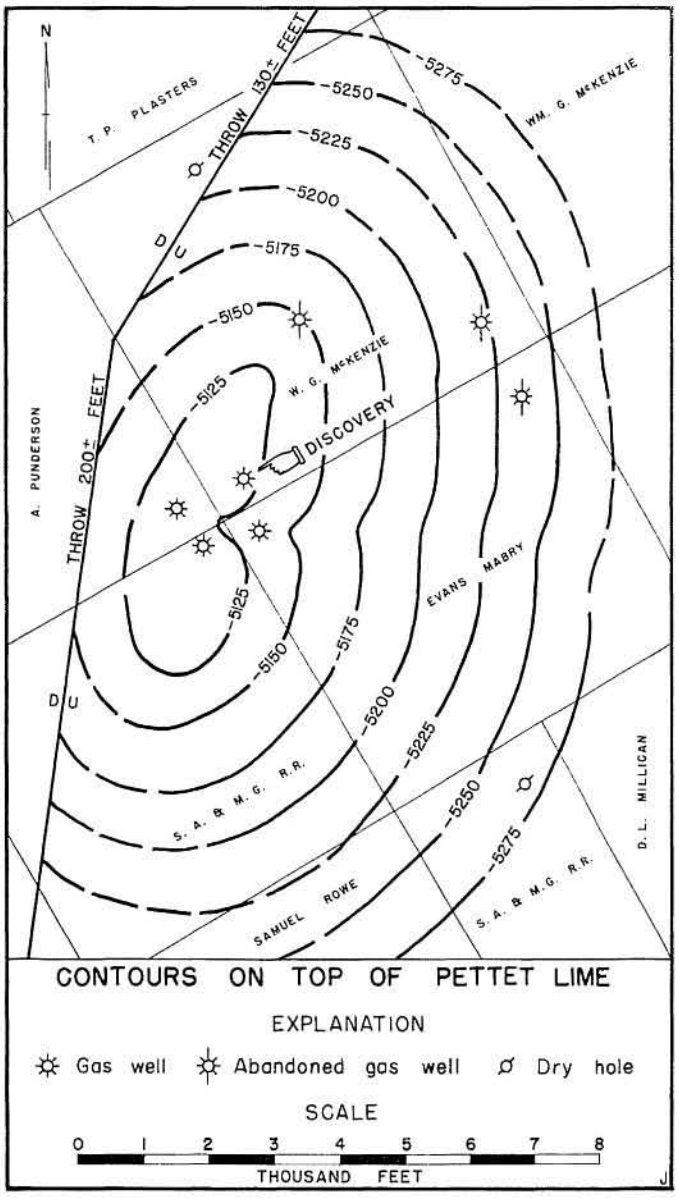
Ley, H. A., and Willson, K. M. (1935) Gas fields in northeast Texas embayment: Amer. Assoc. Petr. Geol., Geology of Natural Gas, pp. 671, 673, 678, 679.

PRODUCTION HISTORY

Pettet lime:

Year	WELLS PRODUCING at end of year: Flowing	GAS PRODUCTION (Mcf): Yearly	GAS PRODUCTION (Mcf): Cum.	CONDENSATE PRODUCTION (barrels): Yearly	CONDENSATE PRODUCTION (barrels): Cum.
1939	1	25,000	25,000	200	200
1940	3	490,300	515,300	742	942
1941	5	950,813	1,466,113	1,150	2,092
1942	6	1,210,400	2,676,513	1,390	3,482
1943	7	1,960,918	4,637,431	4,135	7,617
1944	7	235,217	4,872,648	2,346	9,963
1945	7	1,450,495	6,323,143	803	10,766
1946	7	570,880	6,894,023	907	11,673
1947	4	1,365,078	8,259,101	434	12,107
1948	4	1,056,482	9,315,583	0	12,107
1949*	4	594,303	9,909,886	0	12,107

*P.S. - 1949 data added by amendment.

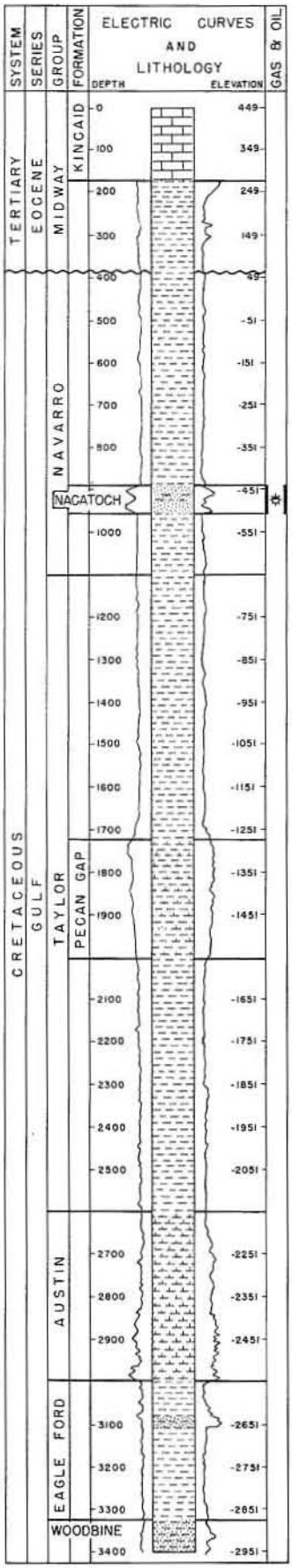


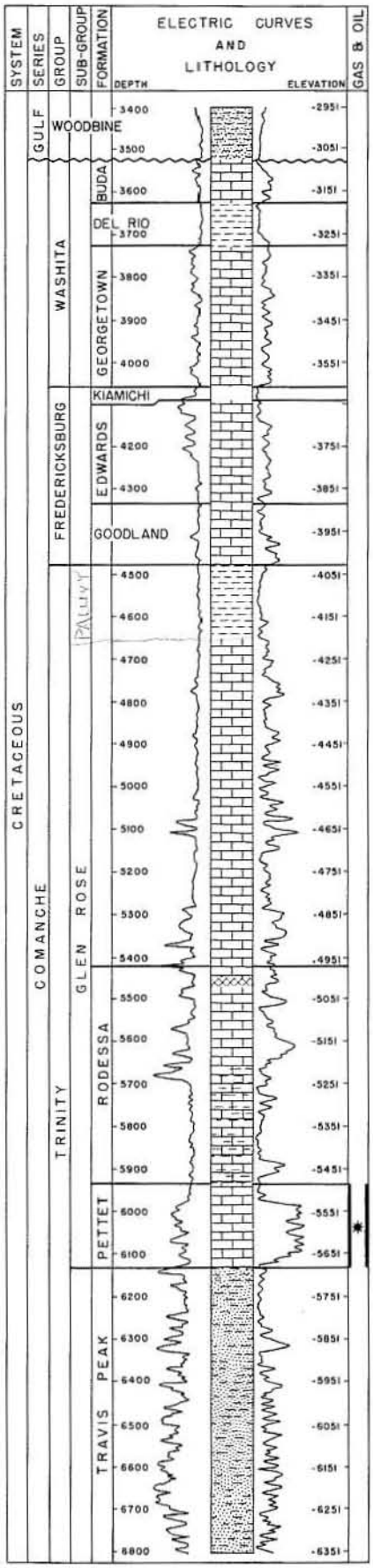
BARRON FIELD, Limestone County, Texas

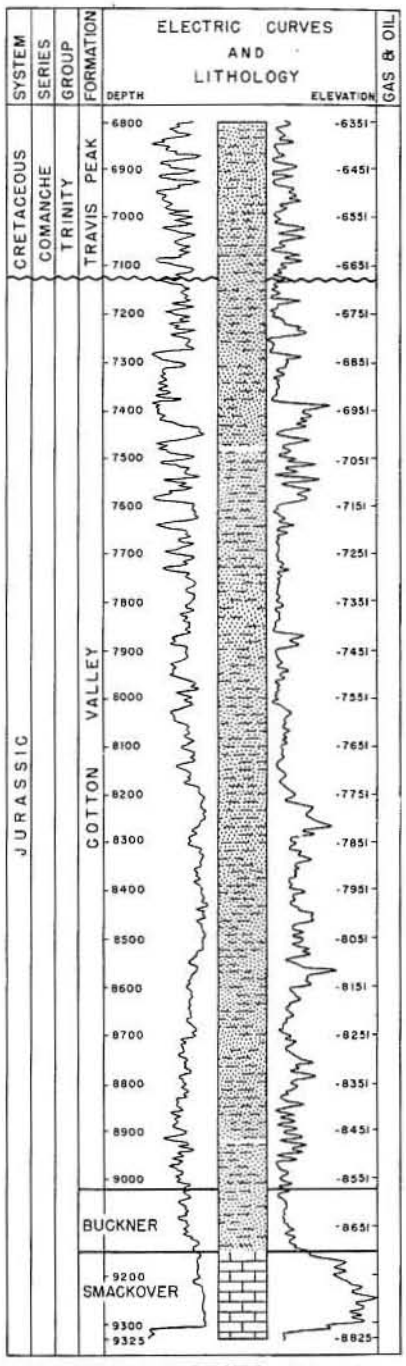
TYPE SECTION OF ROCKS PENETRATED

SURFACE FORMATION: Kincaid

ELEVATION OF SURFACE: Highest, 457 feet; lowest, 440 feet







OLDEST HORIZON PENETRATED: 191 feet below the top of the Smackover

EXPLANATION

- Shale
- Limestone
- Chalk
- Anhydrite
- Sand
- ✱ Gas production; depleted
- ✱ Gas and condensate production

BETHANY FIELD

Panola and Harrison Counties, Texas and Caddo Parish, Louisiana

JOE C. KITCHENS
Geologist, The Pure Oil Company, Tyler, Texas
October 25, 1950

LOCATION and OTHER NAMES

The Bethany field is mainly in the northeast corner of Panola County, Texas, with minor portions of the field in the southeastern corner of Harrison County, Texas, and in the western edge of Caddo Parish, Louisiana.

In some early publications this field is called the Panola field. The portion of the field in the vicinity of the town of De Berry has been called the De Berry field.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Mapping of surface geology led to the first drilling operations and to the discovery of shallow production. The subsurface data afforded by the shallow wells led to successful drilling exploration for production in the deeper zones.

DISCOVERIES

Nacatoch sand and Field: The exact date and the well designation are not certain, but it appears likely that the date was in June 1916 and that the well was Palmetto Petroleum Co. #1 Trosper, the exact location of which the writer has been unable to determine. In a following listed reference, Dumble reports: "In June 1916, the Palmetto Petroleum Company, drilling a well on the Trosper farm in the northeastern corner of Panola county, had a blow-out from a sand found at 1050 feet. The flow was estimated at ten million cubic feet of gas and four thousand barrels of water daily. The gas not only came up from the well, but broke out at five different points, one of them a thousand feet away from the well. On June 25th it was estimated that at least 25,000,000 cubic feet of gas was escaping from the six vents.

Blossom sand (Buckrange): March 28, 1921; Magnolia Petroleum Co. #2 Mrs. Corrie Steele. Initial production: 20 million cubic feet of dry gas per day.

Comanchean lime (Barlow): February 25, 1917; Gulf Production Co. #1 Jehu Jernigan. This well was started by Palmetto Petroleum Co. and acquired by Gulf while drilling. Its initial production was at the rate of 6 barrels of oil per day.

Paluxy: Upper Paluxy sand (Adams): May 16, 1918; The Texas Co. #4-B T. C. Adams. Initial production: 6 million cubic feet of dry gas per day.

Paluxy: Lower Paluxy sand (Deep Bethany sand): The writer has been unable to determine the discovery well with certainty. The Gulf Production Co. #1 Taylor-Trosper is probably the discovery well for this zone. This well was completed on October 10, 1919, with an initial production of $17\frac{1}{2}$ million cubic feet of dry gas per day.

Upper Glen Rose: Tiller: October 27, 1929; Magnolia Petroleum Co. #5 Tiller. Initial production: 15 million cubic feet of dry gas per day.

Upper Glen Rose: Werner: The writer has not determined which was the discovery well nor its date of completion.

Rodessa: Hill lime (Roquemore): May 14, 1930; Natural Production Co. #8 J. R. Roquemore. Initial production: 8 million cubic feet of gas and an unknown amount of condensate per day. Initial closed pressure was 2,190 psi.

Rodessa: Gloyd lime: October 10, 1946; Union Producing Co. #1-A Steele Unit. Initial daily production: 28 million cubic feet of gas and an unestimated amount of condensate through perforations from 4,855 to 4,875 feet. The initial closed pressure was 2,146 psi.

Pettet lime: November 11, 1938; The Texas Co. #1-C T. C. Adams. Initial daily production: 11.7 million cubic feet of gas and 20 barrels of condensate per million through perforations from 5,625 to 5,660 feet and from 5,725 to 5,740 feet. The initial closed pressure was 2,280 psi.

Travis Peak sand: November 12, 1940; Holcomb & Thomasson #15 Crenshaw Heirs. Initial daily production: 60 million cubic feet of gas and 12 barrels of condensate per million through perforations from 5,836 to 5,850 feet and from 6,010 to 6,024 feet. The initial closed pressure was 2,295 psi.

ELEVATION OF SURFACE

At well locations: Highest, 380 ft.; lowest, 255 feet.

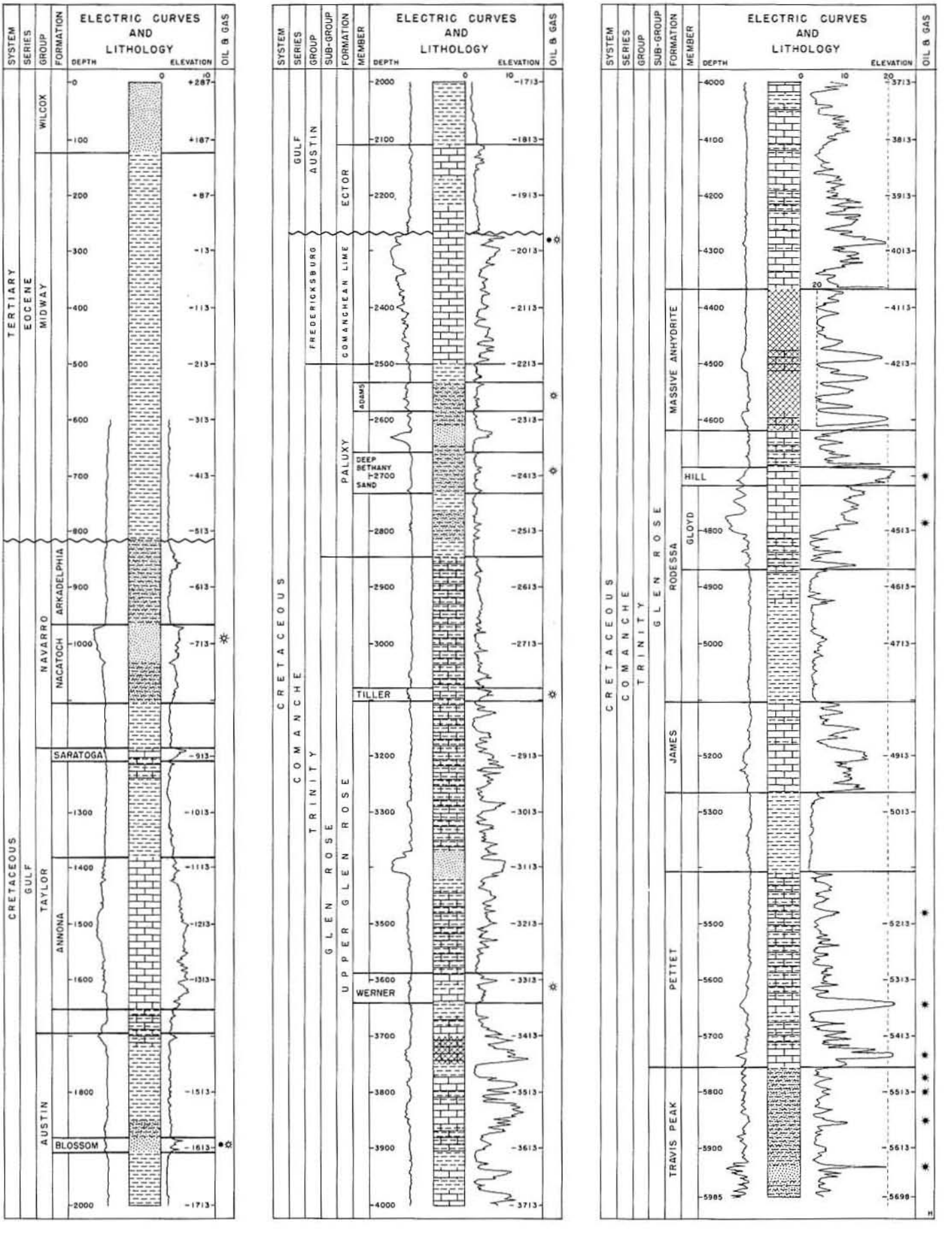
SURFACE FORMATION

Wilcox group, undifferentiated.

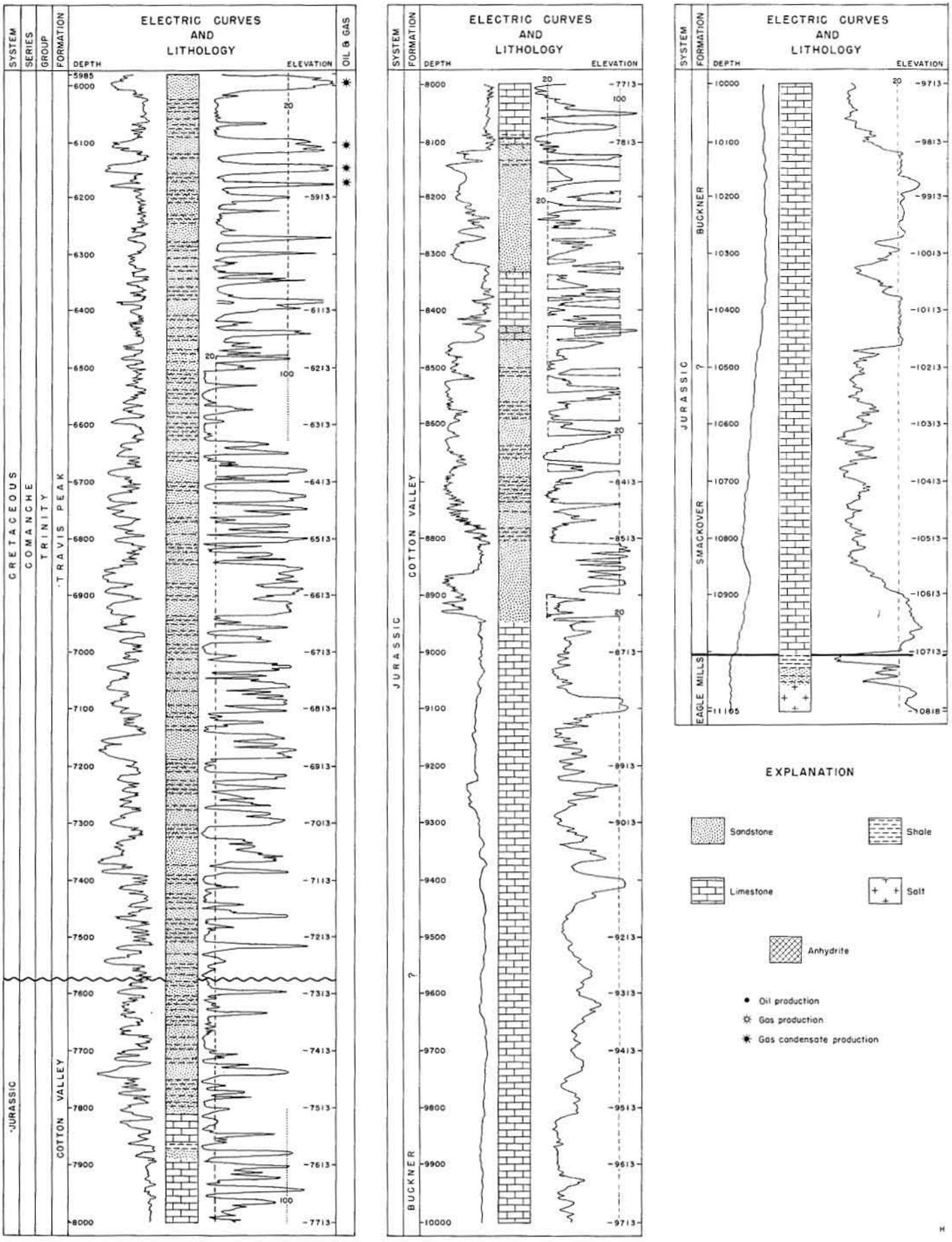
OLDEST STRATIGRAPHIC HORIZON PENETRATED

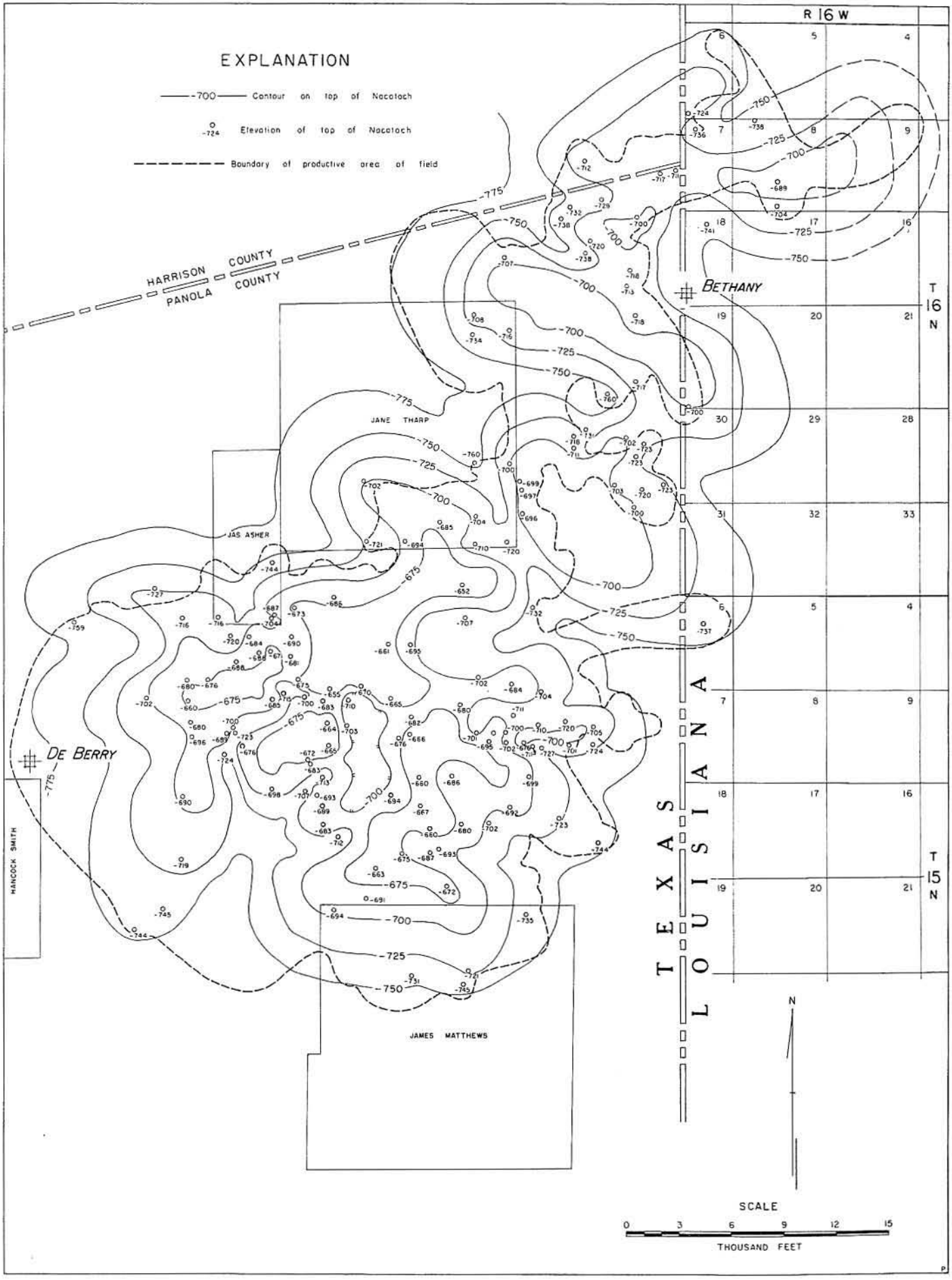
The oldest horizon penetrated is in salt in the Eagle Mills formation about 300 feet below its top. This penetration was in The Texas Co. #1-C T. C. Adams, which is the discovery well in the Pettet lime.

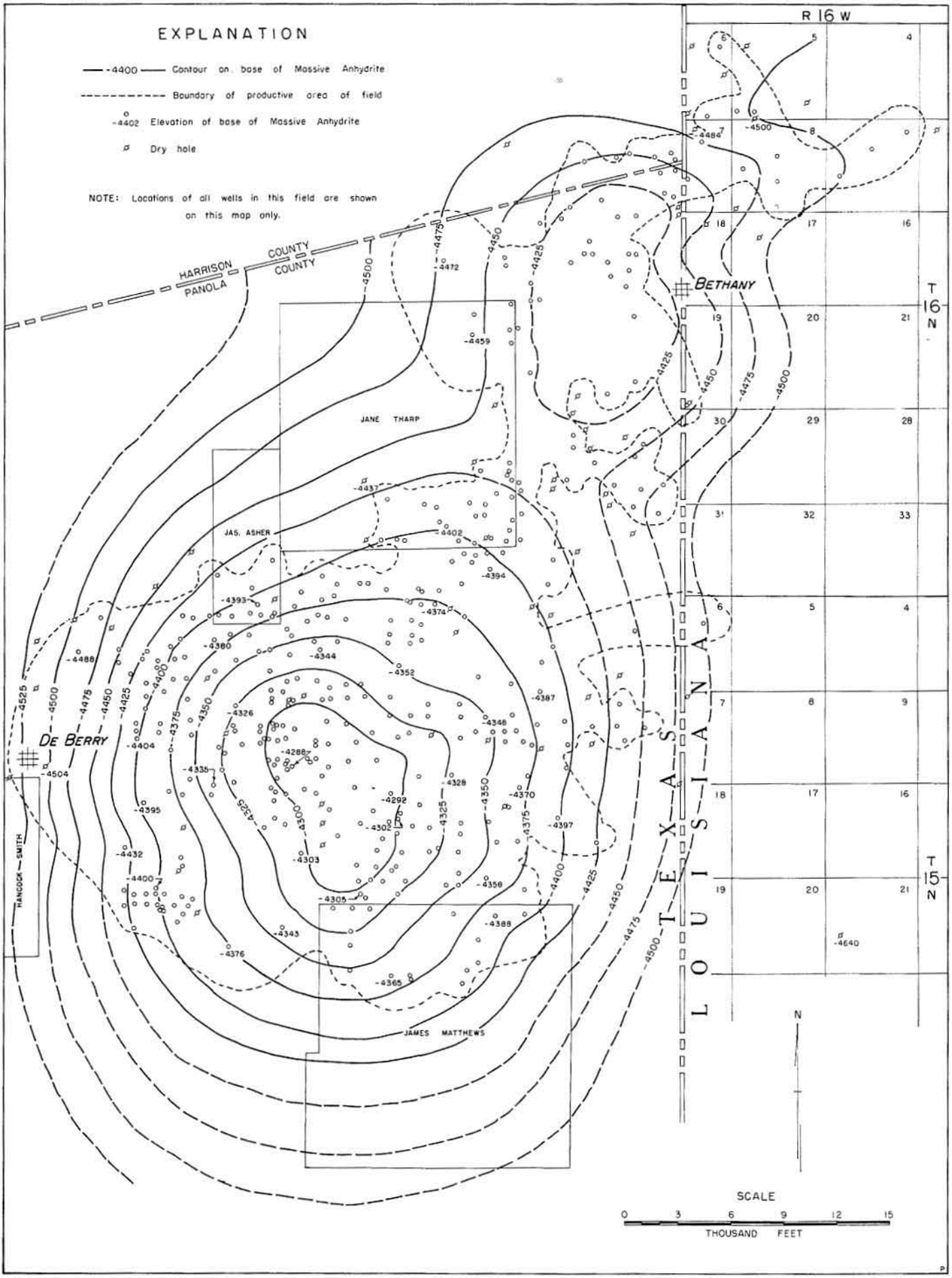
TYPE SECTION OF ROCKS PENETRATED



TYPE SECTION OF ROCKS PENETRATED




EXPLANATION
-700 Contour on top of Nacatoch
-724 Elevation of top of Nacatoch
Boundary of productive area of field
HARRISON COUNTY
PANOLA COUNTY
BETHANY
DE BERRY
JANE THARP
JAS ASHER
HANCOCK SMITH
JAMES MATTHEWS
TEXAS
LOUISIANA
R 16 W
T 16 N
T 15 N
N
SCALE
0 3 6 9 12 15
THOUSAND FEET


EXPLANATION
-4400- Contour on base of Massive Anhydrite
Boundary of productive area of field
-4402 Elevation of base of Massive Anhydrite
Dry hole
NOTE: Locations of all wells in this field are shown on this map only.
HARRISON COUNTY
PANOLA COUNTY
R 16 W
T 16 N
T 15 N
BETHANY
DE BERRY
JANE THARP
JAS. ASHER
JAMES MATTHEWS
HANCOCK - SMITH
TEXAS
LOUISIANA
N
SCALE
0 3 6 9 12 15
THOUSAND FEET

NATURE OF TRAPS and STRUCTURE

The Bethany field is on a northeast-southwest trending anticline situated on the central portion of the Sabine uplift. The northern portion of the producing area is commonly referred to as the North field and the southern portion, as the South field. This is due to the fact that there are two separate closures superimposed on the anticline, one at the north end and one at the south end of the anticline. Porosity is of major importance in the accumulation of oil and gas at Bethany. The porosity in each of the producing zones varies greatly over short distances.

PRODUCTIVE AREAS

	Acres
Nacatoch	6,800
Blossom	2,900
Comanchean	4,800
Paluxy	
Upper	4,800
Lower	2,500
Upper Glen Rose	
Tiller and Werner	2,000
Rodessa	
Hill	2,300
Gloyd	2,100
Pettet	6,900
Travis Peak	16,000
Bethany field	19,000

THICKNESSES OF RESERVOIR ROCKS

	Feet		
	Min.	Max.	Avg.
Nacatoch	19	162	84
Blossom	15	40	29
Comanchean	8	50	24
Paluxy			
Upper	3	52	28
Lower	10	50	20
Upper Glen Rose			
Tiller	21	34	26
Werner	11	40	29
Rodessa			
Hill	5	27	16
Gloyd	10	30	20
Pettet	14	56	34
Travis Peak	15	124	47

Prior to the discovery of production in the Pettet, it was common practice to drill a few feet into a reservoir and complete without penetrating the full thickness of the productive section. As a result of this, the above entries for the reservoirs from the Nacatoch through the Hill are based only on wells which did penetrate the entire section.

As neither the Pettet or Travis Peak production is from a single porous zone, the thicknesses given do not represent a continuous porous section, but are totals of the thicknesses of individual productive members.

LITHOLOGY OF RESERVOIR ROCKS

Nacatoch: The Nacatoch is porous over a greater portion of the Bethany field than is any other unit. In the northeastern part of the field, the Nacatoch is a gray, fine- to medium-grained, calcareous glauconitic sandstone. In the southwest and southeast part of the field the sandstone is highly argillaceous. In some places, there are alternating layers of sandstone and shale, and, in others, an arenaceous shale occurs at the Nacatoch stratigraphic position.

Blossom: The Blossom in the northeastern part of the field is a green, argillaceous, ashy, glauconitic, hard sandstone. Toward the southwest the amount of argillaceous material decreases, and the section is a green, medium- to fine-grained, porous, slightly ashy sandstone. On the eastern side of the field the Blossom is an arenaceous shale.

Comanchean lime: The productive Comanchean section is at the unconformity between the Comanchean and Gulf series. The Comanchean is a white, micro-oolitic, fossiliferous, occasionally chalky or sandy limestone. In the early days of Bethany, this zone was called the Woodbine, and most of the drillers logs show alternating layers of sand and limestone at the top of the section.

Paluxy: Upper Paluxy: The upper Paluxy is a white, fine- to medium-grained, porous sandstone.

Paluxy: Lower Paluxy: This zone is a white, fine- to medium-grained, porous sandstone.

Upper Glen Rose: Tiller: The Tiller is a gray, crystalline, pseudo-oolitic, fossiliferous limestone.

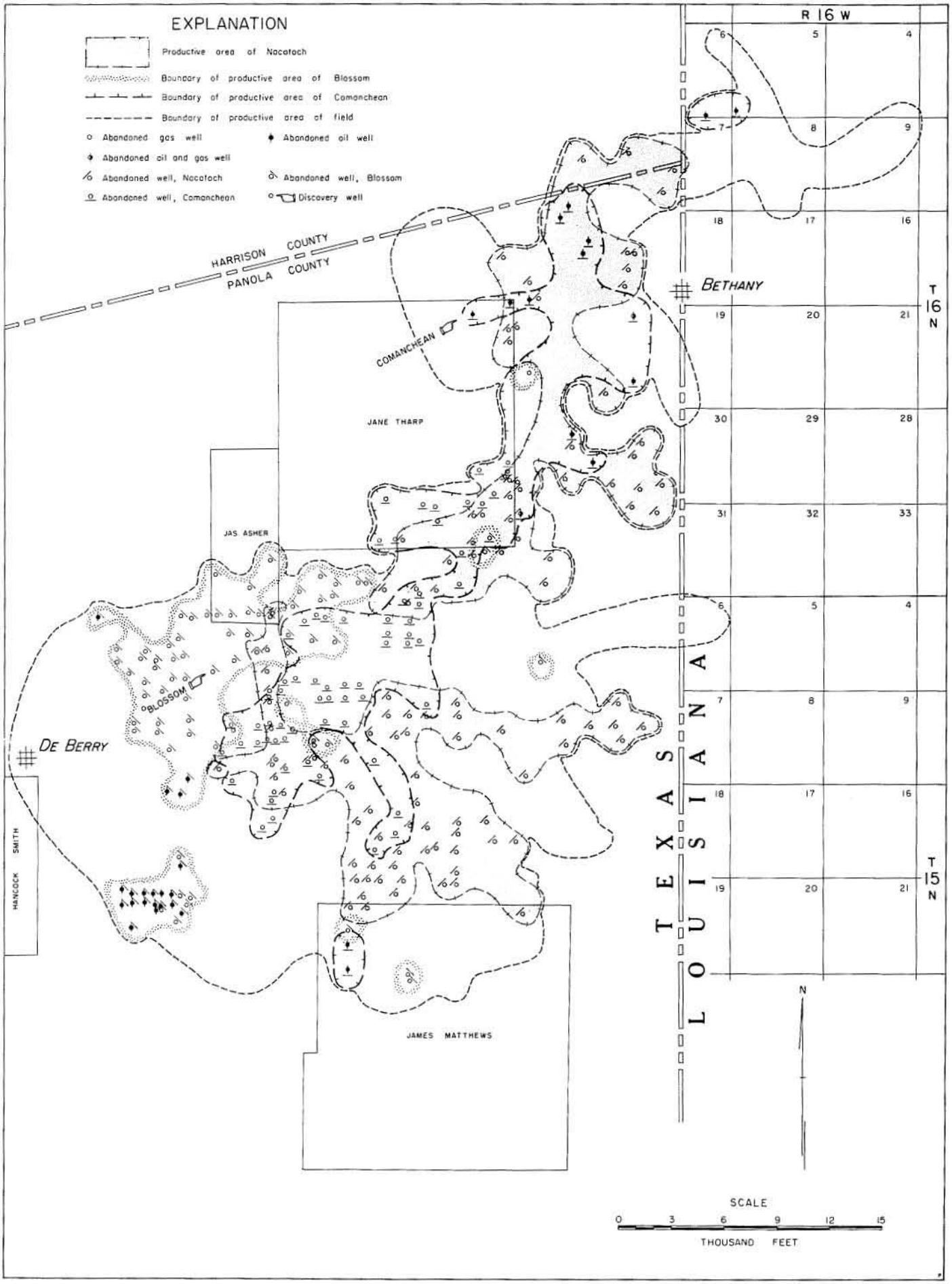
Upper Glen Rose: Werner: This unit is a gray, dense, crystalline, fossiliferous, pseudo-oolitic limestone with a gray to brown shale commonly separating the upper and lower parts of the zone. In places the zone is sandy. To the east of the productive area, this stratigraphic unit is a tannish-gray, medium-grained, porous sandstone.

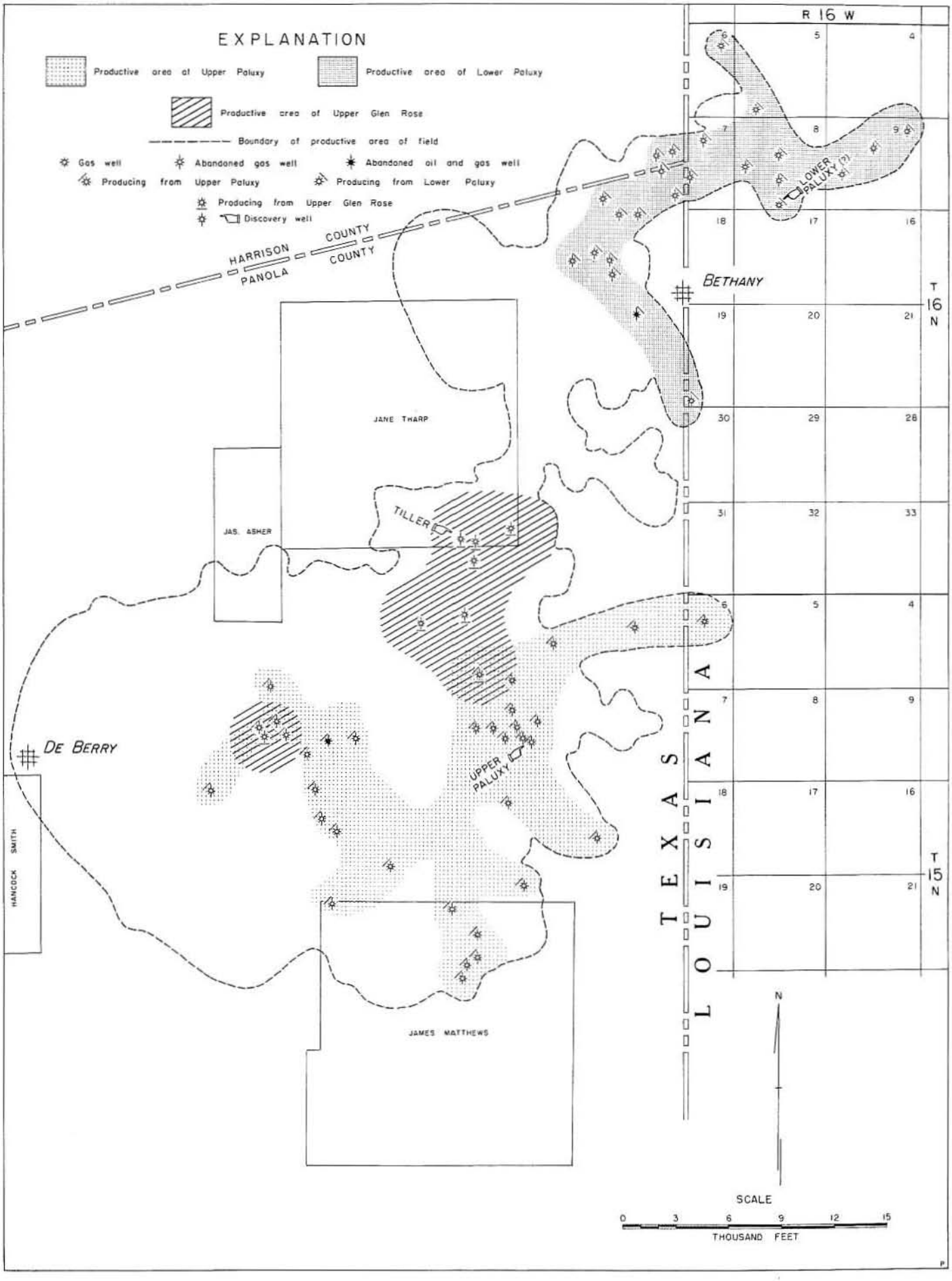
Rodessa: Hill: The Hill is a gray, oolitic and pseudo-oolitic limestone.

Rodessa: Gloyd: The Gloyd is a gray to brownish gray, fossiliferous, occasionally chalky and oolitic limestone.

Pettet: Pettet productive zones are gray and brownish-gray, fossiliferous, oolitic to pseudo-oolitic crystalline, sometimes chalky limestones.

Travis Peak: Travis Peak production occurs in several lenticular zones, with the oldest zone approximately 450 feet below the top of the formation. The Travis Peak sandstones are white, brownish-gray and tan, medium- to fine-grained, porous to slightly porous, occasionally ashy sandstones.


EXPLANATION
Productive area of Nacatoch
Boundary of productive area of Blossom
Boundary of productive area of Comanchean
Boundary of productive area of field
Abandoned gas well
Abandoned oil well
Abandoned oil and gas well
Abandoned well, Nacatoch
Abandoned well, Blossom
Abandoned well, Comanchean
Discovery well
R 16 W
HARRISON COUNTY
PANOLA COUNTY
BETHANY
COMANCHEAN
JANE THARP
JAS ASHER
BLOSSOM
DE BERRY
HANCOCK SMITH
JAMES MATTHEWS
T 16 N
T 15 N
TEXAS
LOUISIANA
N
SCALE
0 3 6 9 12 15
THOUSAND FEET


EXPLANATION
Productive area of Upper Paluxy
Productive area of Lower Paluxy
Productive area of Upper Glen Rose
Boundary of productive area of field
Gas well
Abandoned gas well
Abandoned oil and gas well
Producing from Upper Paluxy
Producing from Lower Paluxy
Producing from Upper Glen Rose
Discovery well
HARRISON COUNTY
PANOLA COUNTY
R 16 W
BETHANY
LOWER PALUXY (?)
JANE THARP
JAS. ASHER
TILLER
DE BERRY
UPPER PALUXY
HANCOCK SMITH
JAMES MATTHEWS
T 16 N
T 15 N
TEXAS
LOUISIANA
N
SCALE
0 3 6 9 12 15
THOUSAND FEET


EXPLANATION
Productive area of Hill
Productive area of Gloyd
Productive area of Pettet
Boundary of productive area of Travis Peak
Boundary of productive area of field
Gas - condensate well
Abandoned gas - condensate well
Producing from Hill
Producing from Gloyd
Producing from Pettet
Producing from Travis Peak
Discovery well
HARRISON COUNTY
PANOLA COUNTY
R 16 W
BETHANY
T 16 N
T 15 N
JANE THARP
JAS. ASHER
GLOYD
DE BERRY
HILL
TRAVIS PEAK
PETTET
HANCOCK SMITH
JAMES MATTHEWS
TEXAS
LOUISIANA
N
SCALE
0 3 6 9 12 15
THOUSAND FEET

CONTINUITY OF RESERVOIR ROCKS

Nacatoch: The Nacatoch is found over the entire northeastern part of Texas. The section is generally a sandstone; however, it is represented by a limestone or chalk in local areas.

Blossom: This unit is found over the greater portion of Northeast Texas, but the lithology varies from sandstone to limestone. At Bethany, porosity in the Blossom is restricted to the west side of the South field with the exception of a few isolated wells.

Comanchean lime: The Comanchean lime at Bethany is a remnant of the much thicker Washita-Fredericksburg section found in the central part of the East Texas basin. Pre-Austin truncation has removed the section from the Buda to the Goodland or Kiamichi. That part of the Comanchean which is productive in the Bethany field is probably a Goodland or Kiamichi equivalent.

Paluxy: The sand facies of the Paluxy is generally restricted to the northern portion of the East Texas embayment, but as a stratigraphic unit the Paluxy occurs throughout the entire region. At Bethany there are two productive sands in the Paluxy. The Upper, or Adams, is productive in the South field, and the Lower, or "Deep Bethany Sand," is restricted to the North field.

Upper Glen Rose: As a stratigraphic unit, the upper Glen Rose is recognized over the entire northeastern part of Texas. The Tiller and Werner reservoirs are quite local in extent. Each is due to locally high porosity, which condition occurs at the location of only a few wells.

Rodessa: The Rodessa is a stratigraphic unit which is recognized over the greater portion of East Texas. The Hill and Gloyd are porous zones in the Rodessa, and this terminology is usually restricted to the Sabine Uplift.

Pettet: This unit is recognized over the greater portion of Northeast Texas and produces oil or gas in several fields. At Bethany, with exception as to one well in the North field, productiveness is limited to the southern part of the field.

Travis Peak: Regionally the Travis Peak occurs throughout all of Northeast Texas. In the Bethany field, this formation consists of alternating layers of sandstone and shale. The productive sands are very erratic in nature. A sand zone found in one well may be missing in an adjoining well. One sand, located approximately 240 feet below the top of the Travis Peak, is the most persistent zone of this formation at Bethany. Production has not yet been found in the lower two-thirds of the formation.

CHARACTER OF OIL

Blossom: Gravity, A. P. I., 46°.

Comanchean lime: Gravity, A. P. I., 36°.

CHARACTER OF GAS

The gases found in the Nacatoch, Blossom, Comanchean, Paluxy, Tiller and Werner are dry. Condensate, ranging in gravity from 55° to 60°, A.P.I., is produced with the gases from the Hill, Gloyd, Pettet, and Travis Peak.

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PRODUCTION HISTORY

Accurate records for the shallow production are not available. To 1939 approximately 147,900,000 Mcf of gas and 126,600 barrels of oil had been produced from approximately 290 wells. The following table summarizes the production data for Rodessa, Pettet and Travis Peak except that the record of the production from the Hill lime is not included until 1949 although this reservoir has been producing since 1930.

Zone	NUMBER OF PRODUCING WELLS*	GAS PRODUCTION (Mcf)		CONDENSATE PRODUCTION (barrels)	
		Yearly	Cumulative	Yearly	Cumulative
1939					
Pettet	1	143,143	143,143	3,016	3,016
1940					
Pettet	1	372,535	515,678	6,442	9,458
1941					
Pettet	1	436,310	951,988	6,343	15,801
Travis Peak	2	668,354	668,354	4,656	4,656
1942					
Pettet	1	206,563	1,158,551	3,104	18,905
Travis Peak	3	1,493,830	2,162,184	9,805	14,461
1943					
Pettet	1	234,751	1,393,302	3,906	22,811
Travis Peak	3	2,630,407	4,792,591	14,043	28,504
1944					
Pettet	1	402,061	1,795,363	6,594	29,405
Travis Peak	3	3,068,295	7,860,886	16,542	45,046
1945					
Pettet	3	883,347	2,678,710	10,833	40,238
Travis Peak	4	4,534,482	12,395,368	18,245	63,291
1946					
Gloyd	1	95,657	95,657	2,510	2,510
Pettet	6	1,272,569	3,951,279	13,057	53,295
Travis Peak	10	6,046,873	18,442,241	46,162	109,453
1947					
Gloyd	3	560,241	655,898	5,576	8,086
Pettet	10	1,796,679	5,747,958	28,764	82,059
Travis Peak	18	9,299,808	27,742,049	55,431	164,884
1948					
Gloyd	2	537,055	1,192,953	3,459	11,545
Pettet	10	4,849,020	10,596,978	78,156	160,215
Travis Peak	24	16,128,621	43,870,670	111,941	276,825
1949					
Hill	1	271,842	**	1,657	**
Gloyd	2	585,175	1,778,128	3,401	14,946
Pettet	11	5,071,821	15,668,799	75,059	235,274
Travis Peak	27	18,354,169	62,224,839	109,135	385,960

*Several of the deep wells in Bethany are dually completed, and in such cases each zone has been considered as a well.

**Records of early Hill production are not available.

BEULAH FIELD
Angelina County, Texas

K. L. McHENRY
Consulting Geologist, Lufkin, Texas
January 5, 1950

LOCATION and OTHER NAMES

The Beulah field is located 7½ miles east of Diboll and near Beulah Church, which is about 12 miles southeast of Lufkin, county seat of Angelina County. It is one of several shallow fields in Angelina County which have produced small quantities of oil from the Queen City formation. This field represents the southernmost, or farthest down-dip, Queen City production.

This field has also been known as the Lee-Tex field and as the Beulah (Lee-Tex) field.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Random drilling led to the discovery of this field. The Leetex Oil Co. drilled and completed the #1 Southern Pine Lumber Co. as a small oil well making considerable amounts of brackish water.

DISCOVERY

Queen City sand: June 29, 1935;
Leetex Oil Co. #1 Southern Pine Lumber Co

ELEVATION OF SURFACE

At well locations: Highest, 225 ft.; lowest, 190 feet.

SURFACE FORMATION

Caddell formation of the lower Jackson group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest stratigraphic horizon penetrated within the area of the field is 235 feet below the top of the Wilcox group. The oldest horizon penetrated in the area covered by the accompanying map is 74 feet below the top of the Midway group. This penetration is in the well on which the stratigraphic tabulation is based.

PRODUCTIVE AREA

Queen City sand and Field: 40 acres.

NATURE OF TRAP

Queen City sand: The Queen City sand apparently developed along a strand line on a small terrace. The accumulation appears to be due primarily to a stratigraphic trap, the deposition of the sands being controlled or affected by a minor interruption of the otherwise normal monoclinal dip to the south.

THICKNESS OF RESERVOIR ROCK

Queen City sand: The productive section consists of 3 feet of sand with other thin sands, ranging up to 3 inches in thickness which have been recovered in cores between depths of 2,000 feet and 2,040 feet. Effective sands probably total about 5 feet in thickness.

LITHOLOGY OF RESERVOIR ROCK

Queen City sand: The Queen City sands in the immediate area of the field are clean, uncemented, fine-grained micaceous sands in a section of brown shale about 50 feet thick. The individual sand streaks range in thickness from knife-like partings to a maximum of 3 feet, the average thickness being less than 6 inches.

CONTINUITY OF RESERVOIR ROCK

Queen City sand: The sand streaks appear to be locally-closed lenses along strand lines with no apparent continuity of individual sands between wells.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Queen City sand:	Feet
Elevation of top of oil	-1,790
Elevation of bottom of oil	-1,830
Relief	40

The above figures are relative to the first saturated sand streaks at the top of the Queen City, as found in cores, and represent the zone below which no saturation was evident. Due to the initial production of water, even where the casing had been cemented and perforated high in the section, it is concluded that some of the sand streaks are water-bearing and are interspersed between the oil sand streaks.

CHARACTER OF OIL

Queen City sand: Gravity, A.P.I., 23°.

WATER PRODUCTION

From the initial completion to the abandonment of the field, the gross production of wells in the Beulah field was 25% to 85% water. The water was slightly brackish, and the principal dissolved solids were bicarbonates instead of the usual chlorides.

ACID TREATMENT

None.

STRATIGRAPHIC SECTION PENETRATED

in K. L. McHenry #1 Southern Pine Lumber Co.

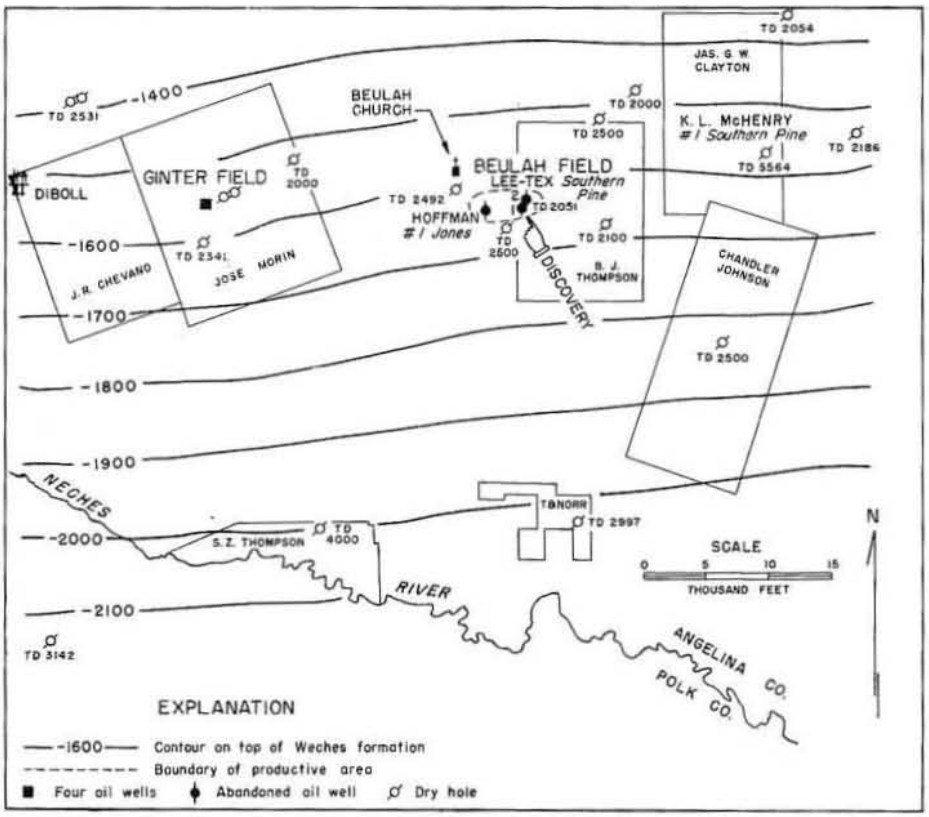
ERA	SYSTEM	SERIES	GROUP	FORMATION	ELEVATION OF TOP (FEET)	THICKNESS (FEET)
CENOZOIC	TERTIARY	EOCENE	JACKSON	CADDELL	TOP ABSENT (SURFACE +207)	125
			CLAIBORNE	YEGUA	+ 82	942
				CROCKETT	- 860	415
				SPARTA	- 1275	281
				WECHES	- 1556	124
				QUEEN CITY	- 1680	56
				REKLAW	- 1736	185
				KITTRELL	- 1921	62
				CARRIZO	- 1983	100
			WILCOX		- 2083	3200
			MIDWAY		- 5283	74
TOTAL DEPTH					- 5357	5564

PRODUCTION HISTORY

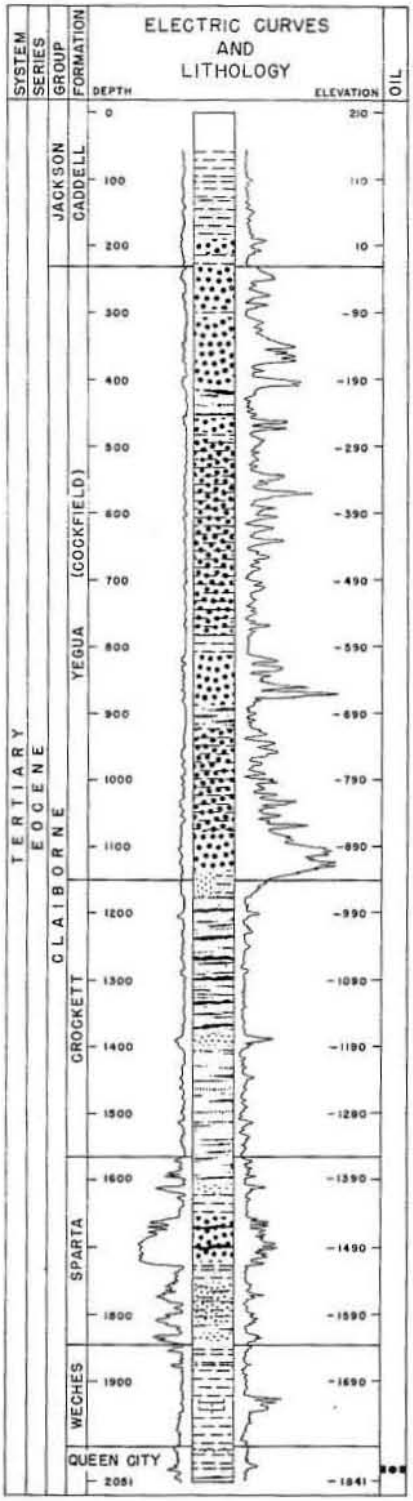
Queen City sand and Total field:

Well	Date of production	OIL PRODUCTION (barrels)
Leetex #1 Southern Pine Lumber Co.	7/35 - 4/36	750
Leetex #2 Southern Pine Lumber Co.	1/36 - 4/36	150
Hoffman #1 Jones	1940	100
Total production - life of field		1,000

All wells have been abandoned.



TYPE SECTION OF ROCKS PENETRATED



EXPLANATION

Sand | Shale | Marl

Interbedded water sands and shale | Sandy shale

Water sands | Hard streaks

Shale and sandy shale | Shaly sand

● Oil production

BLACKFOOT FIELD
Anderson County, Texas

DELMAR O. BRANSON
Geologist, Stanolind Oil and Gas Company, Tyler, Texas
April 26, 1949

LOCATION

The Blackfoot field is in northwest Anderson County, approximately 12 miles northwest of Palestine, Texas.

METHODS OF EXPLORATION LEADING TO DISCOVERY

The presence of an anticlinal trend in the western part of Anderson County has long been known due to surface work completed in the late 1920's and seismic work during the 1930's. Several dry Woodbine tests along the trend corroborated geophysical and surface control and resulted in the drilling of the discovery well, Sanders & Murchison #1 Broadway. American Liberty Oil Co. #1 Gage, a dry Rodessa lime test completed in 1937, and located in the B. Gilbert survey, was the first test on the trend to penetrate lower Cretaceous formations.

DISCOVERIES

Rodessa lime: The Texas Co. #1 Broadway, a south offset to Sanders & Murchison #1 Broadway, was officially completed as the first producer from the Rodessa lime on February 21, 1948, flowing 40.68 barrels of oil per day. However, the productive capacity of this zone was established by a drill-stem test in the Sanders & Murchison #1 Broadway on July 17, 1947.

Pettet lime: Sanders & Murchison #1 Broadway is also the discovery well for the Pettet lime. It was officially completed in this reservoir on September 5, 1947, flowing 406 barrels of oil per day.

Travis Peak sand: The Travis Peak sands of basal Trinity were first cored in Stanolind Oil and Gas Co. #1 Weekly, a due-east offset to Sanders & Murchison #1 Broadway. A diamond core from 9,880 to 9,930 recovered 50 feet of sands and shales. The sediments between the depths of 9,899 and 9,918 feet were identified as oil and gas stained sand. However, The Texas Co. #1 Hanks, a northern outpost well, located in the William Albright survey, was the first well to be completed in the Travis Peak formation. On September 3, 1948, the #1 Hanks was officially completed, pumping 63 barrels of oil per day, and is credited with the discovery.

NATURE OF TRAPS

Rodessa lime: Stratigraphic; porosity development on the flanks of an anticlinal structure.

Pettet lime: Stratigraphic; porosity development on the flanks of an anticlinal structure.

Travis Peak sand: Accumulation of oil and gas in lenticular sands on an anticlinal structure.

PRODUCTIVE AREAS

Developments to date do not warrant estimates of productive areas of the respective reservoirs. However, estimates of the minima for the respective reservoirs and for the field as a whole are entered with the belief that further development will warrant increasing these estimates.

	Acres
Rodessa lime	1,200
Pettet lime	200
Travis Peak sand	1,300
Blackfoot field	1,300

THICKNESSES OF RESERVOIR ROCKS

	Feet	
	Max.	Avg.
Upper Rodessa lime	25	8
Pettet lime	?	7±
Travis Peak sand	?	20±

LITHOLOGY OF RESERVOIR ROCKS

Upper Rodessa lime: Dark to medium to light gray, fossiliferous, pseudo-oolitic, slightly argillaceous limestone becoming sandy near the base. Dark gray to black carbonaceous shale partings occur throughout this reservoir.

Pettet lime: Dark to medium gray, fossiliferous, oolitic fractured limestone containing irregular dark gray shale partings throughout the reservoir.

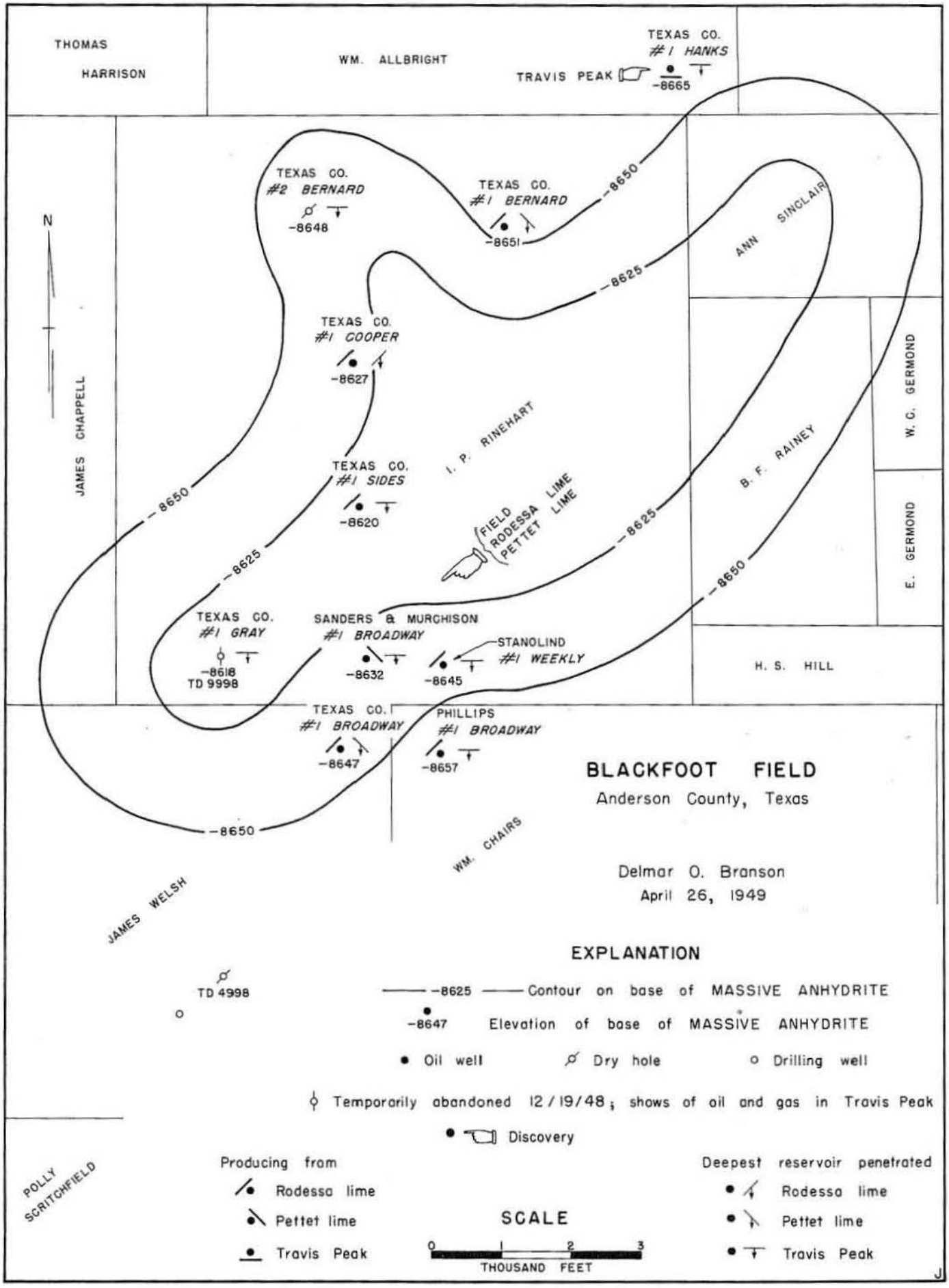
Travis Peak sand: Medium gray to white, fine-grained to medium-grained, argillaceous to clean quartzitic sand containing abundant carbonaceous plant remains. Sand bodies are separated by dark to medium gray carbonaceous sandy shales.

CONTINUITY OF RESERVOIR ROCKS

Rodessa lime: The Rodessa lime is known to be continuous throughout the entire East Texas basin area. Controlling factors for accumulation within the Rodessa lime are porosity and permeability development under favorable structural conditions.

Pettet lime: The Pettet lime, like the Rodessa formation exists over the entire East Texas basin proper, and here again, porosity and permeability are the controlling factors for accumulation.

Travis Peak sand: The Travis Peak sands of basal Trinity are continuous throughout the East Texas basin area.

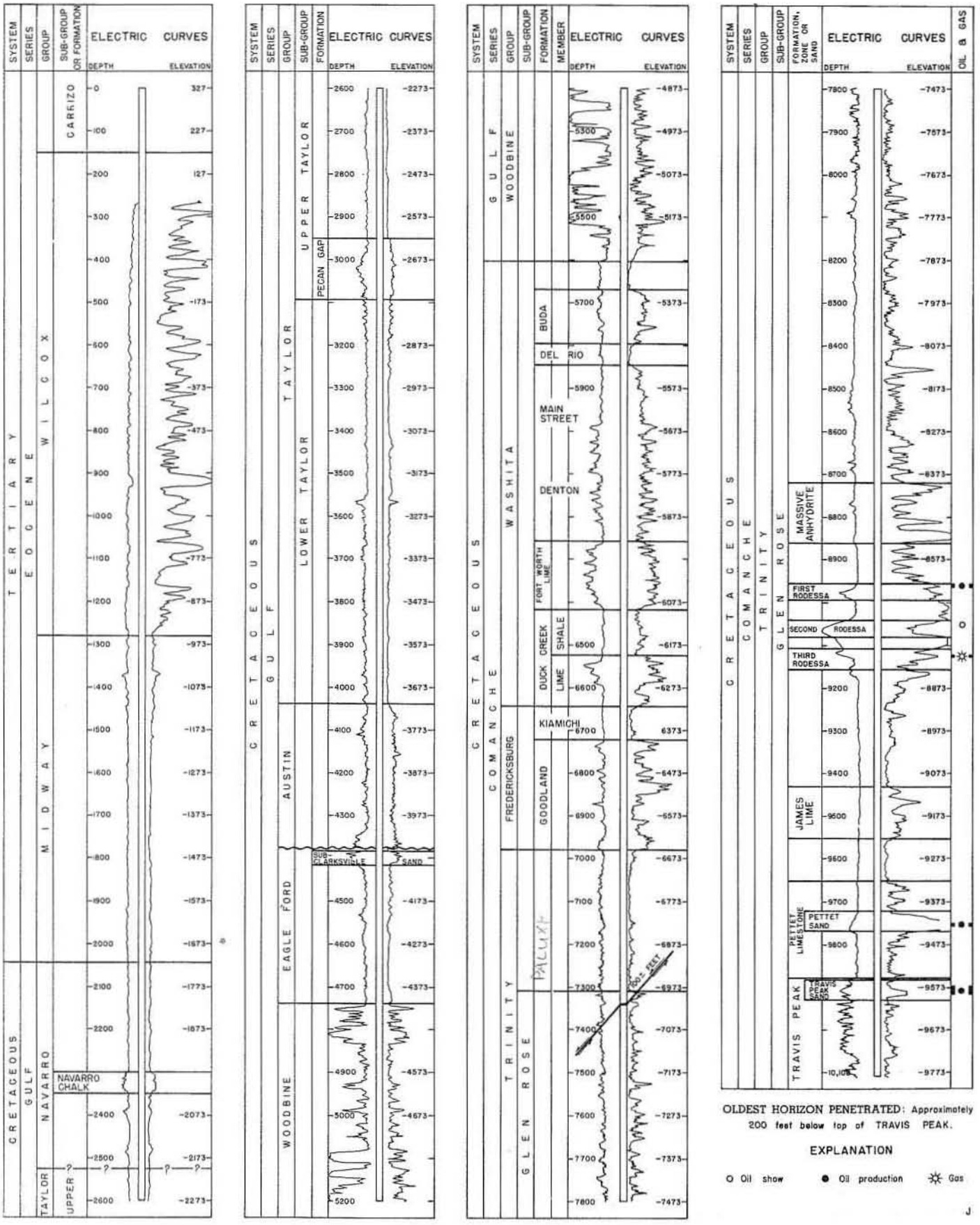

THOMAS HARRISON
WM. ALLBRIGHT
TEXAS CO. #1 HANKS
TRAVIS PEAK
-8665
TEXAS CO. #2 BERNARD
-8648
TEXAS CO. #1 BERNARD
-8651
-8650
-8625
ANN SINCLAIR
N
JAMES CHAPPELL
TEXAS CO. #1 COOPER
-8627
I. P. RINEHART
TEXAS CO. #1 SIDES
-8620
FIELD
RODESSA LIME
PETTET LIME
B. F. RAINEY
W. C. GERMOND
E. GERMOND
H. S. HILL
TEXAS CO. #1 GRAY
-8618
TD 9998
SANDERS & MURCHISON #1 BROADWAY
-8632
STANOLIND #1 WEEKLY
-8645
TEXAS CO. #1 BROADWAY
-8647
PHILLIPS #1 BROADWAY
-8657
BLACKFOOT FIELD
Anderson County, Texas
Delmar O. Branson
April 26, 1949
WM. CHAIRS
JAMES WELSH
EXPLANATION
TD 4998
-8625 Contour on base of MASSIVE ANHYDRITE
-8647 Elevation of base of MASSIVE ANHYDRITE
Oil well
Dry hole
Drilling well
Temporarily abandoned 12/19/48; shows of oil and gas in Travis Peak
Discovery
POLLY SCRITCHFIELD
Producing from
Rodessa lime
Pettet lime
Travis Peak
SCALE
0 1 2 3
THOUSAND FEET
Deepest reservoir penetrated
Rodessa lime
Pettet lime
Travis Peak

BLACKFOOT FIELD, Anderson County, Texas

TYPE SECTION OF ROCKS PENETRATED

SURFACE FORMATION: QUEEN CITY, REKLAW and CARRIZO

ELEVATION OF SURFACE: Highest, 400 feet; lowest, 375 feet

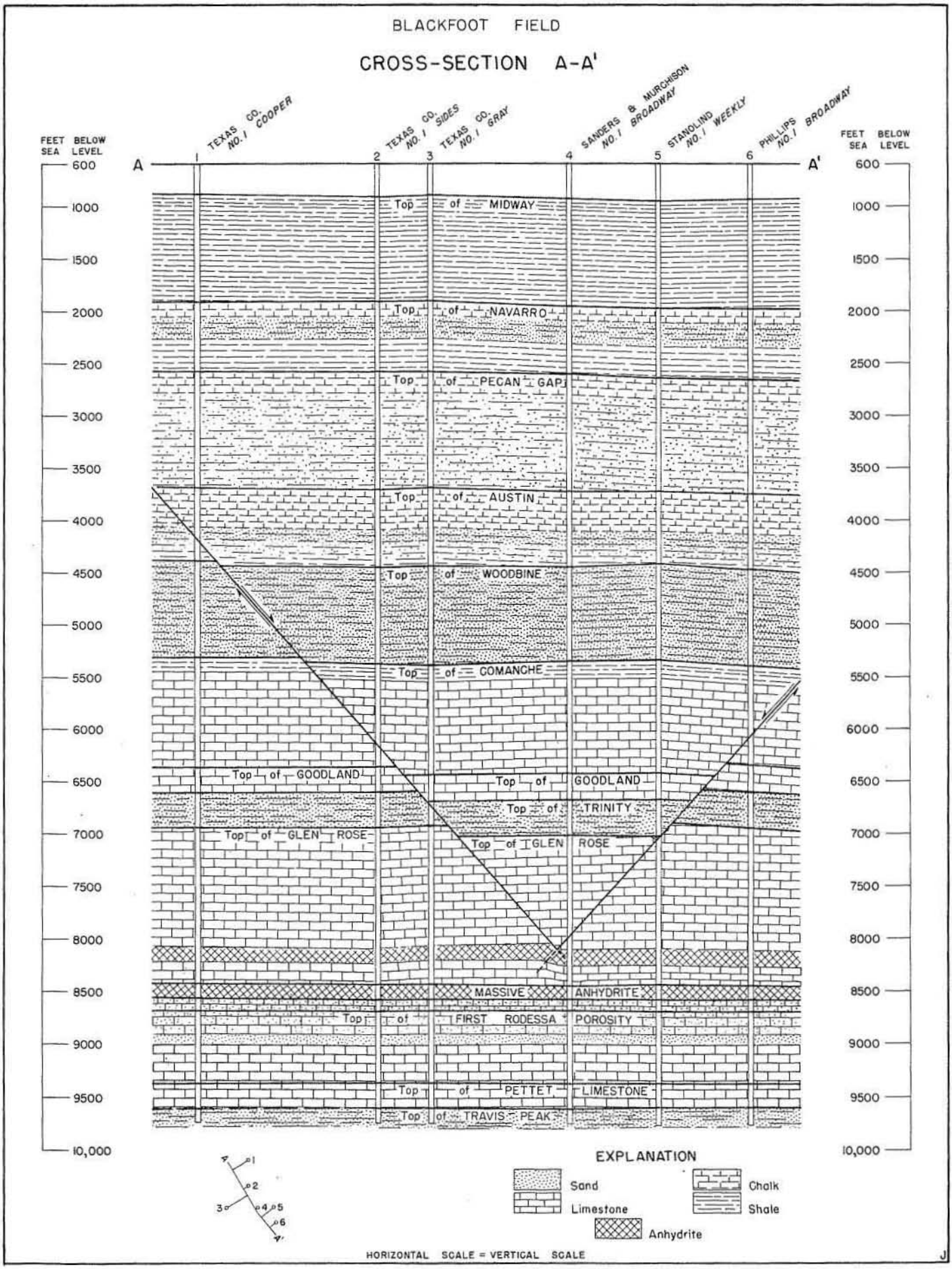


OLDEST HORIZON PENETRATED: Approximately 200 feet below top of TRAVIS PEAK.

EXPLANATION

O Oil show ● Oil production ☼ Gas

J


BLACKFOOT FIELD
CROSS-SECTION A-A'
A
A'
1 TEXAS CO. NO. 1 COOPER
2 TEXAS CO. NO. 1 SIDES
3 TEXAS CO. NO. 1 GRAY
4 SANDERS & MURCHISON NO. 1 BROADWAY
5 STANOLIND NO. 1 WEEKLY
6 PHILLIPS NO. 1 BROADWAY
FEET BELOW SEA LEVEL
600
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
8500
9000
9500
10,000
Top of MIDWAY
Top of NAVARRO
Top of PECAN GAP
Top of AUSTIN
Top of WOODBINE
Top of COMANCHE
Top of GOODLAND
Top of GLEN ROSE
Top of GOODLAND
Top of TRINITY
Top of GLEN ROSE
MASSIVE ANHYDRITE
Top of FIRST RODESSA POROSITY
Top of PETTET LIMESTONE
Top of TRAVIS PEAK
EXPLANATION
Sand
Limestone
Anhydrite
Chalk
Shale
HORIZONTAL SCALE = VERTICAL SCALE
J

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Rodessa	Pettet	Travis Peak
Elevation of top of oil, feet	-8,628	-9,392	-9,542
Elevation of bottom of oil, feet	-8,665	-9,422	-9,589
Relief, feet	37	30	47

CHARACTER OF OIL

The oils produced to date from both the Rodessa and Pettet reservoirs are sweet paraffin-base oils. Following are reports of fractional analysis and Hempel distillation of a sample from a depth of 8,990 feet at first porosity in Rodessa lime in Stanolind Oil and Gas Co. #1 Weekly. These are the only analyses available at present.

FRACTIONAL ANALYSIS

Constituent compound	Vol. %	Mol. %
Propane	.02	.07
Iso-butane	.04	.08
Normal butane	.25	.60
Iso-pentane	.28	.57
Normal pentane	.28	.60
Hexanes	3.33	6.13
Heptanes and heavier	95.80	91.95
	100.00	100.00

Residue: Molecular wt., 203
Gravity: Specific, 60/60° F., .815; A.P.I., 42.1°
Base of crude: Paraffinic-intermediate.

APPROX. SUMMARY - HEMPEL DISTILLATION
By U.S.B.M. method

Fractions	% Fraction	Gravity° A.P.I.
Light gasoline	8.83	69.7
Total gasoline & naphtha	35.50	57.7
Kerosene distillate	12.50	44.7
Gas oil	16.63	37.7
Residuum	19.33	24.4
Distillation loss	.67	
		Vis. @ 100° F.
Non-viscous lub. distillate	13.40	50 - 100
Medium lub. distillate	1.97	100 - 200
Viscous lub. distillate	-	Above 200
Carbon res. of residuum	.40	

PRODUCTION HISTORY

	WELLS PRODUCING at end of year		OIL PRODUCTION (barrels)	
	Flowing	Pumping	Yearly	Cumulative
Field totals				
1947	1	0	24,608	24,608
1948	7	1	162,535	187,143
1949*	10	1	214,700	401,843
Rodessa lime				
1948	6	0	88,109	88,109
1949*	9	0	172,434	260,543
Pettet lime				
1947	1	0	24,608	24,608
1948	1	0	73,192	97,800
1949*	1	0	39,611	137,411
Travis Peak				
1948	0	1	1,234	1,234
1949*	0	1	2,655	3,889

*P.S. - Amended to include the whole of 1949.

BOGGY CREEK FIELD
Anderson and Cherokee Counties, Texas

R. W. EATON*
Geologist, Tyler, Texas
October 5, 1949

LOCATION

The Boggy Creek field is located in northeastern Anderson and northwestern Cherokee counties, approximately 16 miles northeast of Palestine. It is on the southeast flank of the Boggy Creek salt dome, the only shallow salt dome in the East Texas area which has produced oil in commercial quantities.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Physiographic expression of a dome led the late M. A. Davey of Palestine, Texas, to make a careful study of the area. As a result of his surface investigations, Mr. Davey assembled a small block of leases in the area during the latter part of 1924. With the financial assistance of the Rio Bravo Oil Co., core-drilling operations were instigated in the fall of 1925. The Midway formation was encountered abnormally high in the first core-test, and on the basis of this information, Humble Oil & Refining Co. acquired the remainder of Mr. Davey's block. Subsequently an agreement was consummated with the Rio Bravo Oil Co. whereby exploration and development of the entire block was to be carried out by Humble for the joint account of the two companies.

During 1925 and 1926, an extensive core-drilling and geophysical program was conducted leading to a delineation of the structure.

After drilling two failures in 1926, the discovery well, Humble Oil & Refining Co. #1 Elliott & Clark, was completed as an oil well on March 19, 1927.

DISCOVERY

Woodbine sand: March 19, 1927;
Humble Oil & Refining Co. #1 Elliott & Clark.

STRATIGRAPHIC POSITIONS OF OIL AND GAS

While the only commercial production in the area of the Boggy Creek salt dome has been from the Woodbine sand, showings of oil have been found in the Wilcox, the Washita and the Glen Rose. Showings of oil have been found in the Wilcox at several locations. In places, the Washita is slightly porous and stained with asphalt, and at one well it had a showing of 21.6° Be. oil. Showings of asphalt were obtained from limestone of Glen Rose age in two wells.

NATURE OF TRAP

Woodbine sand: Reservoir on piercement-type salt dome. Closure is partially controlled by faulting in the southwestern portion of the field.

PRODUCTIVE AREA

Woodbine sand and Field: 265 acres, of which an area of about 50 acres has produced only gas.

THICKNESSES OF RESERVOIR ROCK

Woodbine sand:	Feet		
	Min.	Max.	Avg.
North part of field	2	92	30
South part of field	20	82	55

LITHOLOGY OF RESERVOIR ROCK

Woodbine sand: Medium- to fine-grained, somewhat ashy and calcareous porous sand.

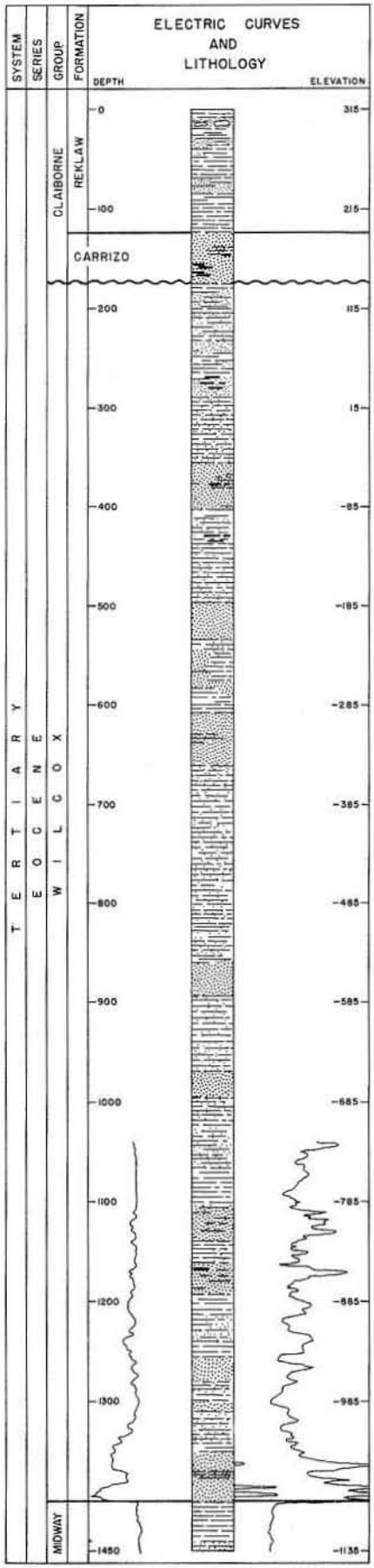
CONTINUITY OF RESERVOIR ROCK

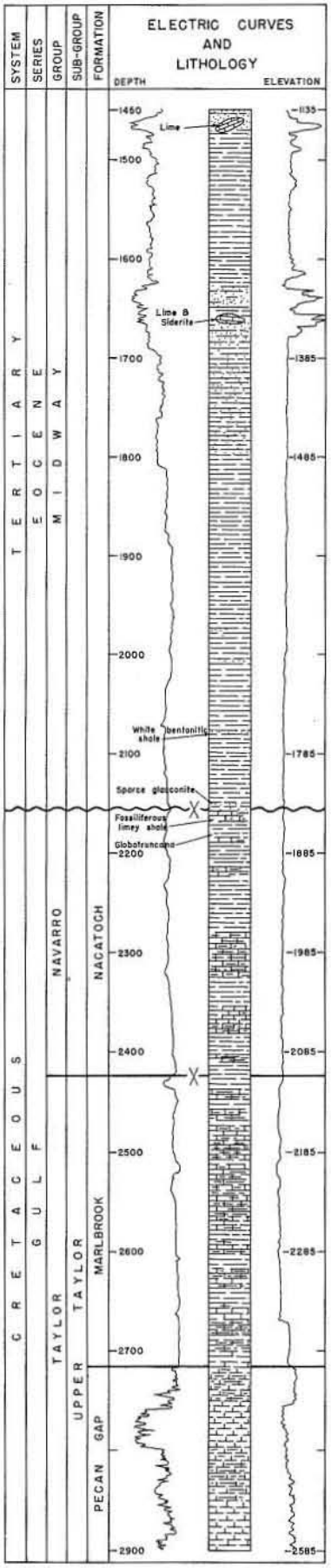
The Woodbine sands producing in this field appear to constitute a single reservoir. The Woodbine formation is present in all directions from the field in the form of a continuous blanket of sands, sandy shales and shales over the East Texas basin.

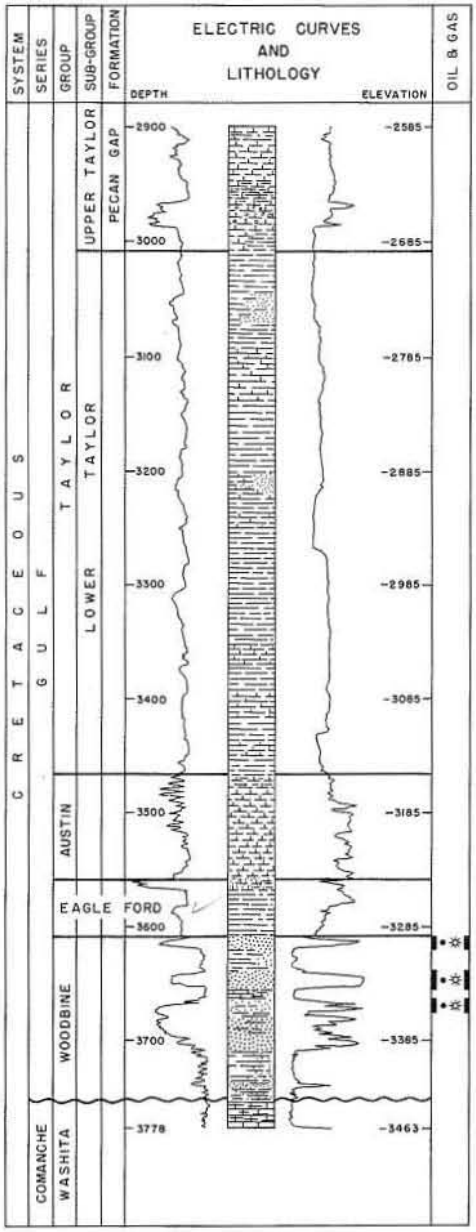
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*In the preparation of this paper, the author has extracted extensively from McLellan, H. J., Wendlandt, E. A., and Murchison, E. A. (1932) Boggy Creek salt dome, Anderson and Cherokee counties, Texas, Amer. Assoc. Petr. Geol., Bull., vol. 16, pp. 584-600.

TYPE SECTION OF ROCKS PENETRATED







EXPLANATION

Sand
Chalk
Lignite
Shale or clay
Limestone
Concretions
X Contact picked on basis of samples
• Oil production
✲ Gas production

ELEVATION OF SURFACE at well locations: Highest, 477 feet; lowest, 295 feet.

SURFACE FORMATIONS:
Within area of field: Reklaw.
Within area of dome: Sparta, Weches, Queen City, Reklaw, Carrizo and Wilcox.

OLDEST HORIZON PENETRATED within area of field (also within area of dome): In Pettet formation of lower Glen Rose sub-group; 7,984 feet below top of Woodbine group.

ELEVATION OF TOP OF SALT: Average at main portion of dome, -2,000 feet; at southwest portion, -3,000 feet.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine sand

West of fault (gas area) (depleted in 1933)	Feet
Highest elevation at which gas was found	-3,007
Elevation of original gas-water contact	-3,200
Relief	193

Oil was found in only one well, and there at -3,191 ft.

Northeast of fault (main field)	
Highest elevation at which gas was found	-3,164
Lowest elevation at which gas was found	-3,272
Highest elevation at which oil was found	-3,094
Lowest elevation at which oil was found	-3,370

At the time of discovery there was considerable variation in the elevations of the gas-oil contacts and oil-water contacts. While there is a difference of 206 feet in the above elevations, it does not appear that there was a gas-oil column in excess of 180 feet anywhere along the length of the field. The narrowness of the field, a strong water drive, and the distribution of wells, of course, occasioned wide variations in the elevations of fluid contacts as depletion progressed.

CHARACTER OF OIL

Woodbine sand:

Gravity, A.P.I. @ 60° F.: Average, 38.5°
Base: Intermediate Sulphur: 0.24%
Color: Green-black
Viscosity: 40 Saybolt secs. @ 100° F.

At the extreme northwest edge of the productive area west of the fault (gas area) there was produced from one well (#1 on cross section C-C') about 2,000 barrels of black, 26.8° gravity oil with viscosity of 100 Saybolt secs. @ 100° F. and containing 1.11% sulphur. This is the only known exception to the characteristics as above stated.

For analyses see:

U. S. Bureau of Mines	Lab. ref. No.	27332
Tabulated Analyses of Texas Crude Oils, R. I. 3252 (1934)	Group 4, Item	1
Tabulated Analyses of Texas Crude Oils, T. P. 607 (1939)	Group 4, Item	1

CHARACTER OF GAS

No analysis of the gas produced from the field is available. The production from the four gas wells west of the fault was characterized as dry gas. It had a gasoline content of about 0.3 gallon per thousand feet. In 1931 the casinghead gas treated at the gas plant yielded about 3.5 gallons per Mcf and in 1934 the yield averaged 5.5 gallons per Mcf.

WATER PRODUCTION

Salt water encroachment was very rapid. On October 1, 1929, the field was making 25% water. During the early part of 1930 this amount increased to 50% and by February 1, 1932, 85% of the production of the field was salt water. During the latter part of 1931, gas wells in the south part of the field began showing water, and by February 1932, all gas wells had been abandoned except two.

As of December 31, 1948, all but 2 of the remaining 10 wells were producing salt water. Of the original 33 productive oil wells, 23 have been abandoned because of intrusion of salt water.

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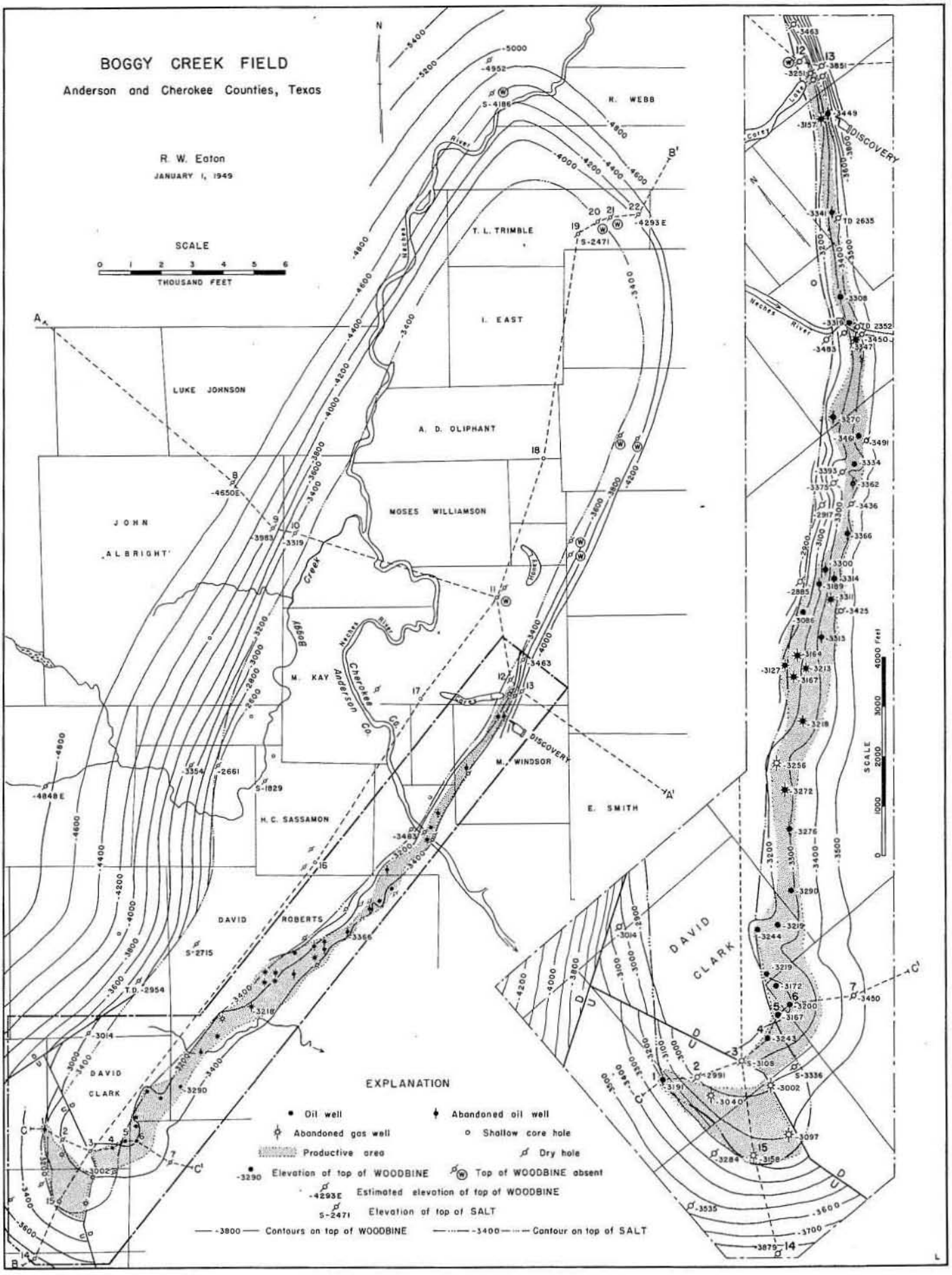
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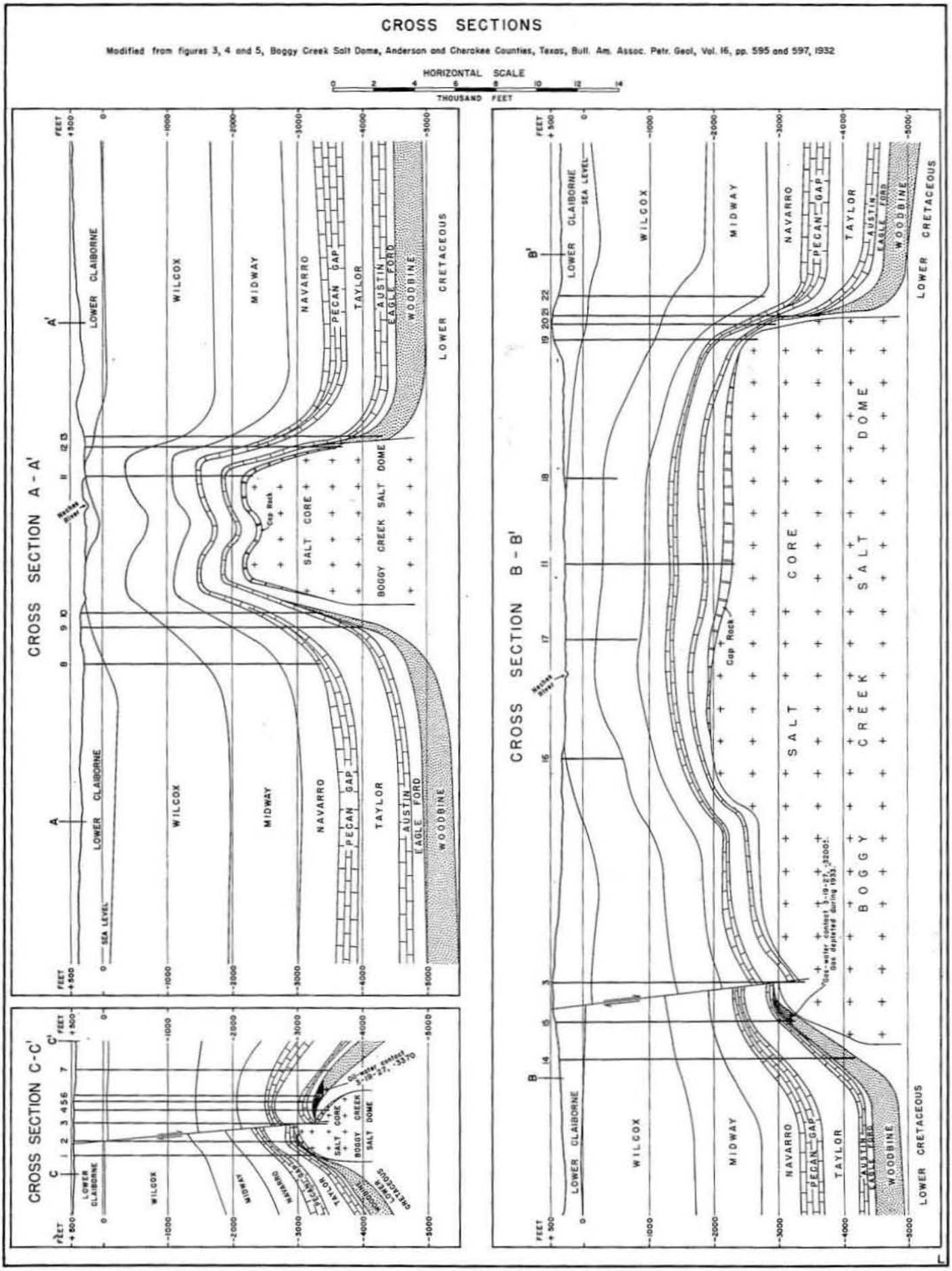
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Tomlinson, C. W. (1934) Mid-Continent region: Amer. Assoc. Petr. Geol., Problems of Petroleum Geology, p. 579.

Van Orstrand, C. E. (1934) Temperature gradients: Amer. Assoc. Petr. Geol., Problems of Petroleum Geology, p. 1018.


BOGGY CREEK FIELD
Anderson and Cherokee Counties, Texas
R. W. Eaton
JANUARY 1, 1949
SCALE
0 1 2 3 4 5 6
THOUSAND FEET
R. WEBB
T. L. TRIMBLE
I. EAST
LUKE JOHNSON
A. D. OLIPHANT
MOSES WILLIAMSON
JOHN ALBRIGHT
M. KAY
M. WINDSOR
E. SMITH
H. C. SASSAMON
DAVID ROBERTS
DAVID CLARK
DISCOVERY
TD 2635
TD 2352
TD 2954
Neches River
Boggy Creek
Cherokee Co.
Anderson Co.
EXPLANATION
Oil well
Abandoned oil well
Abandoned gas well
Shallow core hole
Productive area
Dry hole
Elevation of top of WOODBINE
Top of WOODBINE absent
Estimated elevation of top of WOODBINE
Elevation of top of SALT
Contours on top of WOODBINE
Contour on top of SALT
SCALE
4000 Feet
3000
2000
1000
0


CROSS SECTIONS
Modified from figures 3, 4 and 5, Boggy Creek Salt Dome, Anderson and Cherokee Counties, Texas, Bull. Am. Assoc. Petr. Geol, Vol. 16, pp. 595 and 597, 1932
HORIZONTAL SCALE
THOUSAND FEET
CROSS SECTION A - A'
CROSS SECTION B - B'
CROSS SECTION C - C'
LOWER CLAIBORNE
WILCOX
MIDWAY
NAVARRO
PECAN GAP
TAYLOR
AUSTIN
EAGLE FORD
WOODBINE
LOWER CRETACEOUS
SEA LEVEL
Neches River
Cap Rock
SALT CORE
BOGGY CREEK SALT DOME
FEET

PRODUCTION HISTORY

Year	WELLS PRODUCING at end of year: Oil Flow.	Oil Pump.	Gas only	OIL PRODUCTION (barrels): Yearly	Cumulative	GAS PRODUCTION (millions c.f. @ 14.65 psi. @60° F.): Yearly	* Cumulative	LIQUID PRODUCTS OF GAS PROCESSING PLANT (Gasoline - barrels): Yearly	** Cumulative
1927	0	1	1	14,760	14,760				
1928	7	3	?	325,774	340,534				
1929	13	8	2	1,120,309	1,460,843				
1930	8	16	4	1,153,359	2,614,202				
1931	10	19	4	622,704	3,236,906		666+		
1932	9	18	3	370,256	3,607,162				
1933	1	22	0	278,760	3,885,922				
1934	0	20	0	217,882	4,103,804				
1935	0	21	0	203,378	4,307,182				
1936	0	21	0	188,000	4,495,182				
1937	0	21	0	149,000	4,644,182				
1938	0	20	0	121,256	4,765,438				
1939	0	19	0	104,491	4,869,929				
1940	0	16	0	89,644	4,959,573				
1941	0	16	0	80,759	5,040,332				
1942	0	16	0	71,770	5,112,102				
1943	0	15	0	60,988	5,173,090				
1944	0	16	0	49,384	5,222,474				
1945	0	10	0	45,208	5,267,682		1,274		1,389,000
1946	0	10	0	38,981	5,306,663	83	1,357	9,000	1,398,000
1947	0	9	0	35,544	5,342,207	25	1,382	6,000	1,404,000
1948	0	10	0	42,298	5,384,505	0	1,382	0	1,404,000
1949†	0	11	0	43,777	5,428,282	0	1,382	0	1,404,000

†P.S. - 1949 data added by amendment.

*Data as to quantities of gas produced annually are not available for the years prior to 1946. The four gas wells west of the fault had produced 666,000 Mcf up to 9/1/31.

**Data as to annual quantities of liquid products of the gas plant prior to 1946 are not available. The plant began operations in 1928 and was dismantled in 1947.

The last well drilled in the field was completed in May 1931. There has been no injection of either water or of gas into the reservoir.

BOYNTON FIELD
Smith County, Texas

W. E. RICHARDSON
Geologist, Stanolind Oil and Gas Company, Tyler, Texas
October 5, 1948

LOCATION

The Boynton field, 13 miles northwest of Tyler, county seat of Smith County, and 2 miles southeast of Mt. Sylvan, is located on a local upwarp associated with the Van uplift.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Aerial reconnaissance in the vicinity of Mt. Sylvan was conducted in 1930 and a study made of the significant features of the survey. Subsequently a number of major companies purchased small blocks of acreage in the area, notably Magnolia, General Crude, Humble, Phillips, Sinclair, Stanolind, and Tidewater. Reflection seismograph surveys were conducted in the general area in 1937, 1939, 1943, and 1946 by Magnolia, Pure, and Sinclair Prairie. The nature of the information leading to the actual discovery is not known. On October 12, 1946, Delta Drilling Co. on a farm-out contract with Magnolia Petroleum Co. commenced the well which resulted in the discovery of the field on December 16, 1946. Leaseholders with acreage in the vicinity wrote dry hole contracts for a total of about 30% of the cost of the well.

DISCOVERY

Paluxy sand: December 16, 1946;
Delta Drilling Co. #1 W. H. Boynton.

NATURE OF TRAP

Paluxy sand: Reservoir is at apex of anticlinal nose and is terminated by the pinchout of porosity and permeability.

PRODUCTIVE AREA

Paluxy sand and Field: 45 acres. Further development may increase this estimate.

THICKNESS OF RESERVOIR ROCK

	Feet		
	Min.	Max.	Avg.
Paluxy sand:			
From top to bottom	4	12	8
Net productive	4	12	8

LITHOLOGY OF RESERVOIR ROCK

Paluxy sand: Clean sandstone with no shale partings.

CONTINUITY OF RESERVOIR ROCK

Paluxy sand: The extent of the reservoir is unknown due to incomplete control. The pinchout of the sand to the east and west suggests an elongate bar sand, developed 20 feet higher in the stratigraphic section than the producing sand in the Mount Sylvan field to the west.

CHARACTER OF OIL

Gravity: A.P.I. @ 60°, 33.3°
Color: Dark brown-green
B.t.u./#: 19,750
Viscosity: @; 40°, 166; 60°, 100; 90°, 68; 130°, 55.
Pour point: Less than 20° F.
Base: Asphaltic
Odor: Sweet
Sulphur: 3.30%

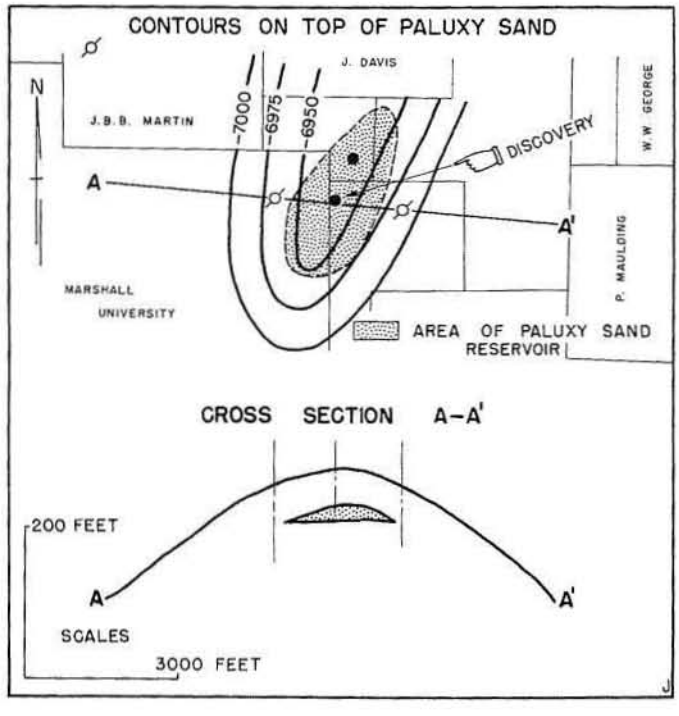
WATER PRODUCTION

Water encroachment became apparent in the north portion of the field in the latter part of 1947 and in the south portion early in 1948. The producing wells are making from 5% to 25% water at present.

PRODUCTION HISTORY

	WELLS PRODUCING at end of year		OIL PRODUCTION (barrels)	
Year	Flowing	Pumping	Yearly	Cumulative
1946	1	0	2,433	2,433
1947	0	2	90,617	93,050
1948*	0	2	88,634	181,684
1949*	0	2	40,167	221,851

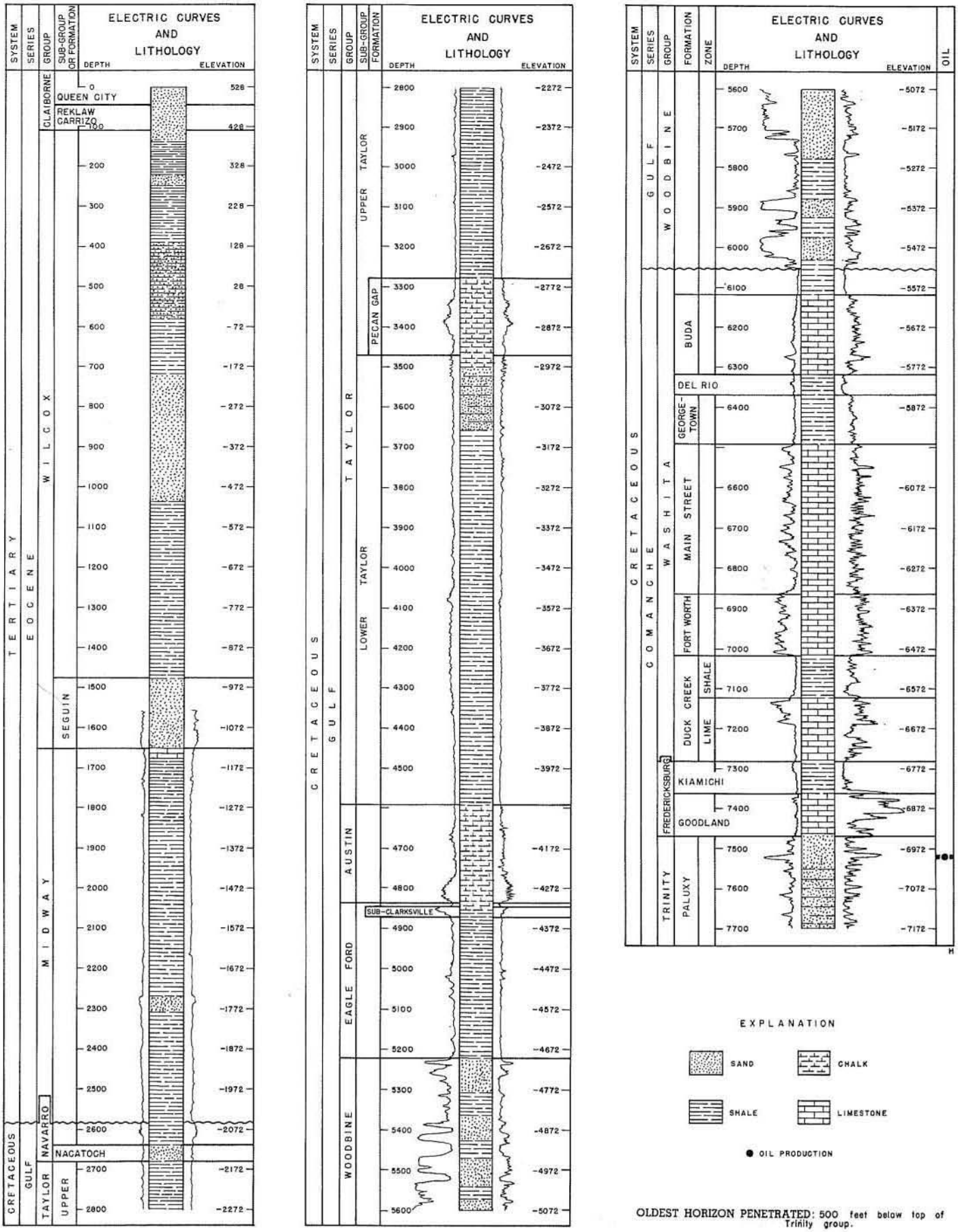
*P.S. - 1948 and 1949 data added by amendment.



TYPE SECTION OF ROCKS PENETRATED

SURFACE FORMATION: Queen City.

ELEVATION OF SURFACE: Highest, 571 feet; lowest, 448 feet



OLDEST HORIZON PENETRATED: 500 feet below top of Trinity group.

BUD LEE FIELD
Smith County, Texas

G. J. LOETTERLE
Consulting Geologist, Hudnall, Pirtle & Loetterle, Tyler, Texas
July 18, 1950

LOCATION

The Bud Lee field is in western Smith County 3/4 mile northwest of the town of Mt. Sylvan and 12 miles northwest of the city of Tyler. It is near the axis of the East Texas geosyncline. Other nearby fields are Boynton, situated 1½ miles to the southwest, and Mt. Sylvan, about 3½ miles to the west.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Presence of a locally high area had long been indicated by seismic work and by subsurface data from several shallow wells in the general area. A Woodbine test, McMurrey #1 Becker, was drilled near the indicated crest in 1941 but resulted in a dry hole. The first well to penetrate below the Woodbine in the immediate area was the discovery well, which was drilled in 1949 about 1,400 feet northeast of McMurrey #1 Becker.

DISCOVERY

Paluxy sand: October 5, 1949; A. O. Phillips #1 E. G. Staples. Flowed 309 barrels of 32.8° gravity oil in 24 hours through ½-inch tubing choke. Gas-oil ratio, 145 to 1. Flowing tubing pressure, 40 pounds. Perforated from 7,556.5 to 7,568.5 feet. Total depth, 7,692 feet. This well was placed on pump in a few weeks.

NATURE OF TRAP and STRUCTURE

Available control suggests a local anticline traversed by a 70-foot fault which is cut in all the wells. This fault may be downthrown toward the west instead of toward the east as indicated on the accompanying map. Additional control at right angles to the fault trend is needed to determine this point.

PRODUCTIVE AREA

Paluxy sand: Because of the extreme lenticularity of the single producing sand, as evidenced by its complete absence in a dry hole 1,700 feet southwest of the discovery well and by results in the nearby Boynton and Mt. Sylvan fields, we would hesitate to estimate more than 40 productive acres per well or 120 acres for the field. Actual productive limits have not been defined, however, except on the southwest side.

LITHOLOGY OF RESERVOIR ROCK

Paluxy sand: Fine-grained, well-sorted, clean, porous sandstone. Average porosity, 19 per cent. Average permeability, 350 to 400 millidarcys.

THICKNESS OF RESERVOIR ROCK

Paluxy sand: The three productive wells are producing from a single sand lens. This sand body has a net effective thickness of 11 feet in the discovery well, 10 feet in the next well northeast and 15 feet in the northernmost well.

CONTINUITY OF RESERVOIR ROCK

Paluxy sand: The Bud Lee field is regionally near the south limits of sand development in the Paluxy formation, and consequently the sands are highly lenticular in this vicinity. The particular sand lens which is productive in this field has not been correlated beyond the limits of the field. There is no corresponding sand at the location of the dry hole 1,700 feet southwest of the discovery well where the datum elevation is indicated as -6,942 feet on the accompanying map. In the nearby Boynton and Mt. Sylvan fields the Paluxy sands are lenticular and of local extent only. This lenticularity, coupled with the 7,600-foot depth, poses a formidable dry hole hazard.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Paluxy sand:	Feet
No free gas cap	
Highest proven elevation of oil	-6,988
Lowest proven elevation of oil	-7,003
Proven relief	15

The stratigraphic position of the productive sand is at -7,017 feet in the dry hole where the datum horizon is at -6,942 feet. Since there is no sand at this location, this dry hole does not provide data as to fluid levels nor does it condemn other locations equally low.

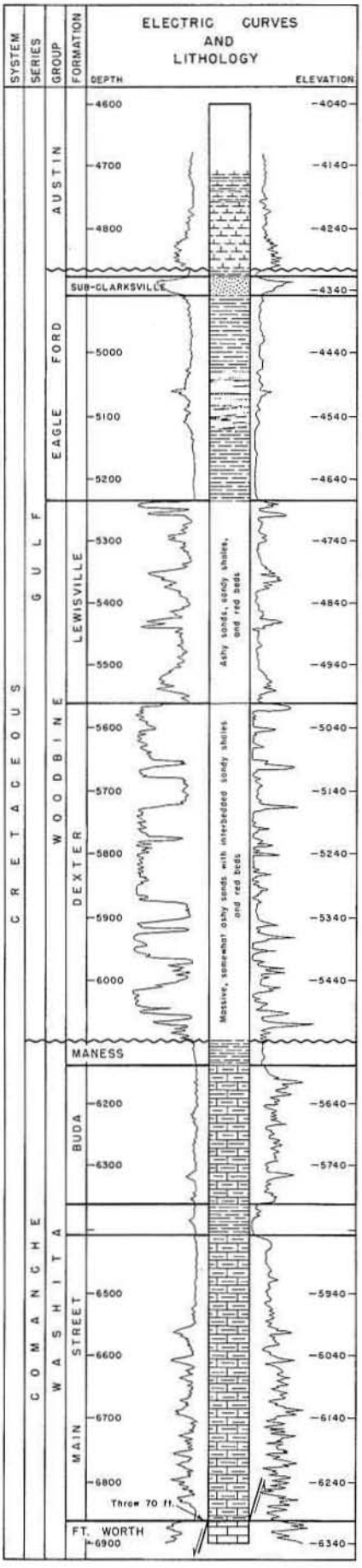
CHARACTER OF OIL

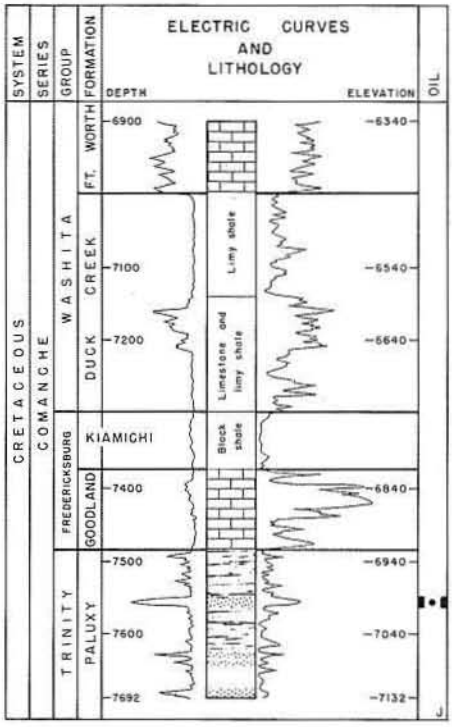
Gravity, A.P.I.: 32.5°.
Base: Predominantly asphalt.
Color: Black.

WATER PRODUCTION

Paluxy sand: None of the wells makes more than a few per cent of water. It appears that there is no effective water drive and that very little encroachment of water is to be expected.

TYPE SECTION OF ROCKS PENETRATED





EXPLANATION

Chalk — Limestone

Shale — Sand

Limestone and shale — Sandy shale

• Oil production

ELEVATION OF SURFACE

At well locations: Highest, 580 ft.; lowest, 570 feet.

SURFACE FORMATIONS

Sparta sand and Weches glauconitic clay.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

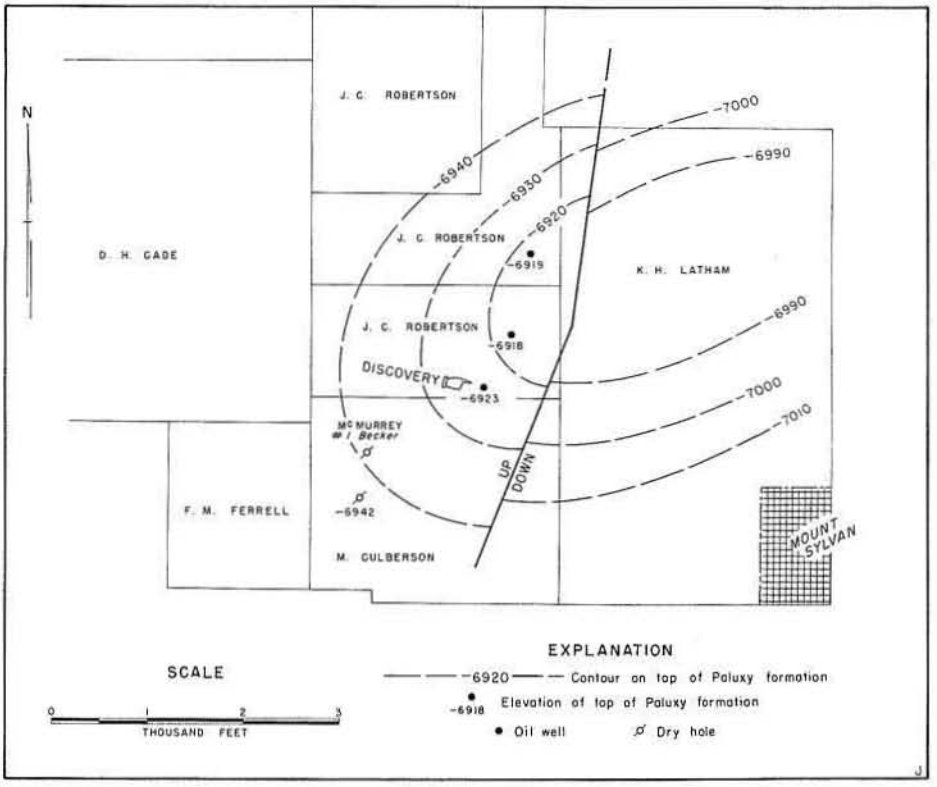
281 feet below the top of the Paluxy formation.

PRODUCTION HISTORY

Paluxy sand and Field total

Year	WELLS PRODUCING at end of year — Oil	OIL PRODUCTION (barrels) — Yearly	Cumulative
1949	2	9,370	9,370
1950 to 6/1	3	35,626	44,996

All production now is by pumping. The discovery well flowed a few weeks when it was first put on production.



BUFFALO FIELD
Leon County, Texas

W. K. SMITH
Exploitation Engineer, Shell Oil Company, Kilgore, Texas
July 14, 1950

LOCATION

The Buffalo field is located in the north-central part of Leon County approximately 7 miles northeast of Centerville, the county seat of Leon County.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Surface and core drill work established the presence of a major structural feature. Seismograph work and subsequent development revealed two domes separated by a saddle.

DISCOVERIES

Woodbine sand:
South dome: December 21, 1933;
Shell Petroleum Corp. #1 A. Beggs
North dome: May 18, 1934;
Shell Petroleum Corp. #1 G. W. Lee

ELEVATION OF SURFACE

At well locations: Highest, 423 ft.; lowest, 276 feet.

SURFACE FORMATION

Queen City beds are the only rocks at the surface within the area of the field.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The deepest test in the field penetrated 716 feet of the Travis Peak formation. This penetration was in Shell Oil Corp. #1 W. L. Tandy, which was drilled to a total depth of 10,802 feet at a location in the W. Martin survey on the north dome.

AREAL DISTRIBUTION OF OIL AND GAS

North dome: Gas: All of the area above the gas-oil contact and south of the east-west fault shown on the accompanying structural map.

Oil: A narrow oil rim has been proved on the southeast flank and on the west flank. In addition, one well produced oil from a separate closure against a fault on the north flank of the north dome.

South dome: Gas: Based on the meager data available it appears that most of the area above the water level will be productive.

NATURE OF TRAPS

Woodbine sand: There are separate closures on the north and on the south domes and the two domes have different water levels. Each dome is a simple convex trap.

PRODUCTIVE AREAS

Woodbine sand	Acres
North dome	
Gas	2,600
Oil	200
South dome	
Gas	4,300
Total field	7,100

THICKNESSES OF RESERVOIR ROCK

Woodbine sand	North dome	South dome
Avg. net productive, feet	30	15

LITHOLOGY OF RESERVOIR ROCK

Woodbine sand: Fine- to very fine-grained, well consolidated, lignitic, calcareous to non-calcareous sand. The sand grains are poorly sorted with large amounts of silty material in the pore space.

CONTINUITY OF RESERVOIR ROCK

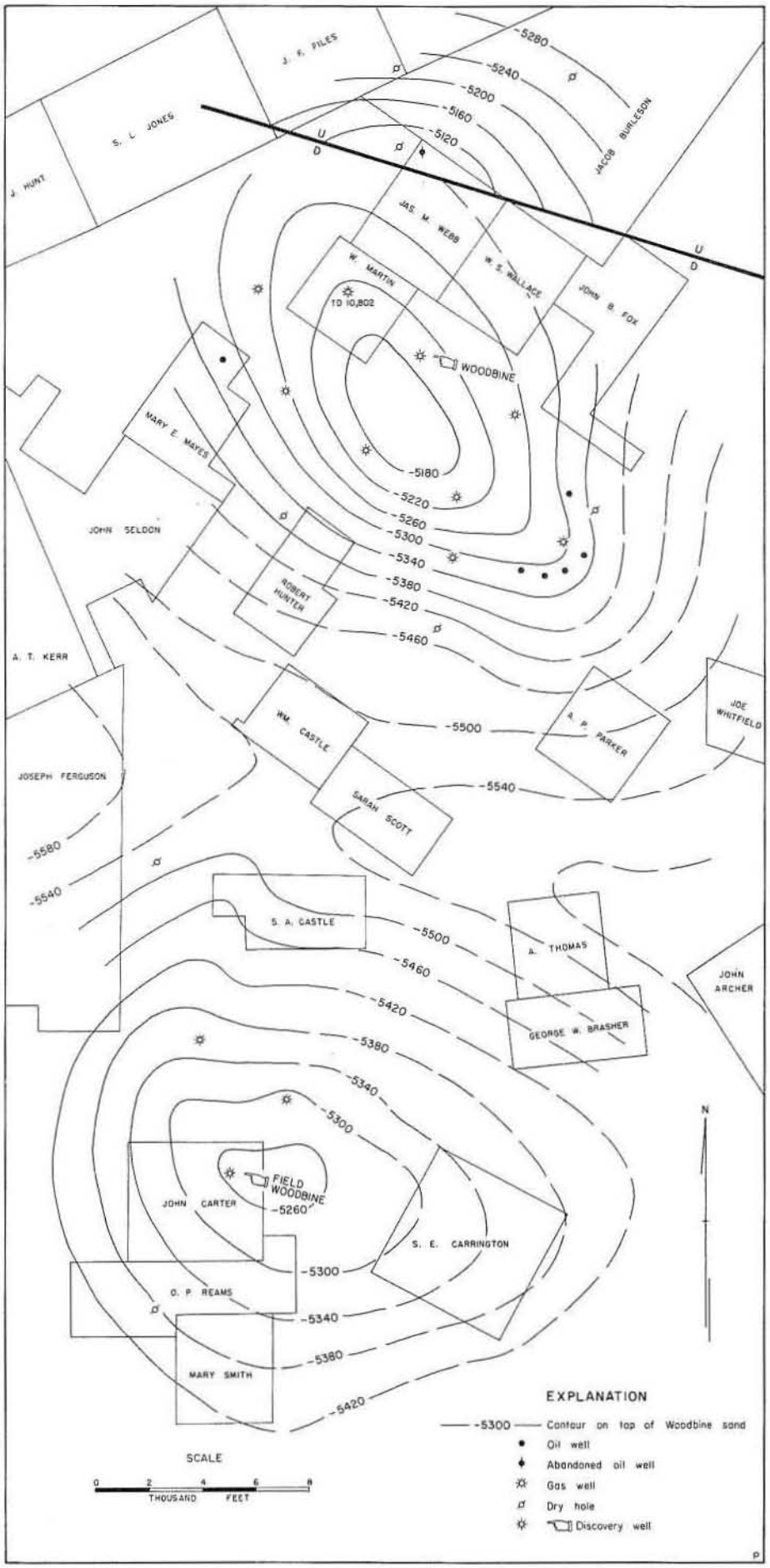
Woodbine sand: There are pronounced facies changes in comparatively short distances. However, on the north dome three sand bodies are generally recognizable and on the south dome two sands are present in the productive section. Although these members may have a varying amount of net porous thickness in the different wells, the sands appear to be continuous over the entire structure.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

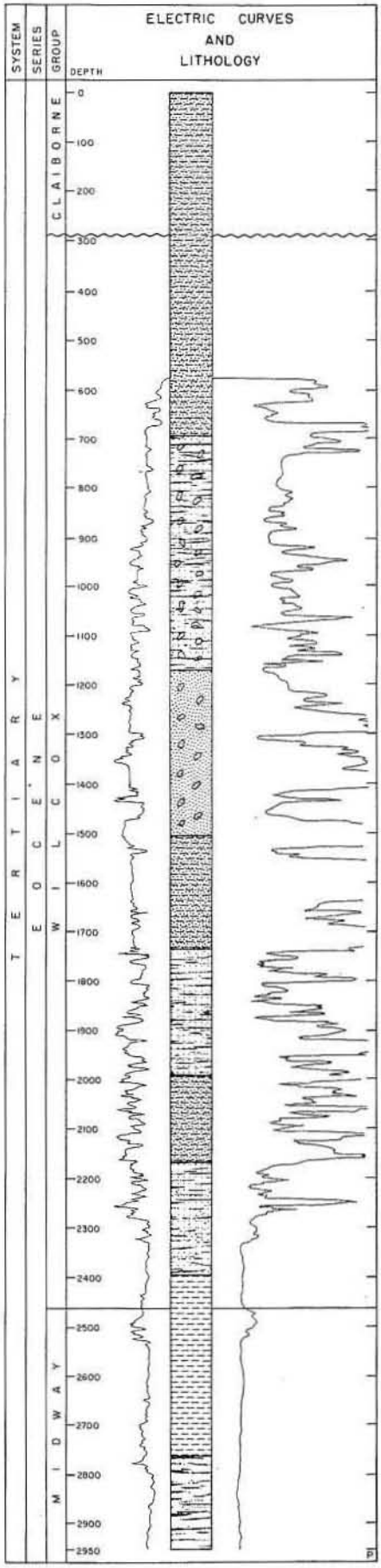
Woodbine sand	Feet
North dome	
Elevation of top of gas	-5,196
Elevation of bottom of gas	-5,361
Relief	165
Elevation of top of oil	-5,361
Elevation of bottom of oil	-5,370
Relief	9
South dome	
Elevation of top of gas	-5,359
Elevation of bottom of gas	-5,572
Relief	213

WATER PRODUCTION

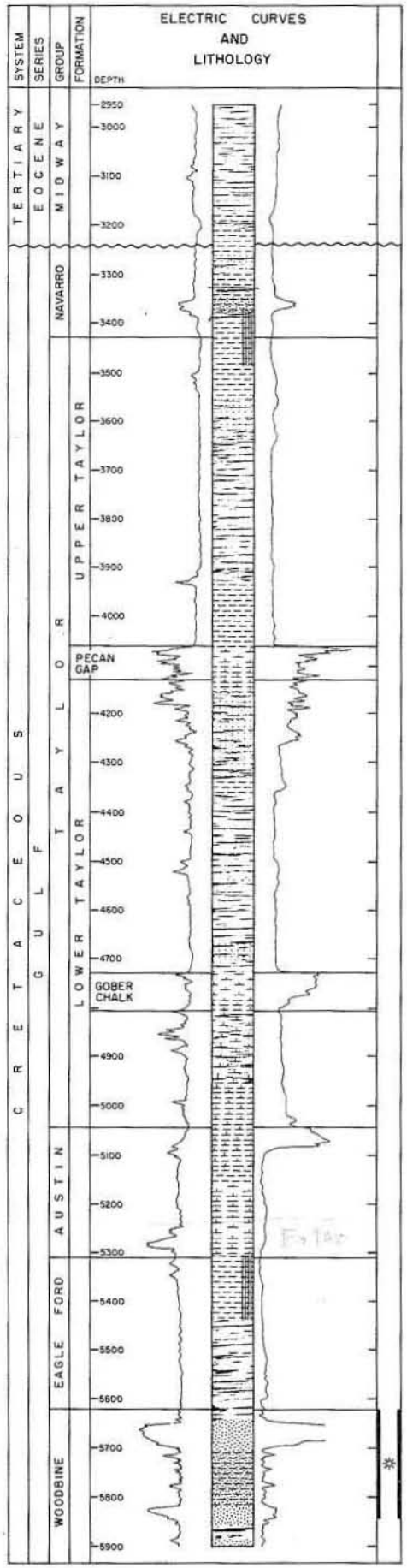
Woodbine sand: All of the oil wells produce water in varying amounts. Water production from the gas wells has been negligible. Disposal has been by means of evaporating pits.

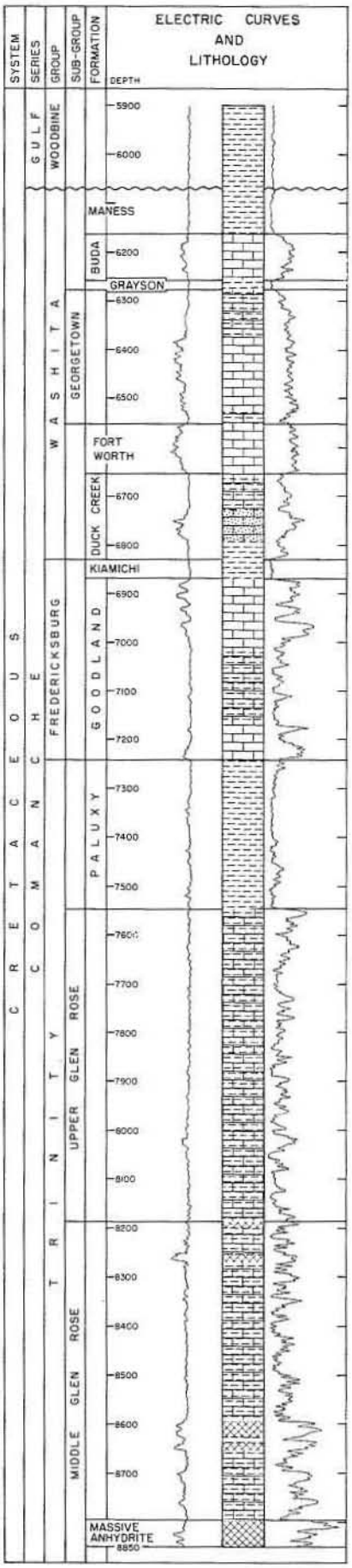


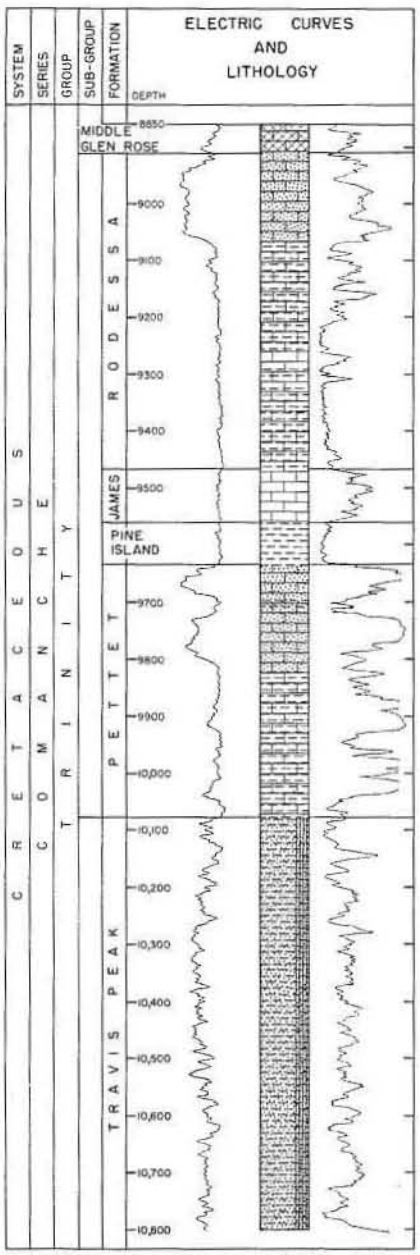
TYPE SECTION OF ROCKS PENETRATED



TYPE SECTION OF ROCKS PENETRATED

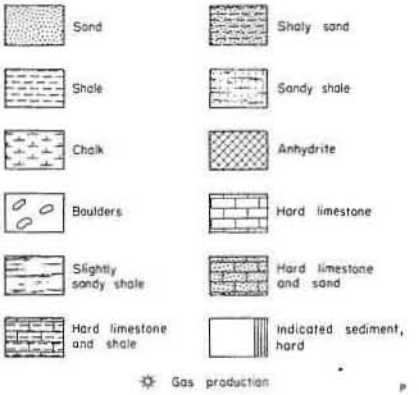






Note: The above is based on a composite log. It was compiled to show the complete section.

EXPLANATION



CHARACTER OF OIL

Woodbine sand

Gravity, A.P.I.	27°
Sulphur	0.26%
Base	Intermediate

For analysis see:

U.S. Bureau of Mines Lab. ref. No. 39096,

Tabulated Analyses of Texas Crude Oils T.P. 607 (1939) Group 4, Item 38

CHARACTER OF CONDENSATE

Woodbine sand:

Gravity, A.P.I.	52°
Sulphur	Less than 0.1%
Base	Intermediate

For analysis see:

U.S. Bureau of Mines Sample No. 39299

Analyses of Crude Oils from Some Fields of Texas R.I. 3699 (April 1943) Item 12

CHARACTER OF GAS

Woodbine sand:

Component	Mol. %
Methane	98.72
Ethane	.81
Propane	.22
Iso-butane	.05
N-butane	.07
Iso-pentane	.04
N-pentane	.02
Hexanes plus	.07
Recoverable Liquids	0.15 G/Mcf
Heating Value	976 B.t.u./cf
Inert	4%
Specific Gravity	.582

PRODUCTION HISTORY

Woodbine sand and Field totals

Year	NUMBER OF WELLS Completed Oil	Completed Gas	Producing at end of year Gas	Producing at end of year Oil Flow.	Producing at end of year Oil Artif.	OIL PRODUCTION (barrels) Yearly	OIL PRODUCTION (barrels) Cumulative	CONDENSATE PRODUCTION (barrels) Yearly	CONDENSATE PRODUCTION (barrels) Cumulative	GAS PRODUCTION (MMcf @ 14.65 psi. 60° F.) Yearly	GAS PRODUCTION (MMcf @ 14.65 psi. 60° F.) Cumulative
1933	0	1	1	0	0	0	0	x	x	x	x
1934	0	2	3	0	0	0	0	x	x	x	x
1935	0	0	3	0	0	0	0	x	x	x	x
1936	0	0	3	0	0	0	0	x	x	x	x
1937	0	0	3	0	0	0	0	x	x	x	541
1938	1	3	6	1	0	x	x	1,224	1,816	661	1,202
1939	0	1	7	0	0	x	17,000	4,940	3,040	2,267	3,469
1940	0	2	9	0	0	0	17,000	2,580	7,980	1,396	4,867
1941	0	0	9	0	0	0	17,000	2,440	10,560	1,321	6,186
1942	0	0	9	0	0	0	17,000	3,009	13,000	1,407	7,593
1943	0	0	9	0	0	0	17,000	4,744	16,009	1,379	9,971
1944	0	0	9	0	0	0	17,000	2,124	20,753	1,488	11,459
1945	0	1	10	0	0	0	17,000	4,604	22,877	2,567	14,026
1946	0	0	10	0	0	0	17,000	4,085	27,481	2,093	16,119
1947	0	0	10	0	0	0	17,000	11,165	31,566	5,347	21,466
1948	0	2	12	0	0	0	17,000	7,464	42,731	3,601	25,067
1949	3	0	11	1	2	19,280	36,280	3,486	50,195	1,824	26,891
									53,681		

CADDO FIELD
Marion County, Texas

DAVID J. FLESH* and CHARLES A. PEEK**
March 12, 1951

LOCATION and OTHER NAMES

The Caddo field, as herein treated, is the Texas portion of the Caddo-Pine Island field, which is largely in Louisiana. It is on the west flank of the Pine Island uplift and is continuous with the Louisiana portion of the Caddo-Pine Island field.

As indicated on an accompanying map, the names Potter, Smithland, Northeast Marion County Shallow and East Marion County Shallow have been used in designating certain portions of the field. The name Marion County Shallow has been loosely used in designating all or some portion of the area herein treated.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Random drilling.

DISCOVERIES

Nacatoch: Date and well are unknown.
Tokio: 1911; Cudahy-Chew #1 James Bayou.
Goodland: 1910; The Texas Co. #1 Colgin (Probable)
Paluxy: 1916; The Texas Co. #1 Harrell (Probable)

ELEVATION OF SURFACE

At well locations: Highest, approximately 350 feet.
Lowest, approximately 170 feet.

SURFACE FORMATIONS

Principally, undifferientiated Wilcox, there are also isolated exposures of Weches, Queen City, Reklaw and Carrizo.

OLDEST STRATIGRAPHIC ZONE PENETRATED

Upper Glen Rose.

NATURE OF TRAPS

Nacatoch: Low-relief local convex fold.
Tokio: Low-relief closure coupled with lenticularity.
Goodland: Truncated wedges.
Paluxy: Lenticular sands and truncated sand wedges.

PRODUCTIVE AREAS

Nacatoch .... 80 acres	Goodland .... 160 acres
Tokio ..... 850 acres	Paluxy ..... 550 acres

LITHOLOGY OF RESERVOIR ROCKS

Nacatoch: Soft unconsolidated sand and sandy shale.
Tokio: Very sandy shale with laminations of hard indurated ash and chlorite.
Goodland: Dense, white, granular lime containing mealy or chalky granular zones.
Paluxy: Hard firm sand and sandy shales interspersed with shale and red beds.

THICKNESSES OF RESERVOIR ROCKS

The average net productive thickness of each Nacatoch, Tokio and Goodland is about 5 feet; of Paluxy, about 8 feet.

CONTINUITY OF RESERVOIR ROCKS

Nacatoch: Continuous; a blanket sand.
Tokio: Identifiable as a zone in all wells, but productive sand is discontinuous because of lenticularity.
Goodland: Continuous except where truncated by erosion. Porous zone is discontinuous because of either depositional character or secondary solution.
Paluxy: Continuous as a zone, but members are discontinuous because of lenticularity.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Not determined.

CHARACTER OF OIL

Nacatoch: Gravity, A. P. I.: 24° - 26° Base: Paraffin
Color: Dark brown, almost black
Tokio: Gravity, A. P. I.: Average, 40° Base: Paraffin
Color: Light brown.
Goodland: Gravity, A. P. I.: 43° Base: Paraffin
Color: Light brown to amber in indirect light, green in sunlight.
Paluxy: Gravity, A. P. I.: Average, 44° Base: Paraffin
Color: Dark brown.

CHARACTER OF GAS

No appreciable gas other than casing head gas.

WATER PRODUCTION

All reservoirs except the Tokio produce some water. The water has an average salinity of 30,000 parts per million chloride content. All Nacatoch wells produce a high percentage of water even when first completed. The Tokio reservoir contains connate water, but the water is not yielded into well bores.

ACID TREATMENT

The Goodland lime requires acid treatment; the other reservoirs do not.

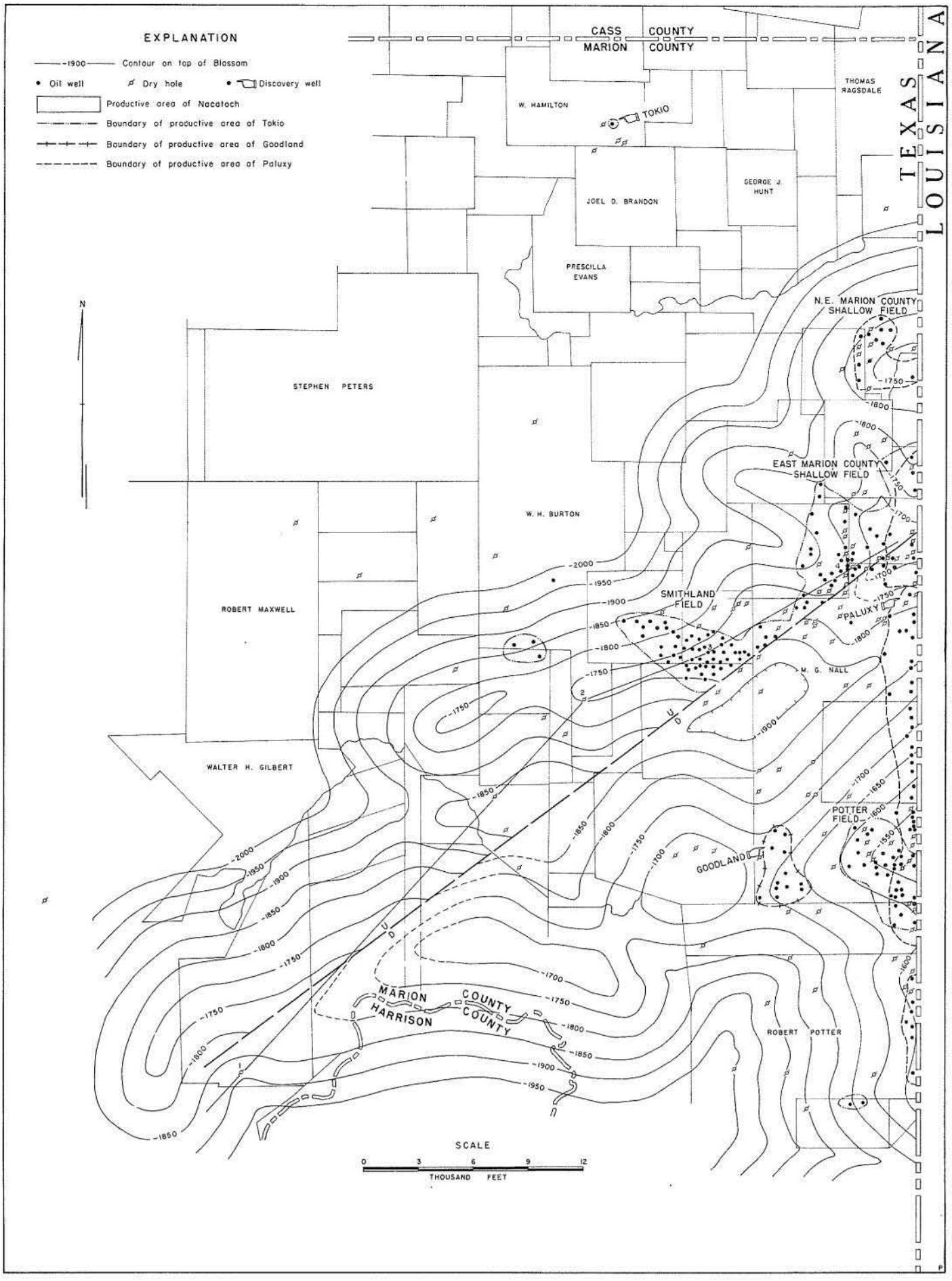
PRODUCTION HISTORY

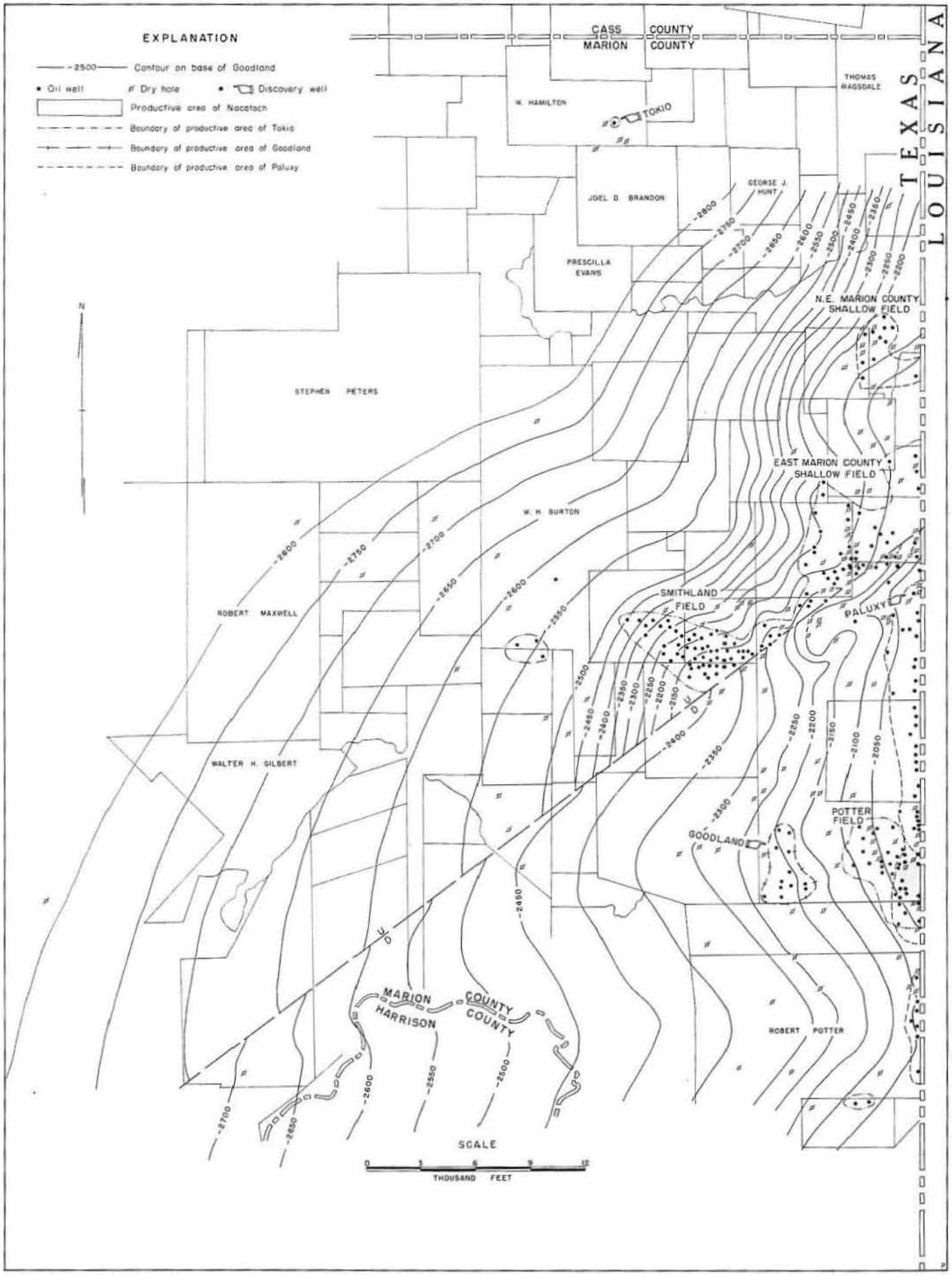
The cumulative oil production to January 1, 1950 is reported as 8,925,467 barrels on page 579 of National Oil Scouts & Landmen's Association Year Book 1950 (Review of 1949). There probably has been considerably more oil produced, but because of poor records an accurate estimate is impossible. During 1949, 72 wells produced 70,000 barrels of oil.

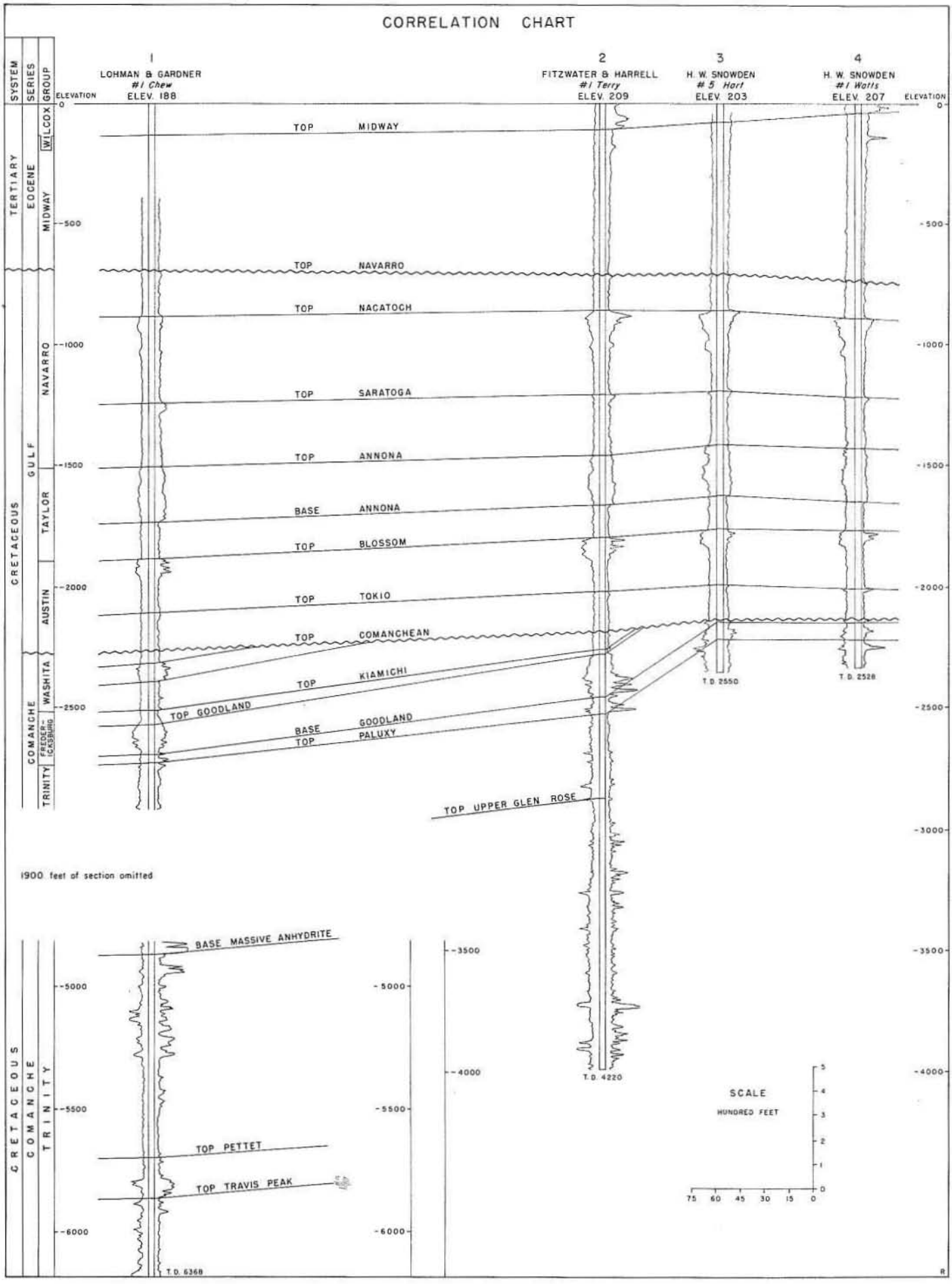
There have been more than 300 tests drilled in the area during the last 40 years. Approximately 200 of the tests have produced oil.

*Consulting Geologist, Jefferson, Texas.
**Geologist, Stanolind Oil & Gas Co., Tyler, Texas.

CADDO FIELD, Harrison and Marion Counties, Texas




EXPLANATION
-2500- Contour on base of Goodland
Oil well
Dry hole
Discovery well
Productive area of Nacatoch
Boundary of productive area of Tokio
Boundary of productive area of Goodland
Boundary of productive area of Paluxy
CASS COUNTY
MARION COUNTY
TEXAS
LOUISIANA
W. HAMILTON
TOKIO
THOMAS HAGSDALE
JOEL D. BRANDON
GEORGE J. HUNT
PRESCILLA EVANS
N.E. MARION COUNTY SHALLOW FIELD
STEPHEN PETERS
EAST MARION COUNTY SHALLOW FIELD
W. H. BURTON
ROBERT MAXWELL
SMITHLAND FIELD
PALUXY
WALTER H. GILBERT
POTTER FIELD
GOODLAND
MARION COUNTY
HARRISON COUNTY
ROBERT POTTER
SCALE
0 3 6 9 12
THOUSAND FEET


CORRELATION CHART
SYSTEM
SERIES
GROUP
ELEVATION
1
LOHMAN & GARDNER
#1 Chew
ELEV. 188
2
FITZWATER & HARRELL
#1 Terry
ELEV. 209
3
H. W. SNOWDEN
#5 Hart
ELEV. 203
4
H. W. SNOWDEN
#1 Watts
ELEV. 207
TERTIARY
EOCENE
WILCOX
MIDWAY
CRETACEOUS
GULF
NAVARRO
TAYLOR
AUSTIN
COMANCHE
WASHITA
FREDERICKSBURG
TRINITY
TOP MIDWAY
TOP NAVARRO
TOP NACATOCH
TOP SARATOGA
TOP ANNONA
BASE ANNONA
TOP BLOSSOM
TOP TOKIO
TOP COMANCHEAN
TOP KIAMICHI
TOP GOODLAND
BASE GOODLAND
TOP PALUXY
TOP UPPER GLEN ROSE
T.D. 2550
T.D. 2528
1900 feet of section omitted
BASE MASSIVE ANHYDRITE
TOP PETTET
TOP TRAVIS PEAK
T.D. 6368
T.D. 4220
SCALE
HUNDRED FEET

CALVERT FIELD
Robertson and Milam Counties, Texas

JOHN HAMMAN, Jr.
President and Geologist, Hamman Oil & Refining Company, Houston, Texas
February 16, 1951

LOCATION

The Calvert field is in western Robertson County and eastern Milam County five miles west of the town of Calvert. It is in the valley of the Brazos River and is mainly on the Robertson County side of the river. It is in the zone of the Luling-Mexia-Talco fault system.

METHOD OF EXPLORATION LEADING TO DISCOVERY

A seismic exploration survey was made for the Hamman Oil & Refining Company in 1941 by George F. Hamman and the writer.

DISCOVERY

Gibson sand: October 20, 1944; Hamman Oil & Refining Co. #1 P. C. Gibson Estate. Initial daily production, 69.56 barrels of 37° gravity oil through screen set in open hole after plugging back to 2,207 feet; gas-oil ratio, 150 cubic feet to 1 barrel. The top of the sand is at depth of 2,180 feet; the bottom, at 2,194 feet. Total depth, 5,022 feet. The accompanying TYPE SECTION is based on the log of this well.

ELEVATION OF SURFACE

At well locations: Highest, 306 ft.; lowest, 290 feet.

SURFACE FORMATION

Recent river deposits and undifferentiated members of Wilcox group of the Eocene series.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The Edwards is the oldest formation which has been penetrated. This formation has been penetrated in the three wells where total depths are indicated on the accompanying map.

NATURE OF TRAP and STRUCTURE

The trap is controlled by faulting. The main fault trends in an almost north-south direction and has a displacement of approximately 400 feet. It is downthrown to the east, or to the coast, and thus far production has been limited to the downthrown side. There are several small faults which also affect the oil accumulation and which are apparently related to the main faulting. The numerous small cross faults appear to be fracture faults off the main fault. They separate the reservoir into various producing segments and make the structure very complex.

Closure to the north is occasioned by faulting and apparently also by lensing of the reservoir rock. On the south, faulting also causes closure, but, beside the faulting, the dip of the formation and lensing of the sand also are effective. The trap appears to be of the modified fault trap variety with lenticular permeability trap characteristics.

The accompanying map portrays the structure at a stratigraphic horizon about 95 feet above the top of the Gibson sand. There is considerable, apparently unpredictable, variation in the thickness of the section between this horizon and the top of the Gibson sand.

PRODUCTIVE AREA

Gibson sand and Field: Oil, 850 acres, gas, 100 acres; total, 950 acres.

THICKNESS OF RESERVOIR ROCK

Gibson sand:

From top to bottom	10 to 12 feet
Net productive, average	About 8 feet

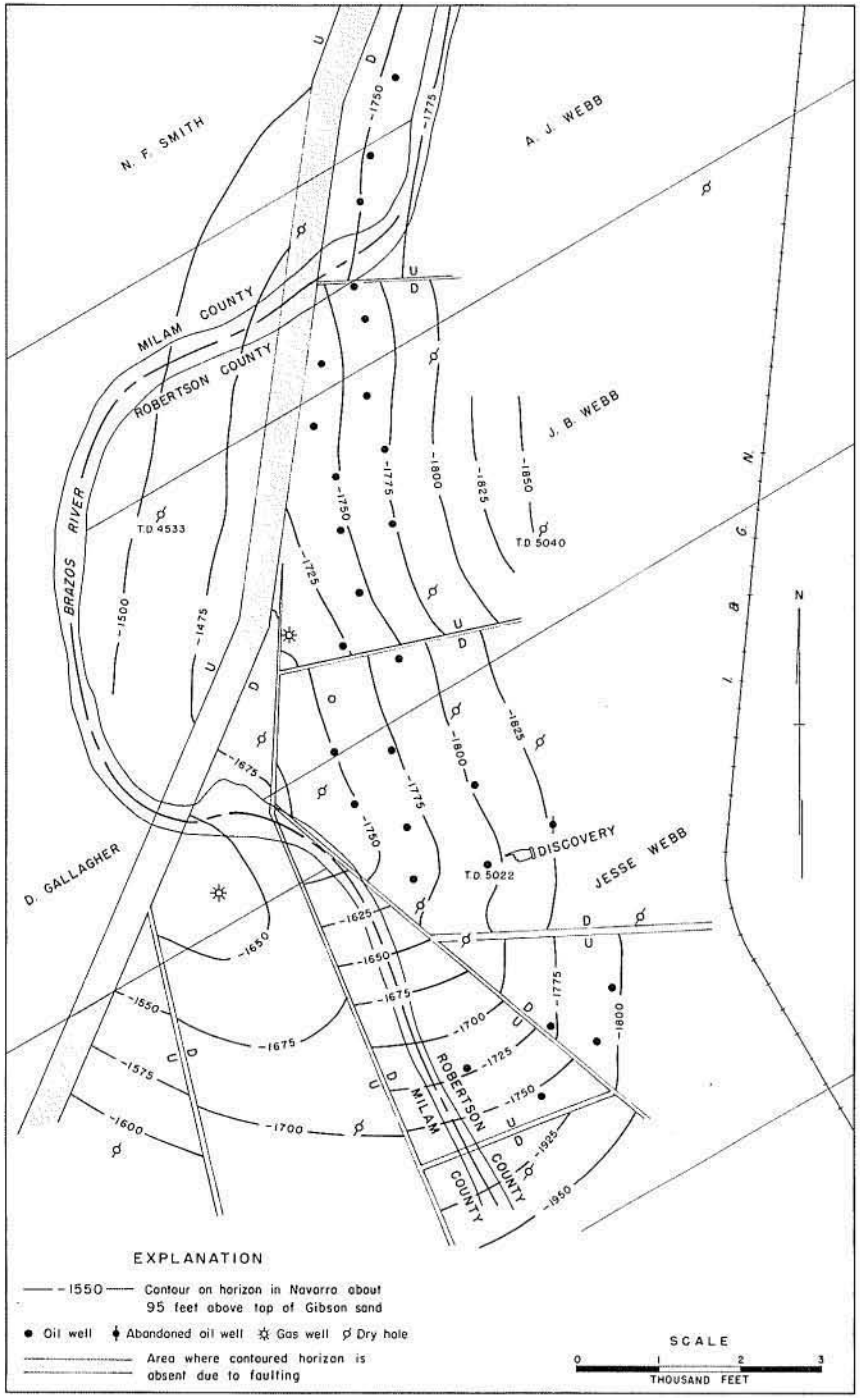
LITHOLOGY OF RESERVOIR ROCK

Gibson sand: The sand is coarse, clean and porous, but has interbedded in it a few shale partings of variable thickness. It contains considerable green glauconite. The average total thickness of the shale streaks is approximately 2 feet. These shale streaks vary in position throughout the sand section, are lenticular and are absent entirely at some places.

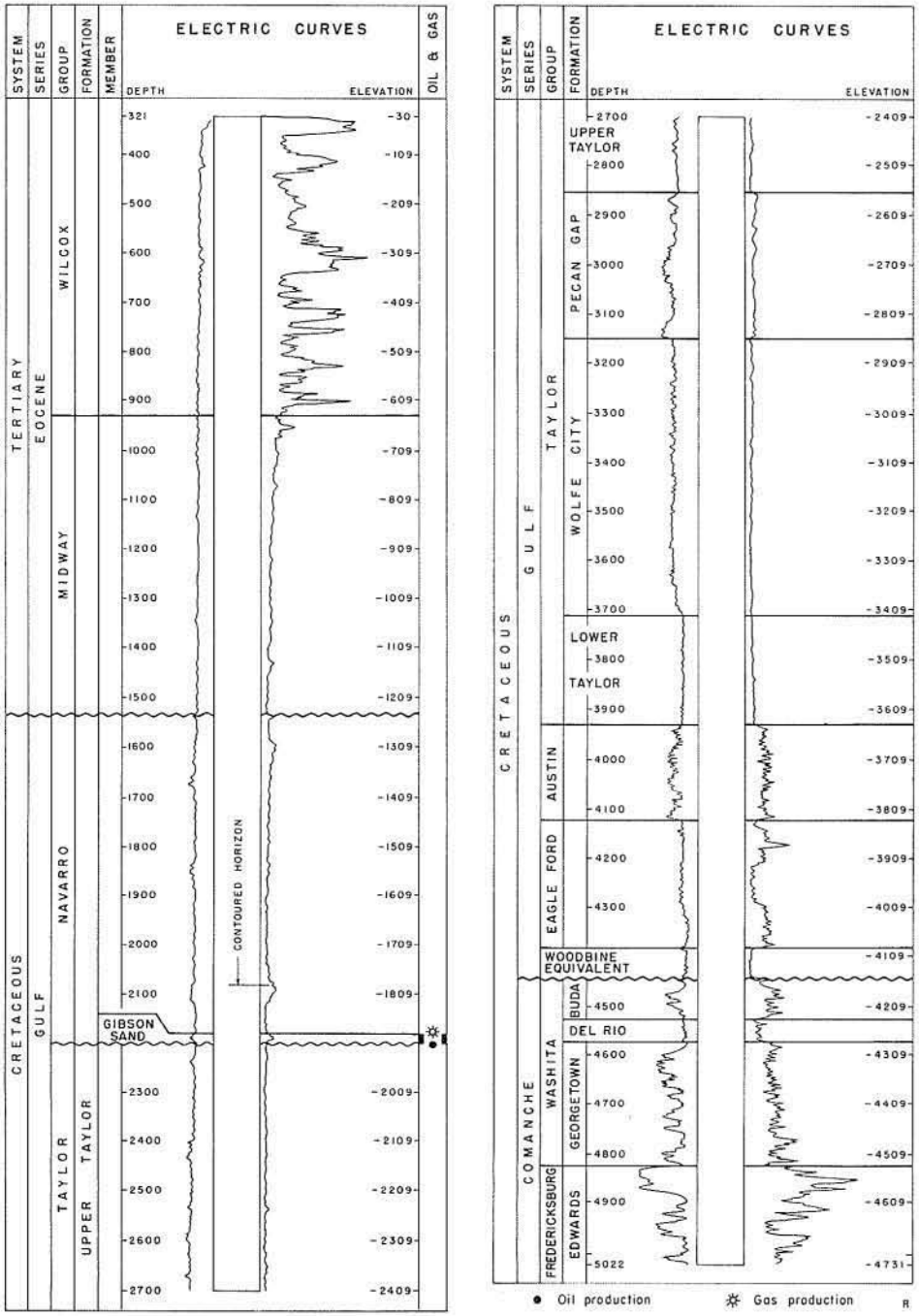
The deposition of the sand appears to have been influenced by the faulting. The best development of the sand is on the downthrown side of the main fault.

CONTINUITY OF RESERVOIR ROCK

Gibson sand: This sand is developed for approximately 3 miles along the strike of the fault and for approximately 1 mile in an east-west direction at the maximum known width. The maximum known east-west extent is from Hamman Oil & Refining Co. #1 F. W. Patske (the more southern of the two gas wells) in an easterly direction to Hamman Oil & Refining Co. #2 P. C. Gibson Estate (abandoned well about 950 feet northeast from the discovery well), where the sand section is very thin.



TYPE SECTION OF ROCKS PENETRATED



ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Gibson sand:	Feet, approx.
Highest known elevation of gas	-1,717
Elevation of bottom of gas	-1,770
Relief	53
Elevation of top of oil	-1,770
Elevation of bottom of oil	-1,930
Relief	160

The above figures represent estimates of conditions as they were at time of discovery.

CHARACTER OF OIL

Gibson sand:

Gravity, A.P.I. @ 60° F.: 36.3°
Sulphur 0.149%
Odor Sweet
Base Paraffin
Color Dark green
Pour Point Plus 70° F.
Viscosity, Say. Univ. @ 100° F.: 49.0 sec.
Yield: Distillation at 100 psi.:

	Gravity	%
Gasoline, 400 E.P.	52.4°	17.5
Kerosene, 500 E.P.	41.6°	16.0
Gas oil, 650 E.P.	37.5°	20.0
Residue	26.0°	45.5

The above analysis is of a sample from the discovery well made by E. W. Saybolt & Co., Houston, Texas, on October 25, 1944.

CHARACTER OF GAS

Gibson sand: Sweet, very dry and readily suitable for domestic and industrial uses. No detailed analysis is available.

WATER PRODUCTION

Gibson sand: There is a limited water drive. Water production has been held to a minimum. Water encroachment has been uniform throughout the various individual segments of the reservoir.

ACID TREATMENT

Gibson sand: None of the wells have been acidized. Acid treatment has not been deemed advisable for this reservoir rock.

MANNER OF WELL COMPLETION

Almost all of the wells in the field have been completed by setting casing on the immediate top of the sand. A special effort is made to case off the shale above the sand. After the casing is cemented, the sand section is usually underreamed to eliminate cement and mud contamination. The wells are customarily produced from the open hole without screen.

Two wells were gravel packed by the conventional method to control sluffing of the shale. While the shale problem was eliminated, the productive capacity of the wells was not changed. Where the casing is set on the top of the sand, little or no difficulty is encountered because of the shale partings in the sand.

PRODUCTION HISTORY

Gibson sand and Total field:

Year	WELLS PRODUCING at end of year		OIL PRODUCTION (barrels)	
	Oil*	Gas	Yearly	Cumulative
1944	1	0	800.34	800.34
1945	10	1	63,574.59	64,374.93
1946	18	2	208,600.57	272,975.50
1947	21	3	120,053.64	393,029.14
1948	25	2	82,567.78	475,596.62
1949	28	2	80,548.60	556,145.52
1950	28	2	48,670.83	604,816.35

GAS PRODUCTION: Accurate data are not available. Only a small quantity has been produced and that has been used for lease operations.

*All oil wells are pumping. While some of the wells are capable of producing without pumping, it was found advisable to install pumps to improve the productive ability and to control the accumulation of paraffin in the tubing by means of sucker rod scrapers.

CAMPBELL FIELD
Hunt County, Texas

DELMAR O. BRANSON
Geologist, Stanolind Oil and Gas Company, Tyler, Texas
April 4, 1949

LOCATION

The Campbell field is located approximately two miles northwest of the town of Campbell, in the east-central part of Hunt County, Texas, and on a major fault trend known as the Luling-Mexia fault system.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Reflection seismograph work during 1941 and 1942 delineated the Campbell structure.

DISCOVERY

Paluxy sand: May 26, 1943; Stanolind Oil & Gas Co. #1 H. C. Tillson Est., in the Chas. C. Dale survey. Completed as a pumper. During initial potential test of 14 hours the production was 41 barrels of oil.

NATURE OF TRAP

Paluxy sand: Sealed fault type trap.

PRODUCTIVE AREA

Paluxy sand and Field: Approximately 40 acres.

THICKNESS OF RESERVOIR ROCK

	Feet		
	Min.	Max.	Avg.
Paluxy sand			
From top to bottom	400±	400±	400±
Net productive	3±	7±	5±

LITHOLOGY OF RESERVOIR ROCK

Paluxy sand: Fine to medium to coarse, clean to silty sands separated by dark gray to black shale and sandy shale.

CONTINUITY OF RESERVOIR ROCK

Paluxy sand: Excellent reservoir conditions exist in the Paluxy sand throughout the central and northern portions of the East Texas basin.

CHARACTER OF OIL

Gravity: A.P.I. @ 60° F., 32.3°
Base: Paraffinic-intermediate

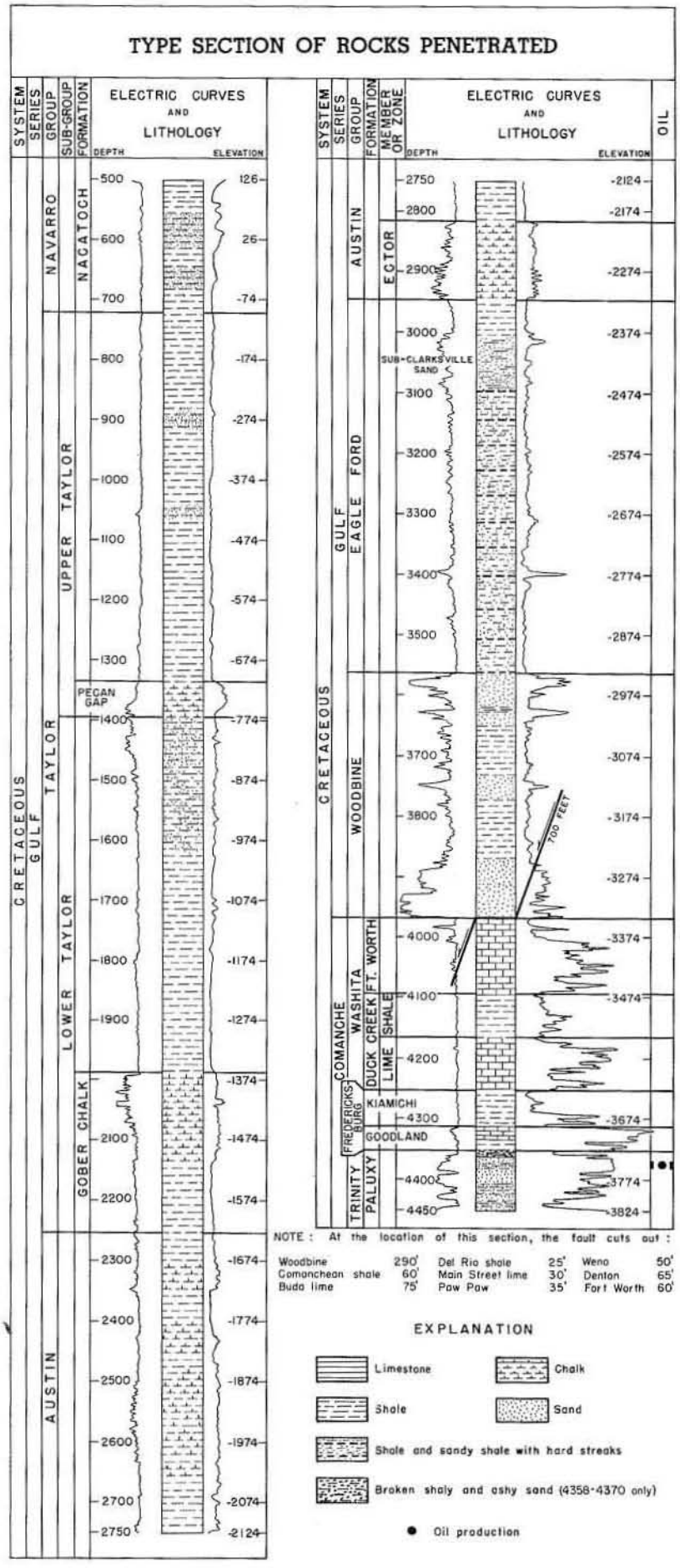
A.S.T.M. DISTILLATION

	Temperatures in F.°				
F.D.O. (%)	Crude chg.	Avia. naphtha	400 E.P. gaso.	Kero- naphtha	Resid. thru kero.
	236	162	170	422	525
5	280	193	207	437	565
10	320	199	230	442	586
20	395	208	254	450	612
30	463	217	273	454	633
40	530	225	290	459	653
50	595	233	306	464	690
60	666	240	320	471	
70		248	337	479	
80		259	352	489	
90		275	371	502	
95		290	384	511	
End point		314	400	522	
% at 140° F.	Loss added.				
158					
221		35.0	8.0		
257	2.5	78.5	21.5		
356	15.0		82.0		
392	19.5		97.0		
500	35.5			88.5	
600	50.5				15.5
700	64.5				52.0
% Loss	0.0	0.0		0.0	0.0

Octanes on 400 end point made by blending sample with 50% "C" reference fuel.
Note: The lightest constituent found in measurable quantity in this sample was pentane.

APPROX. SUMMARY - HEMPEL DISTILLATION
By U. S. Bureau of Mines method.

Fractions	% Fraction	Grav.° A.P.I.
Lt. gasoline	2.16	71.3
Total gasoline and naphtha	21.84	59.1
Kerosene distillate	20.00	43.2
Gas oil	5.50	35.2
Residuum	31.89	18.4
Distillate loss	.70	
		Vis. 100° F.
Non-viscous lub.	12.55	50 - 100
Medium lub. distillate	7.52	100 - 200
Viscous lub. distillate		Above 200
Carbon res. of residuum %	16.93	
Carbon res. of crude %	5.40	



SURFACE FORMATIONS

Kemp clay, Corsicana marl and Nacatoch sand.

ELEVATION OF SURFACE

At well locations: 626 and 605 feet.

OLDEST ZONE PENETRATED

Paluxy sand.

RELIEF OF PRODUCTIVE ZONE

Paluxy sand: The difference in elevation of the top of the oil and the bottom of the oil at time of discovery is believed to have been about 30 feet.

WATER PRODUCTION

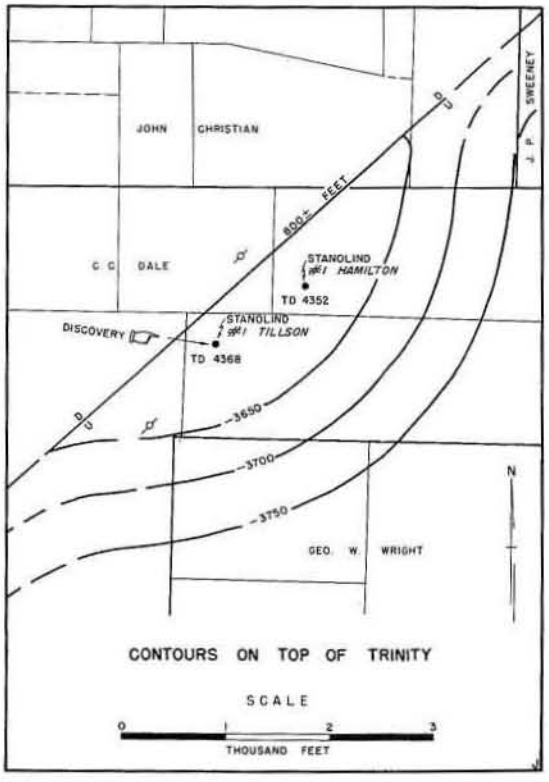
Water production has varied from 2% to 40%. Records of the quantities of water produced are not available.

PRODUCTION HISTORY

Paluxy sand and Field

	WELLS PRODUCING at end of year	OIL PRODUCTION (barrels)			
Year	Pumping	#1 Tillson	#1 Hamilton	Total	Cum.
1943	2	20,427	6,207	26,634	26,634
1944	2	29,646	26,715	56,361	83,995
1945	2	35,115	25,544	60,659	143,654
1946	2	24,910	11,344	36,254	179,908
1947	2	17,010	9,508	26,518	206,426
1948	2	17,709	7,931	25,640	232,066
1949*	2	14,190	6,011	20,201	252,267
Total		159,007	93,260	252,267	

*P.S. - 1949 data added by amendment



CAMP HILL FIELD
Anderson County, Texas

ROBERT T. TRUEHEART
Geologist, Amerada Petroleum Corporation, Tyler, Texas
September 11, 1950

LOCATION

The Camp Hill field centers around the J. C. Rosson survey about 9 miles southeast of Palestine.

METHODS OF EXPLORATION LEADING TO DISCOVERY

As a result of surface geological mapping, Humble Oil & Refining Co. drilled its #1-B Southern Pine Lumber Co. in the northeast part of the H. Main survey. This test was completed dry on August 19, 1927 at a total depth of 5,080 feet in the lower Taylor. After leasing approximately 5,000 acres in the area in 1930, Gulf Oil Corp. conducted extensive seismograph and torsion balance work.

DISCOVERIES

Sub-Clarksville sand: March 15, 1935;
Gulf Oil Corp. #1 Davey & Royall.

Woodbine sand: May 16, 1935;
Gulf Oil Corp. #1 Delaney.

DATA CONCERNING CARRIZO

A sand in the Carrizo formation gave sufficient promise for commercial production that eight shallow wells were drilled for its exploitation, but no commercial production was developed. Gulf Oil Corp. #2 Davey & Royall was completed March 18, 1935, and produced gas for several weeks. This and four other shallow wells were drilled within about 500 feet south, southeast and east of the sub-Clarksville discovery well. The five wells in this group were drilled to an average depth of about 600 feet. Three other tests, slightly shallower, were drilled within a half-mile to the northwest, north and northeast. Since the Carrizo did not yield sufficient production in any well to return the cost of the well, the Carrizo is not further treated in this paper.

ELEVATION OF SURFACE

At well locations: Highest, 655 ft.; lowest, 487 feet.

SURFACE FORMATIONS

Sparta sand and Weches greensand, both in Claiborne group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

293 feet below the top of the Rodessa formation. This penetration was in the dry hole near the fault where the total depth is indicated as 8,383 feet on the accompanying map.

NATURE OF TRAPS

The reservoirs are located on the northwestern flank of a faulted structure where the local dip is approximately 400 feet per mile. The accumulations of hydrocarbons appear to be due to updip pinch-out of the sands.

PRODUCTIVE AREAS

Sub-Clarksville sand	400 acres
Woodbine sand	100 acres
Camp Hill field	500 acres

THICKNESSES OF RESERVOIR ROCKS

The sub-Clarksville sand and the Woodbine sand are each 5 to 8 feet thick.

LITHOLOGY OF RESERVOIR ROCKS

Sub-Clarksville sand: Moderately porous, ashy, micaceous, glauconitic sandstone.

Woodbine sand: Medium-grained, moderately porous, ashy sandstone.

CONTINUITY OF RESERVOIR ROCKS

The distribution of each the sub-Clarksville sand and the Woodbine sand is quite erratic, particularly southeastward (updip) from the central portion of the field. The sub-Clarksville sand apparently lenses out entirely at the southern limit of its productive area.

WATER PRODUCTION

In both reservoirs, water production in each well increased from a small amount at time of completion to a large amount at time of abandonment. Data are not available for determining quantities of water produced.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Sub-Clarksville sand:	Feet
Approximate elevation of top of oil	-4,480
Approximate elevation of bottom of oil	-4,590
Approximate relief	110

Woodbine sand:
Control inadequate for satisfactory estimates.

CHARACTER OF OIL

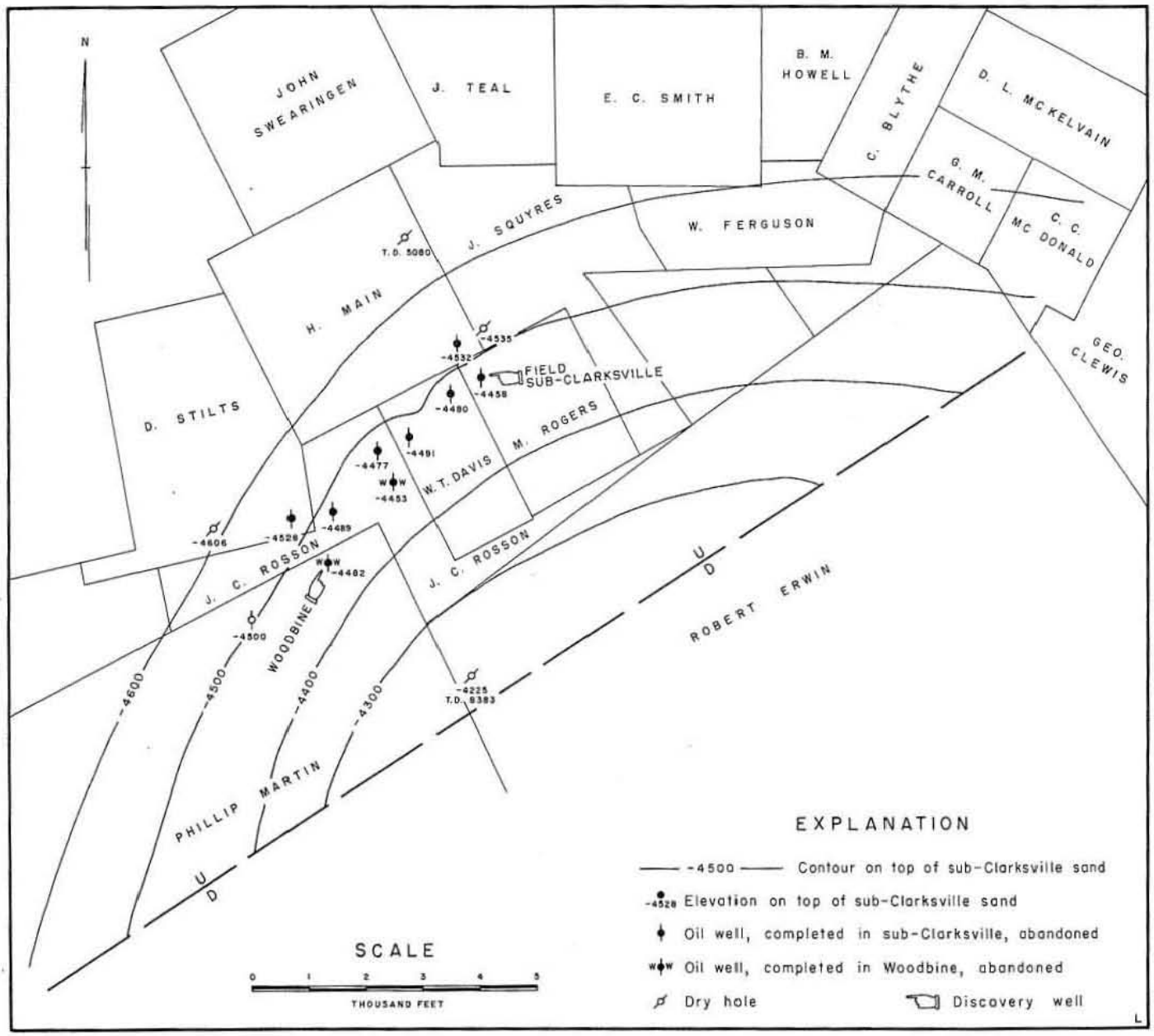
Sub-Clarksville sand:
Gravity, A.P.I.: 37.5° Sulphur: 0.31% Base: Paraffin

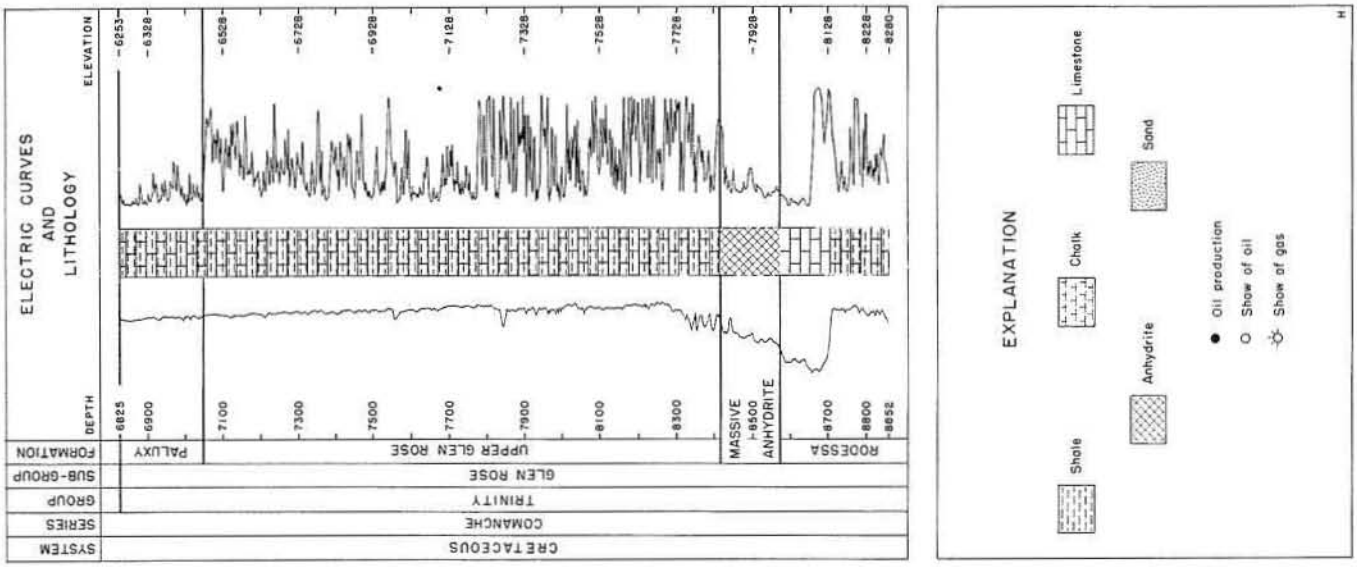
Woodbine sand:
Gravity, A.P.I.: 38° Sulphur: ? % Base: Paraffin

PRODUCTION HISTORY

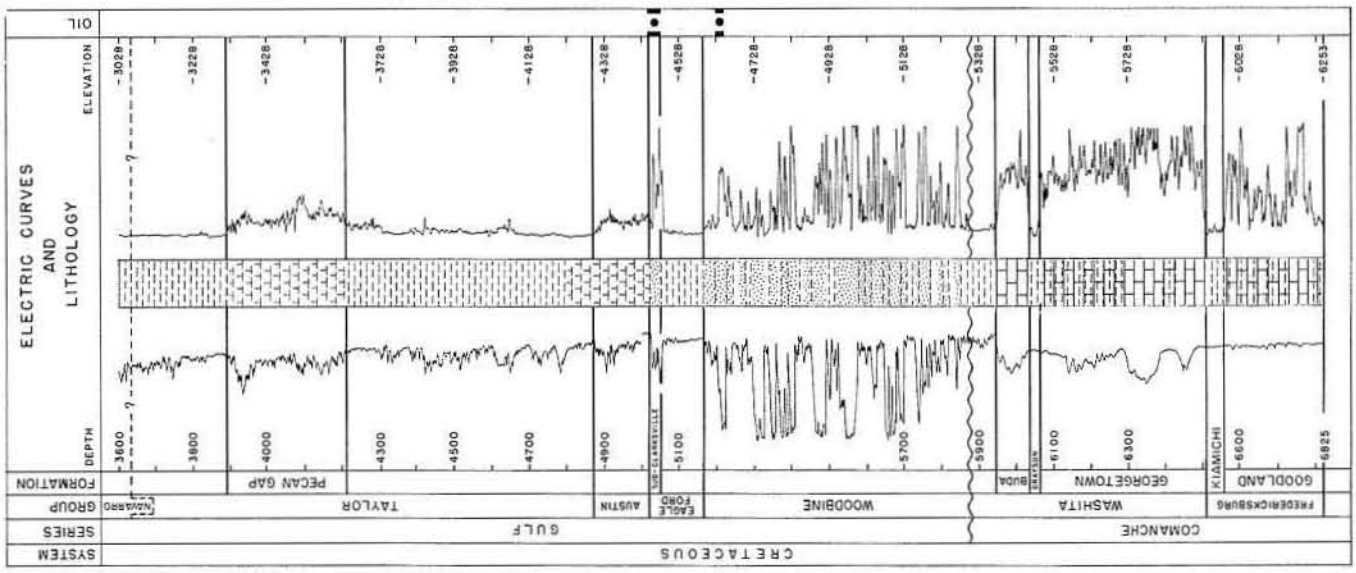
A total of 10 wells were completed as oil producers, 8 from the sub-Clarksville sand and 2 from the Woodbine sand. Generally the wells flowed on completion and then, after a variable period averaging four months, they were put on the pump. The sub-Clarksville discovery well produced gas during the first two weeks after completion and then produced oil thereafter. Total quantities produced in the field are indicated below. Data are not available for determining quantities of production from each of the two reservoirs separately. Operations were abandoned in November 1937.

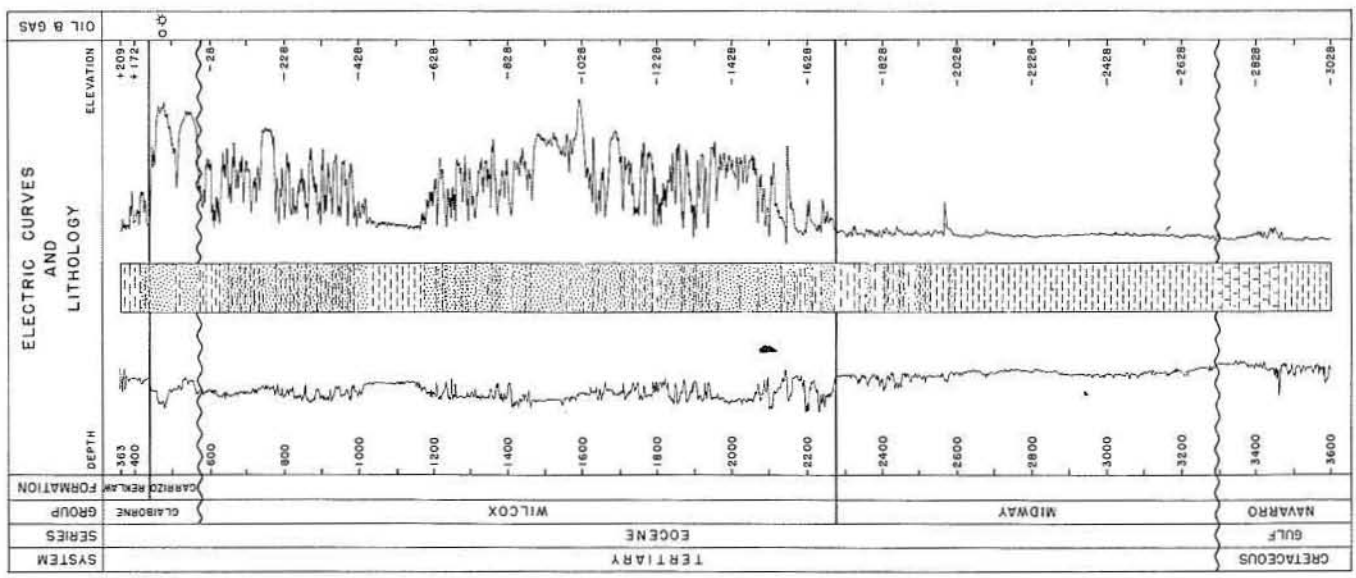
	WELLS PRODUCING at end of year		OIL PRODUCTION (barrels)	
Year	Flowing	Pumping	Yearly	Cumulative
1935	2	6	125,993	125,993
1936	0	8	132,786	258,779
1937	0	0	27,399	286,178





TYPE SECTION OF ROCKS PENETRATED





CARTHAGE FIELD
Panola County, Texas

G. C. CLARK and JACK M. DeLONG
Stanolind Oil & Gas Company, Tyler, Texas
March 29, 1950

LOCATION and FIELD NAMES

The Carthage field covers all of Panola County except a narrow band, generally three to five miles in width, around the periphery. The extreme northeast corner of the county is covered by the Bethany field.

The Carthage field, as the name is now used, includes areas previously designated as Beckville, Hull, Pulaski Ferry and Tacoma.

Beckville field: This name has been used to designate an area about 5 miles northeast of the town of Beckville. Hollingsworth #1 Crain was completed May 25, 1948 as a gas-condensate producer from Lower Pettet through perforations at 6,538-6,560 feet. At the time of its completion, some reporters considered this well as discovering a new field, with the result that this name appears in the literature. In this paper, the Beckville area is considered as within the Carthage field although it is not yet proven that productiveness is continuous out to this area. At present it includes two productive wells, which wells are about 2 miles northwest of the most northwestward extent of proved continuous production.

Hull field: This name has been applied to early Carthage production in the vicinity of Magnolia Petroleum Co. #1 E. A. Hull in the T. Applewhite survey three miles east of the town of Carthage. On the basis of surface geological work, a block of leases was acquired in 1926. During 1936 the Magnolia Petroleum Co. drilled a well to the total depth of 5,960 feet and completed it as a gas-condensate well producing from the Lower Pettet. This is the discovery well for this reservoir in the Carthage field.

Pulaski Ferry field: Some of the early statistical reports carry a portion of the Carthage production under this name, which was applied to only a few wells in the vicinity of the well which discovered production in the Upper Pettet. As development expanded, the use of this name was discontinued.

Tacoma field: The Tacoma field was discovered July 12, 1933 and was abandoned February 28, 1938 after having produced 17,732 barrels of 46° gravity oil from 5 feet of Blossom sand at depths of about 2,100 feet. The production was from three wells within an area of 40 acres located in the P. Martin survey near the town of Tacoma, about 4,000 feet northeast of the well which discovered gas in the Travis Peak. The area of this field is now considered as within the Carthage field although it is beyond the proven extent of productiveness in any of the deeper reservoirs.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Subsurface and surface geological mapping, later confirmed by geophysical work, led to the discovery of the Carthage field.

DISCOVERIES

Hill:

Gas: June 9, 1939; Smith & Turner #1 Bird (now Dunaway #1 Bird), G. Gillespie survey. Flowed 24,000 Mcf of gas and 600 barrels of 60° gravity crude per day.

Oil: November 28, 1946; P. H. Pewitt #1 Carthage Gas Unit #3 (now Chicago Corporation #1 Carthage Gas Unit #34), Hampton West survey. Flowed 107 Mcf of gas and 20.91 barrels of 41.3° gravity crude per day through perforations 5,226-5,230.

Gloyd:

Gas: July 9, 1947; Continental Oil Co. #1-B Warner, J. Husband survey. Initial daily potential, 12,500 Mcf of gas with 80% salt water through perforations 5,163-5,168 feet. This well has been shut-in since completion due to lack of pipeline connection. It is the only well completed in this reservoir.

Upper Pettet:

Gas: October 9, 1936; A. C. Glassell #1 Frost Lumber Co. (now Carthage Unit #1), Mary S. Potts survey. Flowed 2,500 Mcf of gas and 50 barrels of 52.2° gravity crude per day; GOR, 50,000:1; choke, 1/4-inch; perforations, 5,648-5,663 feet. This well was recompleted on July 20, 1943, this time in Lower Pettet through perforations 5,838-5,954; potential open flow, 120,000 Mcf of gas per day.

Lower Pettet:

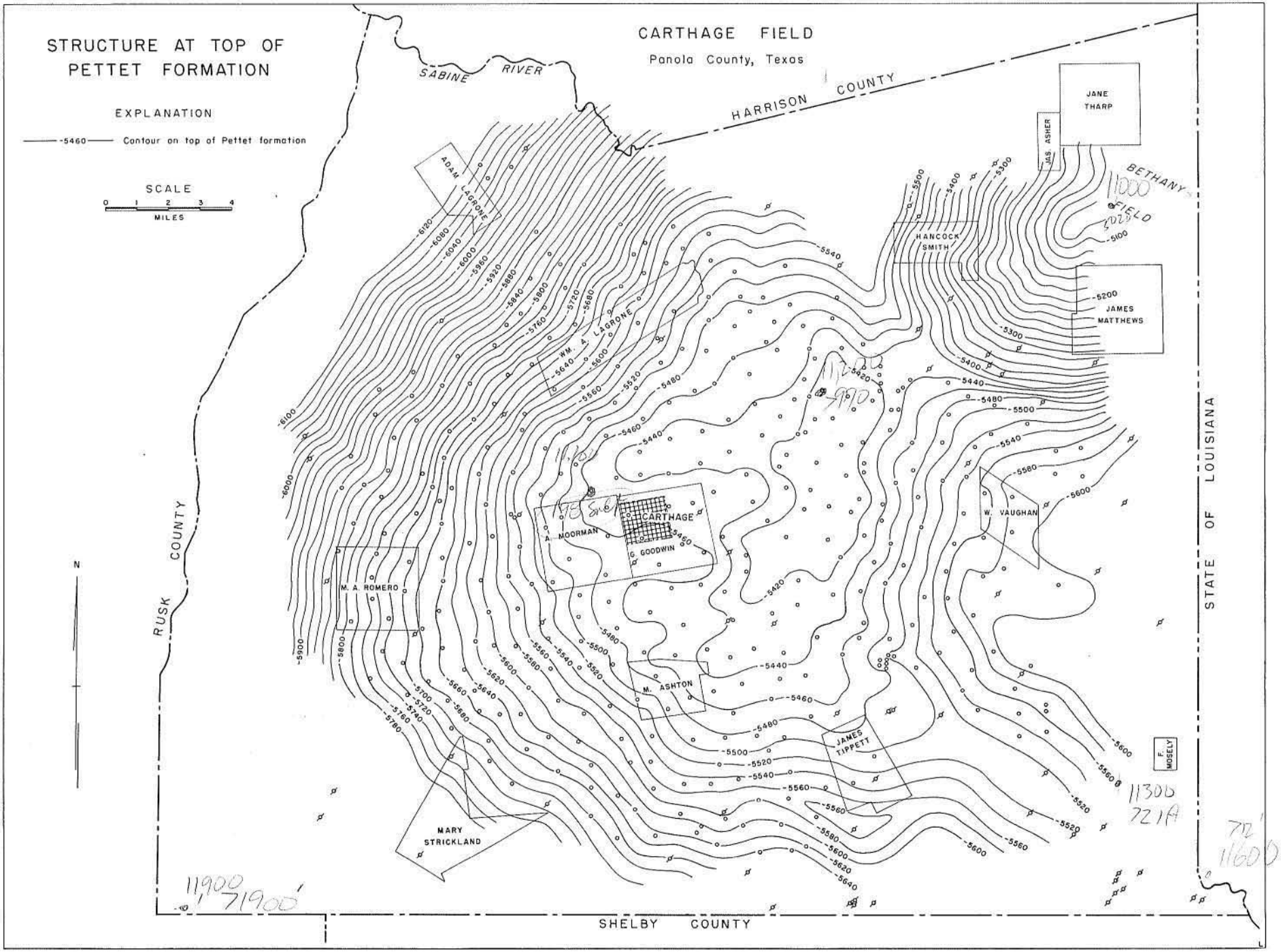
Gas: December 22, 1936; Magnolia Petroleum Co. #1 E. A. Hull, T. Applewhite survey. Flowed 2,095 Mcf of gas and 20 barrels of crude per day on 3/8-inch choke.

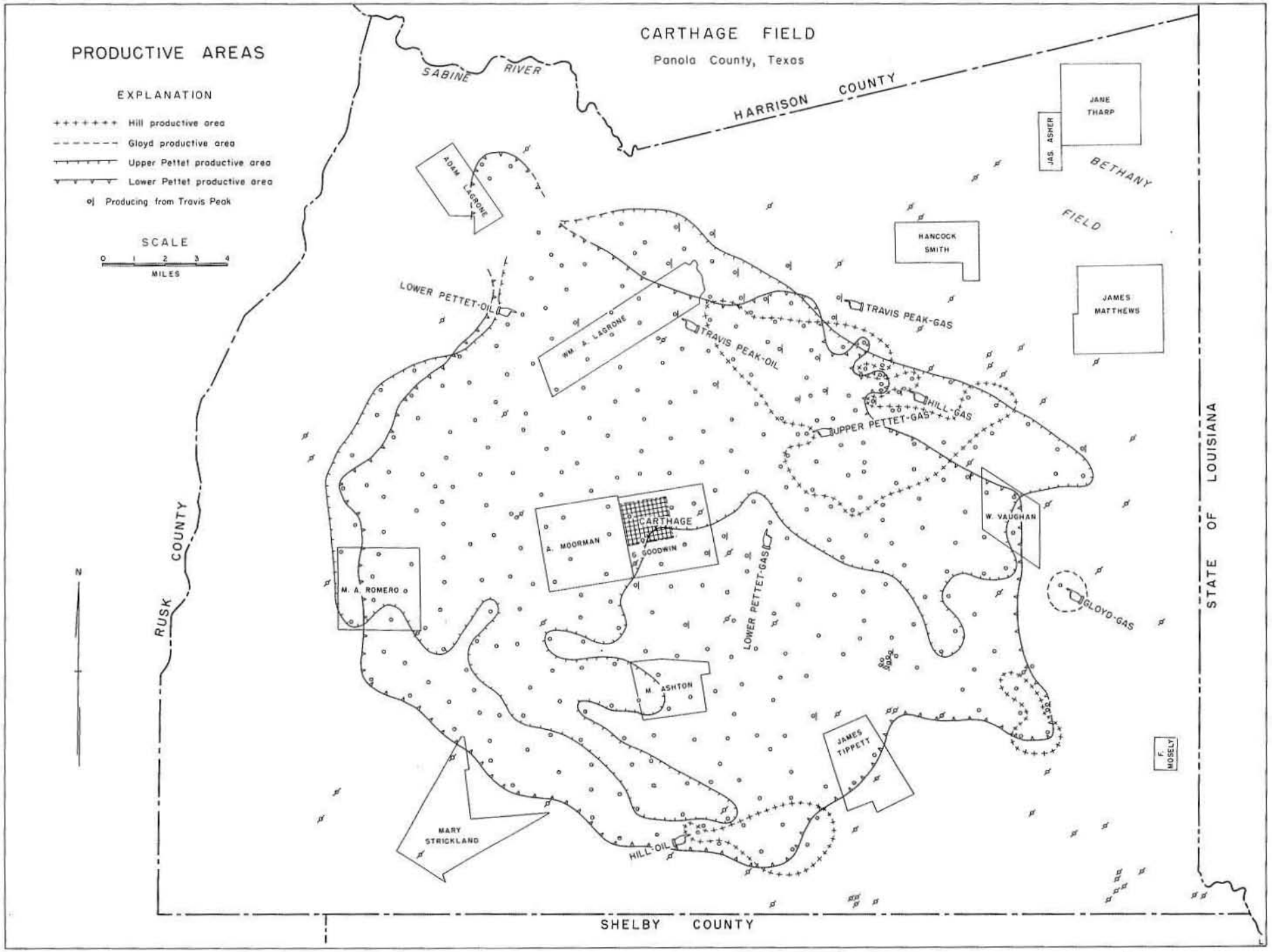
Oil: April 24, 1946; Skelly Oil Co. #1 S. E. Mathews, Wm. McFadden survey. Flowed 348 barrels of 41.6° gravity crude per day; GOR, 2,785:1; choke, 1/4-inch; perforations, 6,262-6,285, 6,314-6,330 and 6,374-6,388 feet. This well was recompleted August 18, 1946 through same perforations; flowed 478.3 barrels of 43° gravity crude per day; GOR, 2,319:1; choke, 3/8-inch.

Travis Peak:

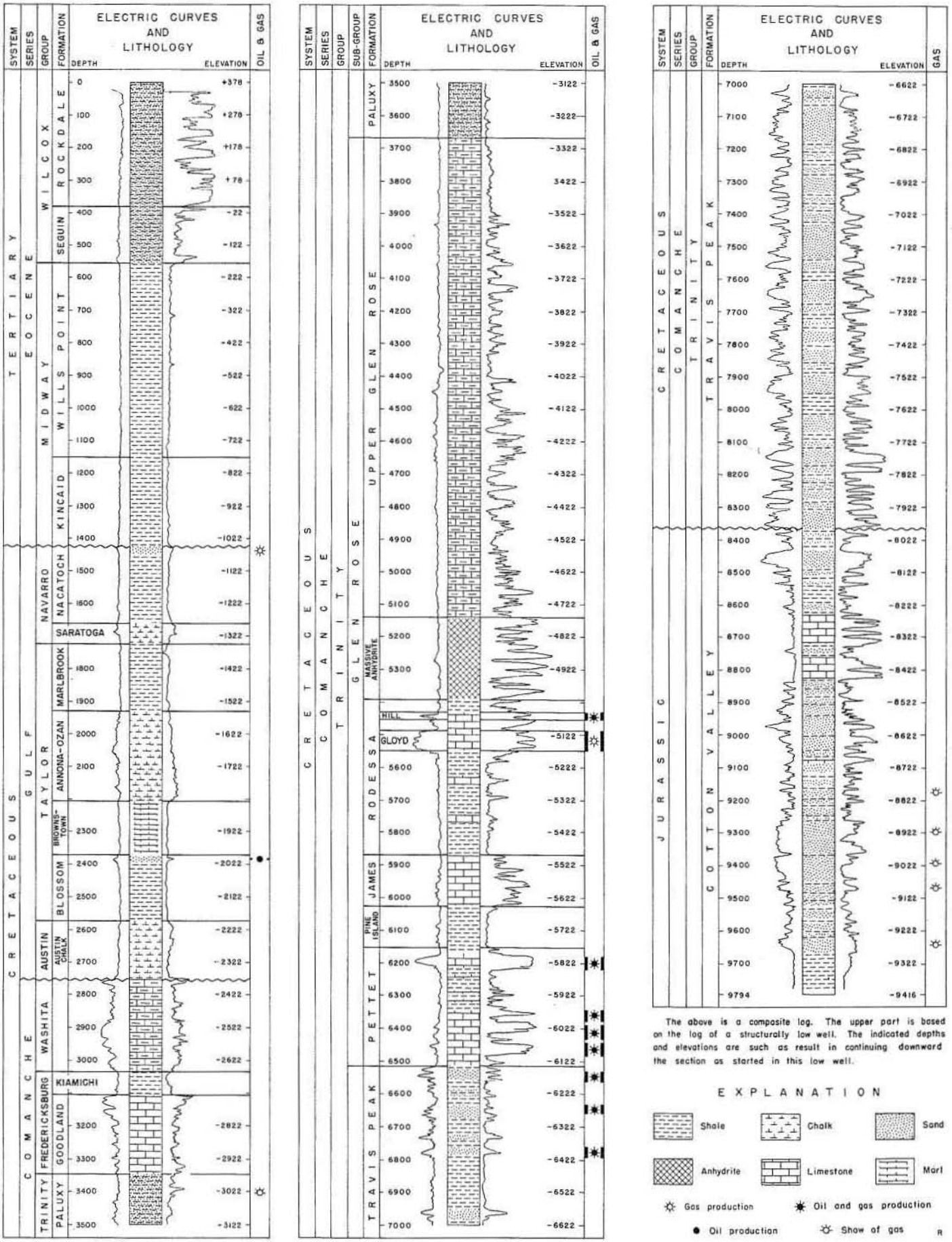
Gas: November 11, 1942; Arkansas Louisiana Gas Co. #1 D. Thompson & S. Hudson, E. Decker survey. Initial daily potential, 5,900 Mcf of gas with an estimated 25 barrels of oil per million; perforations, 6,082-6,128 feet. This well was recompleted October 26, 1944 through perforations 6,090-6,110 feet; initial daily potential, 11,000 Mcf of gas. This well has been abandoned.

Oil: June 15, 1944; Rogers Lacy #1 Cameron Lumber Co., Wm. A. Lagrone survey. Flowed 26.72 barrels of 41.9° gravity crude per day; GOR, 3,900:1; choke, 1/4-inch; perforations, 6,436-6,439 feet.


CARTHAGE FIELD
Panola County, Texas
STRUCTURE AT TOP OF PETTET FORMATION
EXPLANATION
-5460- Contour on top of Pettet formation
SCALE
0 1 2 3 4
MILES
SABINE RIVER
HARRISON COUNTY
RUSK COUNTY
SHELBY COUNTY
STATE OF LOUISIANA
N
ADAM LAGRONE
WM. A. LAGRONE
JANE THARP
JAS. ASHER
HANCOCK SMITH
JAMES MATTHEWS
BETHANY FIELD
A. MOORMAN
CARTHAGE
G. GOODWIN
M. A. ROMERO
M. ASHTON
W. VAUGHAN
JAMES TIPPETT
F. MOSELY
MARY STRICKLAND


CARTHAGE FIELD
Panola County, Texas
PRODUCTIVE AREAS
EXPLANATION
Hill productive area
Gloyd productive area
Upper Pettet productive area
Lower Pettet productive area
Producing from Travis Peak
SCALE
0 1 2 3 4
MILES
SABINE RIVER
HARRISON COUNTY
BETHANY FIELD
STATE OF LOUISIANA
RUSK COUNTY
SHELBY COUNTY
ADAM LAGRONE
JAS. ASHER
JANE THARP
HANCOCK SMITH
JAMES MATTHEWS
WM. A. LAGRONE
LOWER PETTET-OIL
TRAVIS PEAK-OIL
TRAVIS PEAK-GAS
HILL-GAS
UPPER PETTET-GAS
CARTHAGE
A. MOORMAN
S. GOODWIN
W. VAUGHAN
M. A. ROMERO
LOWER PETTET-GAS
GLOYD-GAS
M. ASHTON
JAMES TIPPETT
F. MOSELY
MARY STRICKLAND
HILL-OIL
N

TYPE SECTION OF ROCKS PENETRATED



The above is a composite log. The upper part is based on the log of a structurally low well. The indicated depths and elevations are such as result in continuing downward the section as started in this low well.

EXPLANATION

Shale · Chalk · Sand · Anhydrite · Limestone · Marl

☼ Gas production · ✸ Oil and gas production · ● Oil production · ☼ Show of gas

DATA CONCERNING SHALLOWER RESERVOIRS

The writers have not been able to obtain satisfactory data concerning the reservoirs above the Hill. It is believed that both Nacatoch and Blossom produced gas and oil in minor quantities in scattered wells long before the deeper reservoirs were developed. The only production in material quantity appears to have been at Tacoma, where oil was produced from the Blossom, as mentioned above.

ELEVATION OF SURFACE

At well locations: Highest, 350 ft.; lowest, 200 feet.

SURFACE FORMATION

Wilcox group undifferentiated.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated within the area of the field is 1,249 feet below the top of the Cotton Valley formation. This penetration was in Continental Oil Co. #1 E. L. & B. H. Burnett, John F. Cheairs survey, which was drilled to a total depth of 9,306 feet in January, 1944. This well is located in the northern part of the field in about the center of the triangle formed by three discovery wells, viz., Travis Peak-oil, Travis Peak-gas and Upper Pettet-gas.

NATURE OF TRAPS

Permeability trap for all reservoirs. A large structural nose extends off the west flank of the Sabine uplift and forms the west and south structural limits of the field. The permeability pinchout line which delineates the updip limit of the field is comparatively uniform for all the producing zones.

PRODUCTIVE AREAS

	Acres
Hill	36,813
Gloyd	640
Upper Pettet	161,814
Lower Pettet	213,966
Travis Peak	16,838
Carthage field	240,105

THICKNESSES OF RESERVOIR ROCKS

Hill	0 to 9 feet
Upper Pettet	0 to 32 feet
Lower Pettet	0 to 41 feet
Travis Peak	0 to 15 feet

ACID TREATMENT

All of the wells in the Hill, Upper Pettet and Lower Pettet zones have required acid treatment. The usual treatment is with one to three thousand gallons of acid.

LITHOLOGY OF RESERVOIR ROCKS

Hill: Gray, crystalline to oolitic, porous limestone.
Gloyd: Gray, crystalline to oolitic, porous limestone.
Upper Pettet: Gray, crystalline, fossiliferous, oolitic porous limestone.
Lower Pettet: Gray, fossiliferous to crystalline, porous limestone.
Travis Peak: Fine- to medium-grained subangular sand.

CONTINUITY OF RESERVOIR ROCKS

Hill: Northeast quarter of the field extending 8 miles in a northwest-southeast direction and 3 miles wide. Also an area of 5,600 acres in the south-central portion, and an area of 3,200 acres in the southeast portion of the field.

Gloyd: Covers entire field, but is productive in only one well, which well is at the east edge of the field.

Upper Pettet: Covers the entire field with the exception of a non-porous re-entrant in the southeast quarter of the field.

Lower Pettet: Covers the entire Carthage field.

Travis Peak: The continuity of the Travis Peak is very irregular due to the lenticular nature of the sands. Production from this zone is confined to the northeast and southeast portions of the field.

CHARACTER OF OIL

The gravity of oil in all zones is between 40° and 45°.

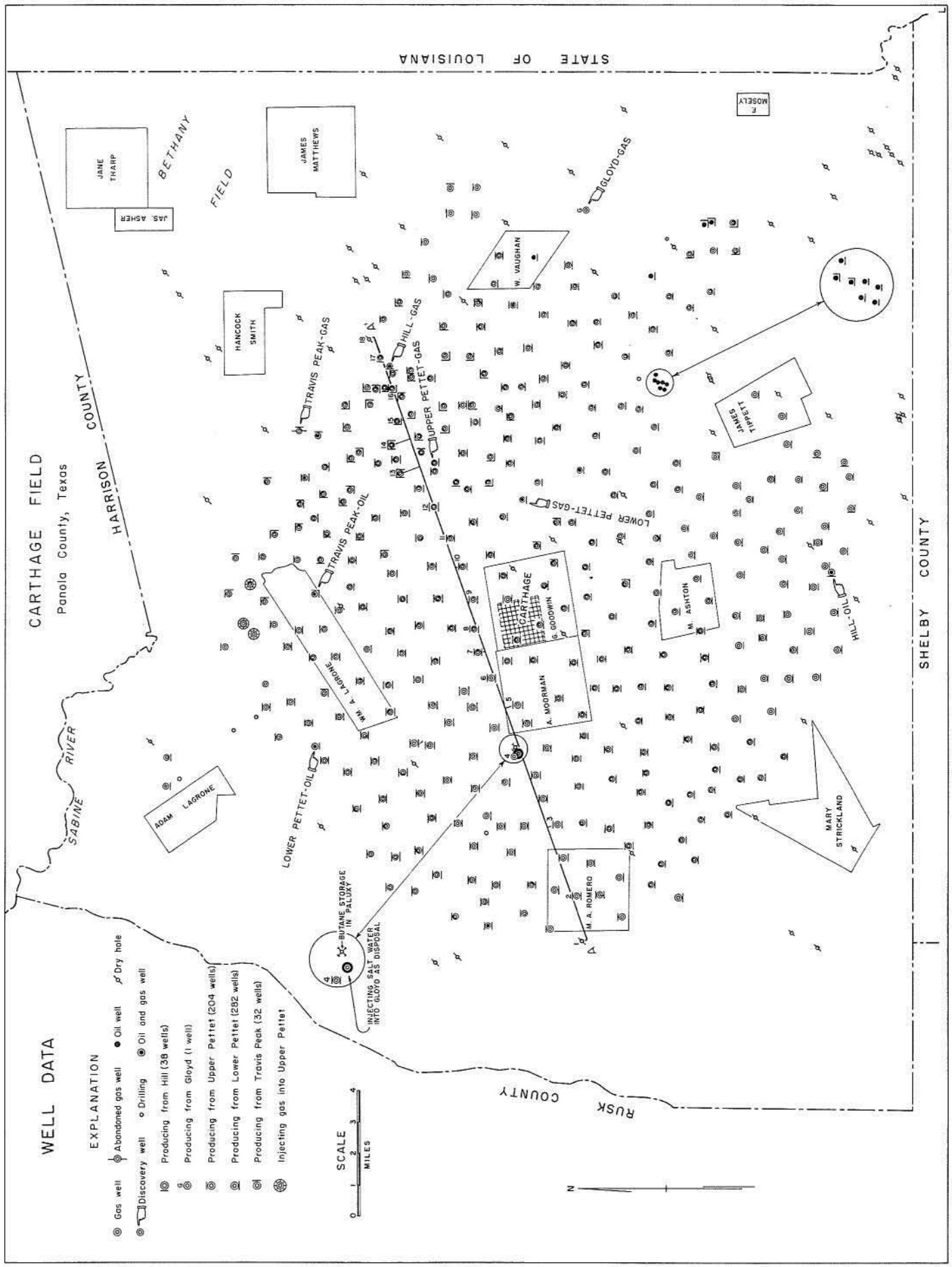
CHARACTER OF GAS

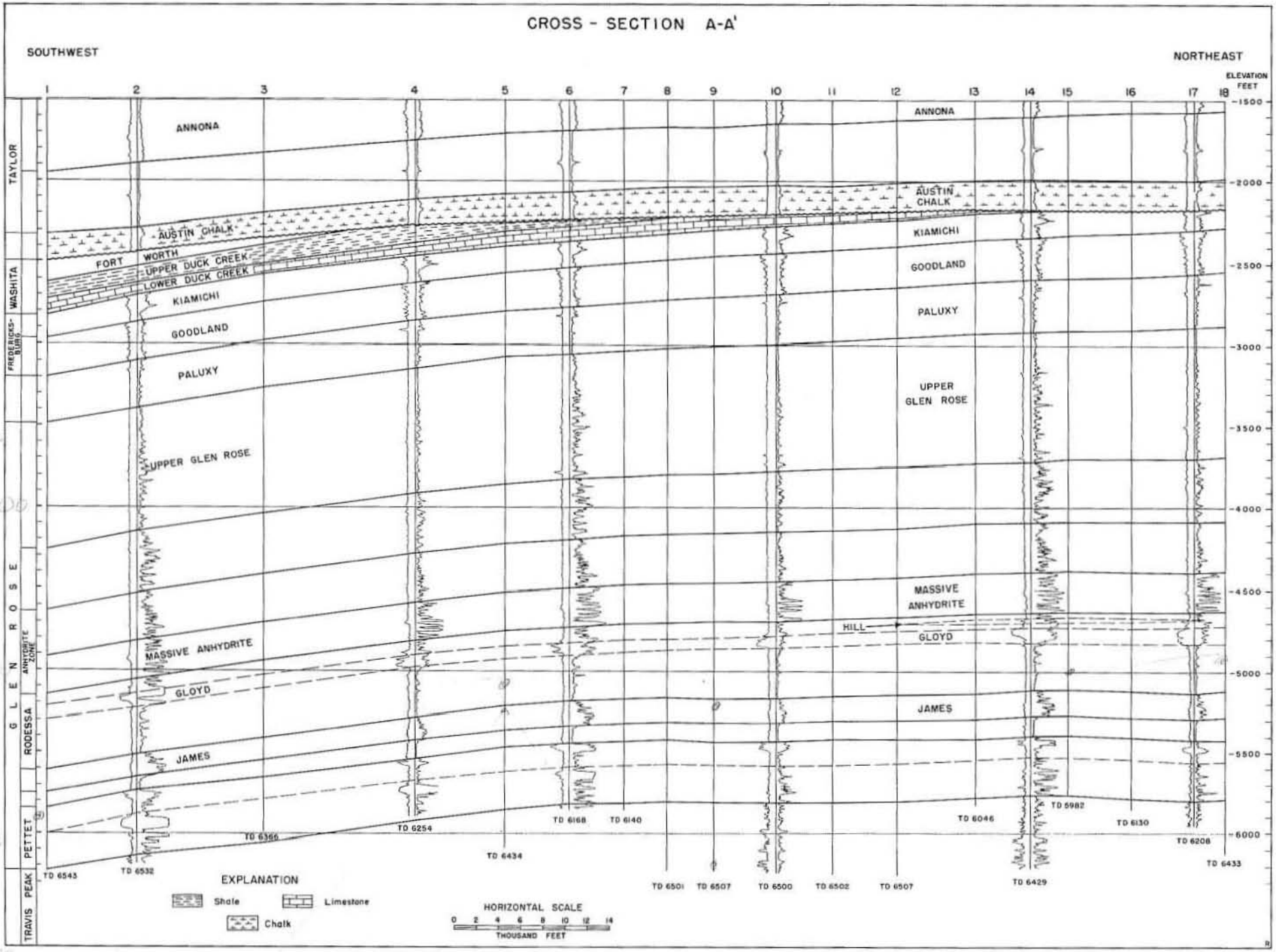
Component	Mol. %	G.P.M.
Methane	92.54	
Ethane	4.71	
Propane	1.31	.359
Iso-butane	.36	.117
Normal butane	.50	.157
Iso-pentane	.23	.084
Normal pentane	.14	.051
Hexanes plus	.21	.097
	100.00	.865

Specific gravity, calculated .616
Heating value, calculated, B.t.u./cf; Dry, 1,109; wet, 1,090.

WATER PRODUCTION

All of the reservoirs have produced some water. The Gloyd is water-filled over most of the area of the field. Water has encroached in the Upper Pettet zone in a finger-shaped area in the southwest portion of the field, causing abandonment of production from this zone locally. Water production in the Lower Pettet has been limited to the downdip edges of the field. Water is present in the Travis Peak throughout the field, but due to lenticularity of the sands, may be readily squeezed off to allow gas or oil production from other sand lenses in the same area.


CARTHAGE FIELD
Panola County, Texas
STATE OF LOUISIANA
HARRISON COUNTY
SHELBY COUNTY
RUSK COUNTY
SABINE RIVER
BETHANY FIELD
JANE THARP
JAS. ASHER
JAMES MATTHEWS
HANCOCK SMITH
W. VAUGHAN
F. MOSELY
GLOYD-GAS
HILL-GAS
TRAVIS PEAK-GAS
UPPER PETTET-GAS
LOWER PETTET-GAS
TRAVIS PEAK-OIL
LOWER PETTET-OIL
HILL-OIL
JAMES TIPPETT
CARTHAGE
G. GOODWIN
M. ASHTON
A. MOORMAN
WM. A. LAGRONE
ADAM LAGRONE
MARY STRICKLAND
M. A. ROMERO
BUTANE STORAGE IN SALT
INJECTING SALT WATER INTO GLOYD AS DISPOSAL
WELL DATA
EXPLANATION
Gas well
Abandoned gas well
Oil well
Dry hole
Discovery well
Drilling
Oil and gas well
Producing from Hill (38 wells)
Producing from Gloyd (1 well)
Producing from Upper Pettet (204 wells)
Producing from Lower Pettet (282 wells)
Producing from Travis Peak (32 wells)
Injecting gas into Upper Pettet
SCALE
MILES
N


CROSS - SECTION A-A'
SOUTHWEST
NORTHEAST
ELEVATION FEET
TAYLOR
WASHITA
FREDERICKSBURG
GLEN ROSE
ANHYDRITE ZONE
RODESSA
PETTET
TRAVIS PEAK
ANNONA
AUSTIN CHALK
FORT WORTH
UPPER DUCK CREEK
LOWER DUCK CREEK
KIAMICHI
GOODLAND
PALUXY
UPPER GLEN ROSE
MASSIVE ANHYDRITE
GLOYD
JAMES
HILL
-1500
-2000
-2500
-3000
-3500
-4000
-4500
-5000
-5500
-6000
TD 6543
TD 6532
TD 6366
TD 6254
TD 6434
TD 6168
TD 6140
TD 6501
TD 6507
TD 6500
TD 6502
TD 6507
TD 6046
TD 6429
TD 5982
TD 6130
TD 6208
TD 6433
EXPLANATION
Shale
Limestone
Chalk
HORIZONTAL SCALE
0 2 4 6 8 10 12 14
THOUSAND FEET

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Hill	Gloyd	Upper Pettet	Lower Pettet	Travis Peak
Elevation of top of gas, feet	-4,683	-5,163	-5,402	-5,609	Unknown due to lenticularity of sands.
Elevation of bottom of gas, feet		-5,168	-6,047		
Elevation of bottom of oil, feet	-4,893			-6,310	
Interval, feet	210	5	645	701	

PRODUCTION HISTORY

	WELLS PRODUCING at end of year		OIL PRODUCTION (barrels)	CONDENSATE PRODUCTION (barrels)	TOTAL LIQUIDS (barrels)		GAS PRODUCTION (Mcf)	
	Oil or Oil & Gas Flowing	Gas or Gas & Condensate	Yearly	Yearly	Yearly	Cumulative	Yearly	Cumulative
Field totals, exclusive of reservoirs above Hill								
1936		3		1,248	1,248	1,248	75,392	75,392
1937		4		15,767	15,767	17,015	1,120,304	1,195,696
1938		4		13,307	13,307	30,322	244,676	1,940,372
1939		5		14,941	14,941	45,263	763,462	2,703,834
1940		6		37,485	37,485	82,748	2,211,974	4,915,808
1941		9		70,972	70,972	153,720	4,201,950	9,117,758
1942		18		105,125	105,125	258,845	6,197,541	15,315,299
1943		25		182,286	182,286	441,131	11,270,198	26,585,497
1944	1	55	4,025	314,187	318,212	759,343	21,731,419	48,316,916
1945	4	225	10,930	507,791	518,721	1,278,064	34,097,393	82,414,309
1946	8	392	80,350	1,338,465	1,418,815	2,696,879	94,712,602	177,126,911
1947	9	448	130,511	1,971,959	2,102,470	4,799,349	138,933,542	316,060,453
1948	19	510	295,974	2,549,874	2,845,848	7,645,197	183,533,578	499,594,031
1949	21	536	251,483	3,135,807	3,387,290	11,032,487	239,280,212	738,874,243
Hill								
1939		1		1,745	1,745	1,745	79,700	79,700
1940		2		5,418	5,418	7,163	269,437	349,137
1941		4		27,880	27,880	35,043	1,681,532	2,030,669
1942		7		65,776	65,776	100,819	3,951,373	5,982,042
1943		7		114,969	114,969	215,788	7,530,117	13,512,159
1944		11		142,208	142,208	357,996	10,429,888	23,942,047
1945		16		162,877	162,877	520,873	11,242,157	35,184,204
1946	1	25	1,201	144,834	146,035	666,908	10,343,019	45,527,223
1947	1	32	6,072	112,337	118,409	784,917	9,419,770	54,946,993
1948	1	34	4,600	133,285	137,885	922,802	13,173,106	68,120,099
1949	1	37	2,647	137,820	140,467	1,063,269	13,413,524	81,533,623
Gloyd								
1947		1*		7	7	7	1,516	1,516
1948		1*		0	0	7	0	1,516
1949		1*		0	0	7	0	1,516
*Well shut-in due to lack of pipeline connection.								
Upper Pettet (see next page)								
Lower Pettet								
1936		1					3,225	3,225
1937		2		3,567	3,567	3,567	212,978	216,203
1938		2		6,571	6,571	10,138	323,242	539,445
1939		2		7,159	7,159	17,297	320,248	859,693
1940		2		14,942	14,942	32,239	788,362	1,648,055
1941		2		22,486	22,486	54,725	1,269,808	2,917,863
1942		5		22,801	22,801	77,526	1,161,590	4,079,453
1943		7		27,324	27,324	104,850	1,360,991	5,440,444
1944		21		65,080	65,080	169,930	3,956,979	9,397,423
1945		107		134,349	134,349	304,279	8,986,400	18,383,823
1946	1	197	16,922	539,036	555,958	860,237	37,572,916	55,956,739
1947	2	224	52,998	911,285	964,283	1,824,520	60,348,796	116,305,535
1948	10	256	192,257	1,369,338	1,561,595	3,386,115	91,571,078	207,876,613
1949	13	269	193,305	1,686,960	1,880,265	5,266,380	121,070,806	328,947,419

PRODUCTION HISTORY (CONT'D)

	WELLS PRODUCING at end of year		OIL PRODUCTION (barrels)	CONDENSATE PRODUCTION (barrels)	TOTAL LIQUIDS (barrels)		GAS PRODUCTION (Mcf)	
	Oil or Oil & Gas Flowing	Gas or Gas & Condensate	Yearly	Yearly	Yearly	Cumulative	Yearly	Cumulative
Travis Peak								
1942		1						
1943		3		6,455	6,455	6,455	269,544	269,544
1944	1	4	4,025	6,984	11,009	17,464	413,913	683,457
1945	4	9	10,930	7,487	18,417	35,881	614,398	1,297,855
1946	6	9	62,227	5,174	67,401	103,282	671,634	1,969,489
1947	6	14	71,441	73,349	84,790	188,072	1,309,181	3,278,670
1948	8	21	99,117	39,062	138,179	326,251	4,039,869	7,318,539
1949	7	25	55,531	74,662	130,193	456,444	7,144,910	14,463,449

	WELLS PRODUCING	WELLS INJECTING	CONDENSATE PRODUCTION (barrels)		GAS PRODUCTION (Mcf)		GAS INJECTION (Mcf)		NET GAS PRODUCTION (Mcf)	
			Yearly	Cumulative	Yearly	Cumulative	Yearly	Cumulative	Yearly	Cumulative
Upper Pettet										
1936	2		1,248	1,248	72,167	72,167			72,167	72,167
1937	2		12,200	13,448	907,326	979,493			907,326	979,493
1938	2		6,736	20,184	421,434	1,400,927			421,434	1,400,927
1939	2		6,037	26,221	363,514	1,764,441			363,514	1,764,441
1940	2		17,125	43,346	1,154,175	2,918,616			1,154,175	3,981,616
1941	3		20,606	63,952	1,250,610	4,169,226			1,250,610	4,169,226
1942	5		16,552	80,504	1,084,578	5,253,804			1,084,578	5,253,804
1943	8		33,538	114,042	2,109,546	7,363,350			2,109,546	7,363,350
1944	29		97,915	211,957	6,930,639	14,293,989			6,930,639	14,293,989
1945	93		203,078	415,035	13,254,028	27,548,017			13,254,028	27,548,017
1946	161	2	649,021	1,064,456	46,125,033	73,673,050	2,871,992	2,871,992	43,253,941	70,801,958
1947	177	2	934,981	1,999,437	67,854,270	141,527,329	10,647,124	13,519,116	57,206,255	128,008,213
1948	198	3	1,008,189	3,007,626	74,742,039	216,269,368	10,395,520	23,914,636	64,346,516	192,354,732
1949	204	3	1,236,365	4,243,991	97,650,972	313,920,327	8,609,452	32,524,088	89,041,520	281,396,239

LIQUID PRODUCTS OF GAS PROCESSING PLANTS
(barrels)

	Condensate	Gasoline	Kerosene	Propane	Butane	Propane-butane mix	Naphtha	Others	Total
1945		24,474			251				24,725
1946	656,427	484,436	62,688	7,238	70,748	72,749		16,734	1,371,020
1947	196,473	1,964,061	261,351	41,643	304,980	196,510		41,483	3,006,501
1948	322,224	2,580,787	295,485	73,542	306,529	281,902		37,408	3,897,877
1949	351,529	3,698,644	381,022	281,166	617,521	372,905	24,661	90,232	5,817,680

CAYUGA FIELD

Anderson, Freestone, and Henderson Counties, Texas

WAYNE V. JONES
Chief Geologist, Mid-Continent Division, Tide Water Associated Oil Company, Houston, Texas

June 1, 1950

LOCATION

The Cayuga field is located near the town of Cayuga, principally in the northwest corner of Anderson County with portions of it lying in Freestone and Henderson counties. It is on the west flank of the East Texas basin, well down-dip from the Luling-Mexia-Talco fault system.

METHOD OF EXPLORATION LEADING TO DISCOVERY

The Cayuga structure was discovered in the course of a reconnaissance reflection seismograph survey conducted in 1932 under the supervision of K. A. Schmidt, District Geologist for Tide Water Oil Co. and Texas Seaboard Oil Co. (now Tide Water Associated Oil Co. and Seaboard Oil Co.). The crew which did the work under contract to the two companies was a Geophysical Service, Inc. crew with Dr. H. B. Peacock as party chief. The structure was mapped on reflections from three horizons identified as the Pecan Gap chalk, the Austin chalk, and the Georgetown limestone. All three maps revealed the presence of a north-south trending ridge-like anticlinal fold. The Georgetown map showed the most closure (500 feet), was based on the strongest data, and was the map primarily considered in leasing the block and in locating the discovery well and a number of the early outpost wells.

RESERVOIRS

There are two main reservoirs in the field, the Woodbine reservoir and the Glen Rose reservoir, which is called the Trinity reservoir in the records of the Railroad Commission and commonly in the field.

Woodbine: The Woodbine reservoir has been extensively drilled and is a single source of supply beyond question. Its productive history is complicated. Oil, condensate, gas, and salt water have been produced. Gas and salt water have been re-injected into the reservoir and the reservoir has been re-pressured to a modest extent by the injection of Glen Rose gas. For convenience in discussion and for better understanding of the complex reservoir, local names for the various sands of the Woodbine have been in use in the field since 1934. In descending order these are the Robertson, Bowyer, Tubbs zone and Edens sands.

Glen Rose: The Glen Rose has had only fifteen widely-scattered tests drilled to it and, as a result, the reservoirs are not too well understood. The single oil well in this zone is demonstrated by fluid levels to be in a reservoir separate from the gas-condensate wells. Whether there is more than one gas-condensate reservoir being produced remains a question since various lines of reasoning lead to conflicting conclusions. In this paper, the Glen Rose gas-condensate wells will be considered to be producing from a single source of supply. The productive section is sub-divided into four members, (a), (b), (c) and (d) for convenience in discussion.

DISCOVERIES

Woodbine: March 3, 1934, Tide Water Oil Co. and Texas Seaboard Oil Co. #1 J. N. Edens, Samuel Snider survey, Anderson County.

Glen Rose: November 30, 1935, Tide Water Oil Co. and Texas Seaboard Oil Co. #21 Nannie N. Wills "A", Samuel Edmondson survey, Anderson County.

NATURE OF TRAPS and STRUCTURE

Woodbine: The accumulation in the Woodbine is in a north-south trending anticlinal fold, the east flank of which is extensively faulted with a series of step-faults downthrown to the east. Except in two small areas, there is no east dip within the producing limits of the field, the east closure being provided by the faults. To the east of the field is a major synclinal trough out of which rises the Bethel salt dome. Whether the descent into this syncline is accomplished by a continuation of the down-to-the-east step-faulting or whether actual east dip eventually develops is not known. Geophysically the entire east flank to the bottom of the syncline was mapped as east dip.

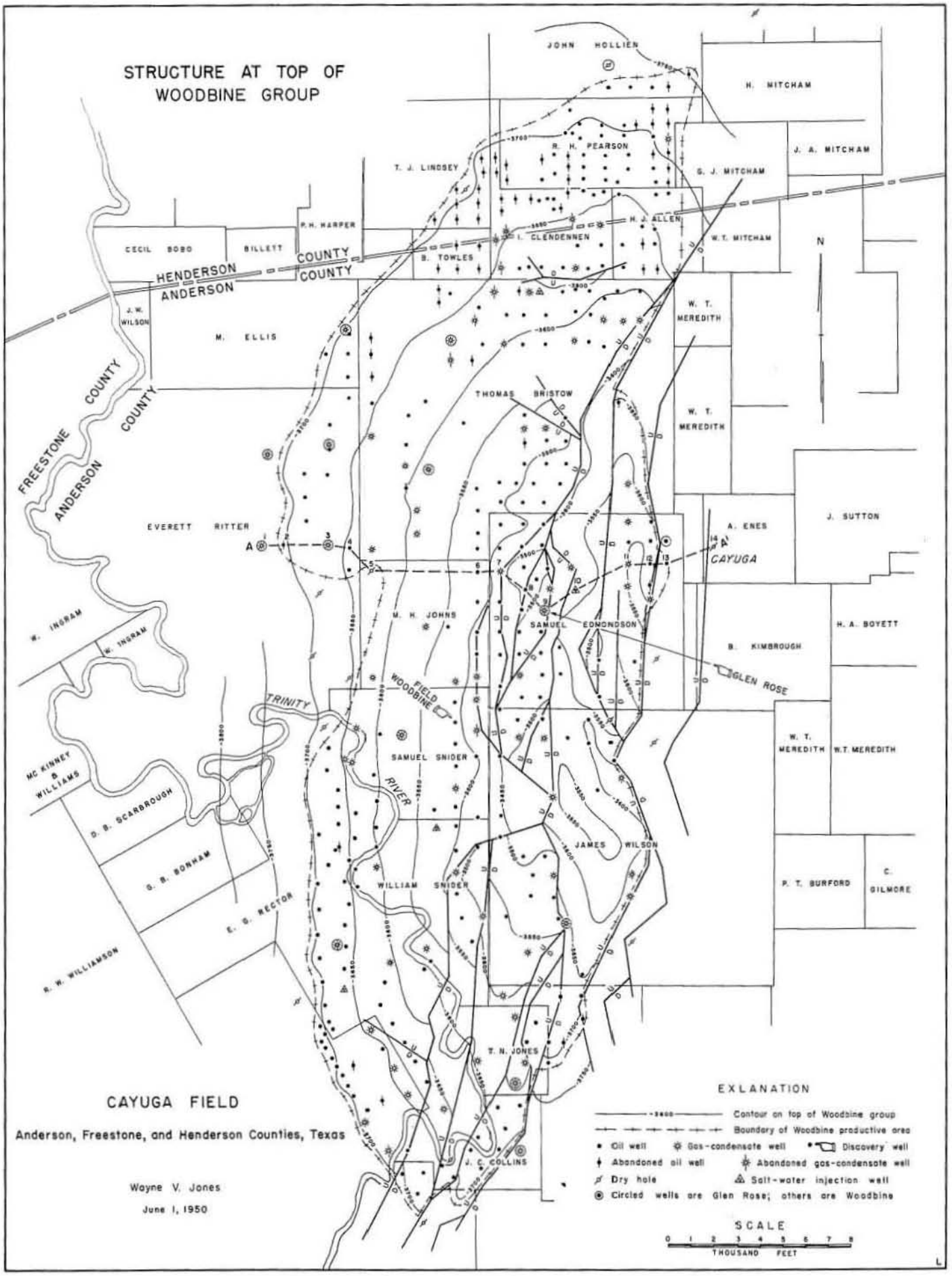
The various sands of the Woodbine are tied together by the faulting to create a common reservoir. Although some of the sands are lenticular, the lenticularity is not sufficient to create any exceptions to the structural control of the accumulation of oil and gas in the Woodbine. Lenticularity has not occasioned important variations in fluid levels.

Glen Rose: The structure in the Glen Rose is very similar to that in the Woodbine and, as in the case of the Woodbine, the traps are created by the structure, with lenticularity of the pay playing little part at least on the basis of present development.

PRODUCTIVE AREAS

Woodbine: 12,600 acres.

Glen Rose: Due to the scant development of the Glen Rose pay, its productive area is indeterminate. There is sufficient conformance to the Woodbine structure, however, to suggest an ultimate productive area somewhat similar to that of the Woodbine.


STRUCTURE AT TOP OF WOODBINE GROUP
JOHN HOLLIEN
H. MITCHAM
J. A. MITCHAM
S. J. MITCHAM
W. T. MITCHAM
R. H. PEARSON
T. J. LINDSEY
H. J. ALLEN
I. CLENDENNEN
B. TOWLES
P. H. HARPER
CECIL BOBO
BILLETT
HENDERSON COUNTY
ANDERSON COUNTY
J. W. WILSON
M. ELLIS
W. T. MEREDITH
THOMAS BRISTOW
FREESTONE COUNTY
ANDERSON COUNTY
EVERETT RITTER
A. ENES
J. SUTTON
CAYUGA
M. H. JOHNS
SAMUEL EDMONDSON
H. A. BOYETT
B. KIMBROUGH
GLEN ROSE
W. INGRAM
TRINITY
FIELD
WOODBINE
SAMUEL SNIDER
RIVER
MC KINNEY & WILLIAMS
D. B. SCARBROUGH
G. B. BONHAM
E. G. RECTOR
R. W. WILLIAMSON
JAMES WILSON
WILLIAM SNIDER
P. T. BURFORD
C. GILMORE
T. N. JONES
J. C. COLLINS
CAYUGA FIELD
Anderson, Freestone, and Henderson Counties, Texas
Wayne V. Jones
June 1, 1950
EXLANATION
Contour on top of Woodbine group
Boundary of Woodbine productive area
Oil well
Gas-condensate well
Discovery well
Abandoned oil well
Abandoned gas-condensate well
Dry hole
Salt-water injection well
Circled wells are Glen Rose; others are Woodbine
SCALE
0 1 2 3 4 5 6 7 8
THOUSAND FEET
N

THICKNESSES OF RESERVOIR ROCKS

Woodbine:

	Feet		
	Min.	Max.	Avg.
Robertson sand	0	21	1
Bowyer sand	0	55	23
Tubbs zone sand	0	51	22
Edens sand	0	63	33
All sands - Woodbine	0	121	44

Thicknesses of Robertson, Bowyer, and Tubbs sands are based only on sand thicknesses in those wells where the base of the sand in question is above water level. Thicknesses of Edens sand are based on sand thicknesses above water level in those wells which encounter Edens sand above water level, since only a very few wells have all of the Edens sand above water level. Thicknesses of "All sands - Woodbine" are based on thicknesses of all Woodbine sands (Robertson, Bowyer, Tubbs, Edens and sub-Edens sands) above water level in all electrically-logged wells.

Glen Rose:

	Feet		
	Min.	Max.	Avg.
Member (a)	1	26	14
Member (b)	6	18	12
Member (c)	0	29	15
Member (d)	0	35	17
All members - Glen Rose	37	81	58

The indicated Glen Rose pay thicknesses, which were calculated from electrical logs, probably are greater than they would have been if adequate core analyses had been available. This is believed to be particularly true of the (d) member. The thicknesses are based on pay thicknesses in those wells where the entire pay in question, including "All members - Glen Rose", is above water level. The maximum and minimum for "All members - Glen Rose" are not the sums of maxima or minima for the individual members since neither the maximum nor the minimum for each member occurs in a single well.

LITHOLOGY OF RESERVOIR ROCKS

Woodbine:

Robertson sand: Generally poorly developed, being little better than a siltstone, this sand cleans up into a typical Woodbine sand in the northeast part of the field, and occasionally elsewhere, and is productive of oil and gas. Adequate core descriptions of the Robertson sand are not available.

Bowyer sand: A firm to hard, medium-grained sand varying from clean to badly cemented with chloritic ash and silt. It is characterized by a number of irregularly distributed quartzitic streaks. It is gray to greenish-gray in color and has numerous lignite partings. Near the base of the sand is a conglomeratic zone six to twelve inches in thickness containing many macro-fossils, principally Ostrea. This bed, when present, is an excellent marker. Porosity of the sand is quite variable and reaches a maximum of 25%.

Tubbs zone sands: The Tubbs zone extends from the base of the Bowyer sand to the top of the Edens sand. Frequently, but not always, the upper 25 feet of the zone is devoid of effective sand. The next 45 feet contains the main lenses of the Tubbs sand. This sand is medium-grained, firm, usually lignitic, and often somewhat silty or ashy. The uppermost occurrence of siderite in the form of spherulitic concretions of radiate structure is at the top of this sand zone. This material is called ankerite by some. These concretions occur in beds from a few inches to several feet in thickness and usually in close proximity to a sand body being either immediately above or below sand, or, in some cases, occupying the stratigraphic position occupied by sand in offsetting wells. Where the sand builds up into good bodies, porosities of 25% to 29% are the rule.

The following 60 to 80 feet constitutes the remainder of the Tubbs zone. It is typically shale but there is an occasional lentil of sand 15 to 30 feet above the base of the zone. For a time this was known as the Wills sand but the name did not become established. It is similar to the main Tubbs sand described above.

Edens sand: The Edens sand is the most uniform and best sand in the field. It is firm and almost completely free of ash and lignite. In places it contains pebbly streaks with the pebbles being well separated by sand grains as a rule. Porosity ranges from 24% to 30% and averages 28.7%. Permeability of the Edens sand averages 4,363 millidarcys.

Sub-Edens sand: Little is known regarding this sand which is penetrated only in the few highest wells in the field. It appears to be of a quality comparable to the Edens sand.

Glen Rose:

The Glen Rose pay zone has been called, variously, Trinity, Rodessa zone, and Lower Glen Rose. None of these names is ideal. Trinity, which is the name commonly in use, is not sufficiently precise. The top of the pay zone appears to be stratigraphically equivalent to the Bacon limestone of the New Hope field while the sandy member near its base is probably equivalent to the Hill sand of the Rodessa field. Thus, the pay section overlaps the boundary between the Ferry Lake and Rodessa formations, rendering both Rodessa and Lower Glen Rose inaccurate. A name is needed for this group of beds which are in similar development and constitute the pay section in several fields from Cayuga northeastward. Cayuga zone would be appropriate but is not formally proposed by this mention.

The following descriptions of the four members of the Glen Rose pay are based on scant information. Many of the wells were not cored and core recovery was characteristically poor on those that were cored.

Member (a) Brown, oolitic, porous limestone containing milliolids and shell fragments.

Member (b) Brown, granular, slightly-porous limestone and dark gray, porous, organic limestone, approaching a coquina in character.

Member (c) Tan to brown, porous, organic (fine coquina) and oolitic limestone.

Member (d) Gray, fine-grained, calcareous sandstone in upper part grading to gray, fine-grained, shaly sandstone with thin beds of gray to black shale in lower part.

In addition, one well, Tide Water Associated-Seaboard #7 Lutterloh, encountered a lens of pay a few feet above member (a) in the Ferry Lake formation of the Glen Rose. While samples of this were not saved, there is little doubt that this pay also is an oolitic limestone replacing the anhydrite normally present at its level.

CONTINUITY OF RESERVOIR ROCKS

Woodbine:

The various sands of the Woodbine vary considerably in their degree of lenticularity. In spite of this, the faults are so numerous and of such varying displacements that all of the sands are tied together into a single reservoir with common fluid levels by communication across the faults.

Robertson sand: This sand is developed as a producing zone only along the northern part of the east flank of the field. Elsewhere it is recognizable as a silty or sandy shale and only occasionally is a reservoir rock.

Bowyer sand: The Bowyer sand blankets the field excepting for an east-northeast trending band extending entirely across the field in its northern part but well south of its northern extremity. In this channel-like area the sand is completely cemented with chloritic ash. The marked indentation in the west side of the productive area of the field (see map) is a result of this depositional phenomenon.

Tubbs zone sands: The main Tubbs sand as described above is highly lenticular but the sand persistently recurs at the same stratigraphic position with the result that the sand is developed more often than not. While the lower sand recurs at a consistent level, it does so only occasionally with the result that it generally is missing.

Edens sand: The Edens sand is a blanket deposit and is present as a well-developed sand in every well which has penetrated to it.

Sub-Edens sand: This sand also appears to be a blanket deposit although data on it are very meager.

Glen Rose:

The four members, (a), (b), (c) and (d) of the Glen Rose pay are quite consistently present but occasionally the permeability of one or more of them becomes so poor as to render the member locally non-effective.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Woodbine	Glen Rose	
		Gas area	Oil area
Elev. of top of gas, feet	-3,487	-6,910	-
Elev. of bottom of gas, ft.	-3,745	-7,355	-7,204-
Relief, feet	258	445	-
Elev. of top of oil, feet	-3,745	0	-7,204-
Elev. of bottom of oil, ft.	-3,773	0	-7,261+
Relief, feet	28	0	57+

The above presents original levels as best they can be determined. They have changed substantially during the years the field has produced.

CHARACTER OF GAS

Components	Woodbine Mol. %	Woodbine G/Mcf	Glen Rose Mol. %	Glen Rose G/Mcf
Carbon Dioxide	.80		.99	
Methane	91.62		93.01	
Ethane	1.88		2.96	
Propane	1.43	.524	1.41	.391
Iso-butane	.53	.163	.26	.083
N-butane	1.00	.322	.48	.154
Iso-Pentane	.60	.168	.32	.116
N-pentane	.50	.138	.21	.075
Hexanes & heavier	1.64	.361	.36	.146
		1.676		.964

The Woodbine analysis is of virgin gas; the Glen Rose analysis, of separator residue gas. Both analyses were made by Tide Water Associated Oil Co. - Seaboard Oil Co. laboratory.

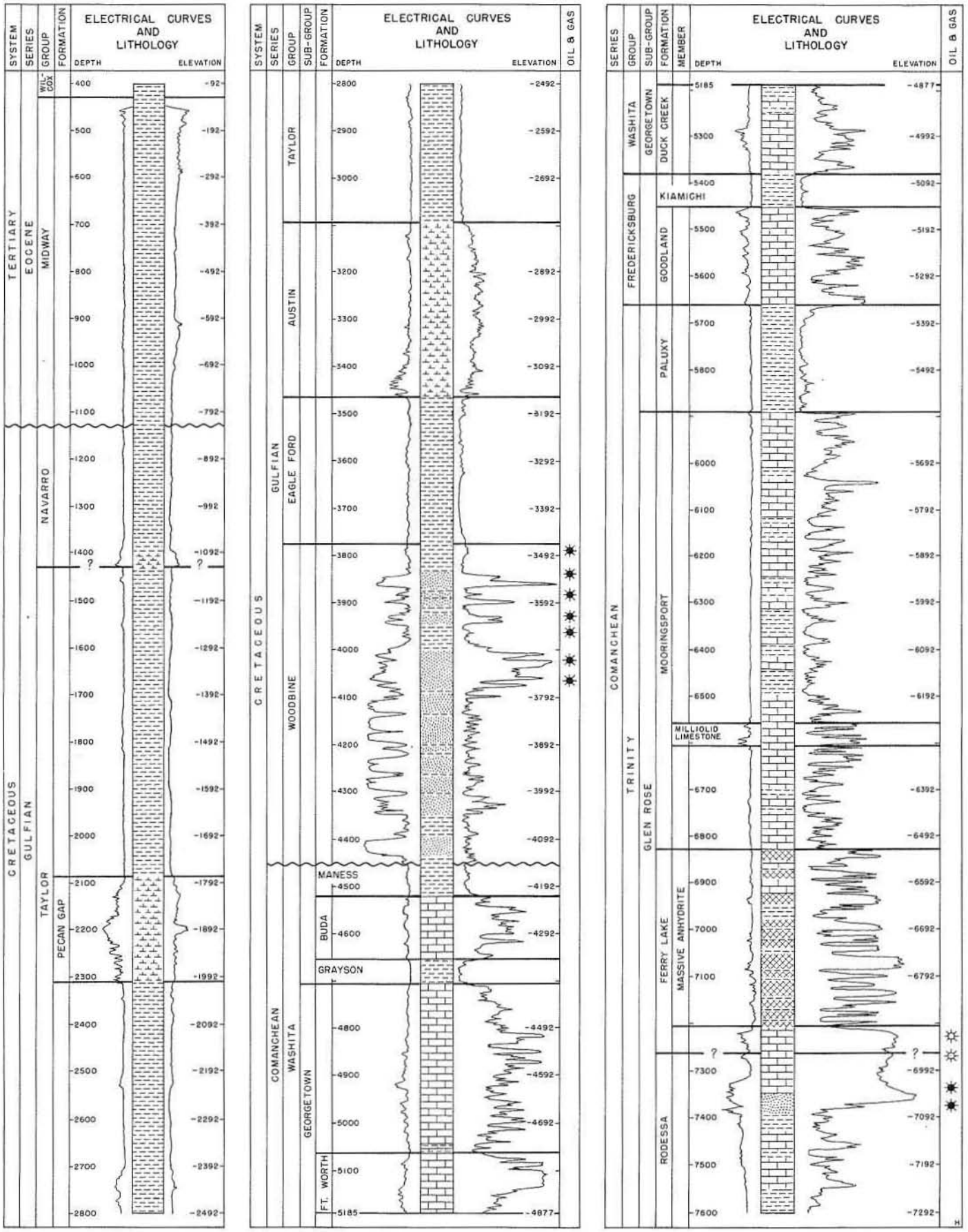
ACID TREATMENT

Glen Rose: Most of the Glen Rose wells have been acidized, the treatments varying in size from 3,000 gallons to 15,000 gallons and averaging 6,000 gallons.

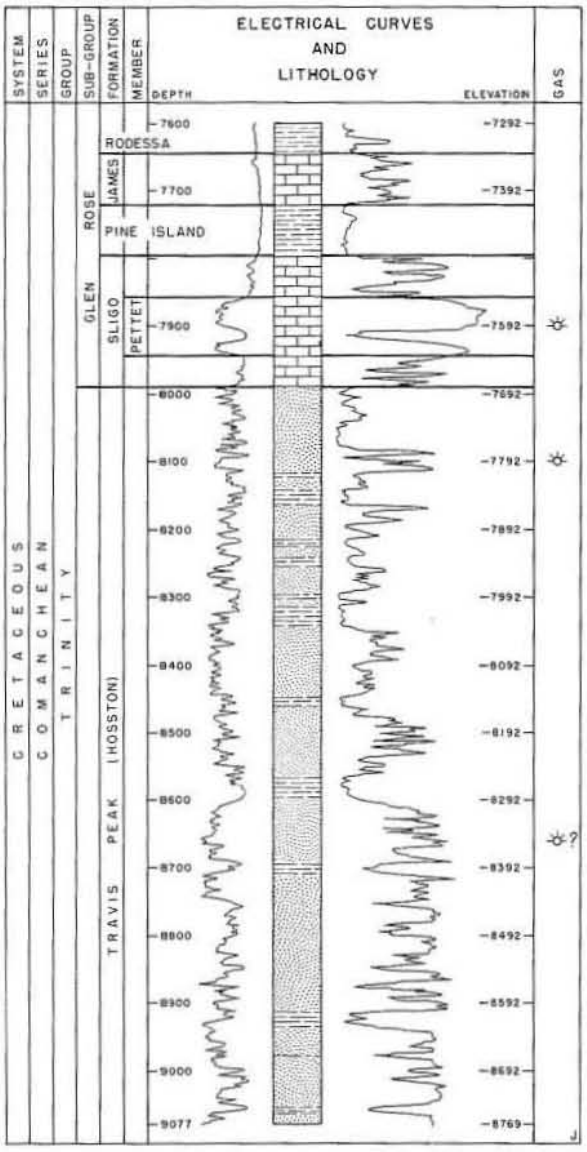
TYPE SECTION OF ROCKS PENETRATED

SURFACE FORMATION : Wilcox

ELEVATION OF SURFACE : Highest, 350 feet; lowest, 235 feet



TYPE SECTION OF ROCKS PENETRATED



The above is a composite log based on the logs of three wells. The depths have been adjusted.

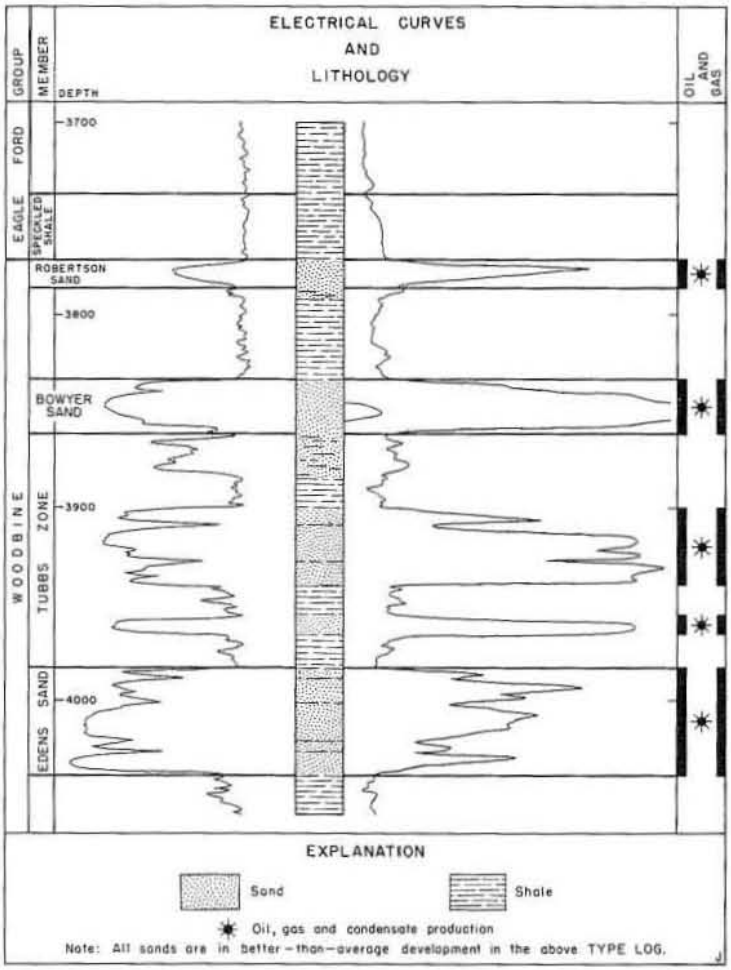
EXPLANATION

Limestone · Chalk · Sand · Shale · Anhydrite

Oil and gas-condensate production · Show of gas · Gas-condensate production

OLDEST HORIZON PENETRATED: 1095 feet below the top of the Travis Peak.

TYPE LOG OF WOODBINE PAY



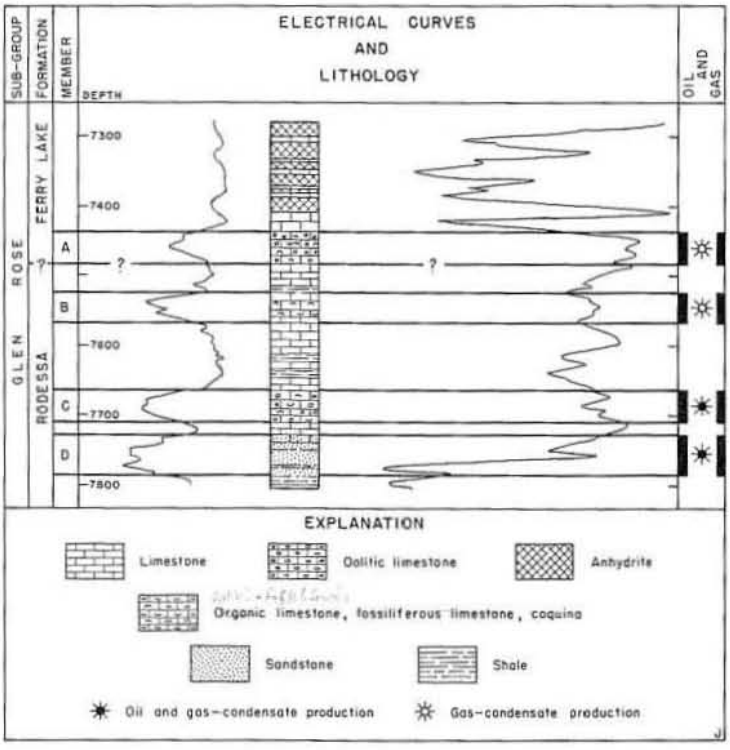
EXPLANATION

Sand · Shale

Oil, gas and condensate production

Note: All sands are in better-than-average development in the above TYPE LOG.

TYPE LOG OF GLEN ROSE PAY



EXPLANATION

Limestone · Oolitic limestone · Anhydrite

Organic limestone, fossiliferous limestone, coquina

Sandstone · Shale

Oil and gas-condensate production · Gas-condensate production

CHARACTER OF OIL

Woodbine

	Crude	Gasolines 320° E.P.	Gasolines 400°E.P.	Kerosene 540° E.P.	Gas Oil 760° E.P.	Bottoms
Gravity	27.3	69.2	62.0	44.5	21.4	7.6
Per cent	-	17.2	28.2	15.2	18.1	38.0
Octane F-1 Res.	-		45.0	-	-	-
Octane F-2 Motor	-	54.7	44.3	-	-	-
Sulphur %	1.653	0.015		0.132	1.381	-
Pour Point °F.	-25				27.5	85
Viscosity @ 50°F.	277					
@ 100°F.	117					
NaCl, gm/bbl.	18.4					
H_2S	Nil					
Base	Asphaltic					
Color	Dark brown					

The above analysis of a typical sample of Cayuga crude was made June 3, 1948.

For other analyses see:

Railroad Commission of Texas
Analyses of Texas Crude Oils (1940) pp. 30 and 59.

U. S. Bureau of Mines

	Reference designation
Flow Characteristics, Composition, and Some Liquid-Phase Properties of Hydrocarbon Fluids from a "Combination" well. R. I. 3402 (1938)	A
Tabulated Analyses of Texas Crude Oils. T. P. 607 (1939)	B
Specific Volume and Phase-Boundary Properties of Separator-Gas and Liquid-Hydrocarbon Mixtures. R. I. 3642 (1942)	C
Analyses of Crude Oils from Some Fields of Texas. R. I. 3699 (1943)	D
Analyses of Crude Oils from 283 Important Oil Fields of the United States. R. I. 4289 (1948)	E

Lab. No.	34018	37240	39043	39179	39451	40031	40032	40033	40200
Reference designation									
A		p.26							
B, Group 4	2	3							
C, Table 14		M-1	M-2	B	M-3	M-4	C	A	M-5
D Item				15					16
E Item			194						

SELECTED REFERENCES

Eilerts, C. K. and M. A. Schellhardt, (1938) Flow characteristics, composition, and some liquid-phase properties of hydrocarbon fluids from a "combination" well: U. S. Bureau of Mines, R. I. 3402, 34 pages. An intensive study of one well in the Cayuga field.

Eilerts, Kenneth and Smith, R. Vincent (1942) Specific volume and phase-boundary properties of separator-gas and liquid-hydrocarbon mixtures: U. S. Bureau of Mines, R. I. 3642, 57 pages.

Peacock, H. B. (1944) The geophysical history of the Cayuga field, Anderson County, Texas: Society of Exploration Geophysicists, Geophysics, vol. 9, no. 3, p. 299 (July 1944), 18 pages.

WATER PRODUCTION

Woodbine: As is commonly the case in fields producing low-gravity oil, the production of salt water is substantial. In recent years part of the water has been returned to the reservoir.

Year	GROSS WATER PRODUCTION		WATER INJECTION		NET WATER PRODUCTION	
	Yearly	Cumulative	Yearly	Cumulative	Yearly	Cumulative
1934	1,200	1,200	-	-	1,200	1,200
1935	24,200	25,400	-	-	24,200	25,400
1936	44,500	69,900	-	-	44,500	69,900
1937	215,000	284,900	-	-	215,000	284,900
1938	866,690	1,151,590	-	-	866,690	1,151,590
1939	1,941,173	3,092,763	-	-	1,941,173	3,092,763
1940	4,623,011	7,715,774	-	-	4,623,011	7,715,774
1941	6,733,520	14,449,294	-	-	6,733,520	14,449,294
1942	6,691,910	21,141,204	-	-	6,691,910	21,141,204
1943	8,447,166	29,588,370	-	-	8,447,166	29,588,370
1944	10,558,537	40,146,907	-	-	10,558,537	40,146,907
1945	12,912,970	53,059,877	430,827	430,827	12,482,143	52,629,050
1946	15,182,905	68,242,782	1,661,330	2,092,157	13,521,575	66,150,625
1947	14,719,720	82,962,502	2,630,056	4,722,213	12,089,664	78,240,289
1948	15,081,700	97,044,202	3,544,417	8,266,630	10,537,283	88,777,572
1949	15,578,565	112,622,767	4,773,700	13,040,330	10,804,865	99,582,437

Glen Rose: There has been no appreciable water production from the Glen Rose.

PRODUCTION HISTORY

Field totals

Year	NUMBER OF WELLS at end of year: Producing Oil: Flow.	Producing Oil: Artif. lift	Producing Gas	Injecting: Gas*	Injecting: Water	OIL PRODUCTION (barrels) Yearly	CONDENSATE PRODUCTION (barrels) Yearly	TOTAL LIQUID HYDROCARBONS (barrels): Yearly	Cumulative	GAS PRODUCTION** (Mcf): Yearly	Cumulative
1934	30	0	10	0	0	608,283	-	608,283	608,283	3,822,890	3,822,890
1935	87	0	15	0	0	1,334,133	9,046	1,343,179	1,951,462	5,139,892	8,962,782
1936	143	3	23	0	0	2,091,187	67,402	2,158,589	4,110,051	10,824,535	19,787,317
1937	197	10	27	0	0	3,125,277	79,945	3,205,222	7,315,273	12,820,973	32,608,290
1938	247	5	32	2	0	3,120,105	145,886	3,265,991	10,581,264	14,078,427	46,686,717
1939	231	32	33	5	0	3,363,242	277,904	3,641,146	14,222,410	15,924,369	62,611,086
1940	165	97	34	9	0	3,889,496	460,817	4,350,313	18,572,723	21,149,443	83,760,529
1941	155	114	37	8	0	4,223,894	576,817	4,800,711	23,373,434	24,229,047	107,989,576
1942	128	155	43	12	0	3,997,007	577,946	4,574,953	27,948,387	25,035,235	133,024,811
1943	105	165	39	12	0	3,392,484	519,971	3,912,455	31,860,842	25,446,276	158,471,087
1944	83	146	38	13	0	2,899,545	479,847	3,379,392	35,240,234	21,580,617	180,051,704
1945	71	146	41	11	1	2,581,130	457,482	3,038,612	38,278,846	22,846,354	202,898,058
1946	54	161	50	6	1	2,429,006	391,500	2,820,506	41,099,352	21,138,000	224,036,058
1947	49	155	50	6	3	2,225,610	336,039	2,561,649	43,661,001	19,335,797	243,371,855
1948	39	149	49	5	3	2,015,563	331,707	2,347,270	46,008,271	21,378,125	264,749,980
1949	25	158	49	5	4	1,909,830	307,112	2,216,942	48,225,213	18,614,818	283,364,798
Total						43,205,792	5,019,421	48,225,213		283,364,798	

*Gas is sold from gas injection wells as well as from gas producing wells.

**Gas production is net after subtracting injected gas from gross produced gas.

Glen Rose

Year	WELLS PRODUCING at end of year: Oil Flowing	Gas	LIQUID HYDROCARBON PRODUCTION: Oil (barrels) Yearly	Lease Condensate (barrels) Yearly	Processed Condensate (barrels) Yearly	Total (barrels): Yearly	Cumulative	GAS PRODUCTION: Lease Production (Mcf) Yearly	Processed Production (Mcf) Yearly	Total (Mcf): Yearly	Cumulative
1935	0	1	-	1,423	-	1,423	1,423	139,164	-	139,164	139,164
1936	0	2	-	29,222	-	29,222	30,645	1,430,540	-	1,430,540	1,569,704
1937	0	3	-	38,847	5,700	44,547	75,192	1,380,665	430,072	1,810,737	3,380,441
1938	0	3	-	7,961	58,510	66,471	141,663	901,907	2,819,532	3,721,439	7,101,880
1939	1	3	5,450	12,121	90,571	108,142	249,805	1,237,590	3,936,517	5,174,107	12,275,987
1940	1	3	5,617	18,534	65,248	89,399	339,204	1,067,806	3,537,932	4,605,738	16,681,725
1941	1	5	5,475	37,320	65,763	108,558	447,762	853,510	3,020,884	3,874,394	20,756,119
1942	1	5	5,494	34,182	64,141	103,817	551,579	146,506	2,011,014	2,157,520	22,913,639
1943	1	6	5,435	36,924	55,003	97,362	648,941	807,257	1,789,910	2,597,167	25,510,806
1944	1	8	5,491	70,212	87,595	163,298	812,239	930,827	2,075,893	3,006,720	28,517,526
1945	1	9	5,189	84,822	100,998	191,009	1,003,248	1,059,277	2,420,097	3,479,374	31,996,900
1946	1	9	5,328	71,952	77,918	155,198	1,158,446	692,321	2,189,814	2,882,135	34,879,035
1947	1	10	4,285	58,012	64,614	126,911	1,285,357	788,891	2,002,553	2,791,444	37,670,479
1948	1	10	2,171	88,365	29,730	120,266	1,405,623	1,034,153	3,549,591	4,583,744	42,254,223
1949	1	10	1,428	75,399	13,955	90,782	1,496,405	524,413	3,440,799	3,965,212	46,219,435
Total			51,363	665,296	779,746	1,496,405		12,994,827	33,224,608	46,219,435	

PRODUCTION HISTORY (CONT'D)

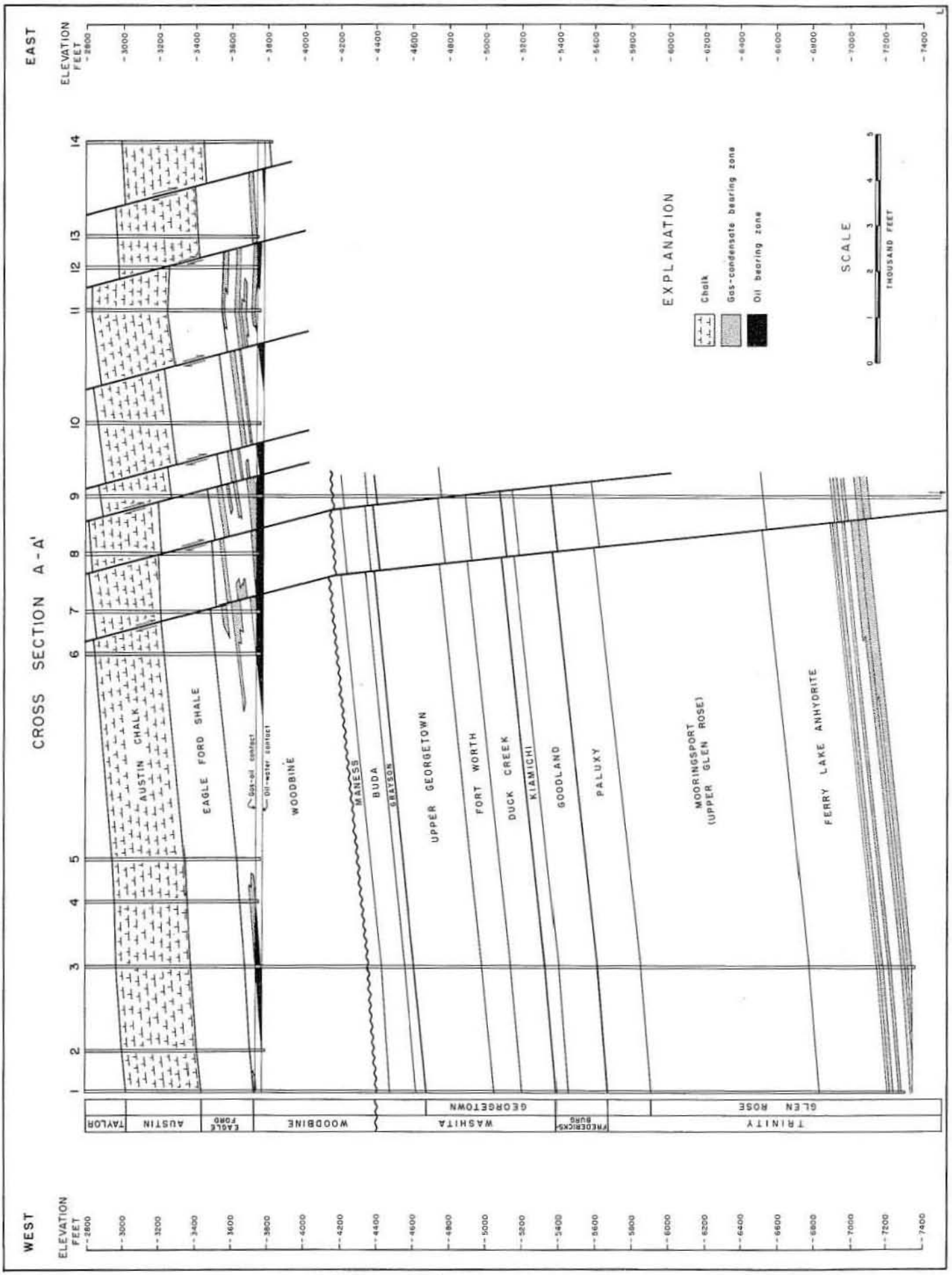
Woodbine

Year	NUMBER OF WELLS at end of year: Producing Oil Flow.	Producing Oil Artif. lift	Producing Gas	Injecting Gas*	Injecting Water	OIL PRODUCTION (barrels) Yearly	OIL PRODUCTION (barrels) Cumulative	CONDENSATE PRODUCTION Lease Production (barrels) Yearly	Processed Production (barrels) Yearly	Total (barrels) Yearly	Total (barrels) Cumulative	LIQUID HYDROCARBON PRODUCTION Total (barrels) Yearly	Total (barrels) Cumulative
1934	30	0	10	0	0	608,283	608,283	-	-	-	-	608,283	608,283
1935	87	0	14	0	0	1,334,133	1,942,416	7,623	-	7,623	7,623	1,341,756	1,950,039
1936	143	3	21	0	0	2,091,187	4,033,603	38,180	-	38,180	45,803	2,129,367	4,079,406
1937	197	10	24	0	0	3,125,277	7,158,880	35,398	-	35,398	81,201	3,160,675	7,240,081
1938	247	5	29	2	0	3,120,105	10,278,985	34,702	44,713	79,415	160,616	3,199,520	10,439,601
1939	230	32	30	5	0	3,357,792	13,636,777	26,382	148,830	175,212	335,828	3,533,004	13,972,605
1940	164	97	31	9	0	3,883,879	17,520,656	22,774	354,261	377,035	712,863	4,260,914	18,233,519
1941	154	114	32	8	0	4,218,419	21,739,075	22,595	451,139	473,734	1,186,597	4,692,153	22,925,672
1942	127	155	38	12	0	3,991,513	25,730,588	27,290	452,333	479,623	1,666,220	4,471,136	27,396,808
1943	104	165	33	12	0	3,387,049	29,117,637	53,206	374,838	428,044	2,094,264	3,815,093	31,211,901
1944	82	146	30	13	0	2,894,054	32,011,691	34,599	287,441	322,040	2,416,204	3,216,094	34,427,995
1945	70	146	32	11	1	2,575,941	34,587,632	25,503	246,159	271,662	2,687,966	2,847,603	37,275,598
1946	53	161	41	6	1	2,423,678	37,011,310	21,023	220,607	241,630	2,929,596	2,665,308	39,940,906
1947	48	155	40	6	3	2,221,325	39,232,635	36,578	176,835	213,413	3,143,009	2,434,738	42,375,644
1948	38	149	39	5	3	2,013,392	41,246,027	48,743	164,869	213,612	3,356,621	2,227,004	44,602,648
1949	24	158	39	5	4	1,908,402	43,154,429	36,078	181,680	217,758	3,574,379	2,126,160	46,728,808
Total						43,154,429		470,674	3,103,705	3,574,379		46,728,808	

*Gas is sold from gas injection wells as well as from producing gas wells.

Woodbine

Year	GROSS GAS PRODUCTION: Unprocessed gas from Gas Wells (Mcf)	Unprocessed gas from Oil Wells (Mcf)	Processed through plant (Mcf)	Total (Mcf) Yearly	Total (Mcf) Cumulative	GAS INJECTED INTO WOODBINE: Woodbine Gas (Mcf)	Glen Rose Gas (Mcf)	Total (Mcf) Yearly	NET GAS PRODUCTION Total (Mcf) Yearly	Total (Mcf) Cumulative
1934	1,370,840	2,452,050	-	3,822,890	3,822,890	-	-	-	3,822,890	3,822,890
1935	2,279,918	2,720,810	-	5,000,728	8,823,618	-	-	-	5,000,728	8,823,618
1936	4,939,515	4,454,480	-	9,393,995	18,217,613	-	-	-	9,393,995	18,217,613
1937	3,936,269	7,498,772	-	11,435,041	29,652,654	-	424,805	424,805	11,010,236	29,227,849
1938	4,131,759	8,752,508	2,640,873	15,525,140	45,177,794	2,518,152	2,650,000	5,168,152	10,356,988	39,584,837
1939	3,414,130	10,679,002	8,004,160	22,097,292	67,275,086	7,655,561	3,691,469	11,347,030	10,750,262	50,335,099
1940	3,823,002	15,295,476	21,486,652	40,605,130	107,880,216	20,731,944	3,329,481	24,061,425	16,543,705	66,878,804
1941	3,926,256	18,076,295	27,641,239	49,643,790	157,524,006	26,392,700	2,896,437	29,289,137	20,354,653	87,233,457
1942	6,874,102	16,301,944	23,709,442	46,885,488	204,409,494	22,186,398	1,821,375	24,007,773	22,877,715	110,111,172
1943	8,042,719	10,783,226	20,866,493	39,692,438	244,101,932	15,842,908	1,000,421	16,843,329	22,849,109	132,960,281
1944	6,155,420	6,919,334	16,221,313	29,296,067	273,397,999	10,203,830	518,340	10,722,170	18,573,897	151,534,178
1945	6,340,960	7,777,427	13,496,743	27,615,130	301,013,129	7,480,452	767,698	8,248,150	19,366,980	170,901,158
1946	4,329,660	8,232,546	13,276,884	25,839,090	326,852,219	6,695,251	887,974	7,583,225	18,255,865	189,157,023
1947	2,680,906	7,486,056	11,992,332	22,159,294	349,011,513	5,033,264	581,677	5,614,941	16,544,353	205,701,376
1948	5,799,658	5,888,557	8,812,763	20,500,978	369,512,491	3,706,597	-	3,706,597	16,794,381	222,495,757
1949	4,854,003	6,629,785	7,433,458	18,917,246	388,429,737	4,267,640	-	4,267,640	14,649,606	237,145,363
Total	72,899,117	139,948,268	175,582,352	388,429,737		132,714,697	18,569,677	151,284,374	237,145,363	


CROSS SECTION A-A'
EAST
WEST
ELEVATION FEET
EXPLANATION
Chalk
Gas-condensate bearing zone
Oil bearing zone
SCALE
THOUSAND FEET
AUSTIN CHALK
EAGLE FORD SHALE
WOODBINE
MANESS
BUDA
GRAYSON
UPPER GEORGETOWN
FORT WORTH
DUCK CREEK
KIAMICHI
GOODLAND
PALUXY
MOORINGSPORT (UPPER GLEN ROSE)
FERRY LAKE ANHYDRITE
TAYLOR
AUSTIN
EAGLE FORD
WOODBINE
WASHITA
GEORGETOWN
FREDERICKSBURG
TRINITY
GLEN ROSE

CEDAR CREEK FIELD
Limestone County, Texas

FRANK BRYAN
Consulting Geologist, Groesbeck, Texas
April 4, 1950

LOCATION and OTHER NAME

The Cedar Creek field is in the Pedro Varela survey 9 miles southwest of the town of Mexia. It is in the zone of the Mexia-Tehuacana fault graben system and is near the southernmost extent of production from the Woodbine sand. Commercial oil and/or gas have been found farther south in the Woodbine sand in only the South Groesbeck and North Groesbeck fields.

The reviving of the field in 1946 occasioned the introduction of a new name, the Honest Ridge field. This name has been used in publications in designating the revived area.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Surface mapping of the Midway limestone by W. A. Reiter revealed the presence of the down-to-west fault along which production was later found. W. A. Reiter et al. drilled the discovery well into pay on September 5, 1927. They had comparatively small holdings, around 300 acres, which included about 30% of the productive area Contributions were received from several companies which held leases in the vicinity.

DISCOVERY

Woodbine sand: September 5, 1927;
W. A. Reiter et al. #1 Ward.

SURFACE FORMATION

Midway limestone, Eocene, is the only formation exposed within the area of the field.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

About ten feet below top of Buda limestone.

NATURE OF TRAP

Woodbine sand: Closure against fault.

PRODUCTIVE AREA

Woodbine sand and Field: 120 acres.

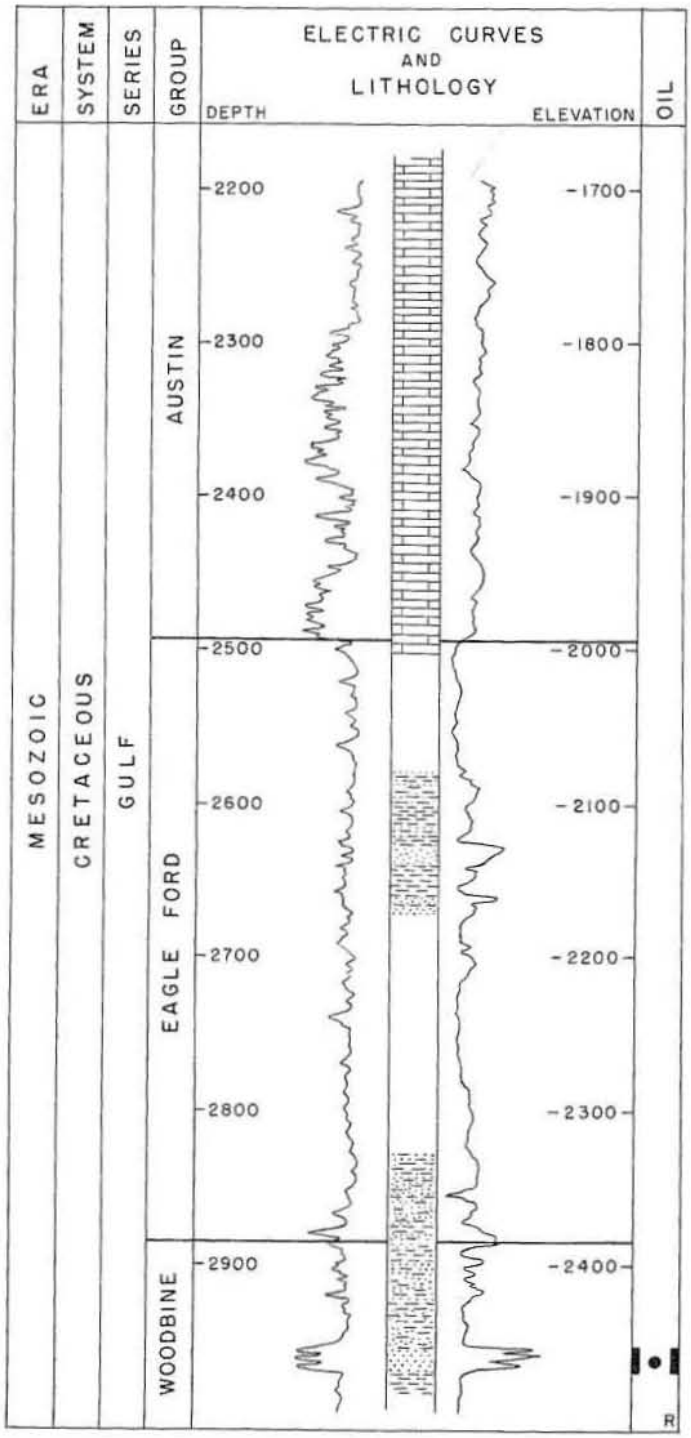
THICKNESS OF RESERVOIR ROCK

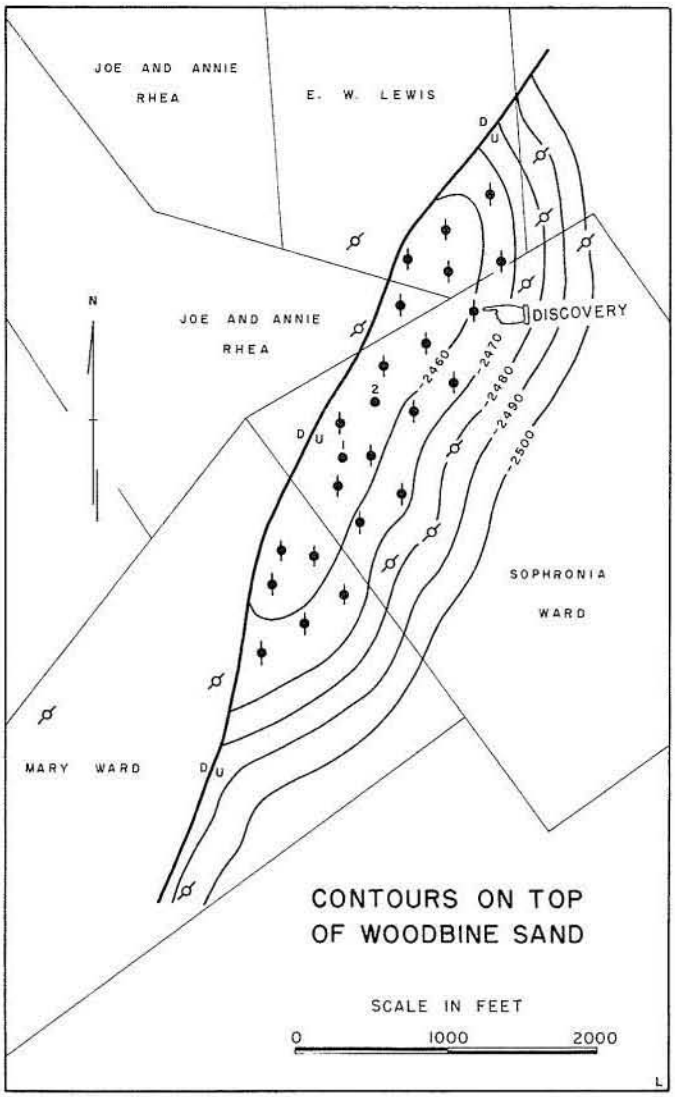
Woodbine sand: From 5 to 8 feet net productive.

ELEVATION OF SURFACE

At well locations: Highest, 505 ft.; lowest, 490 feet.

TYPE SECTION OF ROCKS PENETRATED





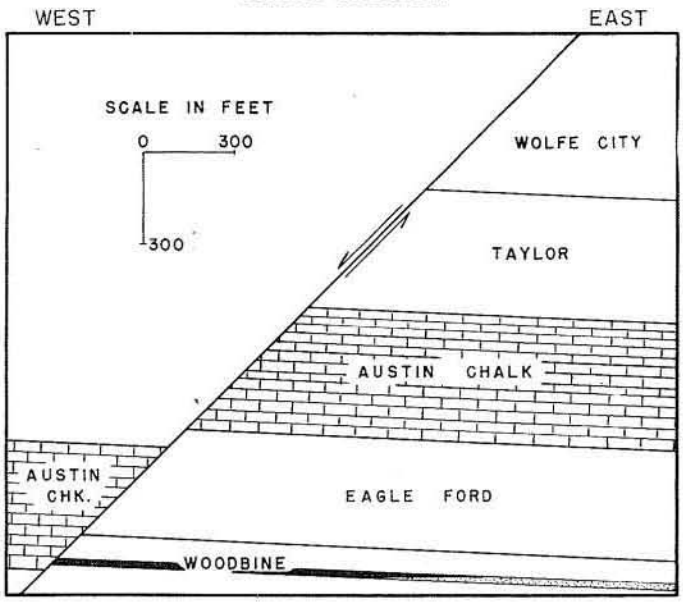
LITHOLOGY OF RESERVOIR ROCK

Woodbine sand: Soft sand with shale partings (the seaward edge of the Woodbine sand where it grades into shale).

CONTINUITY OF RESERVOIR ROCK

Woodbine sand: The sand deposition was very erratic in this area, therefore making it difficult to trace the reservoir rock from one well to another. The field lies on the seaward edge of the Woodbine sand deposition. The Woodbine sand is a blanket sand to the northeastward where it is productive in many fields.

CROSS SECTION



ELEVATION AND RELIEF OF PRODUCTIVE ZONE

	Woodbine sand
Elevation of top of oil, feet	-2,450±
Elevation of bottom of oil, feet	-2,470±
Relief, feet	20±

CHARACTER OF OIL

Woodbine sand: Gravity, A.P.I., 35-38°;
Sulphur, .32% Base, intermediate

For analyses see:

U. S. Bureau of Mines Lab. ref. No. 27695
Tabulated Analyses of Texas Crude Oils
R. I. 3252 (1934) Item 2, Group 4
Tabulated Analyses of Texas Crude Oils
T. P. 607 (1939) Item 4, Group 4

SELECTED REFERENCE

Lahee, F. H. (1929) Oil and gas fields of the Mexia and Tehuacana fault zones, Texas: Amer. Assoc. Petr. Geol., Structure of Typical American Oil Fields, vol. 1, pp. 308, 324, 361, 367, 383.

WATER PRODUCTION

Woodbine sand: Very little water has been produced.

PRODUCTION HISTORY

Woodbine sand and Total field:

The field was abandoned as fully depleted by pumping on June 1, 1930. To that date, the production amounted to 330,600 barrels of oil; 2,755 barrels per acre.

On August 31, 1946, J. V. Flemming #1 Ward was completed at an in-between location and on January 2, 1948, a second in-between well was completed. These two wells have obtained their total production to date by pumping and are the only wells now producing in the field. The production during 1946 amounted to 807 barrels; during 1947, 3,660 barrels; during 1948, 3,523 barrels and during 1949, 1,598 barrels; a total of 9,588 barrels to the end of 1949.

CHAPEL HILL FIELD
Smith County, Texas

H. R. THOMPSON
Exploitation Engineer, Shell Oil Company, Kilgore, Texas
July 14, 1950

LOCATION

The Chapel Hill field is in southeast Smith County 8 to 10 miles west of the East Texas field and about 10 miles east of Tyler, county seat of Smith County.

METHODS OF EXPLORATION LEADING TO DISCOVERY

The presence of a structural high was first discovered by surface geology. The surface evidence was later substantiated by seismograph work.

DISCOVERIES

Paluxy: Gas: November 28, 1939; Shell Oil Co. #1 Henry Campbell. Gas and condensate on drill stem test. The well was completed in Pettet for oil production.

Oil: December 23, 1947; Chapel Hill Gas System #2 J. B. Yancy.

Rodessa: Gas: August 13, 1938; Hunt Oil Co. #1 W. W. Bradley (now Chapel Hill Gas System #1 S. H. Bradley).

Oil: June 12, 1942; Sun Oil Co. #1 Silas Friedlander.

Pettet: Gas: July 31, 1940; Sun Oil Co. "A" #1 E. H. Sanders.

Oil: January 25, 1940; Shell Oil Co. #1 Henry Campbell.

Travis Peak: Gas: September 4, 1947; Chapel Hill Gas System #1 Bina Rayford.

ELEVATION OF SURFACE

At well locations: Highest, 533 ft.; lowest, 388 feet.

SURFACE FORMATION

The Queen City is the only formation at the surface within the area of the field.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated within the area of the field is 197 feet below the top of the Eagle Mills formation. This penetration was at the location indicated on the accompanying map.

PRODUCTIVE AREAS

	Acres	
	Gas	Oil
Paluxy	3,500	Undefined
Rodessa	6,600	Undefined
Pettet	12,700	Undefined
Travis Peak	Undefined	Undefined
Chapel Hill field	12,700+	

NATURE OF TRAPS

Paluxy: The accumulation in Paluxy is due to a combination of localized sand development on the north flank of the anticline and termination of the reservoir on the west flank because of faulting.

Rodessa: With minor exception, the accumulation in the Rodessa is due to a simple convex trap. One well on the northeast flank of the anticline produces oil from a depth 230 feet below the water level in the Rodessa gas-reservoir. The oil accumulation is apparently a local condition caused by impervious barriers within the Rodessa formation.

Pettet: There are three recognized productive zones within the Pettet formation. The highest zone produces on the northern flank of the anticline only and produces only oil. The other two are productive throughout the field, and in them the gas-oil contacts are fairly well defined. In the highest zone, accumulation appears to be due to localized porosity development, and, in each of the other two, the trap is evidently due to convex folding.

Travis Peak: While accumulation in Travis Peak is due primarily to the general convex fold, variations in permeability and porosity have apparently determined the localization of commercial occurrences of oil and gas.

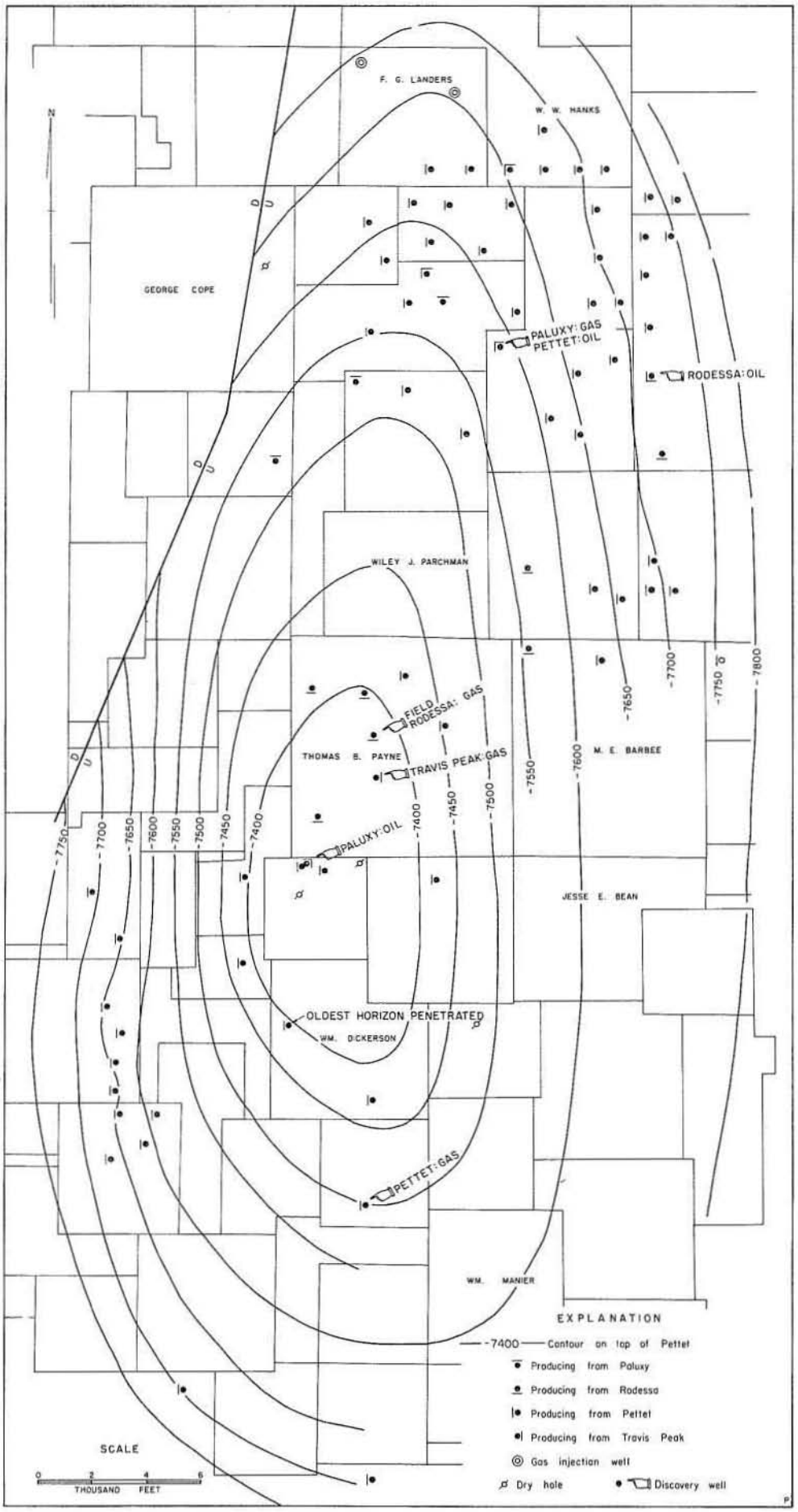
CONTINUITY OF RESERVOIR ROCKS

Paluxy: The Chapel Hill field is situated at the approximate southernmost extent of the Paluxy strand line. Consequently, sand development is extremely erratic. The productive sand is found only on the north flank of the anticline except at one well. Production in the Paluxy formation is confined to the basal member; the upper sand members are water-bearing.

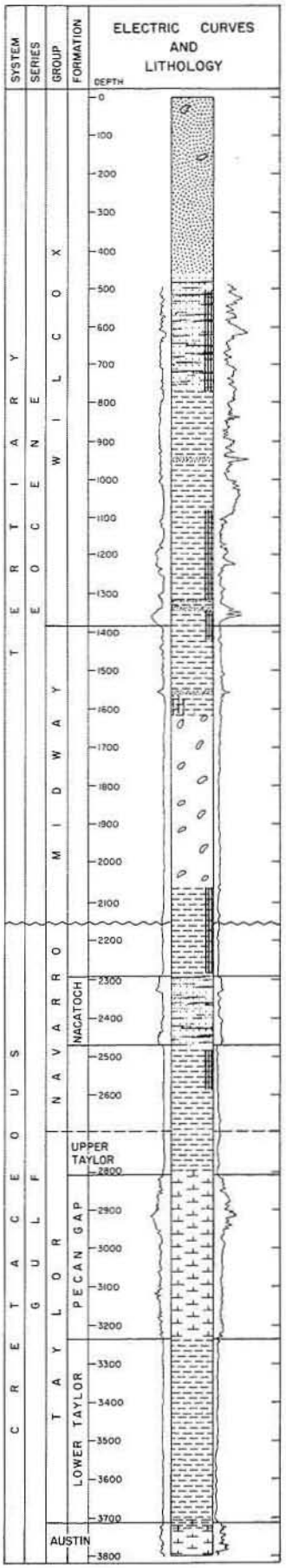
Rodessa: The Rodessa formation is present throughout East Texas and part of northern Louisiana. Here it contains several porous zones, each of which, generally, is of only local extent; probably none extending throughout the area of the field. The lower porous zones are correlated with the Gloyd zone of the Rodessa field.

Pettet: The Pettet formation is continuous throughout the area of the field. It appears that the stratigraphic equivalent of each of the three productive zones is continuous throughout the area of the field and that as to the two lower zones, the condition (relatively high porosity) which occasions production is likewise continuous. However, as to the highest productive zone, it is sufficiently porous to yield commercial production on only the north flank of the anticline.

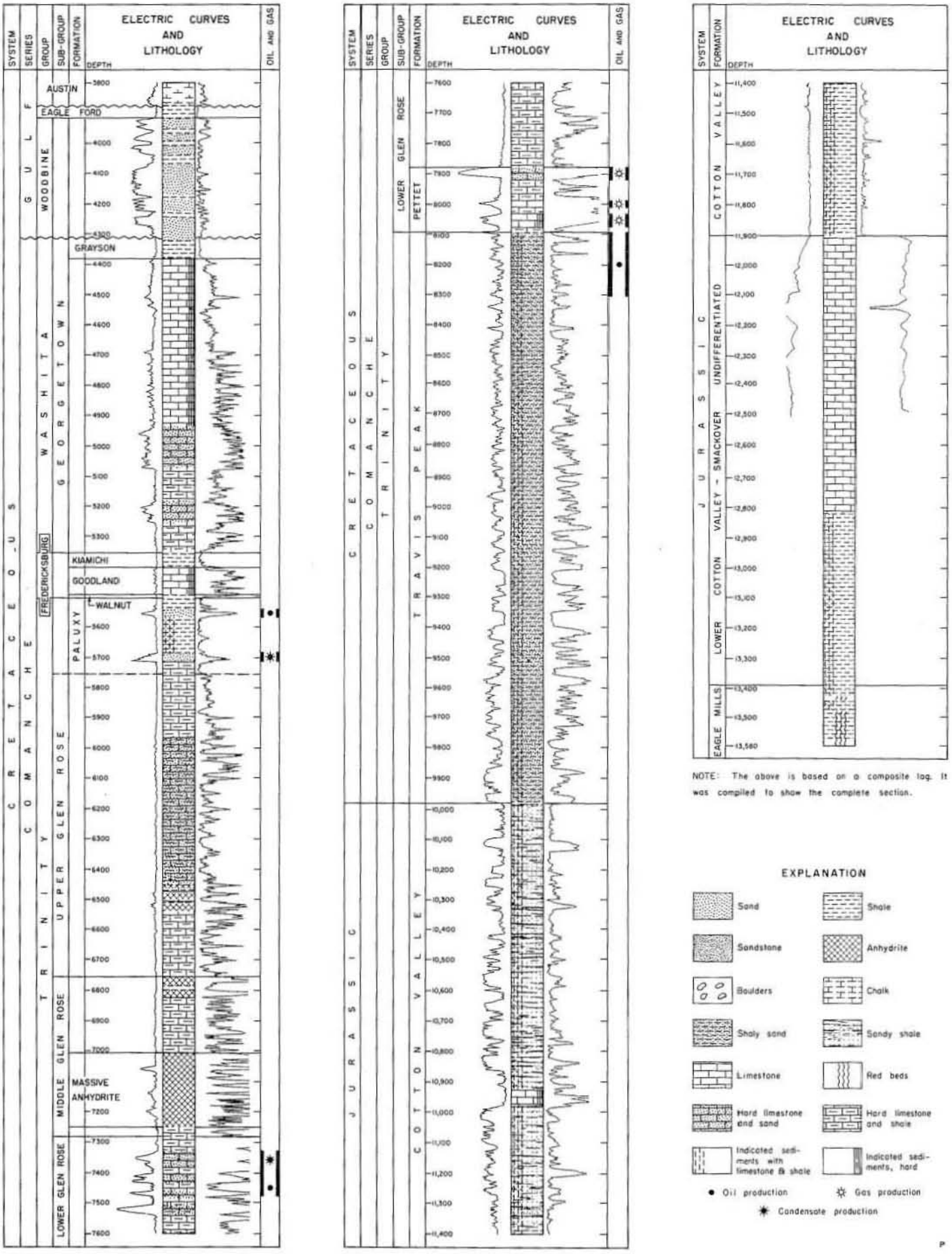
Travis Peak: The Travis Peak is a blanket formation over the area of the Chapel Hill field; however, porosity development is very erratic.



TYPE SECTION OF ROCKS PENETRATED



TYPE SECTION OF ROCKS PENETRATED



NOTE: The above is based on a composite log. It was compiled to show the complete section.

EXPLANATION

- Sand
- Shale
- Sandstone
- Anhydrite
- Boulders
- Chalk
- Shaly sand
- Sandy shale
- Limestone
- Red beds
- Hard limestone and sand
- Hard limestone and shale
- Indicated sediments with limestone & shale
- Indicated sediments, hard
- Oil production
- Gas production
- Condensate production

THICKNESSES OF RESERVOIR ROCKS

	Feet, average	
	Top to bottom	Net productive
Paluxy	40	22
Rodessa	65	10
Pettet	85	30
Travis Peak	75	?

LITHOLOGY OF RESERVOIR ROCKS

Paluxy: Sandstone, fine-grained, partly argillaceous, with streaks of hard limestone.

Rodessa: Limestone, oolitic and dense, with some shale and calcareous sandstone.

Pettet: Oolitic and dense limestone, with sand and sandy shale.

Travis Peak: Sand and sandy shale, fine-grained with numerous streaks of calcareous sand.

ACID TREATMENT

Most of the Rodessa and Pettet wells have required acid treatment of at least 3,000 to 4,000 gallons.

WATER PRODUCTION

Minor amounts of water have been produced from the Rodessa and Paluxy wells in this field.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Paluxy	Rodessa	Pettet	Travis Peak
Elevation of top of gas, feet	5,260	6,866	7,467	7,603
Elevation of bottom of gas, feet	5,390	6,990	7,700	7,835
Relief, feet	130	124	233	232
Elevation of top of oil, feet	5,071	7,220	7,570	
Elevation of bottom of oil, feet	5,090	7,240	7,880	
Relief, feet	19*	20*	310	

*Based on data from discovery well.

CHARACTER OF OIL

	Paluxy	Rodessa	Pettet	Travis Peak
Gravity, A. P. I.	16°	39°	41.43°	56.5°
Color	Black		Green	Greenish-brown
Base	Asphalt		Paraffin	Paraffin

CHARACTER OF CONDENSATE

	Paluxy	Rodessa	Pettet	Travis Peak
Gravity, A. P. I.	67.75°	60.64°	57.63°	63.5°
Color	Water white	INPA	UPA5	Pale straw

CHARACTER OF GAS

Hydrocarbon composition of mixture of combined liquid and gas samples:

	Paluxy		Rodessa		Pettet
	Mol. %	G/Mcf	Mol. %	G/Mcf	Mol. %
Carbon Dioxide	0.60				0.1
Nitrogen	0.40				1.6
Methane	79.08		82.71		85.5
Ethane	7.50		6.65		5.0
Propane	4.53		3.49		1.9
Iso-butane	1.15	0.37	0.73	0.237	1.5
N-butane	1.77	0.56	1.54	0.482	1.5
Iso-pentane	1.79	0.37	1.31	0.474	1.1
N-pentane		0.28			
Hexanes plus	3.38	1.68	3.57	1.785	3.3
Total	100.00	3.175	100.00	2.978	100.0

PRODUCTION HISTORY

Year	WELLS PRODUCING at end of year: Oil	Gas & Condensate	OIL PRODUCTION (barrels): Yearly	Cumulative	CONDENSATE PRODUCTION (barrels): Processing plant	Total: Yearly	Cumulative	NET GAS PRODUCTION (Mcf @ 14.65# & 60°F.): Yearly	Cumulative
Field totals									
1938	0	1	0	0	0	3,343	3,343	169,307	169,307
1939	0	1	0	0	0	66,547	69,890	938,286	1,107,593
1940	3	6	55,183	55,183	0	174,941	244,831	2,468,325	3,575,918
1941	15	10	162,301	217,484	0	317,792	562,623	5,378,282	8,954,200
1942	39	15	46x,xxx	67x,xxx	0	521,364	1,083,987	9,093,606	18,047,806
1943	41	16	65x,xxx	1,32x,xxx	0	626,928	1,710,915	12,949,319	30,997,125
1944	42	18	59x,xxx	1,91x,xxx	0	646,595	2,357,510	15,586,664	46,583,789
1945	43	16	46x,xxx	2,37x,xxx	0	337,559	2,695,069	9,735,033	56,318,822
1946	42	17	34x,xxx	2,748,482	0	21x,xxx	2,90x,xxx	8,717,556	65,036,378
1947	43	21	302,624	3,051,106	664,815?	88x,xxx	3,78x,xxx	8,938,241	73,974,619
1948	43	21	309,871	3,360,977	903,461?	1,149,248	4,947,702	9,163,705	83,138,324
1949*	42	20	202,144	3,563,121	737,539?	962,408	5,910,110	8,448,265	91,586,589

*The production figures are short by the quantities of Paluxy production during December.

Paluxy (a)									
1940	0	1	0	0	0	7,740	7,740	112,539	112,539
1941	0	2	0	0	0	70,573	78,313	1,206,800	1,319,339
1942	0	4	0	0	0	222,643	300,956	3,494,721	4,814,060
1943	0	6	0	0	0	330,471	631,427	6,037,266	10,851,326
1944	0	5	0	0	0	352,369	983,796	7,527,251	18,378,577
1945	0	3	0	0	0	51,323	1,035,119	1,232,608	19,611,185
1946	0	2	0	0	0	23,430	1,058,549	518,585	20,129,770
1947	0	5	0	0	664,815	669,524	1,728,073	669,795	20,799,565
1948	1	6	28,472	28,472	903,461	903,461	2,631,534	(1,044,514)(b)	19,755,051
1949 to 12/1	1	5	16,572	45,044	737,539	737,539	3,369,073	(1,439,444)(b)	18,315,607

(a) - This tabulation presents the data for the unitized area. From a gas-condensate well completed in November 1947 outside that area the cumulative production to 1/1/50 amounted to 313,672 Mcf of gas and 9,462 barrels of condensate (arbitrarily equally divided between 1948 and 1949 in compiling above Field totals). On 1/1/50 this well was recompleted to produce from the Rodessa.

(b) Gross withdrawals from the Paluxy reservoir amounted to 9,118,094 Mcf during 1947, 12,401,192 Mcf during 1948 and 11,075,087 during the reported portion of 1949. During those periods two wells injected 8,448,299 Mcf, 13,445,706 Mcf and 12,514,531 respectively.

Rodessa									
1938	0	1	0	0	0	3,343	3,343	169,307	169,307
1939	0	1	0	0	0	66,547	69,890	938,286	1,107,593
1940	0	2	0	0	0	155,527	225,417	2,139,800	3,247,393
1941	0	3	0	0	0	163,204	388,621	2,627,029	5,874,422
1942	1	5	1x,xxx	1x,xxx	0	180,432	569,053	2,977,911	8,852,333
1943	2	6	1x,xxx	2x,xxx	0	264,512	833,565	4,782,938	13,635,271
1944	1	7	1x,xxx	3x,xxx	0	256,077	1,089,642	4,712,706	18,347,977
1945	1	7	1x,xxx	4x,xxx	0	191,703	1,281,345	3,782,486	22,130,463
1946	1	7	1x,xxx	57,331	0	155,739	1,437,084	3,286,985	25,417,448
1947	1	7	7,275	64,606	?	167,836	1,604,920	3,686,828	29,104,276
1948	1	7	7,142	71,748	?	173,436	1,778,356	4,368,925	33,473,201
1949	1	7	5,873	77,621	?	178,000	1,956,356	4,941,997	38,415,198
Pettet									
1940	3	3	55,183	55,183	0	11,674	11,674	215,986	215,986
1941	15	5	162,301	217,484	0	84,195	95,869	1,544,453	1,760,439
1942	38	6	452,639	670,123	0	118,289	214,158	2,620,974	4,381,413
1943	39	4	646,402	1,316,525	0	31,945	246,103	2,129,115	6,510,528
1944	41	6	583,715	1,900,240	0	38,149	284,252	3,346,707	9,857,235
1945	42	6	454,817	2,355,057	0	94,533	378,785	4,719,939	14,577,174
1946	41	8	336,094	2,691,151	0	4x,xxx	4xx,xxx	4,911,986	19,489,160
1947	40	8	288,696	2,979,847	?	4x,xxx	469,103	4,513,485	24,002,645
1948	40	7	262,394	3,242,241	?	57,408	526,511	5,292,674	29,295,319
1949	39	7	174,349	3,416,590	?	35,608	562,119	4,520,204	33,815,523
Travis Peak									
1947	2	1	6,653	6,653	?	1,089	1,089	68,133	68,133
1948	1	1	11,863	18,516	?	10,212	11,301	389,784	457,917
1949	1	1	5,596	24,112	?	6,530	17,831	268,672	726,589

CHATFIELD FIELD
Navarro County, Texas

O. L. HILL
Geologist, Sun Oil Company, Tyler, Texas
May 15, 1950

LOCATION

The Chatfield field was a small gas field located about 1 mile southeast of the village of Chatfield in northern Navarro County and about 10½ miles northeast of Corsicana, county seat of Navarro County. It was almost entirely within the northeast quarter of the Joseph Mayor survey, Abstract 588. There is nothing at the site of this field at present to indicate its former existence. All wells had been abandoned and equipment was removed before the end of 1911.

DISCOVERY

The exact events leading up to the discovery of this field are not known but the accidental discovery of oil at the Corsicana townsite in the year 1895, and the drilling which steadily expanded this field during the next ten years, must have awakened an interest in the discovery of new fields in the surrounding territory. Gas which was produced with the oil at Corsicana was used for commercial purposes in that city and thus a market was available when in 1905 gas was discovered at Chatfield.

ELEVATION OF SURFACE

It appears that 450 feet is a representative elevation within the area formerly occupied by the field.

SURFACE FORMATION

The surface exposures at the site of the field are of Nacatoch sand and the overlying Corsicana marl.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated within the area of the field is in the Woodbine sand. The only fluid found in the Woodbine was salt water.

NATURE OF TRAP

A northeast-southwest trending closed anticline is thought to be the reason for accumulation.

PRODUCTIVE AREA

The area which was productive is about 1½ miles in length and less than 2,000 feet in width, covering a maximum of 360 acres.

THICKNESS OF RESERVOIR ROCK

The sand was reported to be from 8 to 60 feet thick, but the maximum net productive sand was probably not more than 25 feet.

LITHOLOGY OF RESERVOIR ROCK

Medium- to fine-grained gray sand with shale partings. This sand is probably the equivalent of the Edens sand in the Corsicana-Powell field. There is a sand about 200 feet lower which probably correlates with the Corsicana sand in the Corsicana-Powell field. The upper of these two Taylor sand zones is generally chalky and the lower is generally shaly.

CONTINUITY OF RESERVOIR ROCK

The reservoir rock is continuous over the entire area of the field, and is generally present over a large area in Northeast Texas. However, local conditions seem to have been unstable in northeast Navarro and southwest Kaufman counties during and after its deposition.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

The top of the upper sand is generally at a depth of about 850 feet in the productive area. The top of the gas was at an elevation of -400 to -420 feet, except at one well where it was about -440 feet.

CHARACTER OF GAS

No record is available.

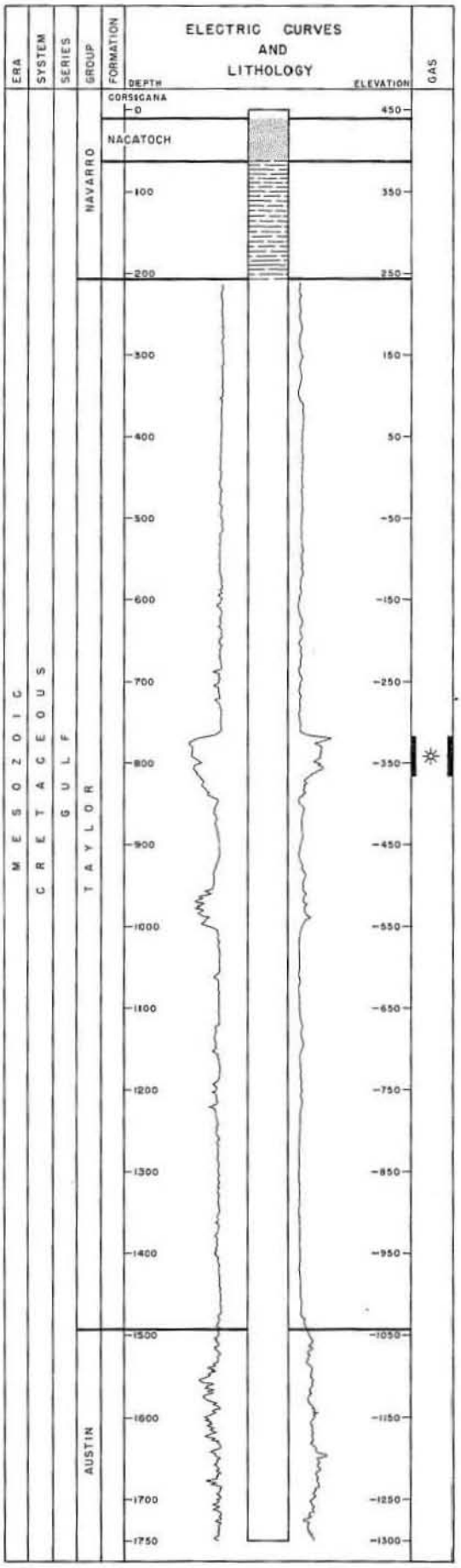
SELECTED REFERENCE

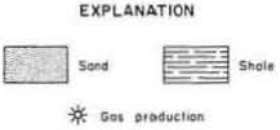
Matson, G. C., and Hopkins, O. B. (1917) The Corsicana oil and gas field, Texas: U. S. Geol. Survey, Bull. 661, pp. 211-252.

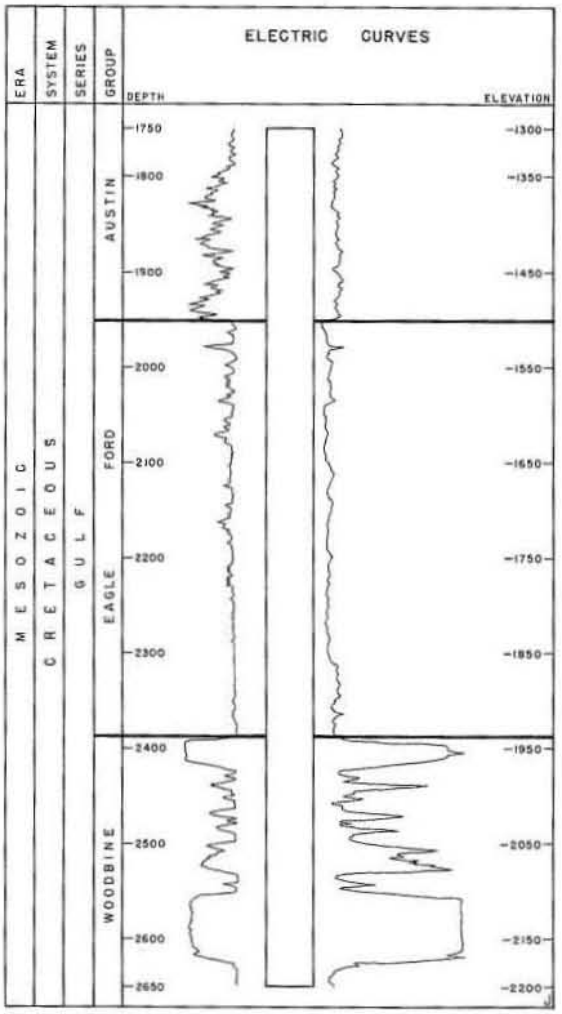
PRODUCTION HISTORY

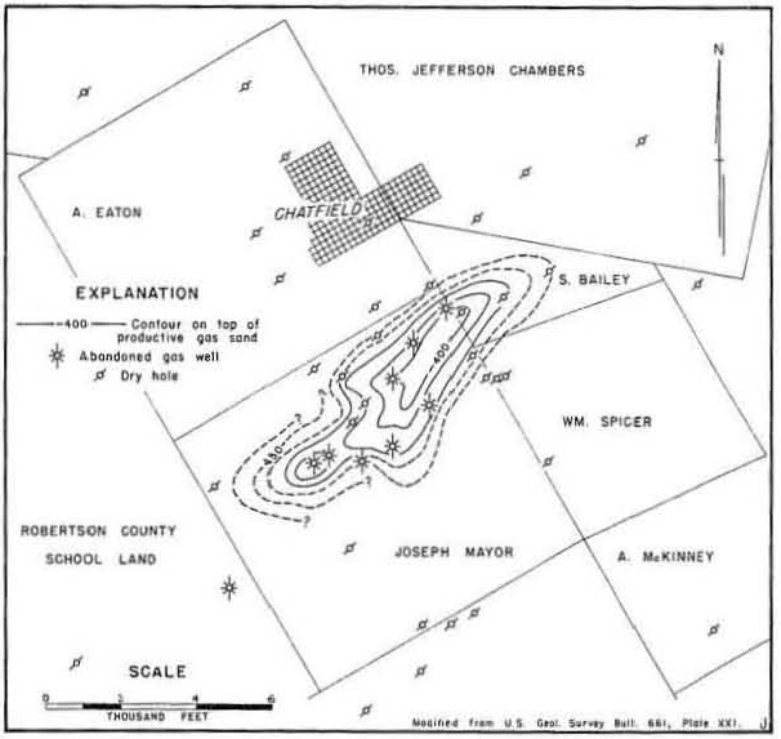
The field was discovered in 1905 and developed in 1905 and 1906. It was completely abandoned before the end of the year 1911. Only gas was produced. The gas was piped to Corsicana for domestic use. The quantity produced has not been determined.

TYPE SECTION OF ROCKS PENETRATED









CHILTON FIELD
Falls County, Texas

GREGORY L. TURNER
District Geologist, The Pure Oil Company, Tyler, Texas
June 1, 1950

LOCATION and OTHER NAME

The Chilton field is 5 miles west of Marlin, the county seat of Falls County, and $2\frac{1}{2}$ miles northeast of the town of Chilton. It is one of several shallow fields located on a broad structural terrace that trends in a northeast-southwest direction through the western part of the county.

This field has also been known as the Post Oak field, although this name is more properly restricted to a small producing area 2 miles to the south.

METHOD OF EXPLORATION LEADING TO DISCOVERY

The discovery well was drilled on the basis of oil shows encountered in the Buda lime in two or three tests previously drilled in the immediate area.

DISCOVERY

Buda lime: September 8, 1923; Post Oak Oil Co. #1 H. Taylor. Flowed 200 barrels of 30° gravity oil per day.

ELEVATION OF SURFACE

At well locations: Highest, 439 ft.; lowest, 383 feet.

SURFACE FORMATION

Lower Taylor shale.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest stratigraphic horizon penetrated within the area of the field is in the Georgetown limestone. Just beyond the boundary of the field, Post Oak Oil Co. #1 B. G. Randolph, northwest offset to the discovery well, was drilled into the Edwards at the location where the datum elevation is indicated as -659 on the accompanying map. The accompanying TYPE SECTION is based on the log of that well.

NATURE OF TRAP

Buda lime: Well data are not sufficiently reliable to afford conclusive evidence as to the trap-forming factors. The accumulation does not appear to be directly controlled by either the fault to the west or the nosing to the east. Possibly, the trap may be the result of a zone of crevice porosity developed through local shattering of the reservoir rock which accompanied the folding and faulting in the vicinity.

THICKNESS OF RESERVOIR ROCK

Buda lime: The total thickness of the Buda lime is about 20 feet. The productive thickness is not known.

PRODUCTIVE AREA

Buda lime and Field: About 20 acres.

LITHOLOGY OF RESERVOIR ROCK

Buda lime: White, impure, fossiliferous limestone.

CONTINUITY OF RESERVOIR ROCK

The Buda formation can be traced on well logs from its outcrop eastward through the East Texas basin and southward into the Gulf Coast region. Local porosity is developed in several areas, and production has also been established from this formation in the Satin field to the north and the Post Oak and Lott fields to the south, all in Falls County.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Buda lime:	Feet
No free gas	
Highest proven elevation of oil	-572
Lowest proven elevation of oil	-671
Proven relief of oil column	99

CHARACTER OF OIL

Gravity, A.P.I.: 31-33°; Avg. 32°
Sulphur: 0.8% Base: Paraffin

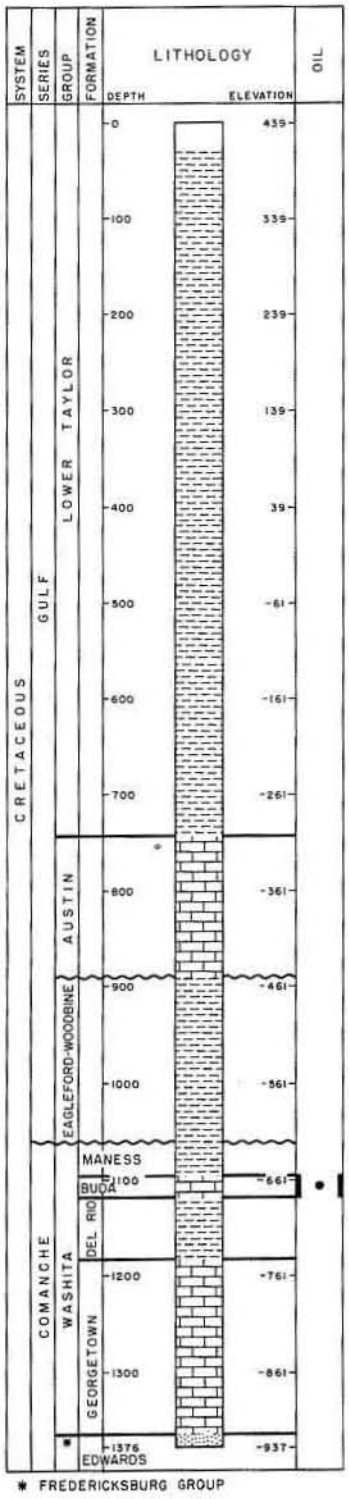
PRODUCTION HISTORY

Year	WELLS PRODUCING at end of year: Oil	OIL PRODUCTION (barrels): Yearly	Cumulative
1923	2	x	x
1924	3	x	x
1925-31	x	x	x
1932	x	x	81,500
1933	2	6,700	88,200
1934	1	2,160	90,360
1935	1	710	91,070
1936	1	1,560	92,630
1937	1	826	93,456
1938	1	730	94,186
1939	1 (shut-in ?)	0	94,186
1940	1	812	94,998
1941	1	573	95,571
1942	0	222	95,793

The above figures have been compiled from several statistical references, none of which agree for any given year. However, an attempt has been made to average out the larger differences, and the writer believes that the totals may be relatively correct.

Data relative to water production and acid treatment are not available.

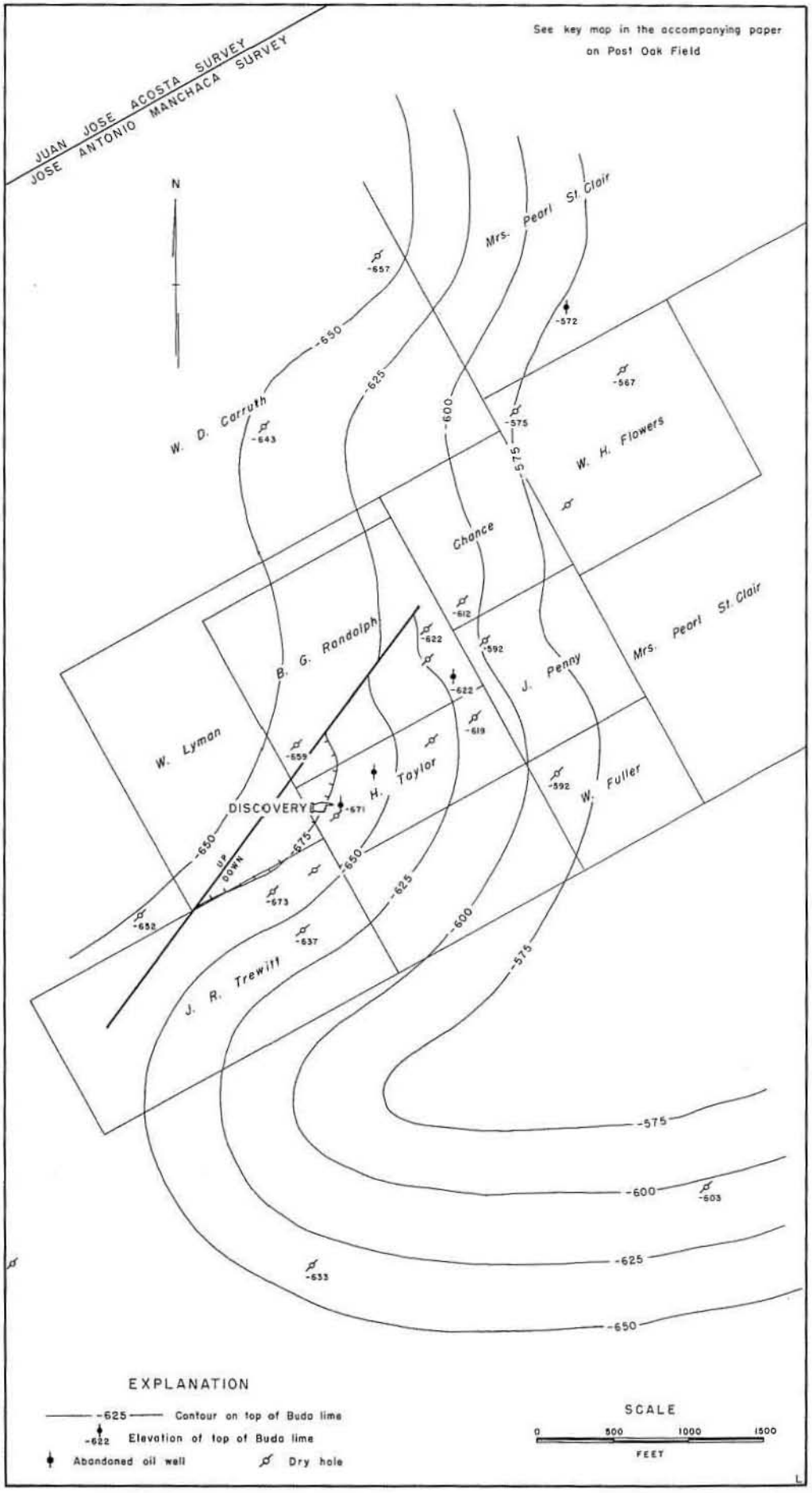
TYPE SECTION OF ROCKS PENETRATED



* FREDERICKSBURG GROUP

EXPLANATION

- Shale
- Limestone
- Sand
- Oil production



COATS FIELD
Wood County, Texas

W. ALLAN RATCLIFF
Research Assistant, Bureau of Economic Geology, Austin, Texas
December 15, 1950

LOCATION

The Coats field is located in central Wood County in the southern part of Jeremiah Stark survey, about 3½ miles northeast of Quitman, the county seat, and 7,500 feet north of Merigale-Paul field.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Subsurface work.

DISCOVERY

Sub-Clarksville: April 14, 1949; Bert Fields et al. #1 W. W. Gilbreath. Drilled to 5,403 feet in Dexter formation and plugged back; pumped 22 barrels of 14° gravity oil and 100 barrels salt water per day through perforations at 4,508-4,520 feet.

ELEVATION OF SURFACE

At well locations: Highest, 473 ft.; lowest, 450 feet.

SURFACE FORMATION

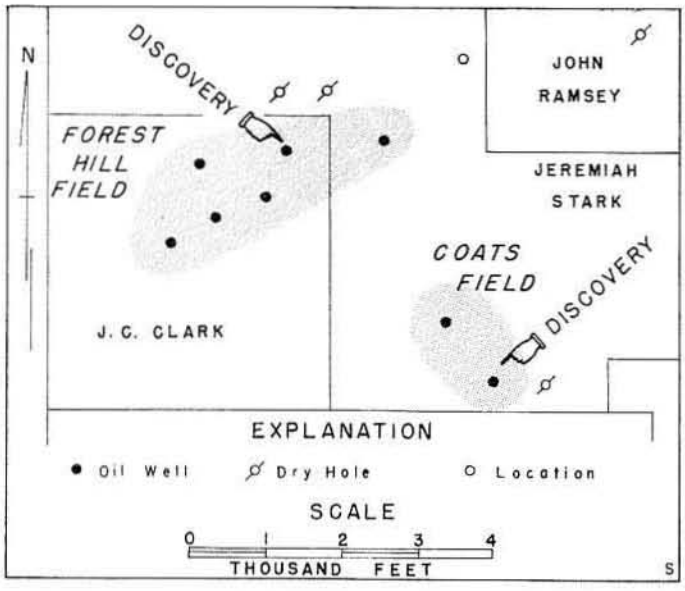
Claiborne group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

108 feet below the top of the Dexter sand (lower Woodbine).

CHARACTER OF OIL

Sub-Clarksville: Gravity, 14°.



PRODUCTION HISTORY

Sub-Clarksville and Total field:

Month	WELLS PRODUCING at end of month: Oil - Pumping	OIL PRODUCTION (barrels): Monthly	Cumulative
1949			
Apr.	1	305	305
May	1	32	337
June	1	15	352
July	1	115	467
Aug.	1	372	839
Sept.	1	226	1,065
Oct.	1	105	1,170
Nov.	0	0	1,170
Dec.	0	0	1,170
1950			
Jan.	0	0	1,170
Feb.	0	0	1,170
Mar.	0	0	1,170
Apr.	0	0	1,170
May	0	0	1,170
June	1	209	1,379
July	2	335	1,714
Aug.	2	173	1,887
Sept.	2	680	2,567
Oct.	2	447	3,014

The development of a nearby productive area, now recognized by the Railroad Commission as a separate field, has led to some confusion in the production records. W. W. Wise et al. #1 J. E. Brown et al. in the J. C. Clark survey, completed on April 25, 1950, is now recognized as the discovery well in a separate field, the Forest Hill field. There were five wells completed in the new field prior to November 1 and oil production to that date amounted to 44,323 barrels.

COKE FIELD
Wood County, Texas

RAY F. YOUNGMEYER
District Geologist, Amerada Petroleum Corporation, Tyler, Texas
November 27, 1950

LOCATION

The Coke field is located one mile north of the Coke community in northern Wood County, one mile south of the Hopkins and Wood county line, and nine miles north of Quitman, county seat of Wood County.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Credit for discovery of the Coke field is due to reflection seismograph work conducted by Amerada Petroleum Corp. in 1941.

DISCOVERIES

Sub-Clarksville: April 30, 1948; J. C. Hawkins #4 J. W. Clark, Berry Smith survey. Pumped 128 barrels of 15.2° gravity oil per day from perforations at 4,056-62, 4,065-70, 4,084-4,105 and 4,108-13 feet.

Paluxy: June 10, 1942; Amerada Petroleum Corp. #1 C. B. Kennemer, Joseph Knight survey. From perforations at 6,262-6,344 feet flowed 320 barrels of 27.5° gravity oil in 4 hours through open 2-inch tubing; tubing pressure, 95 psi.; casing pressure, 225 psi.; gas-oil ratio, 107:1. Shut-in tubing pressure, 300 psi.; casing pressure, 400 psi.

Young: May 19, 1945; Amerada Petroleum Corp. #3 E. L. Faulk (now #1 Coke Unit.), Joseph Knight survey. From perforations at 8,080-8,130 feet flowed 102 barrels of 70° gravity condensate plus 1,800,795 cubic feet of gas daily on 1/4-inch choke; tubing pressure, 1,400 psi.; gas-condensate ratio, 17,580:1. In April 1949, the gravity of the condensate and the gas-condensate ratio decreased rapidly. On a re-potential test on May 11, 1949, the well flowed 245 barrels of 47° gravity oil per day on a 12/64-inch choke, tubing pressure, 1,700 psi.; gas-oil ratio, 2,077:1.

ELEVATION OF SURFACE

Derrick floor elevations: Highest, 552 feet; lowest, 472 feet.

SURFACE FORMATIONS

Wilcox and Reklaw.

NATURE OF TRAPS

The accumulation in each reservoir is due to a convex trap.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

In Travis Peak, 1,304 feet below its top. This penetration was in Amerada Petroleum Corp. #2 Coke Unit, a dry hole drilled to the total depth of 9,648 feet at a structural position high on each of the three productive reservoirs. A dip meter survey indicates dips of 65° to 80° on sediments between the depths of 9,612 and 9,640 feet.

PRODUCTIVE AREAS

Sub-Clarksville	800 acres
Paluxy	1,200 acres
Young	160 acres
Coke field	1,300 acres

THICKNESSES OF RESERVOIR ROCKS

	Sub-Clarksville	Paluxy	Young
From top to bottom, average, feet	40	350	70
Net productive, average, feet	14	50	8

LITHOLOGY OF RESERVOIR ROCKS

Sub-Clarksville: Fine- to medium-grained ashy sandstone.

Paluxy: Fine- to medium-grained sandstone.

Young: Sandy limestone and coquina-type limestone.

CONTINUITY OF RESERVOIR ROCKS

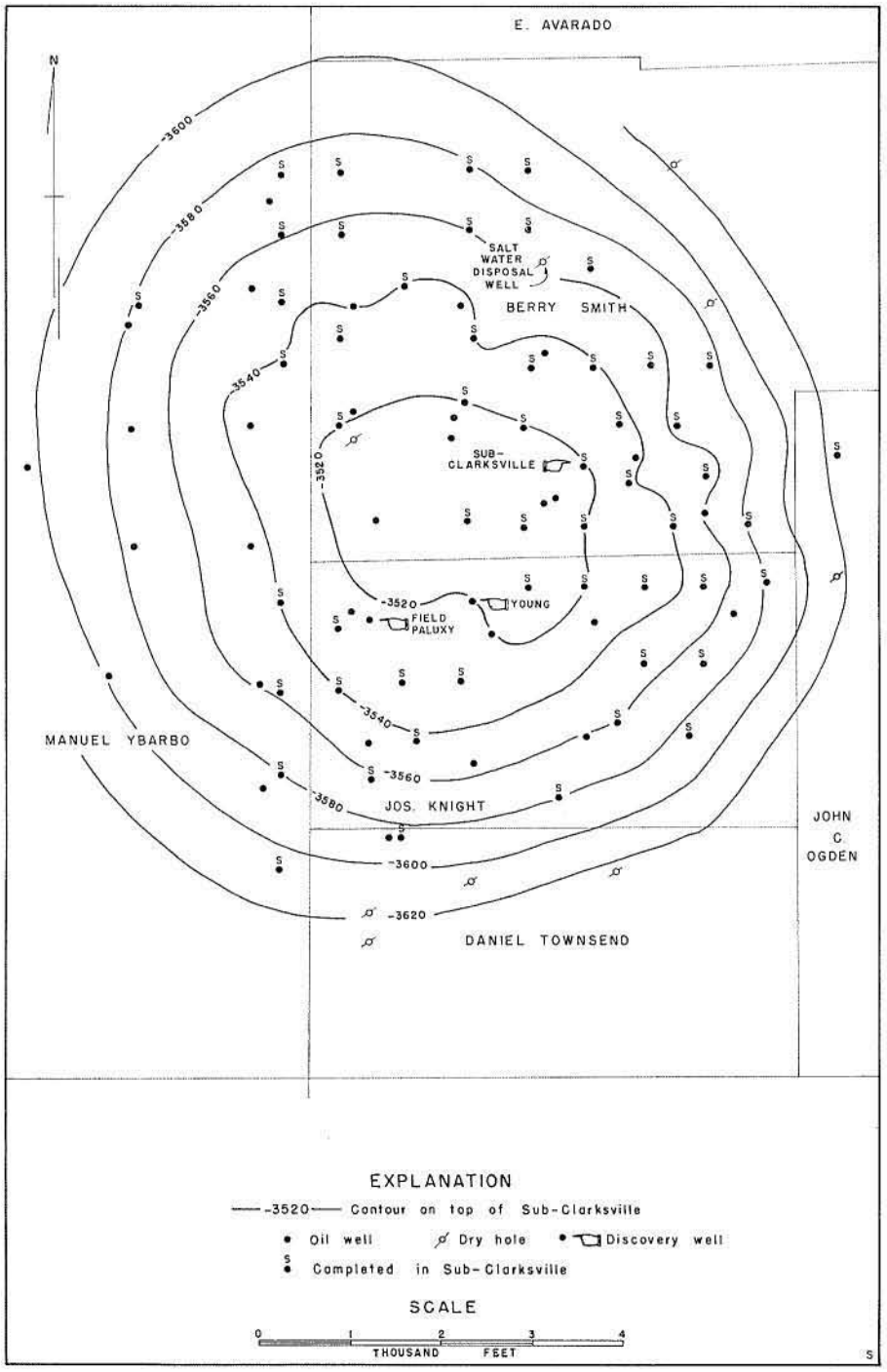
Sub-Clarksville: Continuous as a member but porosity varies locally with ash content.

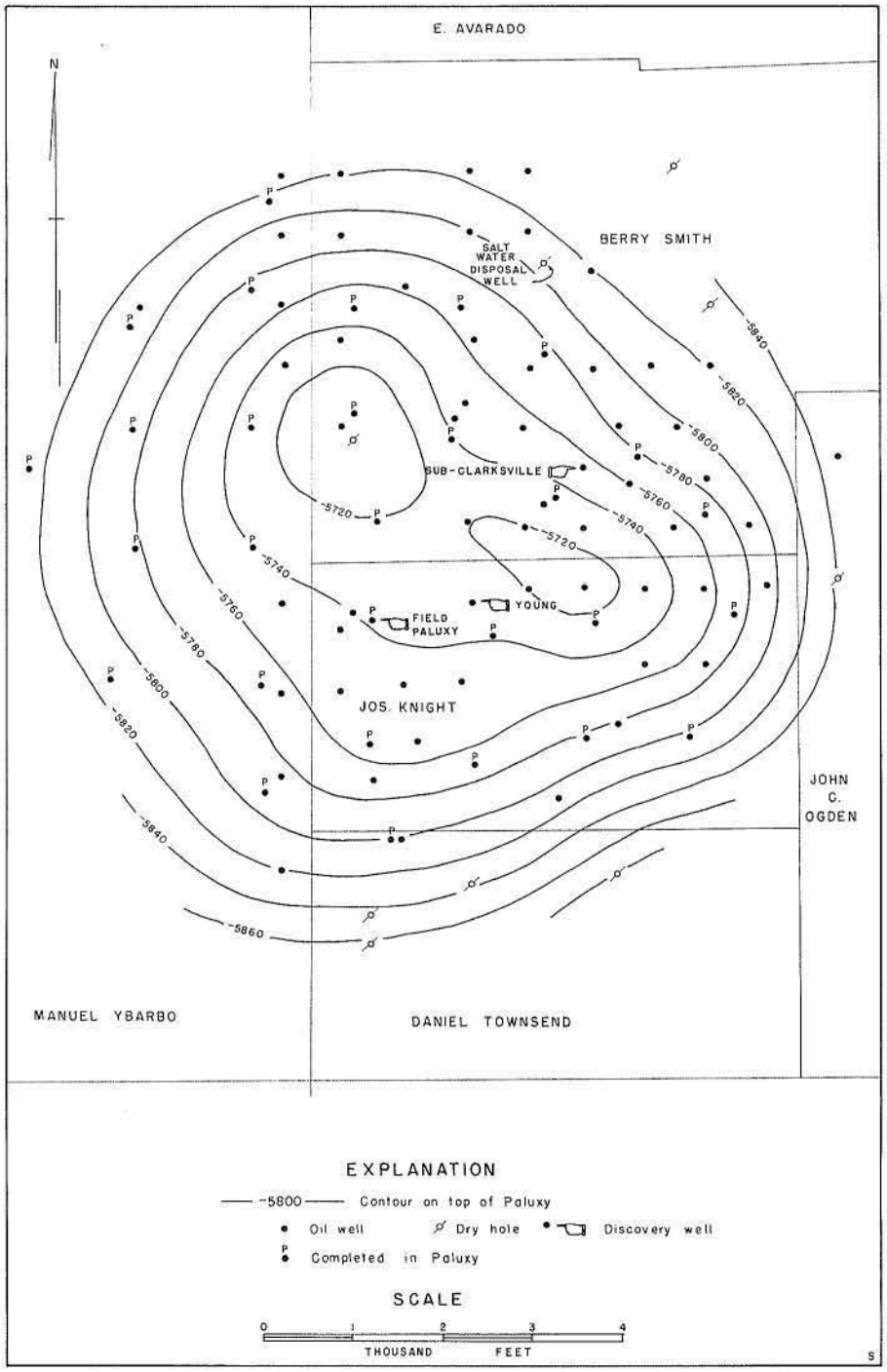
Paluxy: Continuous as a member but very lenticular locally.

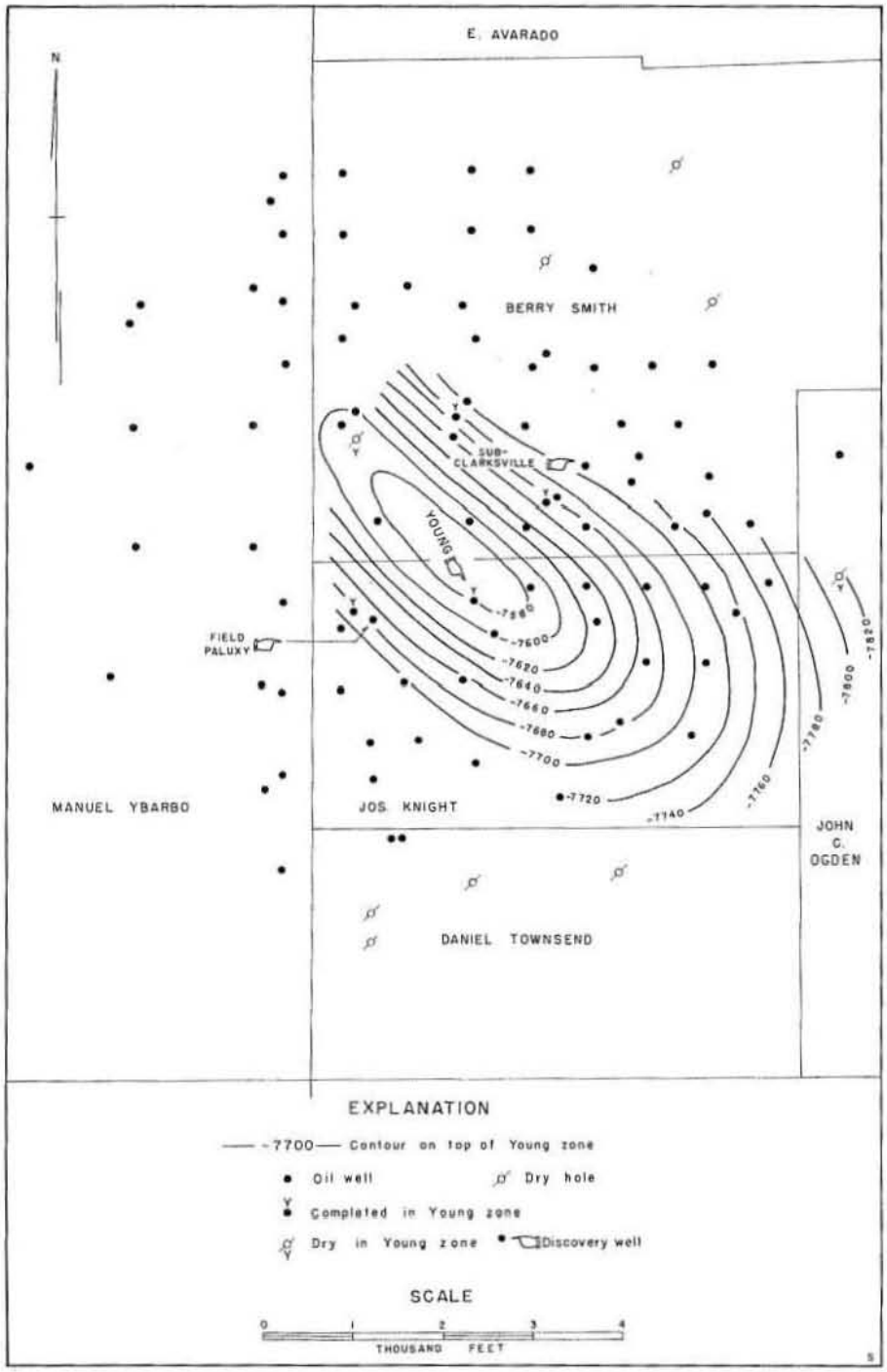
Young: Continuous as a member with local variation in porosity.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Sub-Clarksville	Paluxy	Young
Elev. top of oil, feet	3,512	5,722	7,582
Elev. bottom of oil, ft.	3,631	5,860	7,712
Relief	119	138	130


E. AVARADO
N
-3600
-3580
-3560
-3540
-3520
SALT WATER DISPOSAL WELL
BERRY SMITH
SUB-CLARKSVILLE
YOUNG
FIELD
PALUXY
MANUEL YBARBO
JOS. KNIGHT
JOHN C. OGDEN
DANIEL TOWNSEND
EXPLANATION
-3520- Contour on top of Sub-Clarksville
Oil well
Dry hole
Discovery well
Completed in Sub-Clarksville
SCALE
0 1 2 3 4
THOUSAND FEET


E. AVARADO
N
-5840
-5820
-5800
-5780
-5760
-5740
-5720
-5860
SALT WATER DISPOSAL WELL
BERRY SMITH
SUB-CLARKSVILLE
YOUNG
FIELD
PALUXY
JOS. KNIGHT
JOHN C. OGDEN
MANUEL YBARBO
DANIEL TOWNSEND
EXPLANATION
-5800- Contour on top of Paluxy
Oil well
Dry hole
Discovery well
Completed in Paluxy
SCALE
0 1 2 3 4
THOUSAND FEET



CHARACTER OF OIL

	Sub-Clarksville	Paluxy	Young
Gravity, °A.P.I.	15	27.5	47
Sulphur, %		2.29	

For analysis of Paluxy oil see:

U. S. Bureau of Mines Lab. reference No. 42142
Analyses of Crude Oils from Some Fields of Texas, R. I. 3699 (1943) Item 21

CHARACTER OF GAS

Paluxy casinghead gas:

Component	%
Methane	96.32
Ethane	2.07
Propane	0.81
Iso-butane	0.14
N-butane	0.20
Iso-pentane	0.08
N-pentane	0.19
Heavier	0.19
Total	100.00

ACID TREATMENT

Three of the four wells producing from the Young reservoir were acidized with 500 gallons each. None of the sub-Clarksville or Paluxy wells have been acidized.

WATER PRODUCTION

	Barrels		
Year	Sub-Clarksville	Paluxy	Young
1942		0	
1943		65,724	
1944		231,780	
1945		437,254	0
1946		476,878	0
1947		583,951	0
1948	Data not available	678,593	0
1949	Data not available	341,888	0
1950 to 7/1	64,824+	182,497	0
Total	64,824+	2,998,565	0

RESERVOIR PRESSURES

Year	Paluxy*	Young**
1942	2,722	
1943	2,693	
1944	2,666	
1945	2,663	3,660
1946	2,653	-
1947	2,642	-
1948	2,631	-
1949	2,623	3,266
1950 to 7/1	2,619	3,294

*Average bottom hole pressure (in psi.) in 5 wells.

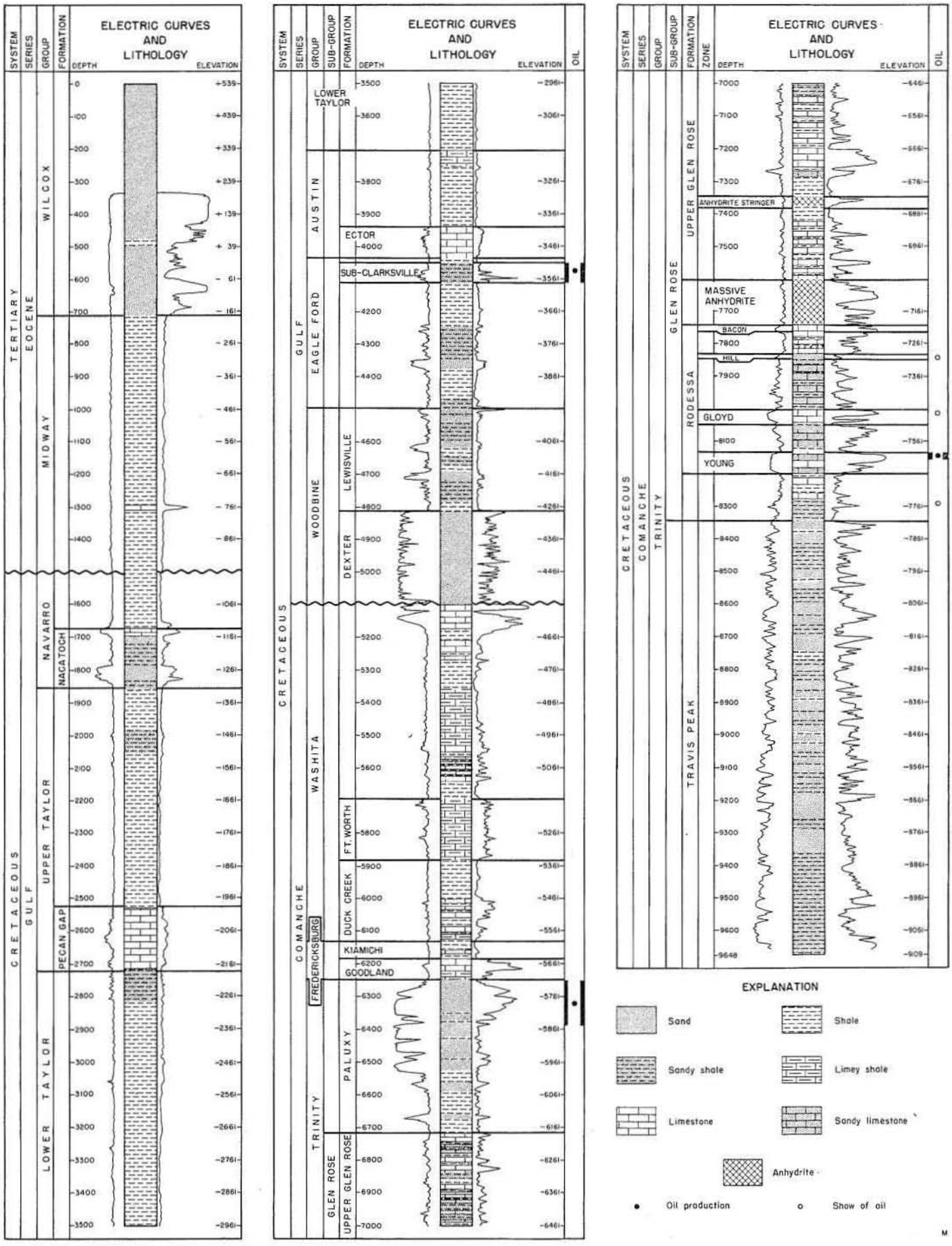
**Bottom hole pressure (in psi.) in Amerada Petroleum Corp. #1 Coke Unit.

PRODUCTION HISTORY

	WELLS PRODUCING at end of year	OIL PRODUCTION (barrels)		CONDENSATE PROD. (barrels)		GAS PRODUCTION (Mcf)	
		Yearly	Cumulative	Yearly	Cumulative	Yearly	Cumulative
Field totals							
1942	26	61,255	61,255				
1943	29	491,664	552,919				
1944	28	814,187	1,367,106				
1945	29	855,978	2,223,084	1,487	1,487	26,546	26,546
1946	29	815,255	3,038,339	8,376	9,863	166,307	192,853
1947	29	799,895	3,838,234	4,542	14,405	55,644	248,497
1948	61	953,807	4,792,041	25,725	40,130	279,030	527,527
1949	85	741,855	5,533,896	33,924	74,054	106,583	634,110
1950 to 7/1	86	387,941	5,921,837	0	74,054	132	634,242
Sub-Clarksville							
1948	32	150,449	150,449				
1949	54	265,412	415,861				
1950 to 7/1	54	119,972	535,833				
Paluxy							
1942	26	61,255	61,255				
1943	29	491,664	552,919				
1944	28	814,187	1,367,106				
1945	28	855,978	2,223,084				
1946	28	815,255	3,038,339				
1947	28	799,895	3,838,234				
1948	28	803,358	4,641,592				
1949	28	396,949	5,038,541				
1950 to 7/1	28	166,319	5,204,860				
Young							
1945	1	0	0	1,487	1,487	26,546	26,546
1946	1	0	0	8,376	9,863	166,307	192,853
1947	1	0	0	4,542	14,405	55,644	248,497
1948	1	0	0	25,725	40,130	279,030	527,527
1949	3	79,494	79,494	33,924	74,054	106,583	634,110
1950 to 7/1	4	101,650	181,144	0	74,054	132	634,242

COKE FIELD, Wood County, Texas

TYPE SECTION OF ROCKS PENETRATED



COMO FIELD
Hopkins County, Texas

JOE C. KITCHENS
Geologist, The Pure Oil Company, Tyler, Texas
December 15, 1949

LOCATION

The Como field is about 6 miles south of the town of Como, in the extreme southern part of Hopkins County, Texas.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Seismic work between 1936 and 1940 indicated a possible oil structure in the Como area, and the first test was drilled as a result of this seismic exploration. Three companies, Magnolia Petroleum Co., The Texas Co., and The Pure Oil Co., did a major portion of the seismic exploration and now hold a large majority of the leases. These leases were taken between 1940 and 1943. A deep test, Delta Drilling Co. #1 Livingston, was begun on September 15, 1945, and drilled to the Travis Peak. This well failed to discover a producing zone and was plugged on February 19, 1946. Interpretations of the electric curves, samples, and core analyses indicated a sand in the Eagleford that was a possible reservoir. A second test, Delta Drilling Co. #1 Coker, was begun on August 18, 1947, and completed on September 23, 1947, from what was then called the lower sub-Clarksville sandstone. The producing sand has since been given the name of Coker.

DISCOVERY

Coker sand: September 23, 1947; Delta Drilling Co. #1 Coker. Pumped 147 b/d of 21.8° gravity crude through perforations at 4,150 to 4,165 feet. The gas-oil ratio was 40:1.

NATURE OF TRAP and STRUCTURE

Coker sand: The Como field is on an anticline with a proved effective closure of about 43 feet at the time this article was written.

A thinning of the Coker sand is indicated by a study of the electric logs in a west-east direction from the Herbert Herff #1 Ivey Rutherford, on the west side of the field, to the Delta Drilling Co. #1 Ruth Starr Blake, on the east side of the field. Both of these tests were dry, but the #1 Ivey Rutherford showed about 14 feet of sand whereas the #1 Blake showed about 4 feet. The accompanying cross-section shows the thinning of the Coker toward the east.

PRODUCTIVE AREA

Coker sand and Field: Approximately 550 acres have been proved to date, and it seems probable that this area will be increased only a small amount by future drilling.

THICKNESS OF RESERVOIR ROCK

Coker sand:	Min.	Max.	Avg.
From top to bottom, feet	4	14	7

LITHOLOGY OF RESERVOIR ROCK

Coker sand: Gray, fine- to medium-grained, glauconitic, cherty, porous sandstone with occasional shale partings.

CONTINUITY OF RESERVOIR ROCK

Coker sand: As a sand unit, the Coker covers a relatively local area. It is traceable over parts of Hopkins, Wood, Franklin, Titus, Morris, Camp, Rains, Van Zandt, Hunt, and Delta counties, Texas. On electric logs this unit can be correlated over a large area although its sand qualities disappear.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Coker sand:	Feet
No free gas cap	
Highest proven elevation of oil	-3,722
Elevation of bottom of oil	-3,749
Relief	27+

CHARACTER OF OIL

Coker sand:
Gravity, A.P.I.: Approximately 21°
Sulphur: Approximately 0.2%

CHARACTER OF GAS

The Como field is characterized by the absence of gas.

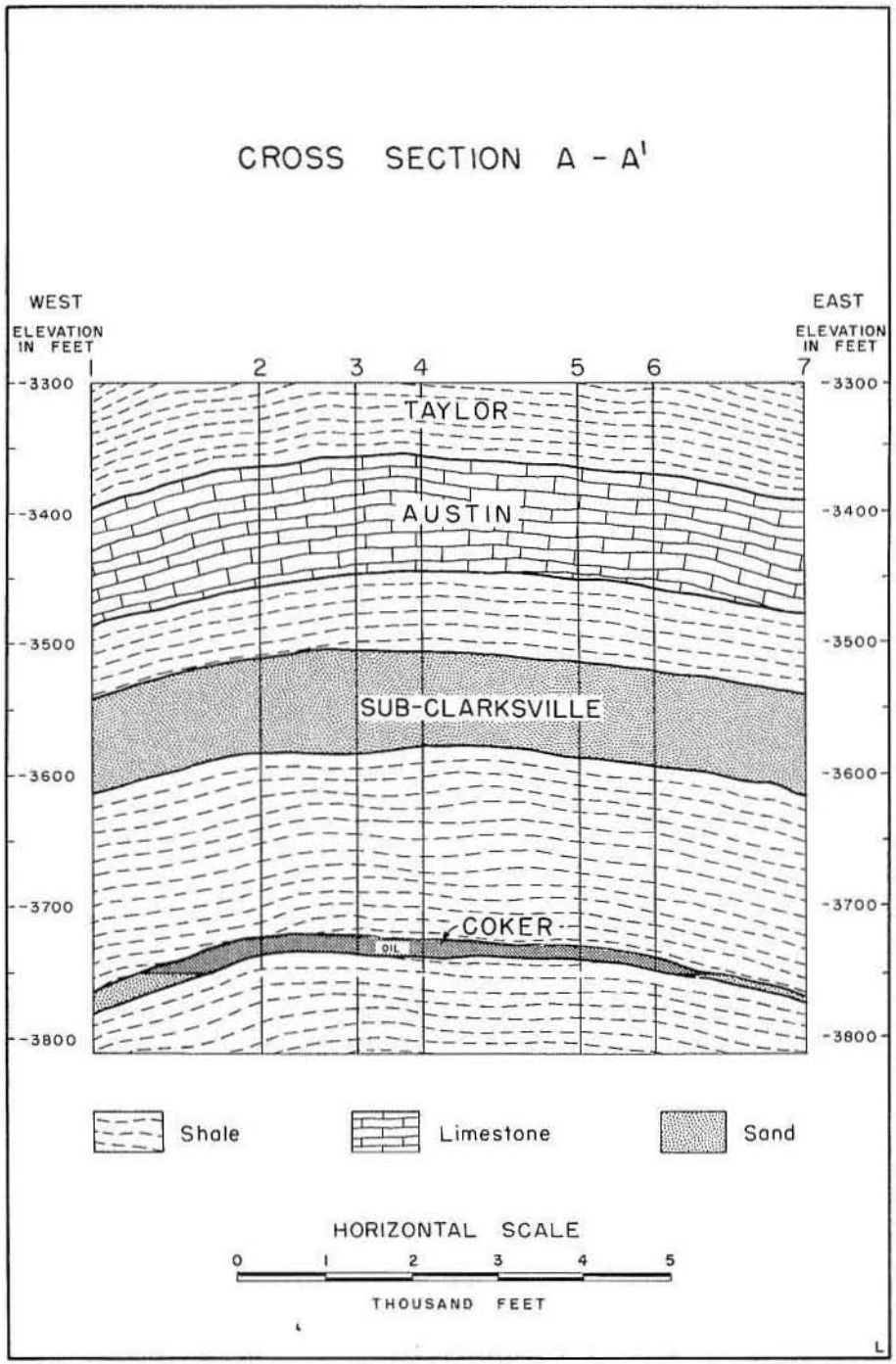
WATER PRODUCTION

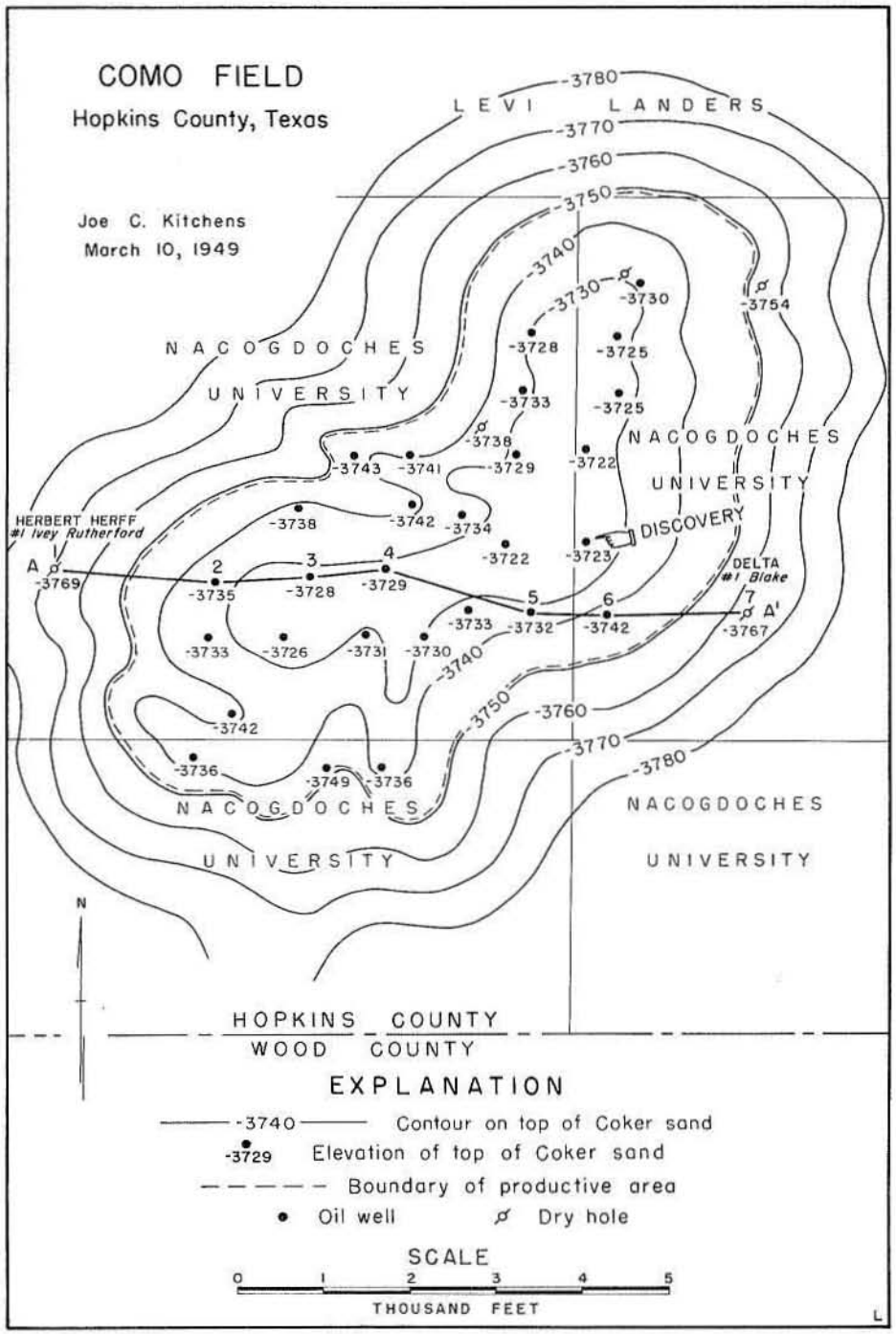
None.

PRODUCTION HISTORY

	WELLS PRODUCING at end of year	OIL PRODUCTION (barrels)	
Year	Oil	Yearly	Cumulative
1947	1 (pumping)	10,000	10,000
1948	20 (pumping)	198,198	208,198
1949*	38 (pumping)	291,275	499,473

*P.S. - Amended to include the whole of 1949.

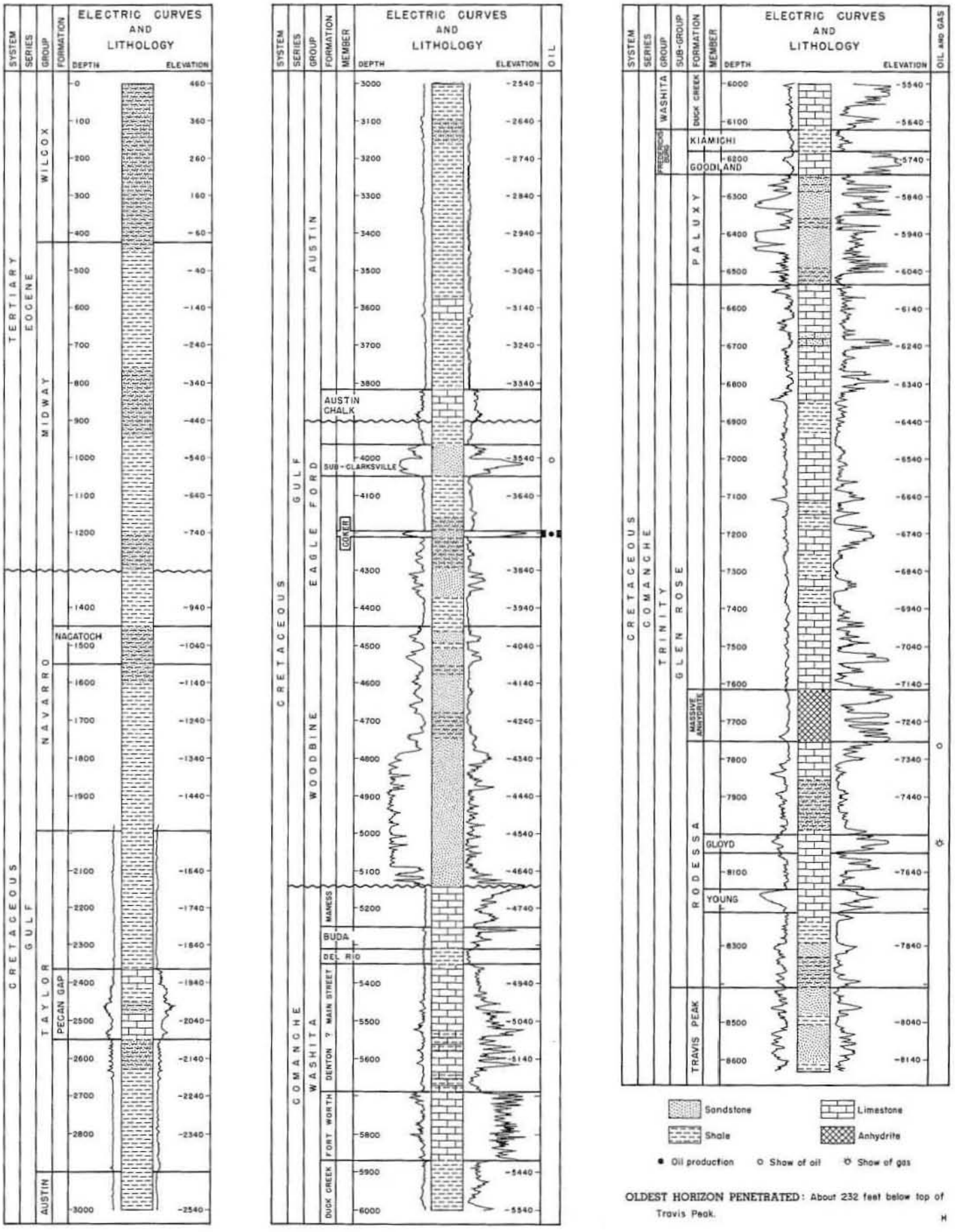

CROSS SECTION A - A'
WEST
ELEVATION IN FEET
EAST
ELEVATION IN FEET
2
3
4
5
6
7
-3300
-3400
-3500
-3600
-3700
-3800
TAYLOR
AUSTIN
SUB-CLARKSVILLE
COKER
OIL
Shale
Limestone
Sand
HORIZONTAL SCALE
0 1 2 3 4 5
THOUSAND FEET


COMO FIELD
Hopkins County, Texas
Joe C. Kitchens
March 10, 1949
LEVI LANDERS
NACOGDOCHES UNIVERSITY
HERBERT HERFF #1 Ivey Rutherford
DISCOVERY
DELTA #1 Blake
A
A'
-3780
-3770
-3760
-3750
-3740
-3730
-3754
-3728
-3725
-3733
-3738
-3743
-3741
-3729
-3722
-3723
-3742
-3734
-3769
-3735
-3726
-3731
-3732
-3767
-3736
-3749
HOPKINS COUNTY
WOOD COUNTY
N
EXPLANATION
-3740 Contour on top of Coker sand
-3729 Elevation of top of Coker sand
Boundary of productive area
Oil well
Dry hole
SCALE
0 1 2 3 4 5
THOUSAND FEET

TYPE SECTION OF ROCKS PENETRATED

SURFACE FORMATION: Wilcox

ELEVATION OF SURFACE: Highest, 478 feet; lowest, 420 feet



OLDEST HORIZON PENETRATED: About 232 feet below top of Travis Peak.

CONCORD FIELD
Anderson County, Texas*

PHILIP M. ROBERTSON
Geologist, Magnolia Petroleum Company, Tyler, Texas
September 13, 1949

LOCATION

Concord field is located in northeastern Anderson County 9 miles north and slightly west of Palestine. It is just west of the axis of the East Texas basin.

METHODS OF EXPLORATION LEADING TO DISCOVERY

A gravity survey indicating an anomaly was followed by a reflection seismograph survey which indicated a structural dome. The first well drilled resulted in the discovery.

DISCOVERY

Woodbine sand: April 24, 1942;
Magnolia Petroleum Co. #1 W. C. Campbell.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated within the area of the Concord salt dome was drilled in Magnolia Petroleum Co. #1 Horowitz. This well penetrated 483 feet of Washita limestone (top at -4,889 feet) and then went into salt at the depth of 6,002 feet (-5,372) and was drilled in salt to the total depth of 6,327 feet.

NATURE OF TRAP

Woodbine sand: The single productive well is located on the flank of a piercement-type salt dome.

PRODUCTIVE AREA

Woodbine sand and Field: One well.

THICKNESS OF RESERVOIR ROCK

Woodbine sand: 20 feet.

LITHOLOGY OF RESERVOIR ROCK

Woodbine sand: Medium-grained, porous, gray sand with small flecks of white ash.

*Published by permission of Magnolia Petroleum Co.

CONTINUITY OF RESERVOIR ROCK

Woodbine sand: Throughout the north-central part of East Texas.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine sand:	Feet
Elevation of top of oil	-3,923
Elevation of bottom of oil	-3,943
Relief	20

The above figures represent the conditions in the one productive well at the time of its completion.

CHARACTER OF OIL

Woodbine sand:
Gravity: 12.2° Color: Black Base: Asphalt
The production was commercial only as a road oil.

WATER PRODUCTION

The only productive well went to water and was plugged and abandoned in 1943.

ACID TREATMENT

None.

SELECTED REFERENCE

Alexander, C. I. (1944) Concord salt dome, Anderson County, Texas: Amer. Assoc. Petr. Geol., Bull., vol. 28, pp. 1537-1538.

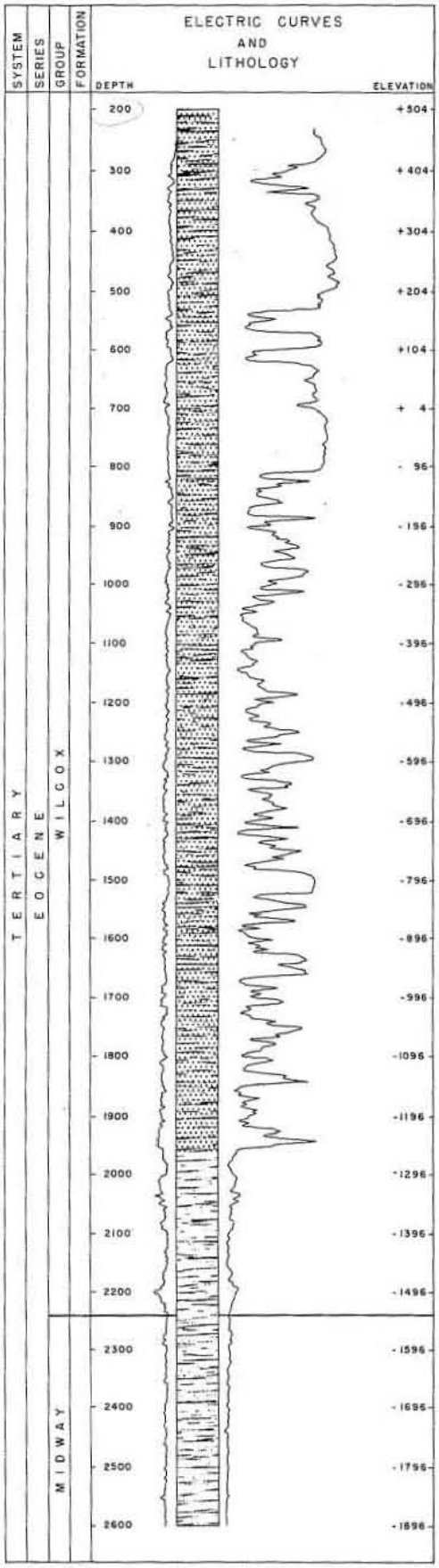
PRODUCTION HISTORY

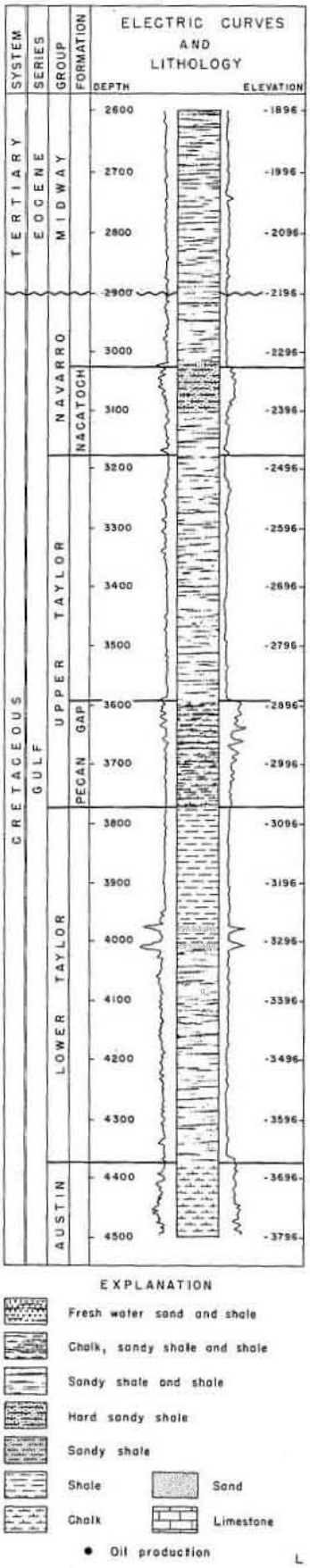
Woodbine sand and Total field:
The discovery well was completed on April 24, 1942, pumping 201 barrels of oil per day from open hole at the depth of 4,520-4,540 feet, after having been cased to 4,520 feet and plugged back from the total depth of 4,669 feet. From the time of its completion to the time of its abandonment in 1943, this well produced about 15,000 barrels of oil.

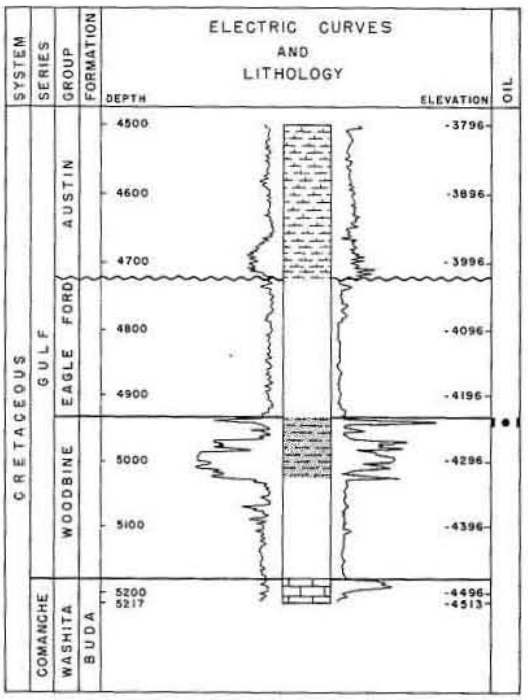
The subsequent wells on the dome were drilled into the Washita limestone without finding commercial production.

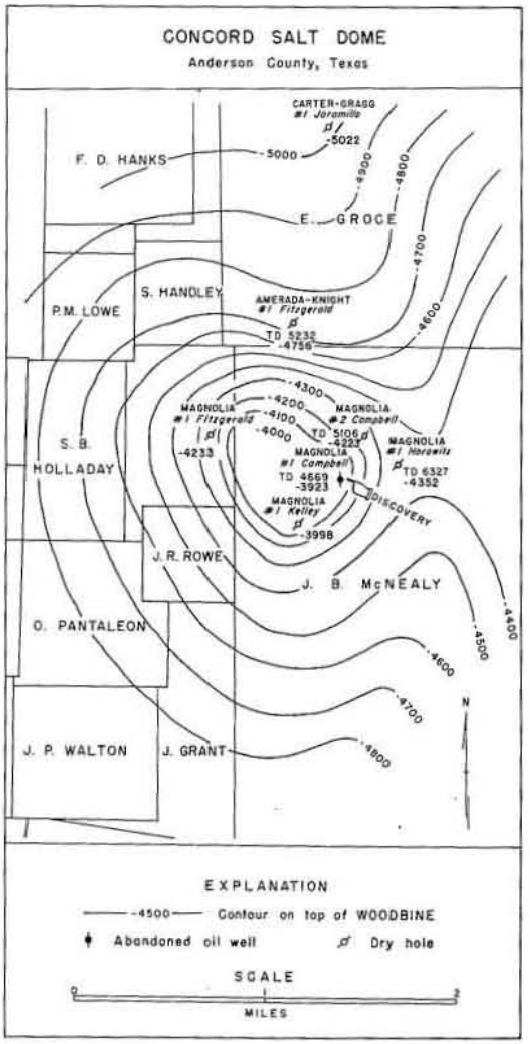
TYPE SECTION OF ROCKS PENETRATED

BY WELLS ON THE CONCORD SALT DOME









CORSICANA-POWELL FIELD
Navarro County, Texas

JAMES S. HUDNALL
Geologist, Hudnall & Pirtle, Tyler, Texas
October 9, 1950

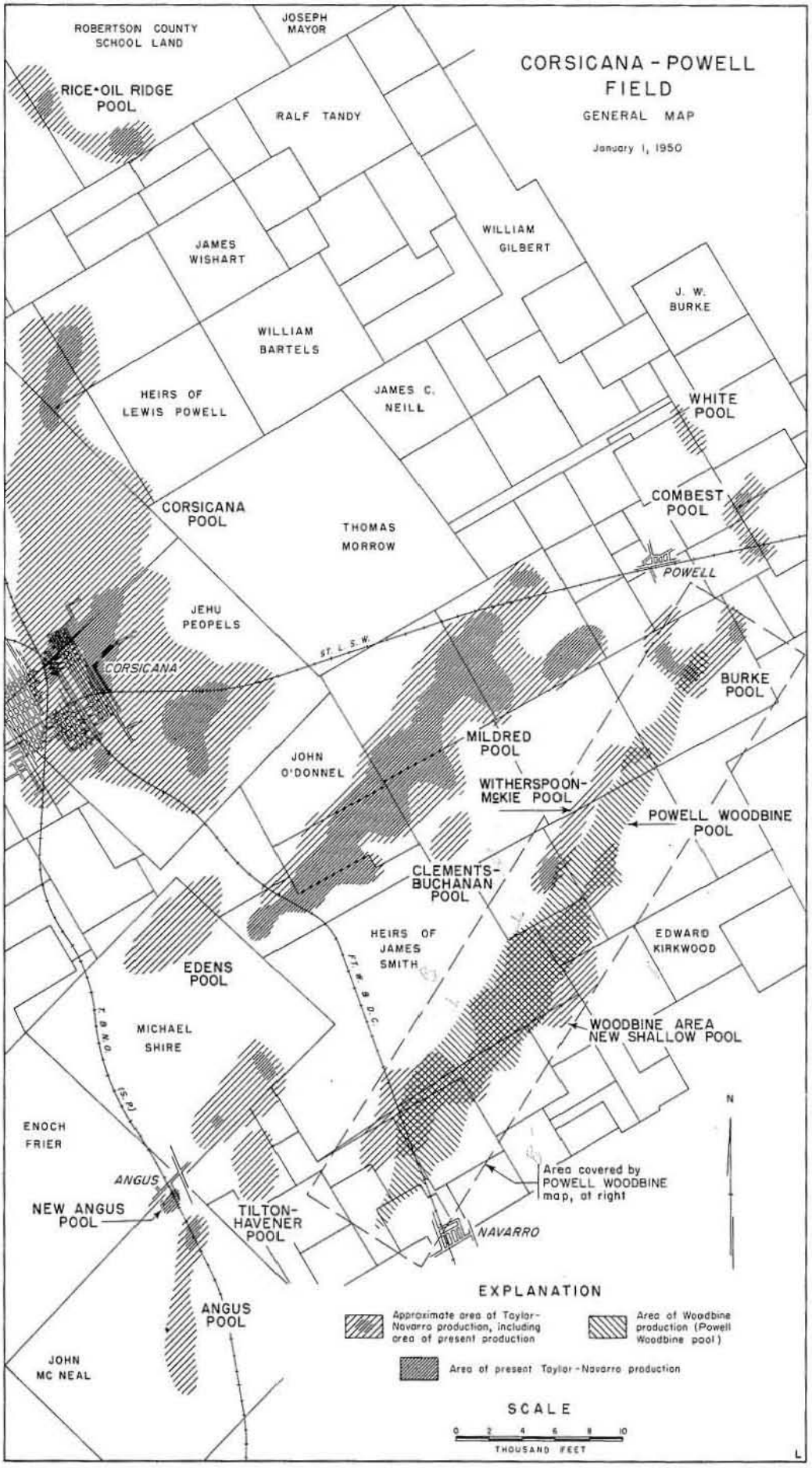
INTRODUCTION

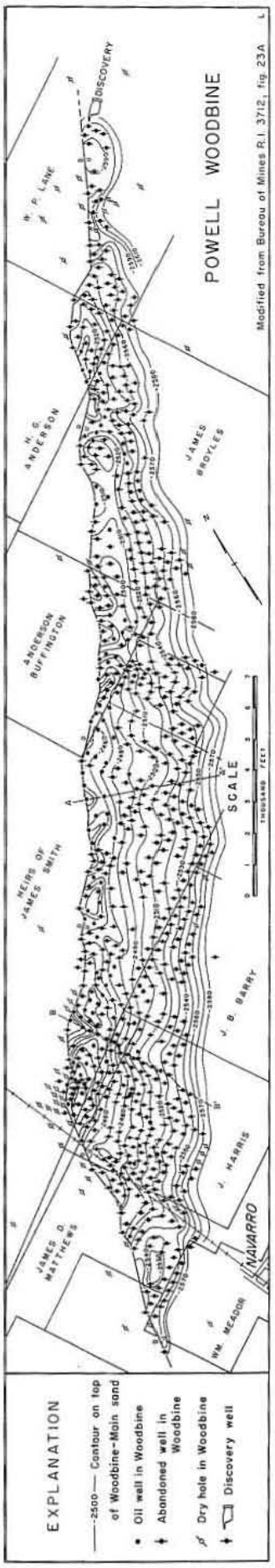
The Corsicana-Powell field is arbitrarily defined to include the area covered by the accompanying general map. It extends about 8 miles north, east and south of Corsicana. It includes several separate and distinct productive areas, each of which might well be the subject of a separate paper in this project except that sufficient data are not available to warrant separate treatment. There has been a long production history during which records have not been publicized in sufficient detail to afford adequate basis for technical studies. The distinctness of the several units of nature has been given only little recognition in the preservation of records. The writer presents the following data with the hope that in due course they may be supplemented in several material respects, although it is recognized that many desired data are permanently lost. The writer has assembled the following information from several sources, and in some cases, has had to select between conflicting data.

Corsicana was the first pool in Texas to produce oil in important quantity. For several years prior to its discovery, the annual production of Texas had been less than 100 barrels. As indicated by the following production data, Corsicana quickly became a large producer. It remained the largest producer in Texas until the discovery of Spindletop in 1901.

Until 1909, when gas was developed in Clay County, almost the entire quantity of gas marketed in Texas was produced and sold in Navarro County. Natural gas from wells in Navarro County supplied the city of Corsicana from 1900 to about 1914. The early supply of gas was largely from the Edens pool, where gas only was then produced, and from a few gas wells near Powell (mainly in the Witherspoon-McKie pool). A small gas field near Chatfield, 10 miles northeast of Corsicana, contributed some gas during four or five years after its discovery in 1905. These sources and scattered gas wells within the oil productive areas throughout the Corsicana-Powell field supplied the market until about 1914 when gas was piped from Mexia-Groesbeck to augment the dwindling and nearly exhausted supply. Of course, casinghead gas continued to be produced and it supplied fuel for pumping the oil wells. While gas has been very important in the Corsicana-Powell field, satisfactory data concerning gas are not now available.

Pool	Year discovered	Productive zone	Depths of wells, approx. (feet)	Elev. of top of prod. zone, approx. (feet) Highest	Lowest	No. of wells producing 1/1/50 approx.
Corsicana	1895	Corsicana	900 - 1,260	-530	-800	185
Mildred (Elm Ridge)	1899	Nacatoch	740 - 1,250	-210	-460	287
Burke	1900	Nacatoch		-400	-480	12
Clements-Buchanan	About 1900	Nacatoch ?		-395	-490	13
Combest	About 1900	Nacatoch				?
Edens (gas)	About 1900	Edens		-630	-660	?
Tilton-Havenor	About 1900	Nacatoch ?		-400	-540	?
White	About 1900	Nacatoch				?
Witherspoon-McKie	About 1900	Nacatoch	825 - 975			7
Rice-Oil Ridge	About 1909	Corsicana	960 - 1,000			32
Angus	Prior to 1915	Nacatoch ?	600 - 800	-200	-340	5
Powell Woodbine	1923	Woodbine	2,925 - 3,000	-2,420	-2,600	87
Woodbine Area New Shallow	1924	Nacatoch & Corsicana	750 - 1,550 (up) 1,150 - 1,950 (down)			7
New Angus	1946	Corsicana	1,450 (See Field Paper in this volume)			1


CORSICANA - POWELL FIELD
GENERAL MAP
January 1, 1950
ROBERTSON COUNTY SCHOOL LAND
JOSEPH MAYOR
RICE-OIL RIDGE POOL
RALF TANDY
JAMES WISHART
WILLIAM GILBERT
J. W. BURKE
WILLIAM BARTELS
HEIRS OF LEWIS POWELL
JAMES C. NEILL
WHITE POOL
CORSICANA POOL
THOMAS MORROW
COMBEST POOL
POWELL
JEHU PEOPELS
ST. L. S. W.
CORSICANA
BURKE POOL
MILDRED POOL
JOHN O'DONNEL
WITHERSPOON-McKIE POOL
POWELL WOODBINE POOL
CLEMENTS-BUCHANAN POOL
HEIRS OF JAMES SMITH
EDWARD KIRKWOOD
EDENS POOL
T. & N. O. (S. P.)
MICHAEL SHIRE
WOODBINE AREA NEW SHALLOW POOL
ENOCH FRIER
ANGUS
NEW ANGUS POOL
TILTON-HAVENER POOL
NAVARRO
Area covered by POWELL WOODBINE map, at right
ANGUS POOL
JOHN MC NEAL
N
EXPLANATION
Approximate area of Taylor-Navarro production, including area of present production
Area of Woodbine production (Powell Woodbine pool)
Area of present Taylor-Navarro production
SCALE
0 2 4 6 8 10
THOUSAND FEET


POWELL WOODBINE
Modified from Bureau of Mines R.I. 3712, fig. 23A
DISCOVERY
W. P. LANE
H. G. ANDERSON
JAMES BOYLES
ANDERSON BUFFINGTON
HEIRS OF JAMES SMITH
J. B. BARRY
J. HARRIS
JAMES O. MATTHEWS
WM. MEADOR
NAVARRO
SCALE
THOUSAND FEET
EXPLANATION
-2500- Contour on top of Woodbine-Main sand
Oil well in Woodbine
Abandoned well in Woodbine
Dry hole in Woodbine
Discovery well

METHODS OF EXPLORATION and DISCOVERIES

Corsicana pool: The discovery of oil in Corsicana followed the finding of oil in a well that was being drilled in 1894 for the city of Corsicana in search of an additional municipal water supply. In this water well, which was near the center of the city, oil was found at a depth of 1,027 feet. The oil was cased off and drilling continued to a depth of 2,470 feet, at which depth a good flow of warm artesian water was encountered. The seepage of oil, which found its way to the surface around the outside of the casing, aroused the interest of the citizens, who organized a company to test the area. The new company drilled 200 feet south of the artesian water well, and, in October 1895, found oil at the depth of 1,040 feet. This first oil well yielded $2\frac{1}{2}$ barrels of oil per day. In May 1896, the second well was completed, yielding 22 barrels of oil per day. In 1896 the production amounted to 1,450 barrels from 5 wells, and thereafter development proceeded rapidly. Subsequent development has shown that the discovery well is at the western edge of the pool.

Other shallow pools: Following discovery of oil at Corsicana, random drilling led to discovery of other pools in the field. Some of the later pre-Woodbine discoveries were probably due to interpretation of geological data, surface and subsurface.

Powell Woodbine pool: The discovery well was drilled on the southeast and upthrown side of a fault running in a northeast-southwest direction. Surface and subsurface mapping afforded the basis for choosing the location. The discovery well was Corsicana Deep Well Co. #1 J. H. Burke, which was completed on January 8, 1923, after having been about 3 years in process of drilling. Initial production was at the rate of 400 barrels of oil per day from Woodbine sand at depth of 2,960 to 2,963 feet (-2,597 to -2,600 feet.) In less than 30 days after completion, salt water appeared and the well quickly went to water.

Woodbine Area New Shallow pool: In the rush of drilling for Woodbine production, development of the shallow sands was deferred. Favorable showings in the shallow sands were observed, but the sands were cased off pending later development. After the Woodbine production declined, wells were drilled to test zones where showings had been observed, and, later, many of the deep wells were plugged back to produce from the shallower sands. An unknown number of reservoirs in upper Taylor and lower Navarro added a total of about 750 acres to the area productive from shallow sands.

SURFACE FORMATIONS

Corsicana-Powell field: Wills Point clay, Midway, Navarro, Nacatoch.

Powell Woodbine pool: Wills Point clay, which forms a more or less flat surface.

ELEVATION OF SURFACE

Corsicana-Powell field: 320 to 450 feet.

Powell Woodbine pool: 388 to 430 feet.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

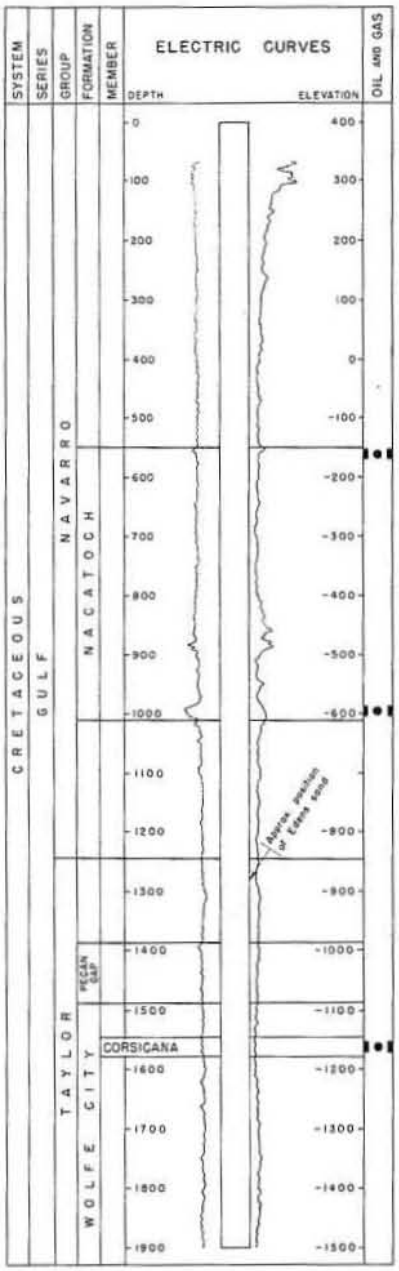
Corsicana-Powell field: The oldest stratigraphic horizon penetrated is within the Trinity group. This penetration was in a well drilled to the total depth of 6,506 feet in the area of the Powell Woodbine pool.

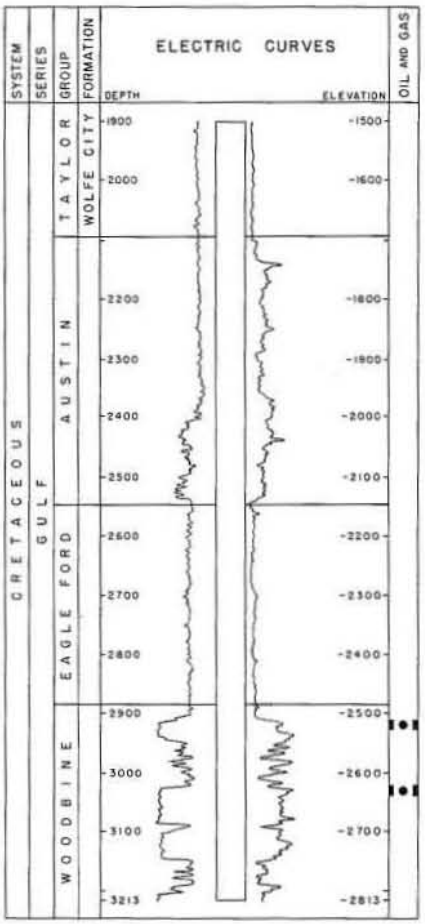
STRATIGRAPHIC POSITIONS OF OIL AND GAS

Shallow pools: There is considerable uncertainty as to the exact stratigraphic positions of some of the reservoirs. There are sands at various positions in the upper part of the Taylor and in the lower part of the Navarro. Many of these sands are of only local extent. The irregularity in the distribution of sands, coupled with structure more complicated than it was thought to be during the development period, resulted in considerable confusion. It is unfortunate that the extensive faulting in the area was not recognized until after most of the pools had been developed. Although they are probably erroneous in some details, the indication of stratigraphic positions on the preceding page are believed to be essentially correct so far as they go. The several entries of "?" indicate uncertainty, but generally there is little doubt about some portion of the production being from one or more sands in the indicated zone, with some probability that some production is from another zone. The shallow productive sands are all known to be within a zone including upper Taylor and lower Navarro, but as to positions within that zone, there is much doubt. There is little doubt that practically all of the oil produced in the Corsicana pool came from Taylor sand or sands, but the large quantity produced in the Mildred pool cannot be assigned to Navarro sands with an equal degree of confidence. There are several sands in the Nacatoch formation and it is possible that this condition has led to assigning to Nacatoch some reservoirs which are actually lower in the section. The Edens sand may be one of the productive sands in the Mildred pool and in the Woodbine Area New Shallow pool. It appears likely that one sand which has contributed a small amount to the total production is about 200 feet above the top of the Nacatoch formation.

Powell Woodbine pool: There are two productive zones within the Woodbine group. The Woodbine Main sand has been productive throughout the area of Woodbine production and has contributed all but a small percentage of the Woodbine oil. The Woodbine Big Pay sand is about 35 to 40 feet below the Main sand and was productive only locally in an area of about 50 acres at the highest part of the structure.

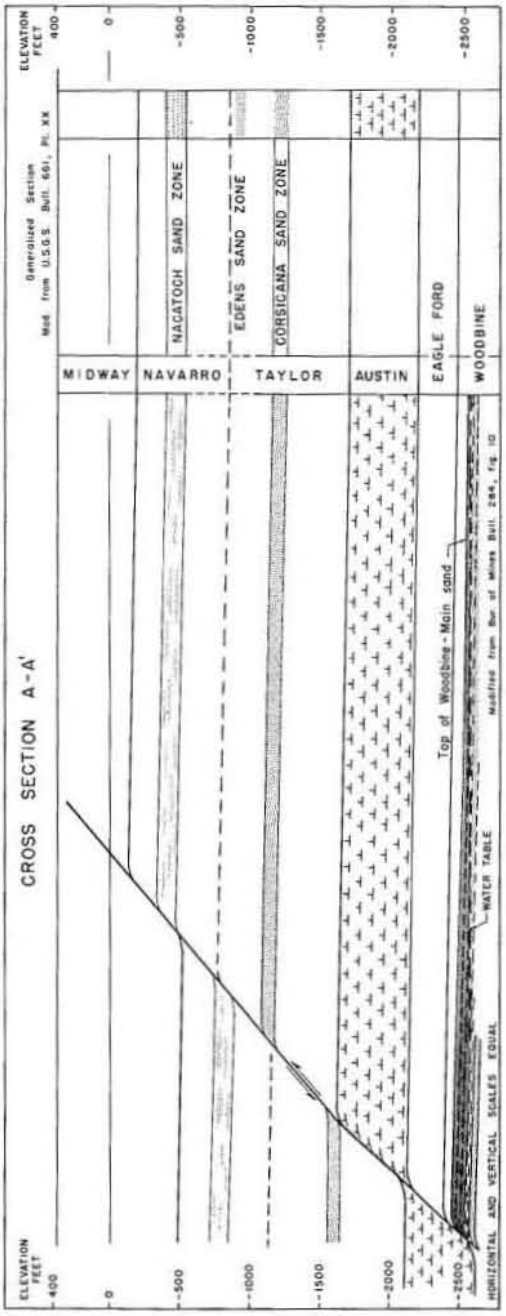
TYPE SECTION OF ROCKS PENETRATED

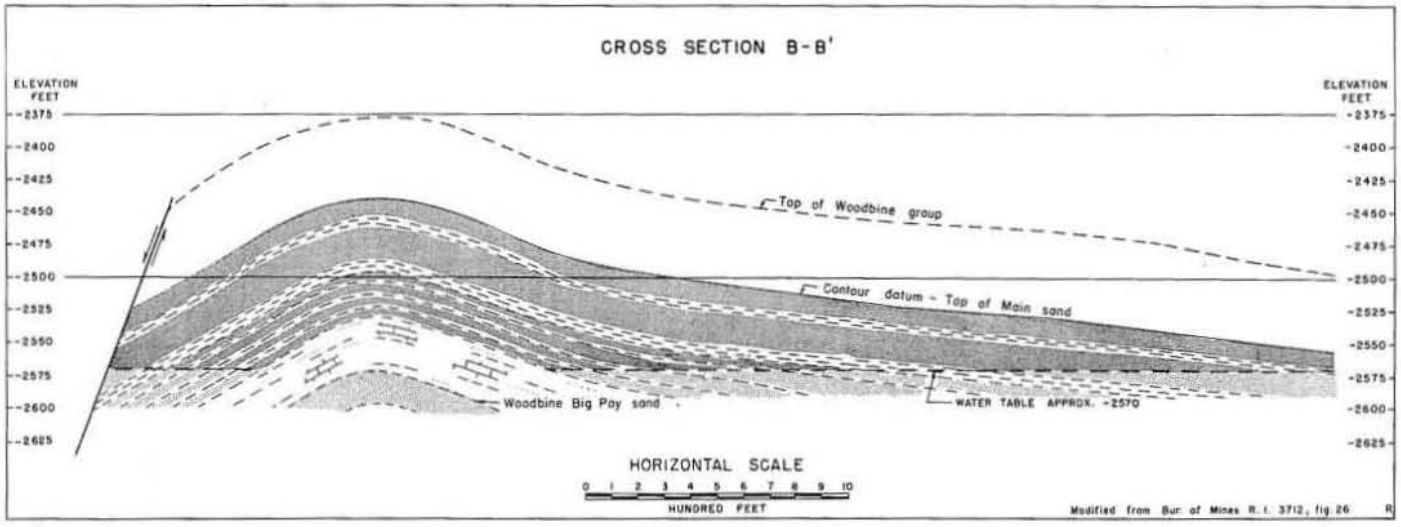




EXPLANATION

Distribution of productive reservoirs within upper Taylor and lower Navarro is so variable that no one section can appropriately be said to be typical in this respect for all the numerous pools in the Corsicana - Powell field. There are many productive sand lenses within upper Taylor and lower Navarro. While this section is fairly representive, it is not intended to convey an impression of constant stratigraphic positions of the sands.





AREAL DISTRIBUTION OF OIL AND GAS

The accompanying general map serves to indicate approximately the productive areas. The boundaries are accurate as to the Powell Woodbine pool but other boundaries are only approximate. It appears likely that there have been several cases of temporary production from one or a few shallow wells at locations not indicated on the map. In generalizing the boundaries, non-productive areas have been included to a slight extent. The areas indicated on the map have been productive of oil. In the early history of the field, gas was being produced generally in minor quantity along with the oil. At that time, in the Edens pool and in the Witherspoon-McKie pool, there were small groups of gas wells and there were isolated gas wells throughout the area, particularly along the western edge of the Corsicana pool. There were few wells, if any, which produced gas only after 1914.

NATURE OF TRAPS and STRUCTURE

General structure: The strata of the region dip generally slightly south of east at the rate of about 115 feet per mile. This general dip is interrupted by the Luling-Mexia-Talco fault system which crosses the area in a north-south direction. A deep graben within the fault zone occasions much local folding.

Corsicana pool: It appears that either updip decrease in porosity or lensing is the main trap-forming factor in each of the several reservoirs constituting this pool. Such changes along strike as well as updip have occasioned, within the general area indicated on the map, distinct productive areas with non-productive areas between. This pool is west of the above mentioned fault zone.

Other shallow pools: Data are not available for determining the trap-forming factors in the many individual reservoirs in the several shallow pools. It appears that most of the accumulations of oil and gas were due to traps formed mainly by folding and faulting. However, it is known that many of the sands are local and that lensing plays a role in forming the traps, probably the predominant role in a few reservoirs. The Woodbine Area New Shallow pool includes reservoirs in convex folds on both the upthrown and downthrown side of the major fault.

Powell Woodbine pool: This pool is typical of the pools in which oil and gas have accumulated on the upthrown side of a major fault. The trap in the Main sand is due to a combination of a reversal of the regional dip and to termination of the reservoir rocks against a fault. Convex folding appears to account for the trap in the Big Pay sand.

PRODUCTIVE AREAS, RESERVOIR THICKNESSES and LITHOLOGY

Pool	Productive area (acres)	Reservoir rocks		
		Character	Porosity (%)	Avg. net thickness (feet)
Corsicana	2,400	Fine sand	25 - 28	30
Mildred (Elm Ridge)	2,500	Fine sand	20 - 25	20
Witherspoon-McKie	400	Fine sand	14 - 19	13
Angus, Edens, Hodge	900	Fine sand	12 - 18	18
Burke	250	Fine sand	12 - 18	11
Rice-Oil Ridge	650	Fine sand	12 - 17	12
Woodbine Area New Shallow	750	Fine sand	14 - 20	15
New Angus	20	Fine sand		10
Other shallow pools	500	Fine sand		
Total shallow	8,370			
Woodbine Powell	2,600	Sand*	28	45
Corsicana-Powell field	9,900			

*There are many shale breaks within the Woodbine Main sand.

CONTINUITY OF RESERVOIR ROCKS

Nacatoch sand: As a group of sands, eastward from the outcrop along the west edge of the field, this zone is continuous throughout the area of the field and far beyond. There appears to be no one sand which is continuous over an extensive area. The sand members, generally one to four, are lenticular and are separated by shale members.

Edens sand: The Edens sand was named for its occurrence in the area of the pool by this name. Beyond the limits of this pool, this sand has not been positively correlated, although sands at several places are recognized as being at about the position of this sand. It is definitely not a blanket sand, but it is at or about the position of sand bodies at various places in the field. It has been tentatively correlated with the productive sand in the Chatfield gas field, which is located just beyond the northern boundary of the Corsicana-Powell field.

Corsicana sand: The Corsicana sand is present throughout the area and is believed to be the equivalent of the Wolfe City sand which has wide distribution in the region. At the west edge of the Corsicana pool, porosity in the zone is erratic because of increased shale content. Lack of continuity of porosity occasions the formation of traps in the gently sloping porous zone.

Woodbine Main sand: This sand is continuous throughout the area of the Powell Woodbine pool. It is of essentially uniform character and thickness throughout this area.

Woodbine Big Pay sand: This sand was productive in an area of only about 50 acres and its continuity beyond this area is not known.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Powell Woodbine pool:	Main sand	Big pay
Elev. of top of oil, feet	-2,420	-2,545
Elev. of bottom of oil, feet	-2,570	-2,570
Relief, feet	150	35

CHARACTER OF OIL AND GAS

Pool	Character of oil: Gravity, A.P.I.@60°F. Max.	Min.	Avg.	Sulphur %	Base	Character of gas: B.t.u. per cu. ft.	Gals. gas per Mcf
Corsicana	37.1	35.9	36.6	.3	Intermediate	1,040	1.8
Mildred (Elm Ridge)	25.0	18.0	19.0	.6	Intermediate	1,040	1.7
Witherspoon-McKie	20.0	18	19.0	.6	Intermediate	1,040	1.6
Angus, Edens, Hodge	36.5	35	36	.6	Intermediate	1,040	2.8
Burke	21	21	21	.8	Intermediate	1,040	
Rice-Oil Ridge	36.4	35.2	35.7	.4	Intermediate	1,040	1.9
Powell Woodbine	38	36	37	.3	Intermediate	1,080	2.5
Woodbine Area New Shallow	34.8	23.5	33	.4	Intermediate		
New Angus			39				

For analyses see:

U. S. Bureau of Mines	Reference designation
Properties of Typical Crude Oils from the Producing Fields of Northern Texas, Northern Louisiana and Arkansas. R.I. 2293 (1921)	A
Production and Development Problems in the Powell Woodbine Oil Field, Navarro County, Texas. Bulletin 284 (1928)	B
Tabulated Analyses of Representative Crude Petroleums of the United States, Bulletin 291 (1928)	C
Tabulated Analyses of Texas Crude Oils. R.I. 3252 (1934)	D
Tabulated Analyses of Texas Crude Oils. T.P. 607 (1939)	E

Lab. No.	703	256 & 23365	23413	24385	24386	221 & 24387	222 & 24388	24876	24877	24913	26511	27388	38084	38085
Reference designation														
A, Item	703													
B, Table				39	41					40	42			
C, Item		256			257	221	222							
D, Grp. 4, Item		33	34	35	36	3	4	37	38	39	40			
E, Grp. 4, Item		50	48		47	6	5				46	45	49	51

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PRODUCTION HISTORY

For the years 1932 to 1935, inclusive, R. B. Kelly and Paul R. Martin, in their annual papers in Petroleum Development and Technology, A.I.M.E., reported data in more detail than are available for other years. The following data are transcribed from those papers:

Pool	Number of oil wells				Total oil production (barrels)				Average oil production to end of 1934 (barrels)	
	Completed to end of		Producing at end of		During	During	During	To end of		
	1933	1935	1933	1935	1932	1933	1934	1935	Per acre	Per acre-foot
Corsicana	1,280	1,280	275	439	42,110	34,675	112,205	111,690	4,798,480	1,953 130
Mildred (Elm Ridge)	1,270	1,270	314	21	57,370	47,180	23,725	6,025	5,808,123	2,321 145
Witherspoon-McKie	85	85	42	0	8,790	8,030	3,960	Depleted	810,495	2,025 156
Angus, Edens, Hodge	205	205	58	40	14,020	13,505	7,200	7,030	1,548,282	1,713 95
Burke	85	85	19	60	4,820	4,645	25,800	25,550	235,930	1,242 113
Rice-Oil Ridge	95	95	68	56	10,840	10,585	8,760	14,965	1,139,400	1,704 142
Powell Woodbine	821	821	191	129	979,645	964,830	884,491	812,208	106,915,279	42,240 939
Woodbine Area New Shallow	185*	237*	70	28	38,610	32,120	40,680	38,160	3,762,100	1,000 67

*Includes Woodbine depleted wells plugged back and casing ripped to produce shallow oil; 50 to end of 1933 and 55 to end of 1935.

PRODUCTION HISTORY

Total of shallow pools

	NUMBER OF OIL WELLS						OIL PRODUCTION (barrels)				
	Corsicana and Powell Shallow					Woodbine Area New Shallow					
	Completed		Abandoned		Producing,	Prod. during		Powell	Woodbine Area	Total Shallow	
Year	Yearly	Cum.	Yearly	Cum.	end of year	Year, avg.	Corsicana*	Shallow**	New Shallow	Yearly	Cumulative
1896	4	5	0	0	5		1,450			1,450	1,450
1897	32	37	0	0	37		65,975			65,975	67,425
1898	346	383	7	7	376		544,620			544,620	612,045
1899	178	561	79	86	475		668,483			668,483	1,280,528
1900	275	836	112	198	638		829,554	6,749		836,303	2,116,831
1901	52	888	27	225	663		763,424	37,121		800,545	2,917,376
1902	15	903	45	270	633		571,059	46,812		617,871	3,535,247
1903	73	976	51	321	655		401,817	100,143		501,960	4,037,207
1904	49	1,025	31	352	673		374,318	129,329		503,647	4,540,854
1905	50	1,075	41	393	682		311,554	132,866		444,420	4,985,274
1906	230	1,305	79	472	833		332,622	673,221		1,005,843	4,991,117
1907	74	1,379	62	534	845		226,311	596,897		823,208	6,814,325
1908	38	1,417	8	542	875		211,117	421,659		632,776	7,447,101
1909	94	1,511	19	561	950		180,764	383,137		563,901	8,011,002
1910	73	1,584	28	589	995		137,331	450,188		587,519	8,598,521
1911	20	1,604	160	749	855		128,526	373,055		501,581	9,100,102
1912	17	1,621	7	756	865		233,282	251,240		484,522	9,584,624
1913	3	1,624	1	757	867		158,830(a)	282,476(b)		441,306	10,025,930
1914	10	1,634	22	779	855		133,811	282,279		416,090	10,442,020
1915	7	1,641	2	781	860		143,275	237,410		380,685	10,822,705
1916							135,263	215,729		350,992	11,173,697
1917							131,828	196,855		328,683	11,502,380
1918							117,577	195,207		312,784	11,815,164
1919								269,000		269,000	12,084,164
1920								297,000		297,000	12,381,164
1921								305,335		305,335	12,686,499
1922								245,705		245,705	12,932,204
1923						90		292,000	72,000	364,000	13,296,204
1924						100		281,800	90,000	371,800	13,668,004
1925						196		269,150	900,000	1,169,150	14,837,154
1926						275		246,300	903,000	1,149,300	15,986,454
1927						280		246,000	541,000	787,000	16,773,454
1928						258		235,000	404,000	639,000	17,412,454
1929						237		225,000	329,000	554,000	17,966,454
1930						190		215,000	202,167	417,167	18,383,621
1931						125		140,000	97,250	237,250	18,620,871
1932	0	3,027			999	100		126,095	70,700	196,795	18,817,666
1933	8	3,035	150	2,189	846	70		144,000	43,325	187,325	19,004,991
1934	0	3,035	121	2,310	725	48		149,129	28,528	177,657	19,182,648
1935	0	3,035	84	2,394	641	42		160,729	22,060	182,789	19,365,437
1936	2	3,037	12	2,406	631	43		166,759	23,000	189,759	19,555,196
1937	0	3,037	5	2,411	626	49		159,373	23,500	182,873	19,738,069
1938	0	3,037	0	2,411	626	50		152,803	22,000	174,803	19,912,872
1939	0	3,037	1	2,412	625	50		151,729	20,500	172,229	20,085,101
1940	4	3,041	2	2,414	627	46		153,385	16,500	169,885	20,254,986
1941	0	3,041	11	2,425	616	50		142,181	14,500	156,681	20,411,667
1942	0	3,041	7	2,432	609	18		137,241	13,500	150,741	20,562,408
1943	1	3,042	3	2,435	607	19		137,264	12,000	149,264	20,711,672
1944	0	3,042	17	2,452	590	10		126,008	9,200	135,208	20,846,880
1945	2	3,044	0	2,452	592	10		125,275	9,000	134,275	20,981,155
1946	3	3,047	0	2,452	595	10		120,857	9,100	129,957	21,111,112
1947	0	3,047	41	2,493	554	10		120,843	9,000	129,843	21,240,955
1948	0	3,047	4	2,497	550	9		119,488	8,200	137,688	21,378,643
1949	0	3,047	2	2,499	548	7		122,918	8,000	130,918	21,509,561

*Includes Corsicana, Edens, Angus and Tilton-Havenor.

**Includes Mildred, Witherspoon-McKie, Clements-Buchanan, Burke, Combest and White.

New Angus: In addition to the above, New Angus, discovered in 1946, produced in 1946 a total of 2,022 barrels; in 1947, 3,221 barrels; in 1948, 2,919 barrels and in 1949, 2,543 barrels; a total of 10,705 barrels to end of 1949. There has been only one productive well. Its production appears to come from the Corsicana sand.

Secondary recovery by means of water flooding is now underway. Water produced from the Woodbine sand is being injected into the shallow sands.

PRODUCTION HISTORY (CONT'D)

Powell Woodbine

Year	WELLS PRODUCING during year, average	OIL PRODUCTION (barrels) Yearly	OIL PRODUCTION (barrels) Cumulative	WATER PRODUCTION (barrels) Yearly	WATER PRODUCTION (barrels) Cumulative
1923	145	29,899,589	29,899,589	5,000,000	5,000,000
1924	611	32,886,381	62,785,970	35,724,000	40,724,000
1925	593	16,195,301	78,981,271	34,708,000	75,432,000
1926	550	9,923,240	88,904,511	33,553,000	108,985,000
1927	521	5,298,108	94,202,619	33,088,000	142,073,000
1928	436	3,535,247	97,737,866	31,953,000	174,026,000
1929	370	2,447,615	100,185,481	31,931,000	205,957,000
1930	284	1,834,615	102,020,096	31,910,000	237,867,000
1931	181	1,160,331	103,180,427	26,504,000	264,371,000
1932	136	884,082	104,064,509	21,833,000	286,204,000
1933	135	946,521	105,011,030	26,841,000	313,045,000
1934	133	851,993	105,863,023	24,933,000	337,938,000
1935	125	809,676	106,672,699	25,459,000	363,437,000
1936	123	774,864	107,447,563	26,576,000	390,013,000
1937	122	769,535	108,217,098	29,133,000	419,146,000
1938	121	709,115	108,926,213	27,828,000	446,974,000
1939	112	660,723	109,586,936	26,244,000	473,218,000
1940	102	614,353	110,201,289	25,330,000	498,548,000
1941	98	573,168	110,774,457	24,419,000	522,967,000
1942	98	548,803	111,323,260	26,955,000	549,922,000
1943	98	539,219	111,862,479	22,770,000	572,692,000
1944	96	468,625	112,331,104	25,372,000	598,064,000
1945	90	441,562	112,772,666	20,192,000	618,256,000
1946	89	427,435	113,200,101	19,916,000	638,172,000
1947	86	391,147	113,591,248	18,266,000	656,438,000
1948	85	365,812	113,957,060	16,720,000	673,158,000
1949	87	350,551	114,307,611	16,398,000	689,556,000

Corsicana-Powell field totals

Year	WELLS PRODUCING at end of year, approximate	OIL PRODUCTION (barrels) Yearly	OIL PRODUCTION (barrels) Cumulative	Year	WELLS PRODUCING at end of year, approximate	OIL PRODUCTION (barrels) Yearly	OIL PRODUCTION (barrels) Cumulative
1896	5	1,450	1,450	1923	235	30,263,589	43,195,793
1997	37	65,975	67,425	1924	711	33,258,181	76,453,974
1898	376	544,620	612,045	1925	789	17,364,451	93,818,425
1899	475	668,483	1,280,528	1926	825	11,072,540	104,890,965
1900	638	836,303	2,116,831	1927	801	6,085,108	110,976,073
1901	663	800,545	2,917,376	1928	694	4,174,247	115,150,320
1902	633	617,871	3,535,247	1929	607	3,001,615	118,151,935
1903	655	501,960	4,037,207	1930	474	2,251,782	120,403,717
1904	673	503,647	4,540,854	1931	306	1,397,581	121,801,298
1905	682	444,420	4,985,274	1932	1,235	1,080,877	122,882,175
1906	833	1,005,843	5,991,117	1933	1,051	1,133,846	124,016,021
1907	845	823,208	6,814,325	1934	906	1,029,650	125,045,671
1908	875	632,776	7,447,101	1935	808	992,465	126,038,136
1909	950	563,901	8,011,002	1936	797	964,623	127,002,759
1910	995	587,519	8,598,521	1937	797	952,408	127,955,167
1911	855	501,581	9,100,102	1938	797	883,918	128,839,085
1912	865	484,522	9,584,624	1939	787	832,952	129,672,037
1913	867	441,306	10,025,930	1940	775	784,238	130,456,275
1914	855	416,090	10,442,020	1941	764	729,849	131,186,124
1915	860	380,685	10,822,705	1942	725	699,544	131,885,668
1916		350,992	11,173,697	1943	724	688,483	132,574,151
1917		328,683	11,502,380	1944	696	603,833	133,177,984
1918		312,784	11,815,164	1945	692	575,837	133,753,821
1919		269,000	12,084,164	1946	694	557,392	134,311,213
1920		297,000	12,381,164	1947	650	520,990	134,832,203
1921		305,335	12,686,499	1948	644	503,500	135,335,703
1922		245,705	12,932,204	1949	642	481,469	135,817,172

The small quantities reported on the preceding page for New Angus should be added to the above totals.

CURRIE FIELD
Navarro County, Texas

FREDERICK R. SCHEERER
Geologist, Atlantic Refining Co., Tyler, Texas
November 24, 1950

LOCATION

Currie field is in southern Navarro County 10 miles north of the town of Mexia and 3 miles north of the Wortham field. It is in the zone of the Luling-Mexia-Talco fault system.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Several shallow oil wells had been drilled near the town of Currie before the discovery of the Currie field. These wells were not on the main Currie structure. Surface mapping by W. A. Reiter, F. Julius Fohs and H. M. Robinson led to the drilling of the well which discovered the Currie field. The surface mapping indicated a long unfaulted anticline. Evidences of the fault which controls the oil accumulation are almost entirely masked at the surface by soil on long even slopes of plowed land and pasture.

DISCOVERIES

Woodbine Main pay: October 21, 1921; Humphreys-Mexia Co. #1 Meador. This well was completed at the depth of 2,994 feet with an initial yield of about 400 barrels of oil per day.

Woodbine Morrow pay: April 1923; J. K. Hughes #1 Morrow. This well was drilled to a depth of 3,181 feet, or 2,770 feet below sea level, and discovered gas and oil in the Morrow sand.

ELEVATION OF SURFACE

Currie field has an average elevation of 400 feet.

SURFACE FORMATIONS

The Wills Point and Kincaid formations, both in the Midway group, are the only formations exposed within the general area of the Currie field.

PRODUCTIVE AREAS

Woodbine Main pay	407 acres
Woodbine Morrow pay	28 acres
Currie field	435 acres

The Morrow productive area is in a narrow strip parallel to and immediately northwest of the Main pay productive area at the southwest end of the field; in fact, the areas may overlap slightly in places. The overall productive area is about 12,000 feet long and has maximum width of about 3,000 feet.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest stratigraphic horizon penetrated in the vicinity of the Currie field is about 100 feet below the top of the Pettet. This penetration was in the R. J. Caraway #1 W. F. Eckhard, a dry hole drilled to the depth of 5,893 feet.

NATURE OF TRAPS

Woodbine sands: Oil is trapped in the Woodbine sands by closures against a northeast-southwest trending fault, which has a total displacement of about 450 feet. The closures here are more irregular than at the other fields along the Mexia-Powell fault zone.

THICKNESSES AND LITHOLOGY OF RESERVOIR ROCKS

The reservoir rocks are sands in the Woodbine formation. The Woodbine consists of sands, gray shales and a few thin limestone beds laid down by the transgressing Woodbine sea.

The Main pay at Currie consists of a sand body, about 40 feet thick, located about 60 feet below the top of the Woodbine formation. The top of this Main pay is the horizon contoured on the accompanying map. The Main pay is overlain by gray shales and sandy shales, and there are a few shale breaks within the Main pay itself.

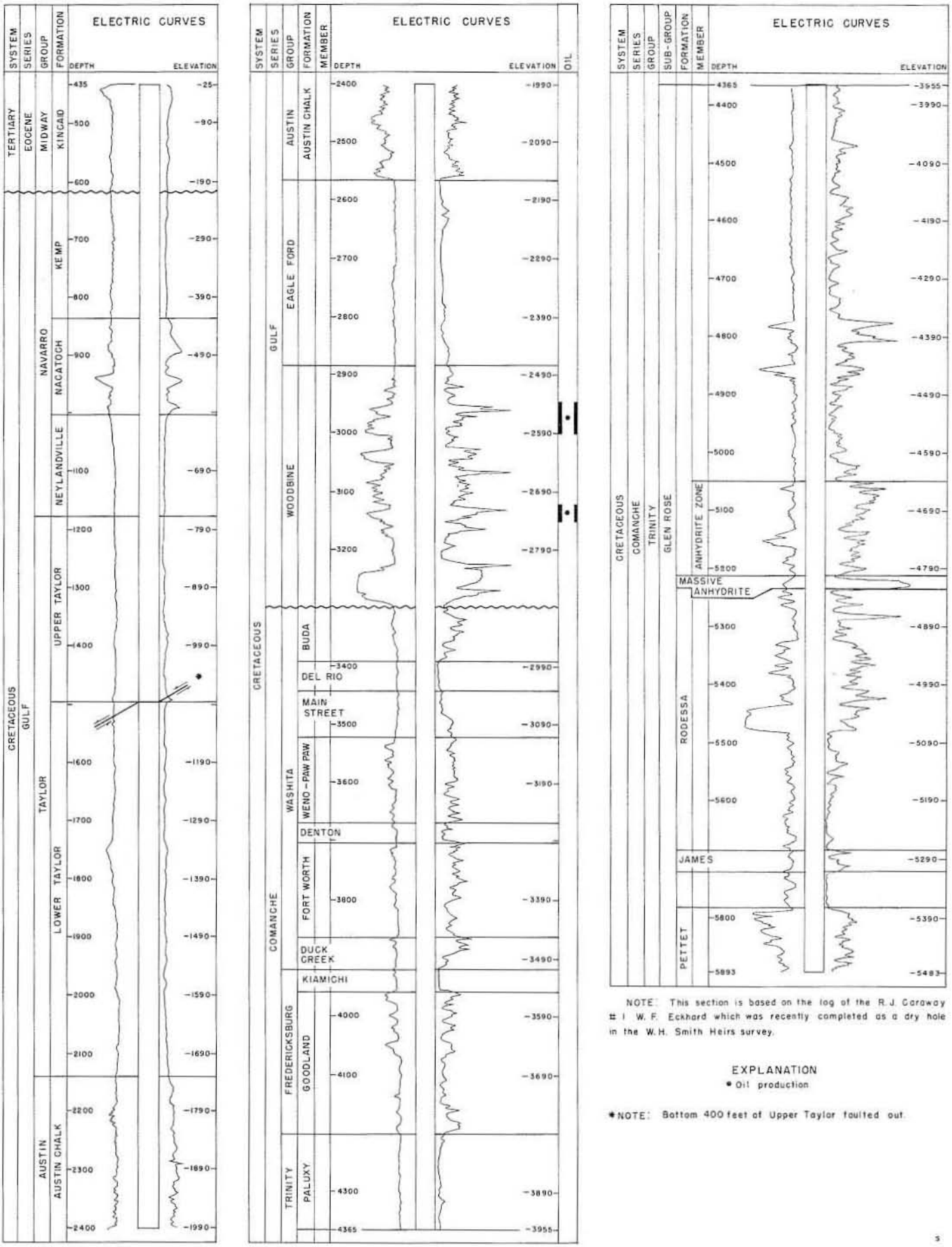
There is a second pay, known as the Morrow sand, in the south end of Currie field. This pay is approximately 225 feet below the top of the Woodbine formation. It is about 30 feet thick.

The Main pay and the Morrow pay have separate water tables. The original oil-water contact in the Main pay was at approximately 2,550 feet below sea level, while the top of the Morrow pay, at its highest elevation, is about 2,735 feet below sea level.

CONTINUITY OF RESERVOIR ROCKS

Woodbine sands: Due to the very poor logging methods in use at the time Currie field was developed, it is hard to trace individual sand bodies from one well to another. However, it appears that the Main pay is a blanket sand and is found throughout the entire field. The Morrow pay produces only along the fault line in the south half of the field. Outside the area where it is productive, only very few wells have been drilled to its depth. However, it too appears to be a blanket sand.

TYPE SECTION OF ROCKS PENETRATED

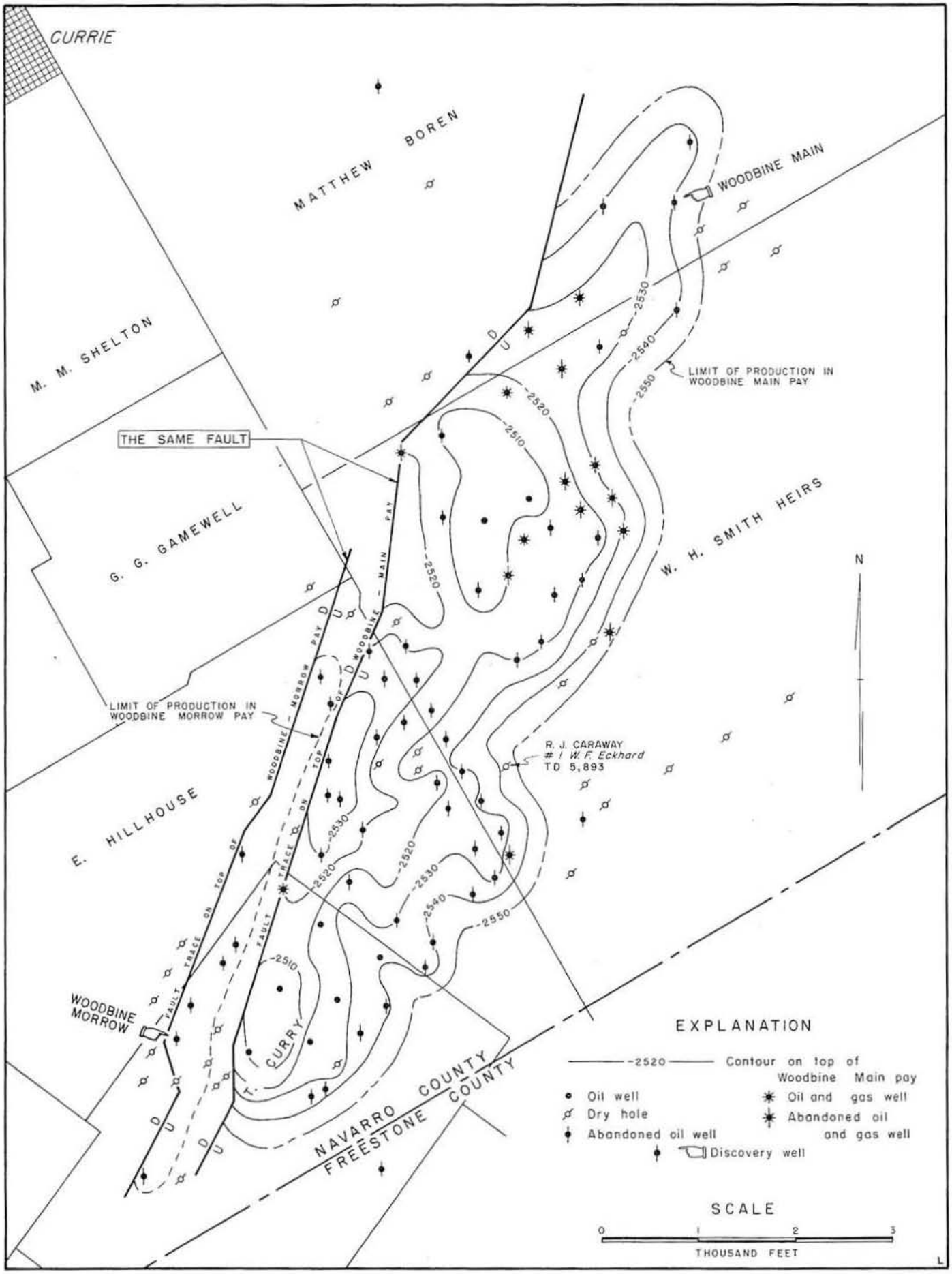


NOTE: This section is based on the log of the R.J. Caraway # 1 W. F. Eckhard which was recently completed as a dry hole in the W.H. Smith Heirs survey.

EXPLANATION

• Oil production

*NOTE: Bottom 400 feet of Upper Taylor faulted out.


CURRIE
MATTHEW BOREN
M. M. SHELTON
G. G. GAMEWELL
E. HILLHOUSE
W. H. SMITH HEIRS
T. CURRY
THE SAME FAULT
WOODBINE MAIN
LIMIT OF PRODUCTION IN WOODBINE MAIN PAY
LIMIT OF PRODUCTION IN WOODBINE MORROW PAY
WOODBINE MORROW
R. J. CARAWAY
1 W. F. Eckhard
TD 5,893
WOODBINE - MORROW PAY
WOODBINE - MAIN PAY
FAULT TRACE ON TOP OF WOODBINE
FAULT TRACE ON TOP OF WOODBINE
-2510
-2520
-2530
-2540
-2550
D
U
N
NAVARRO COUNTY
FREESTONE COUNTY
EXPLANATION
-2520- Contour on top of Woodbine Main pay
Oil well
Dry hole
Abandoned oil well
Oil and gas well
Abandoned oil and gas well
Discovery well
SCALE
0 1 2 3
THOUSAND FEET

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Woodbine Main pay	Feet
Approx. elev. of top of oil	-2,510
Approx. elev. of bottom of oil	-2,550
Approx. relief	40
Woodbine Morrow pay	
Elevation of top of oil	-2,735
Elevation of bottom of oil	?

CHARACTER OF OIL

Woodbine Main pay
Gravity, 40.8° to 42.5° Be.
Paraffin, 1.39% to 1.54%

Woodbine Morrow pay
Gravity, 41.7° to 42.7° Be.
Paraffin, 1.25% to 2.04%

For analyses see:

U. S. Bureau of Mines	Reference designation
Tabulated Analyses of Representative Crude Petroleums of the U. S., Bull. 291 (1948)	A
Tabulated Analyses of Texas Crude Oils., R.I. 3252 (1934)	B
Tabulated Analyses of Texas Crude Oils., T.P. 607 (1939)	C

Lab. ref. No.	219 & 1062	38087	38088
Reference designation			
A	Item 219		
B	Group 4, Item 5		
C	Group 4, Item 7	8	9

WATER PRODUCTION

Most of the wells in the Currie field yielded water upon completion or soon thereafter. At present, all producing wells are making large quantities of water.

SELECTED REFERENCES

Hill, H. B., and Guthrie, R. K. (1943) Analysis of oil production in the near-depleted Mexia-Powell fault-line fields of Texas: U. S. Bureau of Mines, R. I. 3712, pp. 34-38.

Lahee, Frederic H. (1929) Oil and gas fields of the Mexia and Tehuacana fault zones, Texas: Amer. Assoc. Petr. Geol., Structure of Typical American Oil Fields, vol. 1, pp. 312, 313, 314, 332, 340, 342, 358, 363.

PRODUCTION HISTORY

Woodbine sands and Field total: Currie field is primarily an oil field. Some of the earlier wells in the field came in as gas wells, but they quickly began making oil. A total of 71 wells were completed in the Main pay and 7 in the Morrow pay. Only 11 wells are now producing. These 11 wells currently produce a total of about 49 barrels of oil per day.

All production has been from Woodbine sands. No data are available as to quantities of gas which have been produced. Data are not available for determining quantities produced by each of the two sands separately.

Woodbine sands and Field total:

Year	WELLS PRODUCING (avg. number)	OIL PRODUCTION (barrels) Yearly	Cumulative
1921	1	8,905	8,905
1922	24	2,005,012	2,013,917
1923	59	1,601,415	3,615,332
1924	62	956,921	4,572,253
1925	55	463,188	5,035,441
1926	50	335,108	5,370,549
1927	44	249,303	5,619,852
1928	36	196,095	5,815,947
1929	35	158,421	5,947,368
1930	32	126,435	6,100,803
1931	27	91,771	6,192,574
1932	26	66,077	6,258,651
1933	19	52,220	6,310,871
1934	18	55,308	6,366,179
1935	16	49,402	6,415,581
1936	15	44,149	6,459,730
1937	13	42,667	6,502,397
1938	13	35,864	6,538,261
1939	13	37,797	6,576,058
1940	13	36,326	6,612,384
1941	13	33,076	6,645,460
1942	14*	37,635*	6,908,472*
1943	14*	35,240*	6,943,712*
1944	12*	29,273*	6,972,985*
1945	12*	26,552*	6,999,537*
1946	12*	25,365*	7,024,902*
1947	12*	23,223*	7,048,125*
1948	13*	20,489*	7,068,614*
1949	13*	19,350*	7,087,964*

*These figures are inclusive for both Currie and North Currie fields.

EARL-LEE FIELD
Wood County, Texas

HASTINGS MOORE
District Geologist, Danciger Oil & Refining Company, Henderson, Texas
June 20, 1950

LOCATION

The Earl-Lee field is in southeastern Wood County just south of the Pine Mills field. Its eastern limit is determined by the same fault which determines the eastern limit of the Pine Mills field.

MAPS

Because of the geographic and geologic relationships with the Pine Mills field, certain data pertaining to this field are presented on two maps included in the accompanying paper on that field.

STRATIGRAPHIC SECTION

For information relative to the stratigraphic section penetrated in this field, the reader is referred to the accompanying paper on the Pine Mills field. The stratigraphic section is essentially the same in the two fields, which, at present state of development are separated by a distance of only about $\frac{1}{2}$ mile.

METHOD OF EXPLORATION LEADING TO DISCOVERY

The method of exploration leading to the discovery of this field may be described as "playing the trend." Following the discovery of the Pine Mills field on October 9, 1949, Earl Hollandsworth of Longview, Texas, ascertained that the nearest open acreage southward belonged to Dr. George A. Schenewerk of Dallas, Texas. In consideration of leasehold rights, Hollandsworth agreed to drill a Woodbine test, which test was the discovery well in the Earl-Lee field.

DISCOVERY

Lewisville: January 24, 1950; Hollandsworth Oil Co. #1 (now #1-A) Dr. George A. Schenewerk, Wm. Fisher survey. Pumped 110 barrels of 18° gravity crude per day from depth of 5,475 to 5,490 feet.

ELEVATION OF SURFACE

At well locations: Highest, 515 feet; lowest, 430 feet.

SURFACE FORMATION

Queen City.

OLDEST STRATIGRAPHIC ZONE PENETRATED

Woodbine.

PRODUCTIVE AREA

Development to date does not define the productive area.

NATURE OF TRAP and STRUCTURE

The trap is due to a combination of faulting and change in character of sediments. The controlling structural feature is a 230-foot down-to-the-east fault cutting strata dipping westward at the rate of 300 feet per mile. The strike of the strata is about S. 3° W. and the strike of the fault is about S. 18° W. A trap is provided in the Lewisville through an increase in ash content locally northward. There is no trap in the sub-Clarksville, which is highly productive in the nearby Pine Mills field, since there is no such change in the character of sediments.

THICKNESSES OF RESERVOIR ROCK

	Feet		
Lewisville:	Min.	Max.	Avg.
Clean sands	0	35	20
Saturated sandy ash and ashy sands	0	70	35

LITHOLOGY OF RESERVOIR ROCK

Lewisville: The reservoir rock varies from clean sand with average permeability of 2,800 millidarcies to sandy ash with practically no permeability. At the extreme north edge of the field, the ash content is so high that fluid migration is precluded; southward, the ash content decreases.

CONTINUITY OF RESERVOIR ROCK

So far as now known, the clean sands are very local in areal extent. The Lewisville member of the Woodbine occurs as a blanket deposit over all of Wood County and parts or all of several adjoining counties.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Lewisville:	Feet
No free gas cap	
Highest proven elevation of oil	-4,975
Lowest proven elevation of oil	-5,091

The above figures represent elevations in different lenses. While the difference in elevation is 116 feet, that figure does not represent a continuous oil column. The oil-water contact has not been determined.

CHARACTER OF OIL

Lewisville:
Gravity, A.P.I.: 18 - 20°
Odor: Sweet Color: Black

CHARACTER OF GAS

Lewisville: Due to the negligible quantity of gas produced, no analysis has been made.

PRODUCTION HISTORY

As of the first of June, five wells had been completed and two were nearing completion. Production during May amounted to 9,539 barrels of oil. Two wells made their production by pumping, and three by flowing.

EAST SHELBYVILLE FIELD
Shelby County, Texas

PETER DAMM
Geologist, Stanolind Oil & Gas Company, Tyler, Texas
March 6, 1951

LOCATION and OTHER NAMES

The East Shelbyville field is in east central Shelby County about $4\frac{1}{2}$ miles east of the town of Shelbyville.

The name Pickering and the name Shelbyville have been used in designating this field. The name East Shelbyville has been the most used designation since the discovery of the West Shelbyville field in 1936.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Unknown; probably random drilling.

DISCOVERIES

Nacatoch sand: July 18, 1919; The Texas Co. #7 Pickering Lumber Co. This well initially produced at the rate of 15 barrels of oil per day, pumping from a sand section from 1,912 to 1,957 feet. Total depth, 1,957 feet, in Nacatoch sand.

Blossom sand and Field: September 20, 1917; The Producers Oil Co. (The Texas Co.) #2 Pickering Lumber Co. Initial production was 20 barrels of oil per day pumping from the section from 2,684 to 2,994 feet, which included the lower Taylor and upper Austin sections. The oil produced from this interval is believed for the most part to have come from the Blossom sandstone which is the upper member of the lower Taylor group. Total depth, 2,994 feet, in the upper Austin.

Paluxy sand: June 25, 1941; Superior Oil Co. #4 Pickering Lumber Co. This well was drilled in 1940 and 1941 and reached a total depth of 6,085 feet near the base of the Rodessa. It was then plugged back to a depth of approximately 3,700 feet and was completed as an 8,000 Mcf per day gas well from the Paluxy sand at 3,670 to 3,685 feet.

ELEVATION OF SURFACE

At well locations: Highest, 350 ft.; lowest, 298 feet.

SURFACE FORMATION

Wilcox.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated within the area of the field is near the base of the Rodessa formation. This penetration was in the Paluxy discovery well at its total depth of 6,085 feet. Approximately 1/4 mile north of that well, and beyond the productive area, Barnsdall Oil Corp. #1 Pickering Lumber Co. was drilled to a total depth of 7,504 feet after penetrating approximately 250 feet of Travis Peak section and was abandoned as a dry hole on March 31, 1949. The accompanying TYPE SECTION is based on the log of the latter well, the deepest test in the vicinity of the field.

NATURE OF TRAPS

In each of the three reservoirs it appears that the trap is due to a structural nose or terrace.

PRODUCTIVE AREAS

Nacatoch sand	1 well
Blossom sand	450 acres
Paluxy sand	1 well

THICKNESSES OF RESERVOIR ROCKS

	Nacatoch	Blossom	Paluxy
Top to bottom, feet	70	75	290
Net effective, feet	10	10	10

LITHOLOGY OF RESERVOIR ROCKS

Nacatoch sand: Light gray, fine-grained, non-porous, ashy sandstone.

Blossom sand: Greenish-gray to green, medium- to fine-grained, glauconitic sandstone, the basal portion of which is rather shaly. Porosity is low, particularly in the lower portion.

Paluxy sand: Alternating sand and shale, predominantly shale with occasional thin limestone stringers.

CONTINUITY OF RESERVOIR ROCKS

Because of the widespread distribution of each of the three producing sands, they are believed to be more or less continuous within the field area, with possibly some variation in character.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Feet
Nacatoch sand:	
Elevation of top of oil	-1,623
Elevation of bottom of oil	Unknown
Relief	Unknown
Blossom sand:	
Elevation of top of oil	-2,266
Elevation of bottom of oil	-2,317
Relief	51
Paluxy sand:	
Elevation of top of gas	-3,345
Elevation of bottom of gas	Unknown
Relief	Unknown

CHARACTER OF OIL

Nacatoch sand: Unknown.

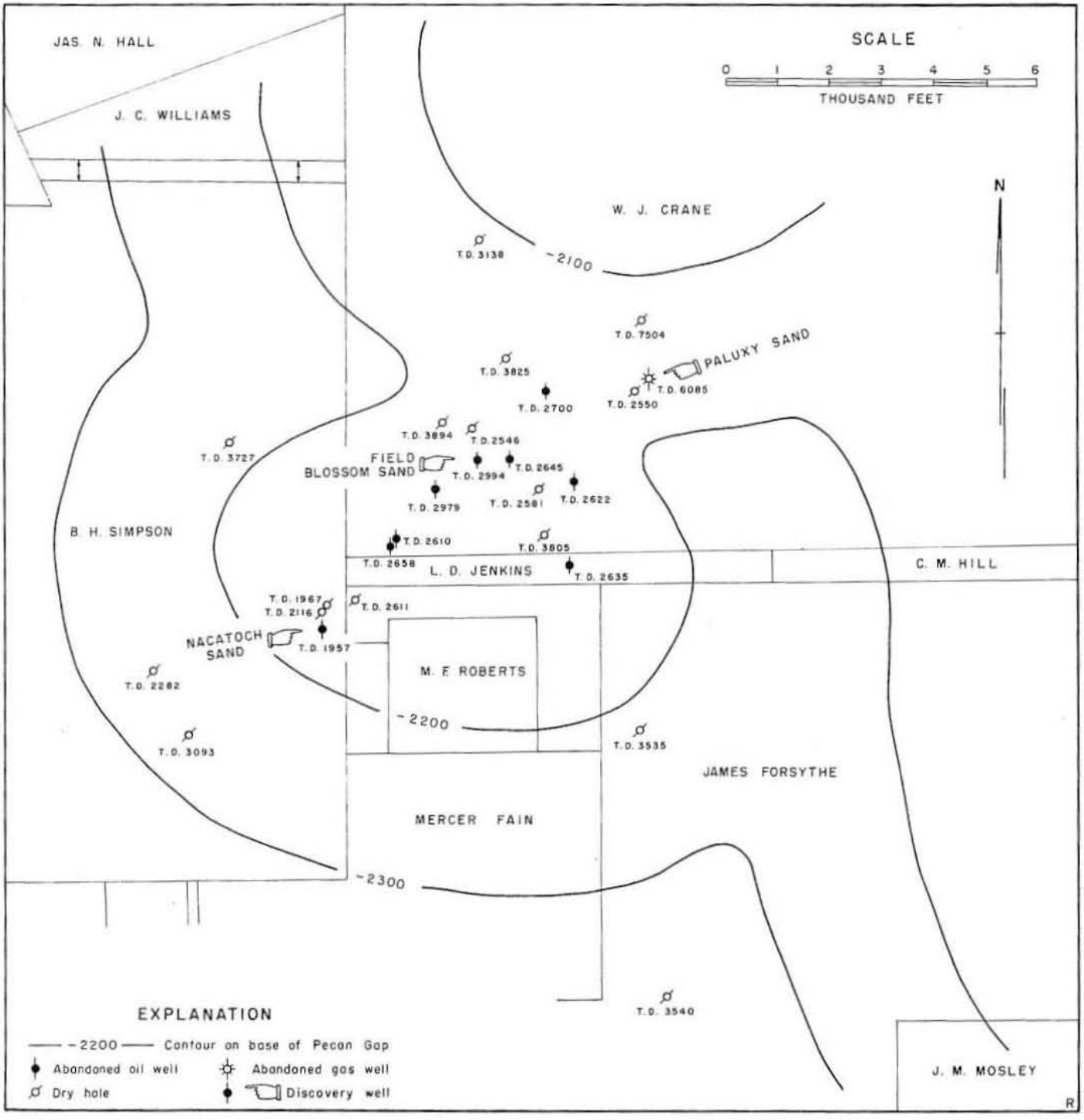
Blossom sand: Gravity, 38°.

CHARACTER OF GAS

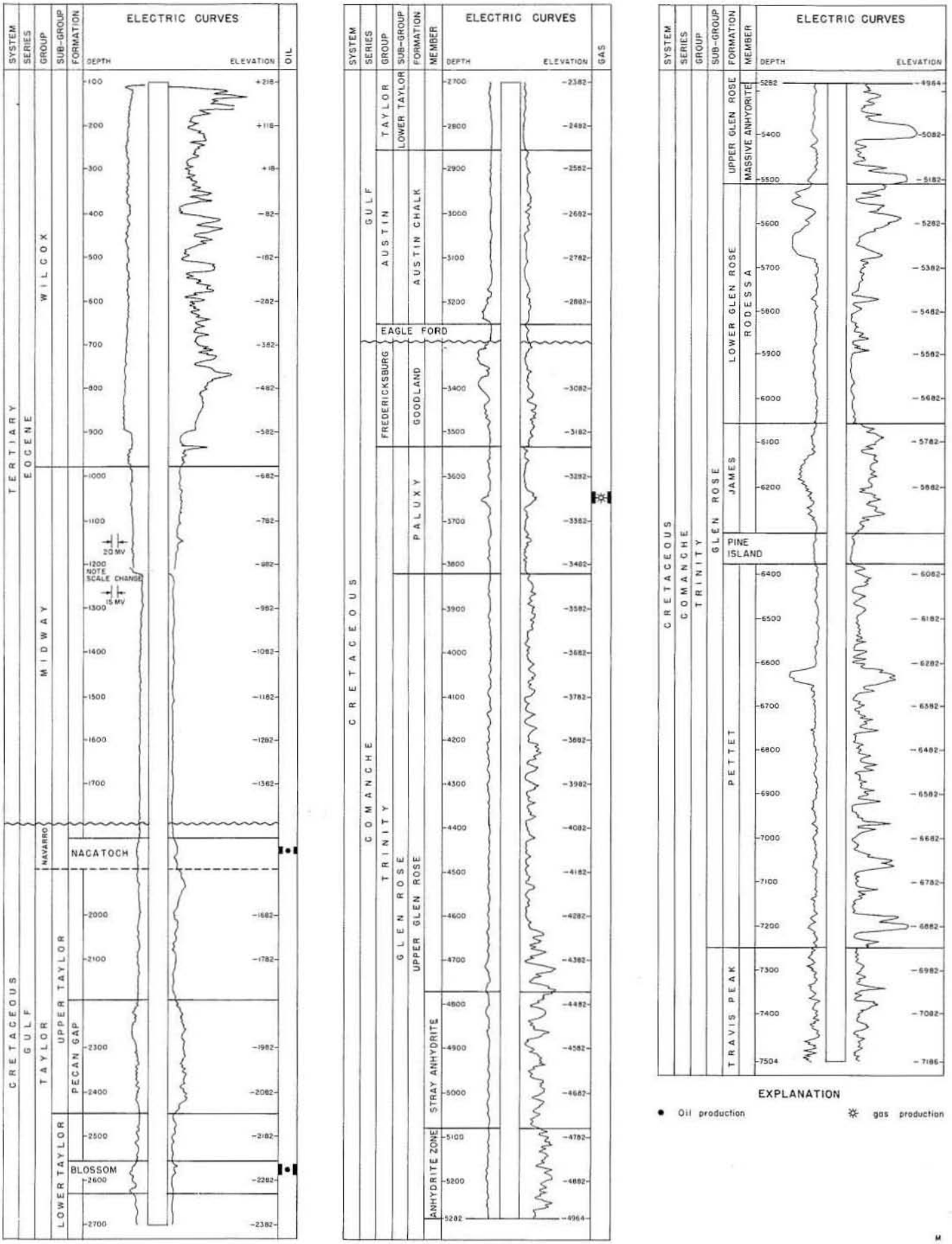
Paluxy sand: Analysis not available.

PRODUCTION HISTORY

No production records are available for this field. The initial production of the oil producing wells was small, ranging from 10 to 30 barrels per well per day. Production from these wells declined rapidly, resulting in abandonment of the field some time between 1922 and 1925. Inasmuch as the wells were short lived and of small capacity, it is reasonable to assume that the total oil recovery for the field was small. The writer finds no record indicating that the gas well was ever operated.



TYPE SECTION OF ROCKS PENETRATED



EAST TEXAS FIELD

Gregg, Rusk, Upshur, Smith and Cherokee counties, Texas

JAMES S. HUDNALL
Geologist, Hudnall & Pirtle, Tyler, Texas
May 27, 1950

LOCATION

The East Texas field covers 140,000 acres in Gregg, Rusk, Upshur, Smith and Cherokee counties, Texas. It extends 43.2 miles in a north-south direction and has an average width of 5 miles. It is on the west slope of the Sabine uplift and the east side of the Tyler basin.

METHOD OF EXPLORATION LEADING TO DISCOVERY

The field was discovered by C. M. (Dad) Joiner by random wildcatting. It was due to his persistence against all odds that the first well was completed for 300 barrels per day on October 3, 1930, at a depth of 3,592 feet. This was the third well for Joiner. His Daisy Bradford #1, begun in August 1927, was junked after six months of effort at a depth of 1,098 feet. His second well, Bradford #2 was begun in April 1928 at a location 100 feet northwest of #1 and reached a total depth of 2,518 feet after nearly one year of intermittent drilling. This well likewise was junked and abandoned. Bradford #3 was then started 300 feet south of the first well, and after sacrificing a large part of his original 10,000 acre block in financing this well, it was finally successfully completed as the discovery.

DISCOVERY

Woodbine sand: First show of oil, September 5, 1930. Completed October 3, 1930; C. M. Joiner #3 Daisy Bradford.

ELEVATION OF SURFACE

Elevations range from 250 feet on Sabine River to 560 feet southeast of Overton.

SURFACE FORMATIONS

The Queen City, Reklaw and Carrizo of the Claiborne group and a small area of the Indio formation of the Wilcox group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

Base of Paluxy sand at depth of 5,353 feet in Humble #37 Holland.

NATURE OF TRAP

Woodbine sand: Stratigraphic trap. Shore-line type of deposition. The sand is truncated and pinches out updip. The Austin chalk generally, and the Eagle Ford formation in a small area, form the cap-rock against which the Woodbine sand and shale members terminate. The updip extent of Woodbine sand determines the eastward extent of production. The westward extent of production is determined by the oil-water contact and is generally at about the position of the -3,320 contour on top of the Woodbine sand.

PRODUCTIVE AREA

Woodbine sand and Field: 140,000 acres.

THICKNESS OF RESERVOIR ROCK

Woodbine sand: The Woodbine formation varies from zero thickness on the east side of the field to a maximum of 250 feet on the west side of the field. The maximum thickness of the oil reservoir rock is 130 feet, found in the Lake Devernia area near the center of the north end of the field. The maximum thickness of the net effective sand is 102 feet, found in the same area. From this it pinches out to zero thickness on the eastern edge. The average net effective thickness of the pay sand is 35.7 feet.

LITHOLOGY OF RESERVOIR ROCK

The Woodbine formation is composed of approximately 70 per cent sand and 30 per cent of sandy shale, volcanic ash, and shale. In many areas the productive stratigraphic zone is largely sandy shale and volcanic ash, which grades laterally into good oil sand with high porosity and permeability. In parts of the reservoir, particularly in the south end of the field, the amount of shale and volcanic ash increases to where it occupies from 40 to 70 per cent of the total Woodbine formation. In this area only 30 to 60 per cent of the total Woodbine formation is net effective sand. Some wells encounter as many as ten shale breaks within the reservoir, and it is rare that the sand body is one continuous member. The shale and sand bodies can not usually be correlated from one well to the next.

The average porosity of the sand ranges from 25 per cent to 27 per cent, and the permeability from 1,500 to 4,000 millidarcys. Throughout a large part of the north end of the field there is a conglomerate and gravel bed that makes up a portion of the pay zone. The permeability is much greater than in the southern end of the field. The sands are more continuous and the pressure more readily equalizes. Throughout the southern 1/3 of the field the sand bodies are so lenticular and the permeability so low that equalization of pressure does not readily occur, and the pressure has continued to drop in this portion of the field at all rates of production that have occurred in the past. While in the north end of the field the pressure has built up some 40 pounds during the past 5 years.

The difference in the permeability of the producing zone in the north end of the field and that of the south end of the field is clearly shown by the fact that, in the north end of the field along the Sabine River the pressure on the west side of the field is approximately 1,150 pounds per square inch and on the east side, 1,070 pounds per square inch, representing a differential in pressure across the field of 80 pounds; while in the south end of the field the pressure on the west side is 1,200 pounds per square inch and the east side between 300 and 400 pounds per square inch, which is a differential of 800 to 900 pounds per square inch. This means that, at the current rate of production, with a pressure differential of 80 pounds, a volume of fluid moves from west to east equivalent to the daily withdrawals; while in the south end of the field a pressure differential of 800 to 900 pounds is hardly sufficient to cause a volume of flow from west to east equivalent to the daily take, as shown by the fact that the pressure is continually dropping in this area on the east side. The sand in the south 1/3 of the field is much finer and the number of shale partings and the percentage of shale to sand are much greater than in the north end of the field.

RESERVOIR ENERGY

The East Texas field is what is commonly termed a "water drive field." Present data indicate that the following three factors, named in the order of their importance, are responsible for the encroachment of water:

1. Compaction of the Woodbine aquifer, extending many miles out from the field into the East Texas basin.
2. The expansion of the water within the aquifer throughout the East Texas basin due to release of pressure.
3. The expansion of gas:
   a. In solution in the water.
   b. Free gas trapped in sand lenses.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

	Extremes	Main Production
Elevation of top of oil, feet	-3,052	-3,160
Elevation of bottom of oil, feet	-3,350	-3,320
Relief	298	160

There is no free gas cap except at the south end of the field, where there is a free gas area covering approximately 2,000 acres. In that area, the gas-oil contact was originally at -3,300 feet and the oil-water contact at -3,320 feet.

CHARACTER OF GAS

Component	Mol. %
Carbon dioxide	.36
Oxygen	.23
Methane	44.52
Ethane	18.81
Propane	24.91
Butane	9.26
Pentane & heavier	1.64
Nitrogen	.63
Total	100.00

Specific gravity (calculated) 1.06
Heating value, B.t.u./cf (calculated) 1,770
Gasoline content based on 26-70 gasoline .791 G/Mcf

The above is an average of analyses of three samples made by United Gas System Laboratory.

SELECTED REFERENCES

Hanna, Marcus A. and Minor, H. E. (1933) East Texas oil field: Amer. Assoc. Petr. Geol., Bull., vol. 17, pp. 757-792.

Hanna, Marcus A. and Minor, H. E. (1941) East Texas oil field, Rusk, Cherokee, Smith, Gregg and Upshur counties: Amer. Assoc. Petr. Geol., Stratigraphic Type Oil Fields, pp. 600-640.

Donoghue, David (1944) Elasticity of reservoir rocks and fluids, with special reference to East Texas oil field: Amer. Assoc. Petr. Geol., Bull., vol. 28, pp. 1032-1056.

Hudnall, J. S. (1931) Geology and economic importance of the East Texas oil field: Oil Weekly, vol. 62, no. 7, pp. 43-50, 114.

Hudnall, J. S. and Pirtle, G. W. (1932) Ultimate recovery from East Texas field: Oil & Gas Journal, vol. 30, no. 50, pp. 15-17.

Hudnall, J. S. (1932) The East Texas oil field - what it has done, and what to expect of it: Oil Weekly, vol. 66, no. 6, pp. 25-30.

CHARACTER OF OIL

The writer has selected the following from among the many available analyses to present a general understanding of the character of the oil. The following data are transcribed from U. S. Bureau of Mines, Report of Investigations 3699 (1943), Item 27:

GENERAL CHARACTERISTICS

Specific gravity, 0.830 A. P. I. gravity, 39.0° Color, greenish black
Sulfur, percent, 0.29 Saybolt Universal viscosity at 100° F., 41 sec.

APPROXIMATE SUMMARY OF DISTILLATION
Bureau of Mines Hempel Method

	Percent	Sp. Gr.	°A.P.I.	
Light gasoline	12.5	0.679	76.9	Viscosity
Total gasoline and naphtha	34.3	0.734	60.0	
Kerosene distillate	9.4	.817	41.7	
Gas Oil	14.6	.846	35.8	
Nonviscous lubricating distillate	9.6	.862- .884	32.7-28.6	50-100
Medium lubricating distillate	7.0	.884- .897	28.6-26.3	100-200
Viscous lubricating distillate	-	-	-	Above 200
Residuum	21.8	.968	14.7	
Distillation loss	3.3			

For analyses see:

Railroad Commission of Texas
Analyses of Texas Crude Oils (1940), pp. 30, 59 and 60.

U. S. Bureau of Mines	Reference designation
Properties of Typical Crude Oils from the East Texas Field. R. I. 3130 (1931)	A
Tabulated Analyses of Texas Crude Oils. R. I. 3252 (1934)	B
Tabulated Analyses of Texas Crude Oils. T. P. 607 (1939)	C
Correlation Index to Aid in Interpreting Crude-Oil Analyses. T. P. 610 (1940)	D
Analyses of Crude Oils from Some Fields of Texas. R. I. 3699 (1943)	E
Analyses of Crude Oils from 283 Important Oil Fields of the United States. R. I. 4289 (1948)	F

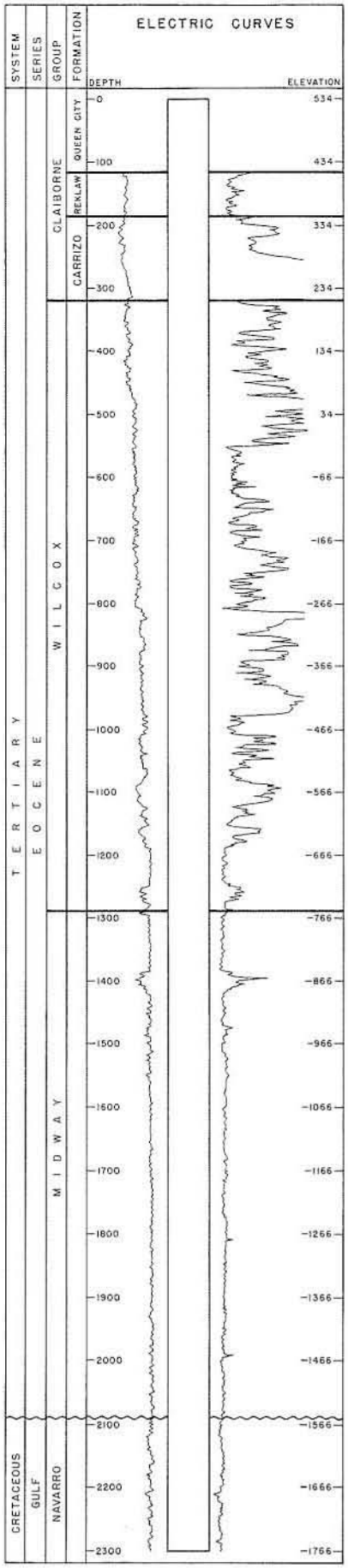
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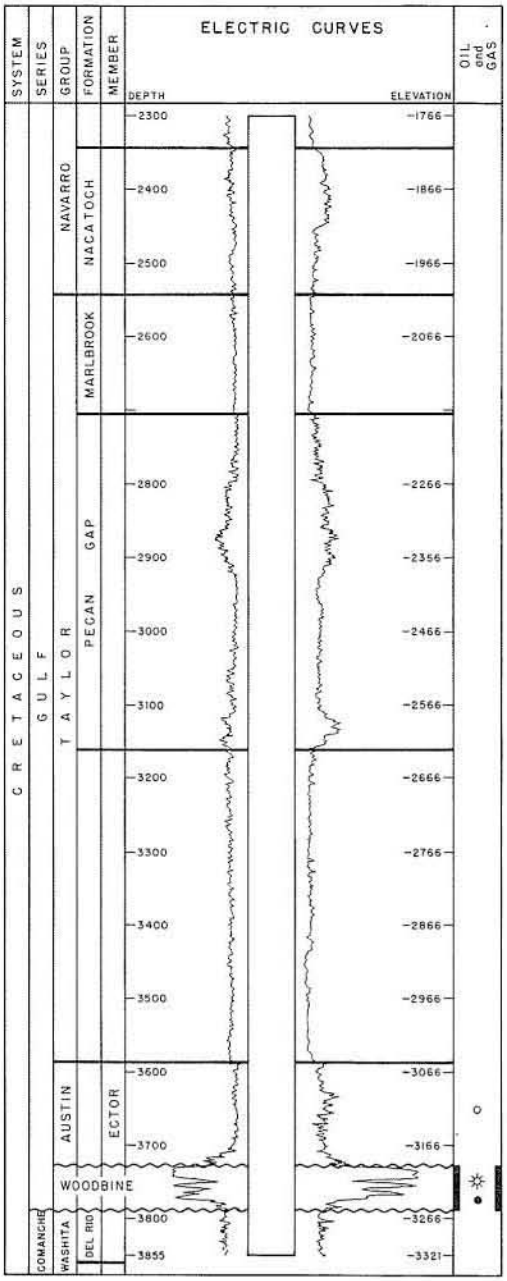
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C, Grp. 4, Item	17	14	11	19	10	30	24	31	26

	32337	32338	32339	32340	32341	32342	39300	45035
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F, Item								200

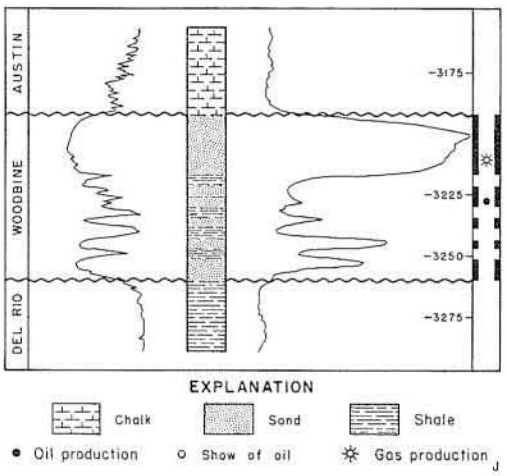
a/ Field name indicated as "Joiner." b/ Field name indicated as "Kilgore."
c/ Field name indicated as "Longview."

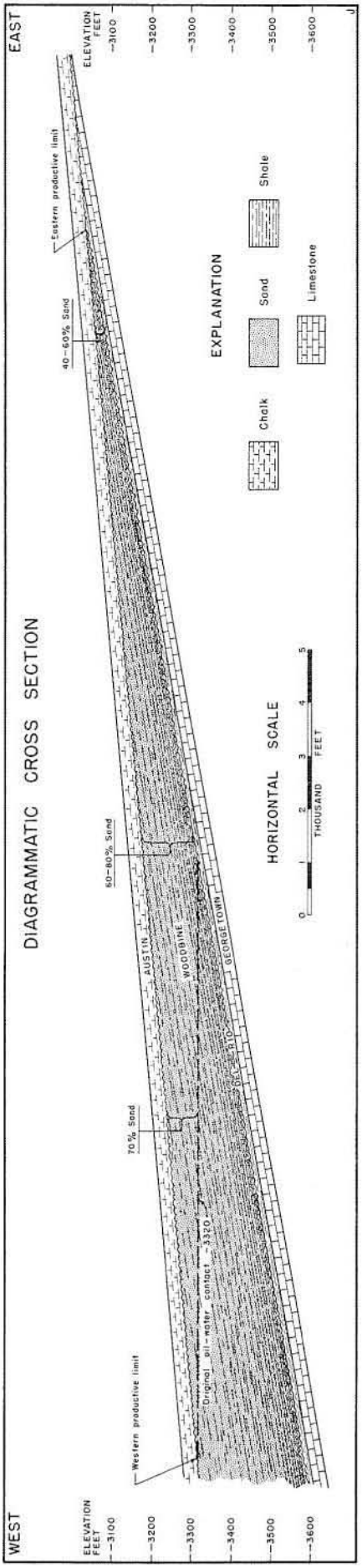
TYPE SECTION OF ROCKS PENETRATED

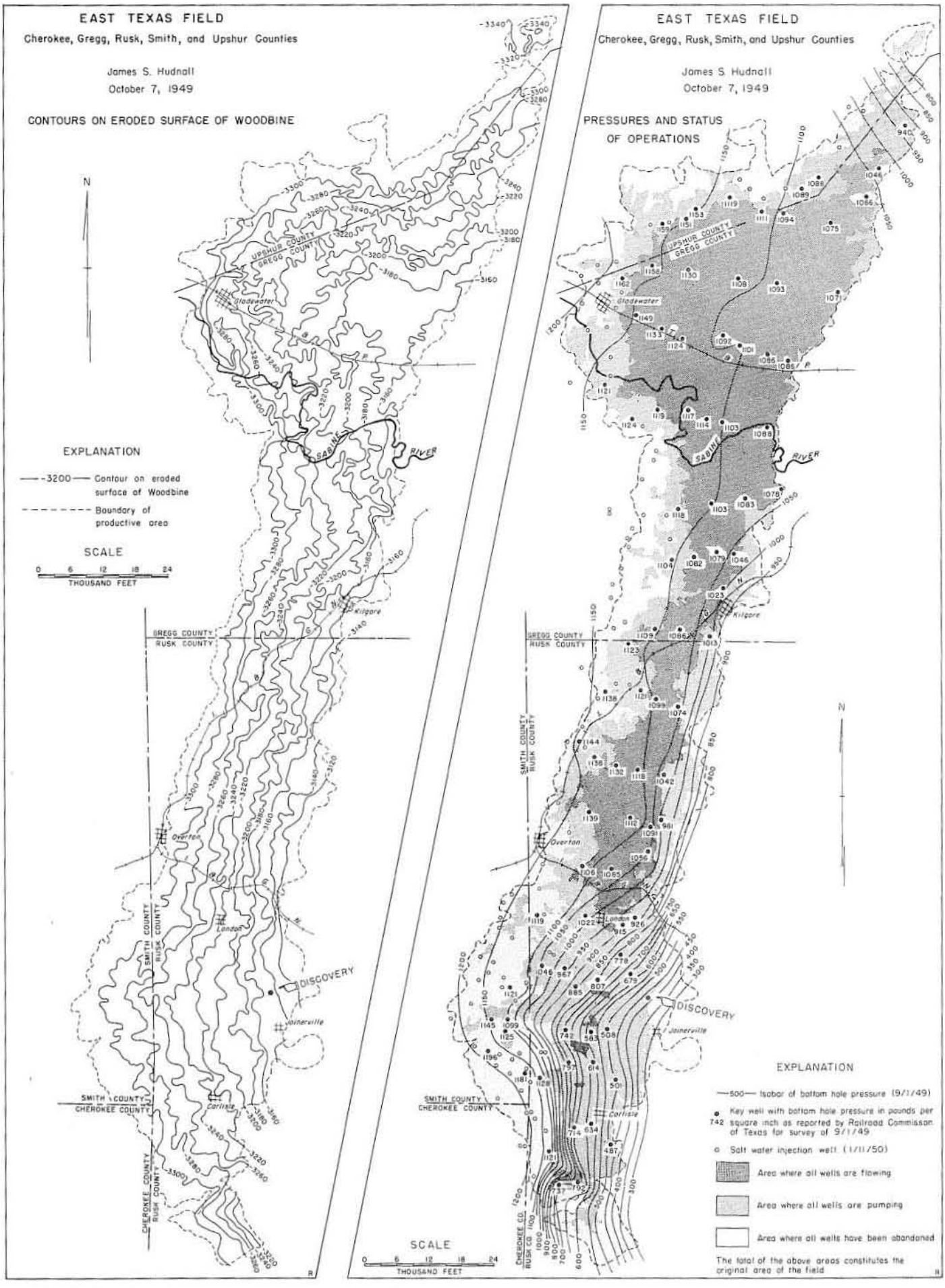




RESERVOIR DETAIL






EAST TEXAS FIELD
Cherokee, Gregg, Rusk, Smith, and Upshur Counties
James S. Hudnall
October 7, 1949
CONTOURS ON ERODED SURFACE OF WOODBINE
EXPLANATION
-3200- Contour on eroded surface of Woodbine
Boundary of productive area
SCALE
0 6 12 18 24
THOUSAND FEET
UPSHUR COUNTY
GREGG COUNTY
RUSK COUNTY
SMITH COUNTY
CHEROKEE COUNTY
Gladewater
Kilgore
Overton
London
Joinerville
Carlisle
DISCOVERY
SABINE RIVER
EAST TEXAS FIELD
Cherokee, Gregg, Rusk, Smith, and Upshur Counties
James S. Hudnall
October 7, 1949
PRESSURES AND STATUS OF OPERATIONS
EXPLANATION
-500- Isobar of bottom hole pressure (9/1/49)
742 Key well with bottom hole pressure in pounds per square inch as reported by Railroad Commission of Texas for survey of 9/1/49
Salt water injection well (1/11/50)
Area where all wells are flowing
Area where all wells are pumping
Area where all wells have been abandoned
The total of the above areas constitutes the original area of the field
SCALE
0 6 12 18 24
THOUSAND FEET

WATER PRODUCTION AND DISPOSAL

Year	GROSS WATER PRODUCTION (barrels) Yearly	GROSS WATER PRODUCTION (barrels) Cumulative	SALT WATER INJECTED (barrels) Yearly	SALT WATER INJECTED (barrels) Cumulative	NET WATER PRODUCTION (barrels) Yearly	NET WATER PRODUCTION (barrels) Cumulative	NUMBER OF WELLS Injecting salt water
1930	0	0	0	0	0	0	
1931	365,000	365,000	0	0	365,000	365,000	
1932	730,000	1,095,000	0	0	730,000	1,095,000	
1933	3,285,000	4,380,000	0	0	3,285,000	4,380,000	
1934	3,650,000	8,030,000	0	0	3,650,000	8,030,000	
1935	4,380,000	12,410,000	0	0	4,380,000	12,410,000	
1936	12,045,000	24,455,000	0	0	12,045,000	24,455,000	
1937	24,090,000	48,545,000	0	0	24,090,000	48,545,000	
1938	34,675,053	83,220,053	223,053	223,053	34,452,000	82,997,000	1
1939	37,750,000	120,970,053	2,250,761	2,473,814	35,499,239	118,496,239	10
1940	44,884,998	165,855,051	10,965,939	13,439,753	33,919,059	152,415,298	31
1941	104,584,642	270,439,693	23,530,319	36,970,072	81,054,323	233,469,621	47
1942	129,317,164	399,756,857	29,635,976	66,606,048	99,681,188	333,150,809	49
1943	145,503,540	545,260,397	73,642,841	140,248,889	71,860,699	405,011,508	64
1944	170,423,237	715,683,634	124,136,102	264,384,991	46,287,135	451,298,643	74
1945	176,152,000	891,835,634	137,179,479	401,564,470	38,972,521	490,271,164	76
1946	174,661,060	1,066,496,694	156,009,065	557,573,535	18,651,995	508,923,159	77
1947	198,729,000	1,265,225,694	180,437,673	738,011,208	18,291,327	527,214,486	78
1948	207,597,213	1,472,822,907	190,940,422	928,951,630	16,656,791	543,871,277	80
1949	199,446,000	1,672,268,907	184,579,162	1,113,530,792	14,866,838	558,738,115	79

DEVELOPMENT, OPERATING AND PRESSURE HISTORY

Year	NUMBER OF WELLS Drilled Yearly	Drilled Cumulative	Plugged and Abandoned Yearly West	Plugged and Abandoned Yearly East	Plugged and Abandoned Cumulative West	Plugged and Abandoned Cumulative East	Plugged and Abandoned Total Cumulative	Producing at end of year Oil Flowing	Oil Artif. lift	Oil Total	Gas	BOTTOM HOLE PRESSURE Avg. at end of year (psi.)
1930	5	5						5	0	5		1,619
1931	3,615	3,620						3,541	71	3,612		1,460
1932	5,732	9,352	1	0	1	0	1	9,186	186	9,372		1,363
1933	2,476	11,828	4	0	5	0	5	11,249	606	11,855	12	1,252
1934	3,686	15,514	5	2	10	2	12	14,490	1,025	15,515	16	1,234
1935	4,038	19,552	5	0	15	2	17	17,656	1,883	19,539	20	1,209
1936	2,458	22,010	18	6	33	8	41	18,435	3,525	21,960	21	1,175
1937	2,351	24,361	55	21	88	29	117	18,863	5,406	24,269	21	1,120
1938	1,703	26,064	164	46	252	75	327	19,164	6,424	25,588	14	1,107
1939	382	26,446	184	83	436	158	594	19,307	6,807	26,114	6	1,061
1940	328	26,774	327	78	763	236	999	17,831	8,090	25,921	6	1,052
1941	475	27,249	391	195	1,154	431	1,585	17,666	8,152	25,818	5	1,026
1942	8	27,257	283	47	1,437	478	1,915	16,637	8,384	25,021	4	1,016
1943	0	27,257	361	19	1,798	497	2,295	16,567	8,214	24,781	4	1,012
1944	0	27,257	469	10	2,267	507	2,774	15,530	8,617	24,147	4	1,001
1945	0	27,257	669	20	2,936	527	3,463	14,688	8,819	23,507	3	1,016
1946	60	27,317	592	21	3,528	548	4,076	13,690	9,365	23,055	2	1,016
1947	152	27,469	636	39	4,164	587	4,751	13,024	9,701	22,725	2	1,011
1948	298	27,767	688	25	4,852	612	5,464	12,573	9,746	22,319	2	1,008
1949	472	28,239	506	13	5,358	625	5,983	12,414	9,803	22,217	2	1,019

PRODUCTION HISTORY

Year	OIL PRODUCTION (barrels) Yearly	OIL PRODUCTION (barrels) Cumulative	LIQUID PRODUCTS of gasoline plants (barrels) Yearly	LIQUID PRODUCTS of gasoline plants (barrels) Cumulative	TOTAL LIQUIDS (barrels) Yearly	TOTAL LIQUIDS (barrels) Cumulative	GAS PRODUCTION (Mcf) Yearly	GAS PRODUCTION (Mcf) Cumulative
1930	27,000	27,000			27,000	27,000		
1931	121,670,485	121,697,485	35,000	35,000	121,705,485	121,732,485		627,000
1932	148,325,961	270,023,446	247,624	282,624	148,573,585	270,306,070	5,268,000	5,895,000
1933	216,291,397	486,314,843	481,272	763,896	216,772,669	487,078,739	7,805,000	13,700,000
1934	182,410,322	668,725,165	1,102,403	1,866,299	183,512,725	670,591,464	690,000?	14,390,000
1935	174,555,919	843,281,084	1,862,180	3,728,479	176,418,099	847,009,563	485,000	14,875,000
1936	165,270,636	1,008,551,720	3,335,567	7,064,046	168,606,203	1,015,615,766	525,000?	15,400,000
1937	171,179,487	1,179,731,207	4,469,447	11,533,493	175,648,934	1,191,264,700	799,240?	16,199,240
1938	150,231,991	1,329,963,198	7,092,045	18,625,538	157,324,036	1,348,588,736	945,700	17,144,940
1939	144,276,550	1,474,239,748	7,079,479	25,705,017	151,356,029	1,499,944,765	836,000	17,980,940
1940	140,124,851	1,614,364,599	7,260,588	32,965,605	147,385,439	1,647,330,204	435,000	18,415,940
1941	134,393,500	1,748,758,099	7,475,355	40,440,960	141,868,855	1,789,199,059	615,132	19,031,072
1942	120,681,257	1,869,439,356	5,969,353	46,410,313	126,650,610	1,915,849,669	585,782	19,616,854
1943	128,569,141	1,998,008,497	7,367,078	53,777,391	135,936,219	2,051,785,888	594,970	20,211,824
1944	134,768,499	2,132,776,996	8,045,931	61,823,322	142,814,430	2,194,600,318	537,295	20,749,119
1945	131,022,334	2,263,799,330	9,977,638	71,800,960	140,999,972	2,335,600,290	354,115	21,103,234
1946	120,574,254	2,384,373,584	8,720,294	80,521,254	129,294,548	2,464,894,838	268,669	21,371,903
1947	118,830,818	2,503,204,402	10,179,655	90,700,909	129,010,473	2,593,905,311	199,680	21,571,583
1948	111,879,934	2,615,084,336	10,260,847	100,961,756	122,140,781	2,716,046,092	289,094	21,860,677
1949	93,573,451	2,708,657,787	7,043,573	108,005,329	100,617,024	2,816,663,116	87,725	21,948,402

ELKHART FIELD

Anderson County, Texas

PHILIP S. SCHOENECK
District Geologist, The Atlantic Refining Company, Tyler, Texas
December 27, 1950

LOCATION and OTHER NAME

The Elkhart field centers about 5 miles southwest of the town of Elkhart.

The name Hemby has been used in certain technical publications in designating this field.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Surface geological work by various companies and individuals in the early 1930's is given credit for the discovery of this field.

DISCOVERY

Woodbine sand: February 2, 1938; H. L. Parsons et al. #1 H. B. Hemby (now American Liberty Oil Co. #1 H. B. Hemby). Completed through perforations at 5,409 to 5,417 feet for an estimated open flow potential of 45 million cubic feet of gas daily; shut-in tubing pressure, 2,200 psi.; shut-in casing pressure, 2,200 psi.; 3.23 barrels of condensate per million cubic feet of gas.

The field was dormant for 9 years with no outlet. The Bluebird Investment Co. #1 J. H. Pierson was completed March 15, 1947 in Woodbine through perforations at 5,504 to 5,520 feet for a calculated open flow potential of 140 million cubic feet of gas daily with 4 barrels of condensate per million cubic feet of gas; equalized tubing and casing pressures, 2,100 psi.

ELEVATION OF SURFACE

At well locations: Highest, 387 ft., lowest, 230 feet.

SURFACE FORMATIONS

The Sparta, Weches and Queen City sand members of the Claiborne group outcrop throughout the fairly rough topography of the productive area. Faulting is evident at the surface.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated is 167 feet below the top of the Woodbine group. This penetration was in American Liberty Oil Co. #2 H. B. Hemby, the log of which is used in presenting the accompanying TYPE SECTION. The location of this well is indicated on the accompanying map.

NATURE OF TRAP

Woodbine sand: Closure against a fault in each of three fault blocks in an inferred central graben. The fault displacement where observed in the wells varies from 60 to 200 feet, dependent upon the depth of intersection. Displacement decreases upward.

PRODUCTIVE AREA

Woodbine sand and Field: Estimated at 1,400 acres. There are now 7 producing gas wells. The average spacing in the south fault segment, where there are 3 producers, is 80 acres per well. There appears to be semi-proven, undrilled acreage in each of the two north fault segments.

THICKNESS OF RESERVOIR ROCK

Woodbine sand: From 8 feet to 32 feet; average, 17.3 feet.

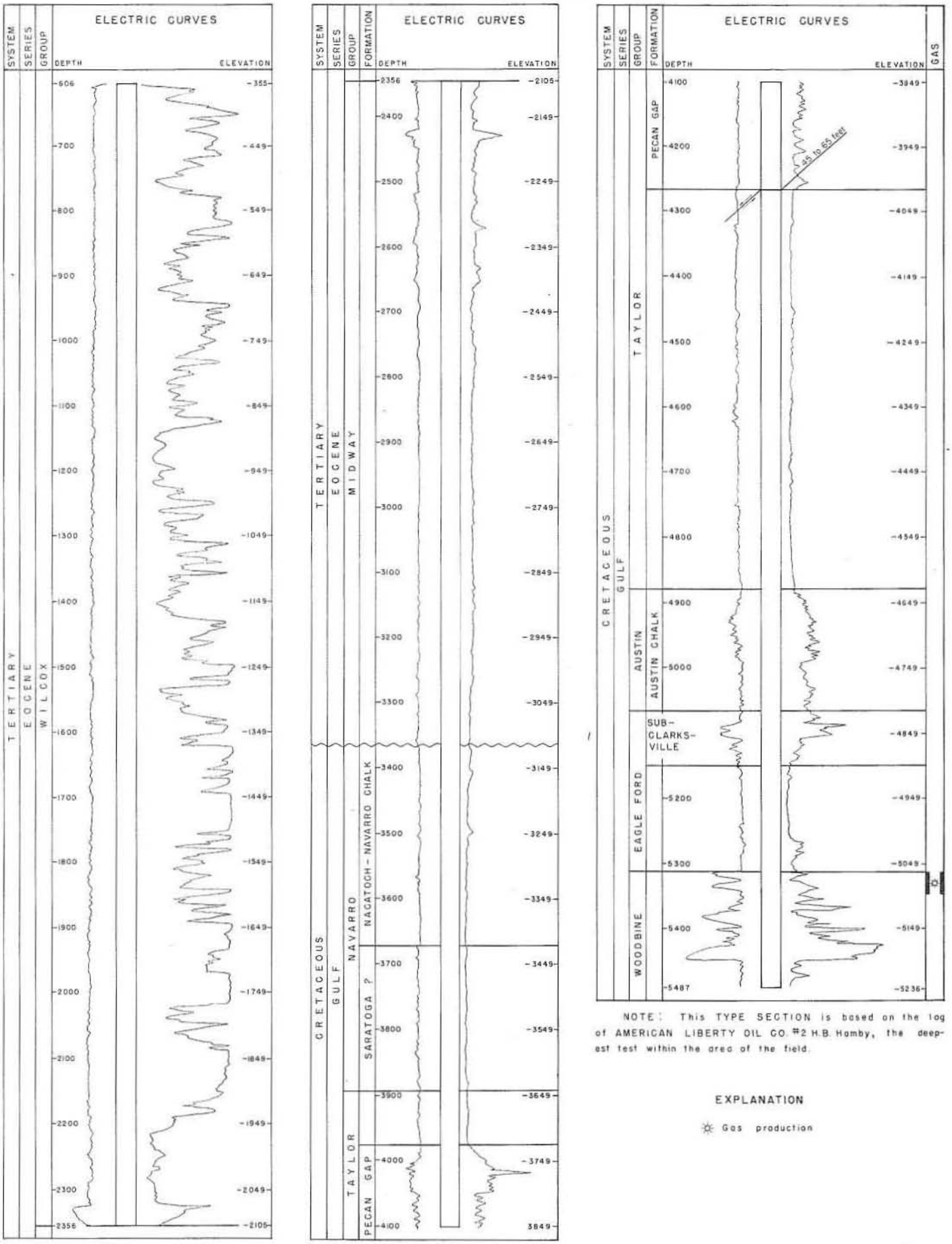
LITHOLOGY OF RESERVOIR ROCK

Woodbine sand: Fine- to medium-grained sand with partings of shale and sandy shale.

CONTINUITY OF RESERVOIR ROCK

Woodbine sand: The Woodbine sand is a blanket sand throughout the area of the field.

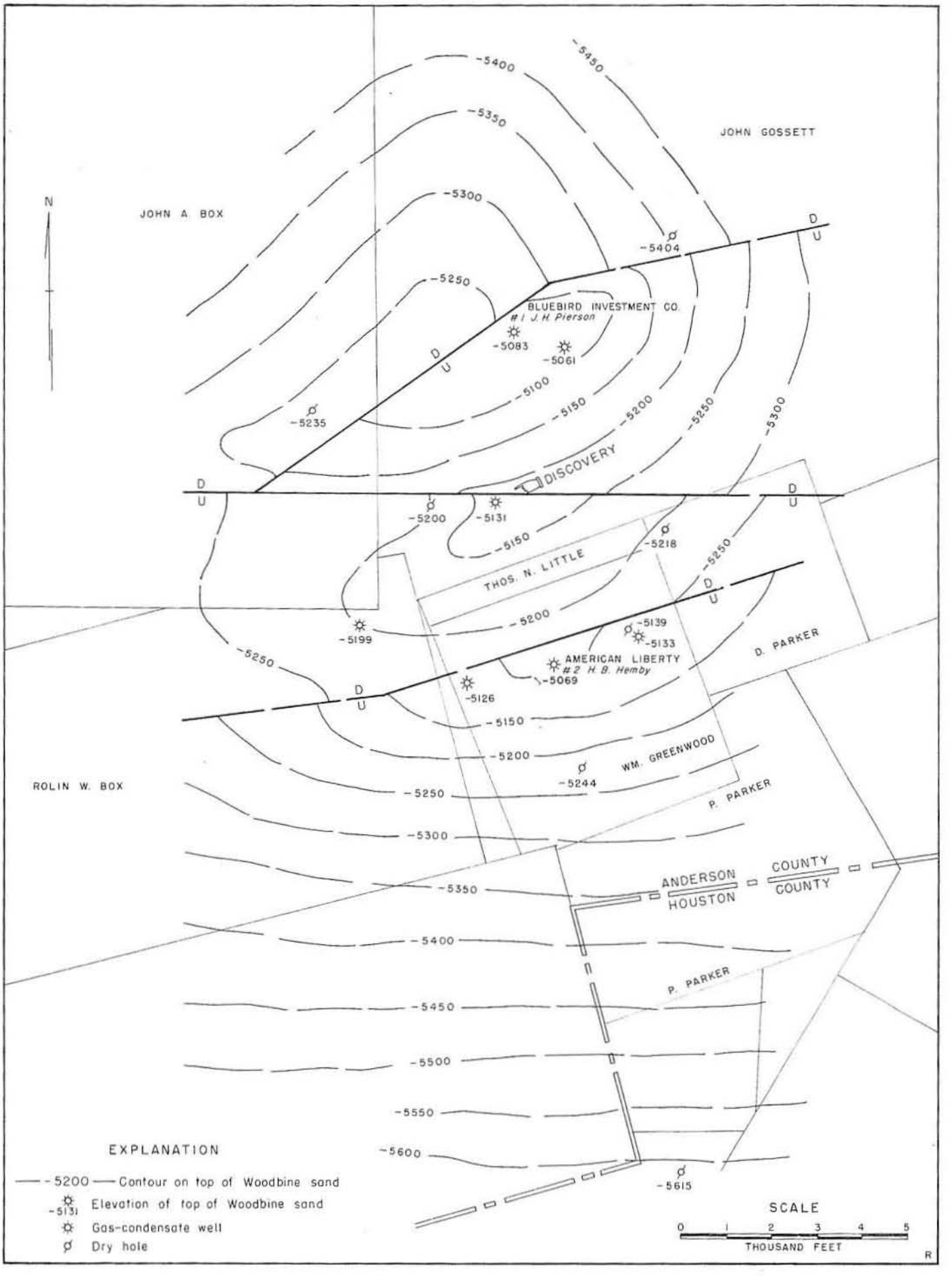
TYPE SECTION OF ROCKS PENETRATED



NOTE: This TYPE SECTION is based on the log of AMERICAN LIBERTY OIL CO. #2 H.B. Hamby, the deepest test within the area of the field.

EXPLANATION

☼ Gas production


N
JOHN A. BOX
JOHN GOSSETT
ROLIN W. BOX
THOS. N. LITTLE
D. PARKER
P. PARKER
P. PARKER
WM. GREENWOOD
BLUEBIRD INVESTMENT CO.
#1 J.H. Pierson
AMERICAN LIBERTY
#2 H.B. Hemby
DISCOVERY
ANDERSON COUNTY
HOUSTON COUNTY
-5400
-5450
-5350
-5300
-5250
-5200
-5150
-5100
-5404
-5235
-5083
-5061
-5200
-5131
-5218
-5199
-5139
-5133
-5069
-5126
-5244
-5615
D
U
EXPLANATION
-5200 Contour on top of Woodbine sand
-5131 Elevation of top of Woodbine sand
Gas-condensate well
Dry hole
SCALE
0 1 2 3 4 5
THOUSAND FEET
R

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine sand:	North segment	Middle segment	South segment
Elev. of top of gas, ft.	-5,061-	-5,146	-5,069-
Elev. of bottom of gas, ft.	?	-5,212	-5,152
Relief	?	66	83+

The elevation of the gas-water contact cannot be determined for the north segment. Only two wells produce, each from an apparently local Woodbine sand lens.

No oil has been found in this field.

CHARACTER OF GAS AND CONDENSATE

Woodbine sand: No analyses of gas are available to the writer. The condensate ranges in gravity from 56° to 58.3° and has been variously described as clear to dark in color.

WATER PRODUCTION

Woodbine sand: Reports of initial production for two of the wells indicated that salt water constituted from 0.3% to 10% of the liquid produced. Available information does not indicate whether any water is being produced currently.

DEVELOPMENT AND PRODUCTION HISTORY

Woodbine sand and Field total:

Year	NUMBER OF WELLS Completed	NUMBER OF WELLS Producing at end of year	CONDENSATE PRODUCTION (barrels) Yearly	CONDENSATE PRODUCTION (barrels) Cumulative	GAS PRODUCTION (Mcf) Yearly	GAS PRODUCTION (Mcf) Cumulative
1938	1	0	0	0	0	0
1939	0	1	180	180	35,000	35,000
1940	0	1	2,400	2,580	935,000	970,000
1941	0	1	502	3,082	72,376	1,042,376
1942	0	1	41	3,123*	15,000	1,057,376*
1943	0	0				
1944	0	0				
1945	0	0				
1946	0	0				
1947	2	0				
1948	1	4	5,436	5,436**	1,246,321	1,246,321**
1949	3	7	24,944	30,380**	7,325,564	8,571,885**
1950 to 8/1	0	7	15,585	45,965**	4,545,070	13,116,955**

*Estimated from Year Books of National Oil Scouts and Landmen's Association; not a part of Railroad Commission records.

**Railroad Commission figures; do not include totals to end of 1942.

There was no pipe line outlet until June 1948.

ELYSIAN FIELDS FIELD

Harrison County, Texas

ERWIN K. KRAUSE
Research Assistant, Bureau of Economic Geology, Austin, Texas
August 18, 1950

LOCATION

The Elysian Fields producing area (one well) is in southeastern Harrison County $3\frac{1}{2}$ miles northwest of the town for which it was named. It is about $10\frac{1}{2}$ miles southwest of the town of Waskom.

MAP

Because of their proximity, and in order to show their positions relative to Waskom field, both Elysian Fields and West Waskom fields are presented on one map in the paper on West Waskom field.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Probably subsurface work.

DISCOVERY

Travis Peak sand: May 16, 1946; Arkansas Fuel Oil Co. and R. W. Williams #1 J. H. Furrh Estate. Flowed $12\frac{1}{2}$ barrels of 42° gravity oil per day through 1/4-inch tubing choke; rock pressure, 2,306 psi.; perforations, 6,294-6,308; G.O.R., 5,000:1.

ELEVATION OF SURFACE

365 feet.

SURFACE FORMATION

Wilcox group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

557 feet below top of Travis Peak productive zone.

NATURE OF TRAP

Travis Peak sand: Lenticular sand on southeast flank of Waskom gas structure.

PRODUCTIVE AREA

Travis Peak sand: One well; 600 acres.

THICKNESS OF RESERVOIR ROCK

Travis Peak:	Feet
Net productive	14±

CHARACTER OF OIL

Travis Peak sand: Gravity, 42°.

PRODUCTION HISTORY

Travis Peak sand and Total field:

Year	WELLS PRODUCING at end of year	GAS PRODUCTION (Mcf)		CONDENSATE PRODUCTION (barrels)	
	Gas	Yearly	Cumulative	Yearly	Cumulative
1946	0	0	0	0	0
1947	1	25,948	25,948	820	820
1948	1	153,163	179,111	1,833	2,653
1949	1	294,530	473,641	3,990	6,643

EYLAU FIELD
Bowie County, Texas

JACK PHILLIPS
Geologist, Cities Service Oil Co., Tyler, Texas
March 16, 1950

LOCATION and DEFINITION

The Eylau field is 6 miles southwest of Texarkana and two miles southwest of Eylau, Bowie County, Texas. Dry holes to the east, west and south of the one productive well definitely limit the extent of the field in those directions. Only further drilling will determine its northern boundary.

METHODS OF EXPLORATION LEADING TO DISCOVERY

In 1944, Barnsdall Oil Co. conducted 26 crew-weeks of geophysical work using electrical, gravity, magnetometer and seismograph methods. The use of these methods led to the discovery of a definite anomaly and to the drilling operations which resulted in the discovery of the field. The first well drilled, Barnsdall Oil Co. #1 Heilborn, found only a show of oil. The discovery well was the third well completed.

DISCOVERY

Smackover lime: September 15, 1944; Barnsdall Oil Co. #2 Heilborn. Initial production, 40 barrels of oil per day plus 8% salt water on 9/64-inch choke; tubing pressure, 1,450 psi.; gas-oil ratio, 1,100:1.

ELEVATION OF SURFACE

Derrick floor, 305 feet.

SURFACE FORMATION

Wilcox.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest stratigraphic horizon penetrated by the one well in the field is 52 feet below the top of the Smackover formation. For penetrations by wells in the vicinity, see following tabulation.

NATURE OF TRAP

Smackover lime: Closure against igneous mass, which appears to be intrusive.

PRODUCTIVE AREA

Smackover lime: Approximately 100 acres.

THICKNESS OF RESERVOIR ROCK

Smackover lime: 5 to 7 feet net productive.

LITHOLOGY OF RESERVOIR ROCK

Smackover lime: Brown, finely-crystalline, porous and non-porous, dolomitic limestone grading into crystalline, non-porous, argillaceous limestone with calcite and shale inclusions.

CONTINUITY OF RESERVOIR ROCK

Smackover lime: The Smackover lime, as described above, is continuous along the north and west rim of the East Texas basin. It wedges out updip and thickens, and possibly changes facies, toward the center of the basin.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Smackover lime:	Feet
No free gas cap	
Elevation of top of oil	-7,404±
Elevation of bottom of oil	-7,409±
Relief	5±

CHARACTER OF OIL

Gravity, A.P.I., 41°. Base, paraffin.

CHARACTER OF GAS

Heating value, approximately 500 B.t.u./cf.
Nitrogen content, approximately 62%.

ACID TREATMENT

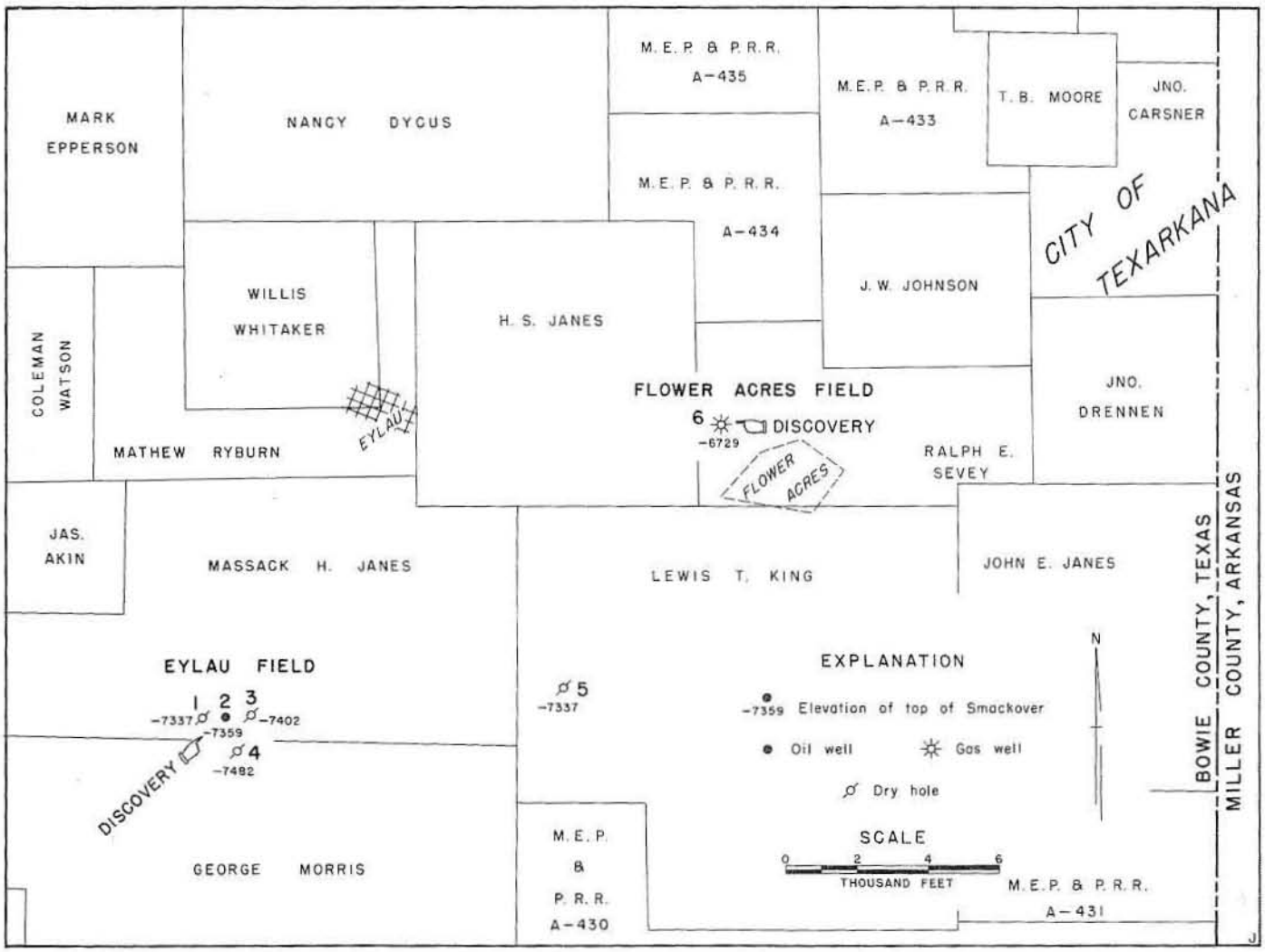
The reservoir has not been subjected to acid treatment.

SELECTED REFERENCES

Bell, John S. and Shepherd, J. M. (1949) Development and production in East and East Central Texas in 1948: Am. Inst. Min. & Met. Eng., Statistics of Oil and Gas Development and Production (covering 1948), pp. 410 and 411.

East Texas Geological Society (1945) Developments in East Texas in 1944: Amer. Assoc. Petr. Geol., Bull., vol. 29, p. 769.

East Texas Oil Scouts Association (1949) Texas East-Oil and gas field development 1948: National Oil Scouts & Landmen's Assn., Year Book, vol. 19, p. 558.



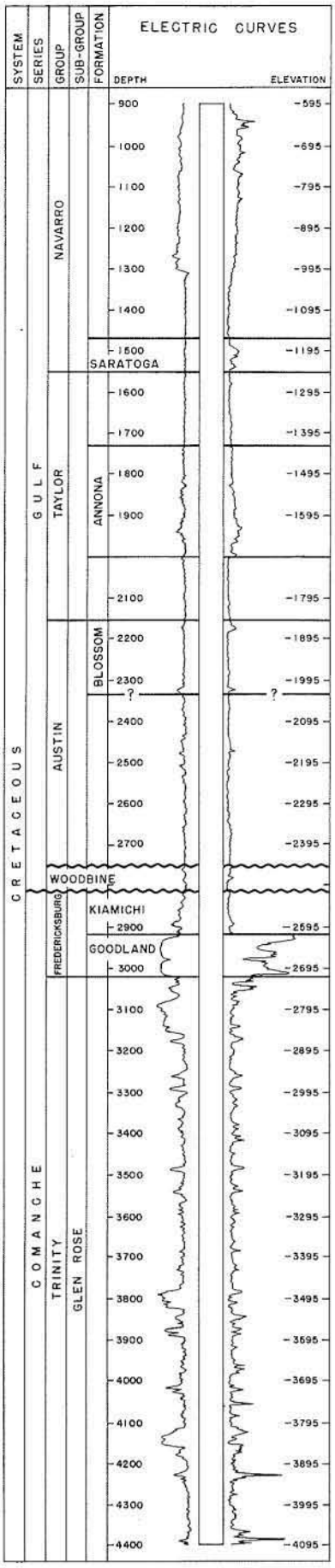
ELEVATIONS OF STRATIGRAPHIC HORIZONS and OTHER DATA

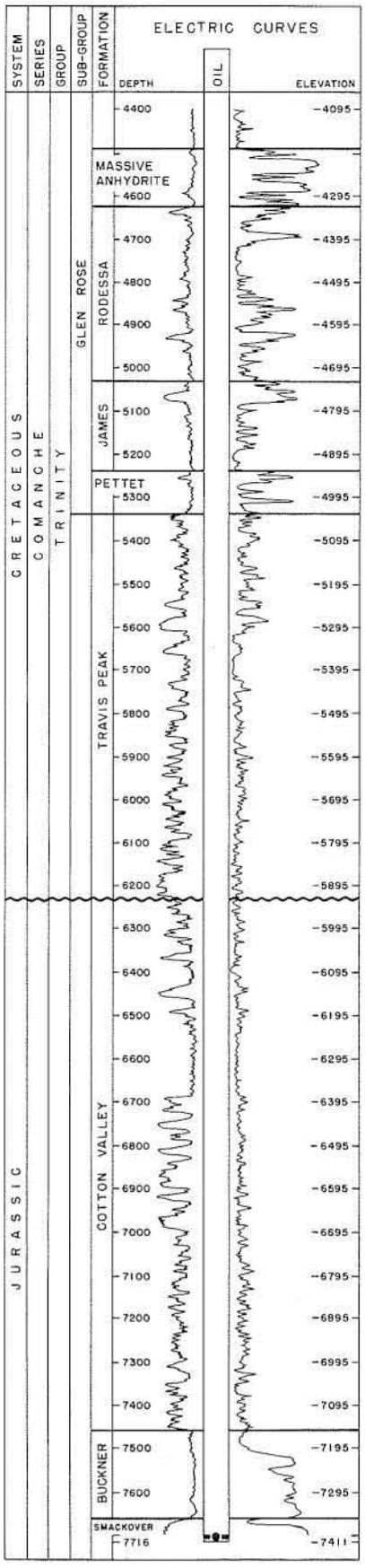
	1 BARNSDALL OIL CO. #1 Gifford-Hill	2 BARNSDALL OIL CO. #2 Heilborn	3 BARNSDALL OIL CO. #1 Heilborn	4 BARNSDALL OIL CO. #1 N. Pickering	5 BARNSDALL et al. #1 J.R. Greenwood	6 BARNSDALL et al. #1 I. Pickering
Top of Nacatoch			- 637	- 632		
Top of Saratoga	-1,190	-1,165	-1,173	-1,210	-1,168	-1,052
Top of Annona		-1,430	-1,433		-1,412	-1,324
Base of Annona	-1,685	-1,695	-1,690	-1,702	-1,676	-1,575
Top of Woodbine	-2,450 ?	-2,447	-2,448			-2,274 ?
Top of Comanche	-2,510 ?	-2,505	-2,510			
Top of Goodland	-2,620	-2,607	-2,620	-2,631	-2,560	-2,404
Base of Goodland		-2,715	-2,713	-2,720	-2,642	
Top of Trinity	-2,735	-2,730	-2,730			-2,456
Top of Paluxy			-2,778	-2,784	-2,695	-2,513
Top of anhydrite zone	-4,067	-3,857	-4,055			-3,746
Top of Massive Anhydrite	-4,197	-4,190	-4,190	-4,197	-4,091	-3,875
Base of Massive Anhydrite	-4,325	-4,315	-4,316	-4,332	-4,232	-4,001
Top of James	-4,737	-4,725	-4,725	-4,740	-4,626	-4,391
Top of Pettet	-4,742 ?	-4,935	-4,935	-4,949	-4,839	-4,603
Top of Travis Peak	-5,040	-5,035	-5,038	-5,050	-4,937	-4,702
Top of Cotton Valley		-5,923 ?	-5,970 ?	-5,954 ?	-5,843	-5,623 ?
Top of Buckner	-7,120	-7,150	-7,185	-7,230	-7,050	-6,376
Top of Smackover	-7,337	● -7,359	o -7,402	-7,482	-7,337	✱ -6,729
Top of igneous rock	-7,367			-7,512		-7,111
Total depth, sub-sea	-7,524	-7,411	-7,549	-7,546	-7,882	-7,202
Elevation, derrick floor	+313	+305	+287	+298	+306	+299
Date of completion	9/1/44	9/15/44	1/22/44	8/23/47	3/15/47	1/5/46

Top of zone containing hydrocarbon indicated as follows:

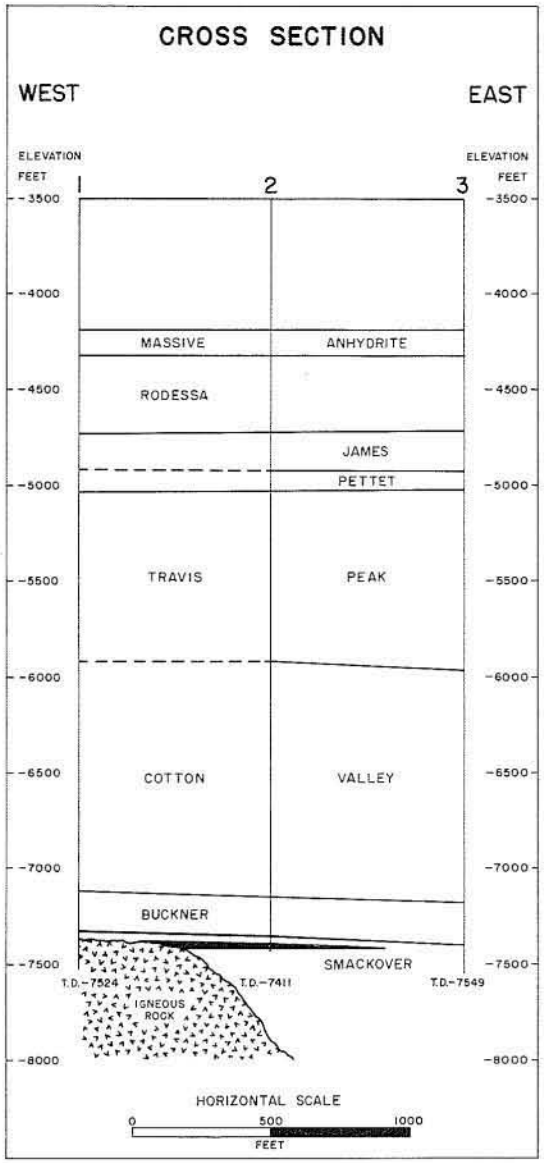
● Oil production o Show of oil ✱ Gas and condensate production

TYPE SECTION OF ROCKS PENETRATED





● Oil production



PRODUCTION HISTORY

Year	WELLS PRODUCING at end of year — Oil: Pumping	Oil: Flowing	OIL PRODUCTION (barrels)	WATER PRODUCTION (barrels)
1944	1	0	3,102	None
1945	0	1	30,629	9,785
1946	0	1	18,596	18,916
1947	0	1	32,871	21,286
1948	0	1	42,815	43,804
1949	0	1	46,235	49,223
Totals			174,248	143,014

FLAG LAKE FIELD

Henderson and Navarro Counties, Texas

A. C. WRIGHT
District Geologist, Shell Oil Company, Tyler, Texas
May 1950

LOCATION and OTHER NAME

The Flag Lake field is located in Henderson and Navarro counties 22 miles west of Athens, the county seat of Henderson County, and 18 miles northeast of Corsicana, the county seat of Navarro County.

The southwestern portion of the field has been commonly referred to as the Bazette field.

METHODS OF EXPLORATION LEADING TO DISCOVERY

A combination of surface and subsurface geology was responsible for the discovery of the field. In 1937 the late Fred Haynes, a well known wildcatter of Plano, Texas, who had previously drilled three dry holes in the vicinity, interested a number of major companies and Messrs. Sherman Hunt and L. O. McMillan, then of Tyler, to drill the #1 A. R. Dillard. This test was drilled to 6,518 feet (98 feet into the Travis Peak formation) before being plugged back and completed in the Woodbine as the discovery well.

DISCOVERY

Woodbine sand: November 18, 1937;
Hunt & McMillan #1 A. R. Dillard.

ELEVATION OF SURFACE

At well locations: Highest, 361 ft.; lowest, 291 feet.

SURFACE FORMATION

Wills Point formation of the Midway group is the only formation exposed within the area of the field.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated is 98 feet below the top of the Travis Peak formation. This penetration was in the discovery well.

NATURE OF TRAP

Woodbine sand: Closure against fault.

PRODUCTIVE AREA

Woodbine sand and Field: 500 acres.

THICKNESS OF RESERVOIR ROCK

Woodbine sand: Average 7 feet net productive.

LITHOLOGY OF RESERVOIR ROCK

Woodbine sand: Soft, friable sand; occasional shale partings.

CONTINUITY OF RESERVOIR ROCK

Woodbine sand: There are two productive sands. The higher is at the top of the Woodbine formation and is present in the area around the discovery well but it shales out to the southward. The second is 50 feet below the top of the Woodbine and is oil- and gas-bearing on the crest of the structure.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine sand:	Feet
Elevation of top of oil	-2,661
Elevation of bottom of oil	-2,738 variable
Relief	77

There are three gas wells completed in sands at elevations about the same as those of sands where oil is being produced in near-by wells.

CHARACTER OF OIL

Woodbine sand:
Gravity, A.P.I.: 37° to 44.8°.

For analyses see:

Railroad Commission of Texas

Analyses of Texas Crude Oils (1940) pp. 30 and 60. * and **

U. S. Bureau of Mines — Reference designation

Tabulated Analyses of Texas Crude Oils, T.P. 607 (1939) — A

Analyses of Crude Oils from Some Fields of Texas, R.I. 3699 (1943) — B

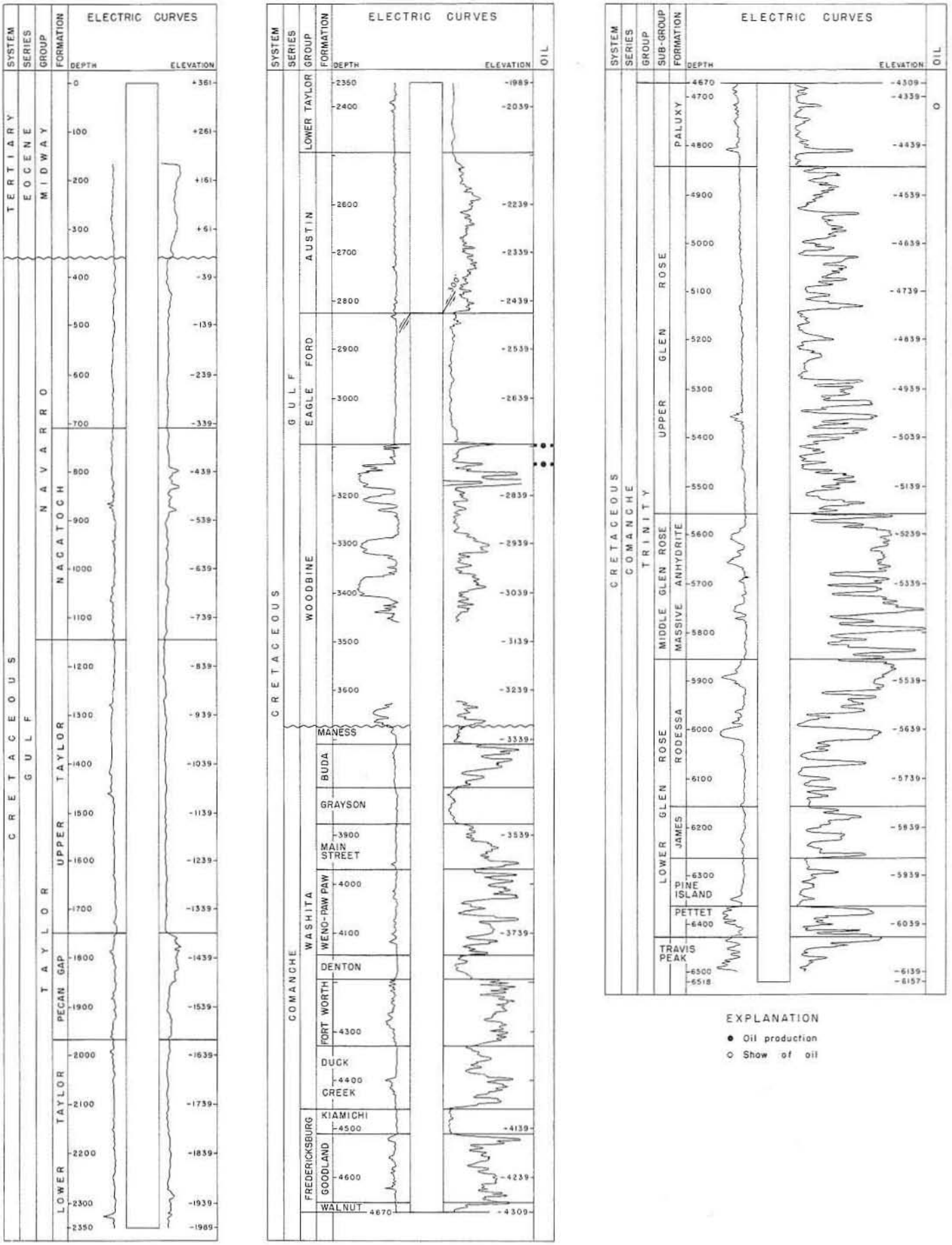
Ref. desig.	Lab. ref. No.	38089	38090	39136	40083
A	Group 4, Item	34*	35*		
B	Item			33*	8**

*Field name indicated as Flag Lake.
**Field name indicated as Bazette.

WATER PRODUCTION

Woodbine sand: No data available on volume of salt water production. All wells will eventually go to salt water as this is a water drive reservoir.

TYPE SECTION OF ROCKS PENETRATED

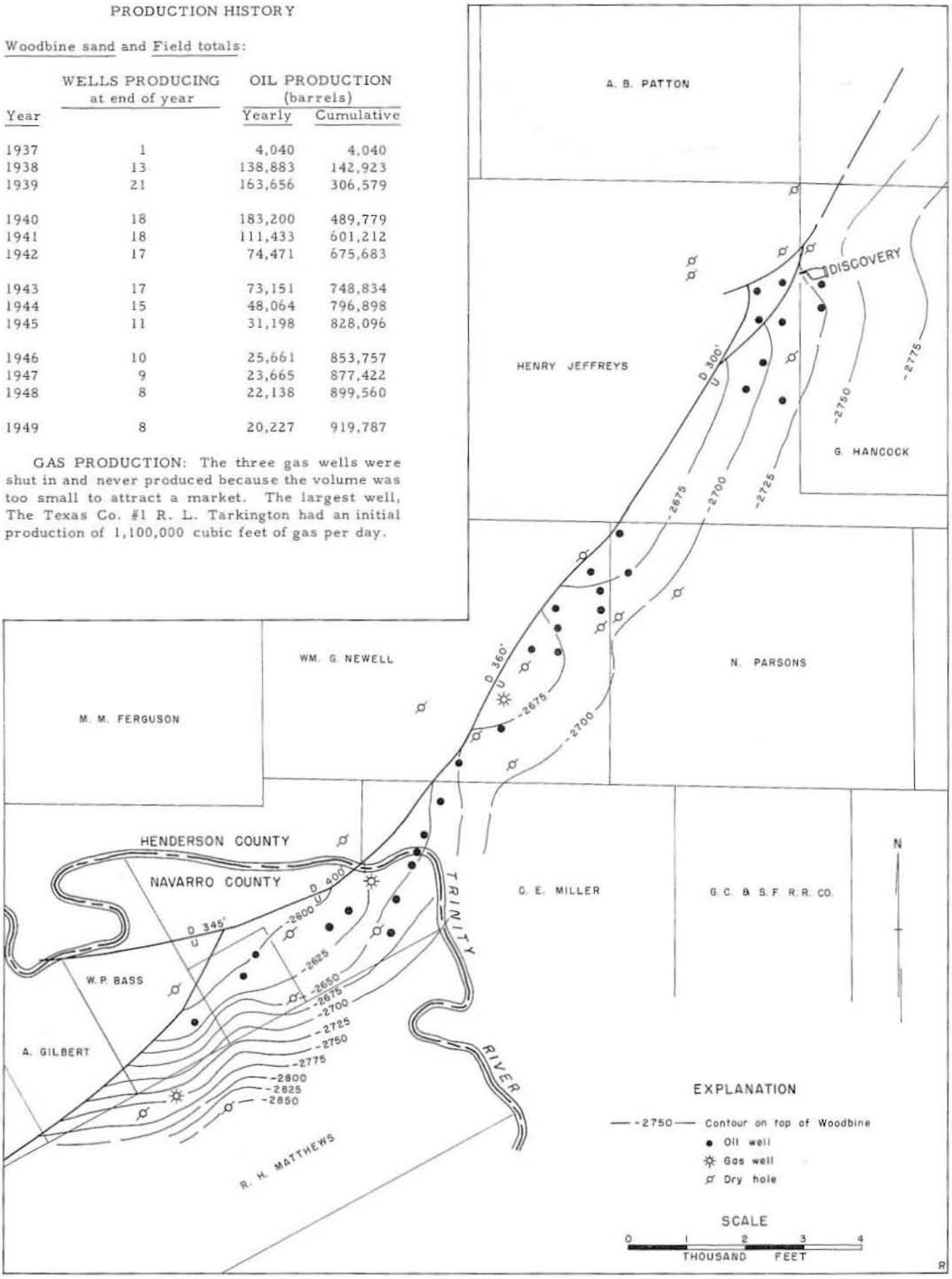


PRODUCTION HISTORY

Woodbine sand and Field totals:

Year	WELLS PRODUCING at end of year	OIL PRODUCTION (barrels) Yearly	Cumulative
1937	1	4,040	4,040
1938	13	138,883	142,923
1939	21	163,656	306,579
1940	18	183,200	489,779
1941	18	111,433	601,212
1942	17	74,471	675,683
1943	17	73,151	748,834
1944	15	48,064	796,898
1945	11	31,198	828,096
1946	10	25,661	853,757
1947	9	23,665	877,422
1948	8	22,138	899,560
1949	8	20,227	919,787

GAS PRODUCTION: The three gas wells were shut in and never produced because the volume was too small to attract a market. The largest well, The Texas Co. #1 R. L. Tarkington had an initial production of 1,100,000 cubic feet of gas per day.



FLOWER ACRES FIELD
Bowie County, Texas

JACK PHILLIPS
Geologist, Cities Service Oil Company, Tyler, Texas
March 16, 1950

LOCATION

The Flower Acres field is 2 miles southwest of Texarkana. Only one well has been drilled in the field to date.

MAP

The reader is referred to the map included in the accompanying paper on the Eylau field.

METHOD OF EXPLORATION LEADING TO DISCOVERY

In 1946 Barnsdall Oil Co. conducted a three crew-week gravity survey in this general area and discovered a definite anomaly at the location of this field. The survey led to the drilling of the discovery well.

DISCOVERY

Smackover lime: January 5, 1946; Barnsdall Oil Co. et al. #1 Ivy Pickering. Initial production, 3,125,000 cubic feet of gas, 49 barrels of condensate and 1.4 barrels of water per day on 20/64-inch choke; gas-oil ratio 63,000:1; tubing pressure, 1,350 psi.; casing pressure, 1,550 psi. Reservoir pressure, 3,152 psi.

ELEVATION OF SURFACE

Derrick floor, 299 feet.

SURFACE FORMATION

Wilcox formation.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest stratigraphic horizon penetrated is in the Eagle Mills formation 259 feet below its top. Below this horizon, the well penetrated 91 feet into igneous rock which is believed to be intrusive.

NATURE OF TRAP

Smackover lime: Closure against igneous mass.

PRODUCTIVE AREA

Smackover lime: Approximately 640 acres.

THICKNESS OF RESERVOIR ROCK

Smackover lime:	Feet
From top to bottom	64
Net productive	22.5

LITHOLOGY OF RESERVOIR ROCK

Smackover lime: Brown, finely-crystalline, porous and non-porous, dolomitic limestone grading into gray, crystalline, non-porous, argillaceous limestone with calcite and shale inclusions.

CONTINUITY OF RESERVOIR ROCK

Smackover lime: The Smackover lime, as above described, is continuous along the north and west rim of the East Texas basin. It wedges out updip and thickens, and possibly changes facies, toward the center of the basin.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Smackover lime:	Feet
Elevation of top of gas	-6,731±
Elevation of bottom of gas	-6,795±
Relief	64±

To date, there is no proof that the reservoir contains hydrocarbon in liquid form.

The above figures represent elevation and relief of gas in the one well. It is probable that the gas column extends both higher and lower than proven in this one well.

CHARACTER OF CONDENSATE

Gravity, A.P.I., 68.7° Base, paraffin

CHARACTER OF GAS

Similar to that associated with the oil in the Eylau field; high in nitrogen content.

ACID TREATMENT

The reservoir was treated with 4,000 gallons of acid.

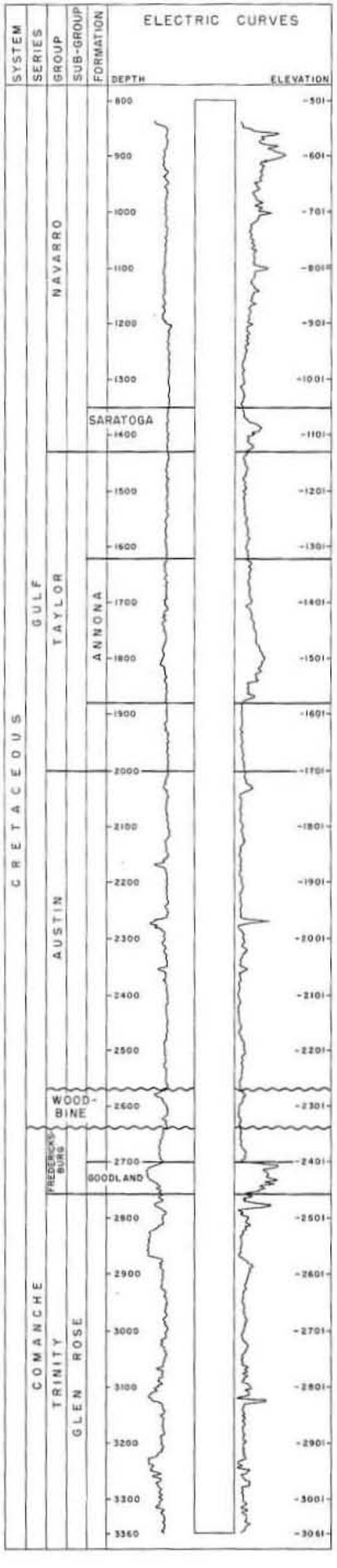
SELECTED REFERENCES

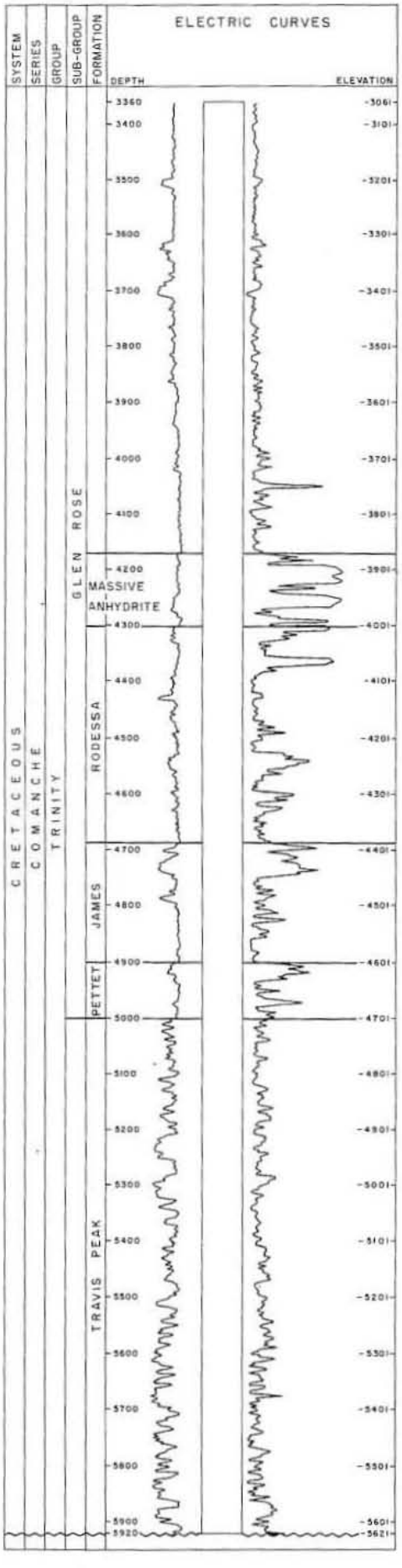
Bell, John S. and Shepherd, J. M. (1949) Development and production in East and East Central Texas in 1948: Am. Inst. Min. & Met. Eng., Statistics of Oil and Gas Development and Production (covering 1948), pp. 410 and 411.

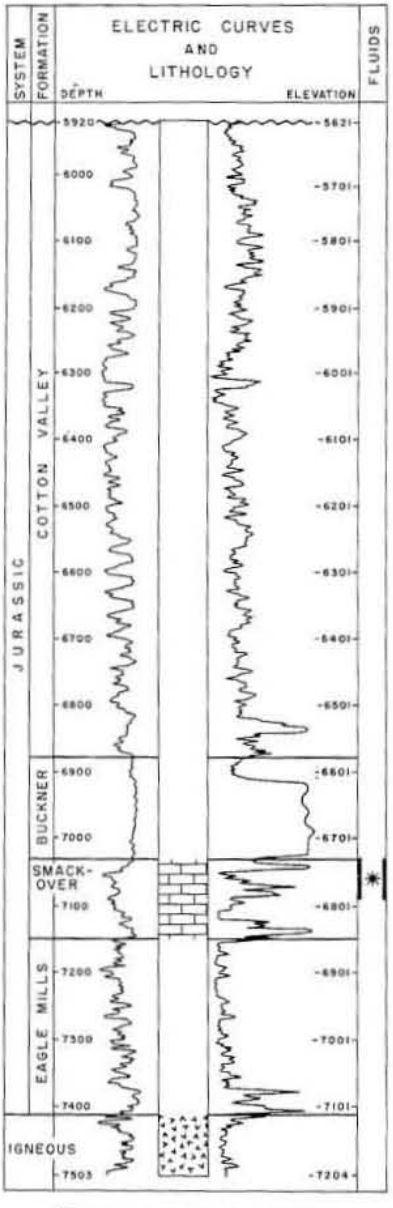
Cash, T. C. and Loetterle, G. J. (1947) Development in East Texas in 1946: Amer. Assoc. Petr. Geol., Bull., vol. 31, pp. 1062 and 1063.

East Texas Oil Scouts Assn. (1947) Texas East-Oil and Gas field development 1946: National Oil Scouts & Landmen's Assn., Year Book, vol. 17, pp. 586 and 590.

TYPE SECTION OF ROCKS PENETRATED







✱ Gas and condensate production

PRODUCTION HISTORY

Smackover lime and Total field (one well)

Year	CONDENSATE PRODUCTION (barrels)	GAS PRODUCTION (Mcf)
1946	903	47,967
1947	0	0
1948	8,388	311,202
1949	8,941	363,138
Totals	18,232	722,307

FREESTONE FIELD

Freestone County, Texas

T. H. SHELBY, Jr.
Geologist, Tyler, Texas
January 29, 1951

LOCATION

The Freestone field is in southwestern Freestone County about 7 miles southeast of the town of Teague and about 1½ miles south of the community of Freestone.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Structural closure mapped by subsurface studies prompted Humble Oil & Refining Co. to purchase a lease block in early 1945, and during the latter part of the year the area was mapped by reflection seismograph. The seismic work confirmed the existence of low-relief anticlinal closure. Drilling operations on the discovery well were begun on August 5, 1947.

DISCOVERY

Lower Pettet: January 29, 1949; Humble Oil & Refining Co. #1 R.P. McWatters. Initial production, 6,500 Mcf of gas per day on calculated open flow through casing perforations from 8,315 to 8,400 feet; 16 barrels of 53.6° A.P.I. gravity condensate per million cubic feet of gas.

ELEVATION OF SURFACE

At discovery well: 478 feet.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

About 5,900 feet below the top of Jurassic at the total depth of 16,347 feet, the greatest depth yet reached in any test in Northeast Texas. Just above total depth, the section consists of interbedded black shale and rock salt of Jurassic age.

NATURE OF TRAP

Lower Pettet: Simple convex trap on a low-relief anticline, possibly modified by permeability barriers.

PRODUCTIVE AREA

Lower Pettet and Field: 640 acres. It appears probably that further development will prove a larger area than proven by the one well.

THICKNESS OF RESERVOIR ROCK

Lower Pettet:	In discovery well
From top to bottom, feet	85
Net productive (estimated), feet	15

LITHOLOGY OF RESERVOIR ROCK

Lower Pettet: Porous and dense gray oolitic limestone.

CONTINUITY OF RESERVOIR ROCK

The Pettet member of the lower Glen Rose formation is recognized and correlated throughout much of the East Texas basin. It consists of more or less lenticular porous limestones interbedded with dense limestones and thin shale streaks. Development to date is insufficient to determine the lateral extent of the producing zone on the Freestone structure.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Lower Pettet	In discovery well
Elevation of top of gas, feet	-7,826
Elevation of bottom of gas, feet	-7,911
Relief, feet	85

The total extent of the gas column is not yet known. Water level has not been established.

CHARACTER OF GAS

Lower Pettet: The gas is sweet and has a specific gravity of 0.615. The heating value is about 1,050 B.t.u./cf. Following is an analysis made by Lone Star Gas Co.

Component	%	Component	%
Methane	95.20	Iso-butane	.24
Ethane	2.53	N-pentane	.16
Propane	1.09	Iso-pentane	.17
N-butane	.40	Hexanes plus	.21

ACID TREATMENT

Lower Pettet: The discovery well was acidized in two stages, using 1,000 and 10,000 gallons respectively. The breakdown pressure on the initial stage was 2,000 psi. On the second stage, a pressure of 1,200 psi. was required to break the formation resistance, and the pressure declined to 500 psi. as pumping progressed.

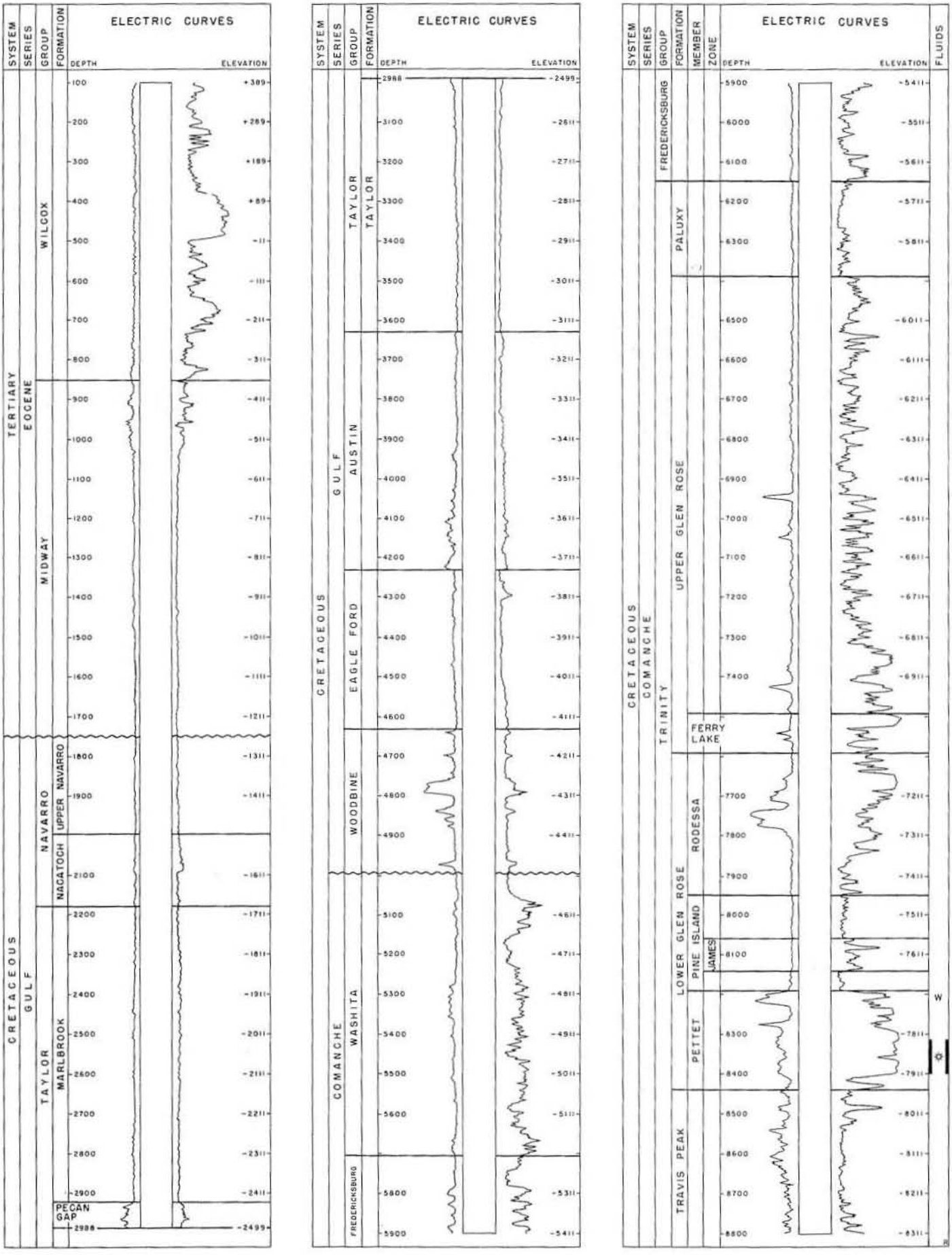
WATER PRODUCTION

The discovery well is free of water.

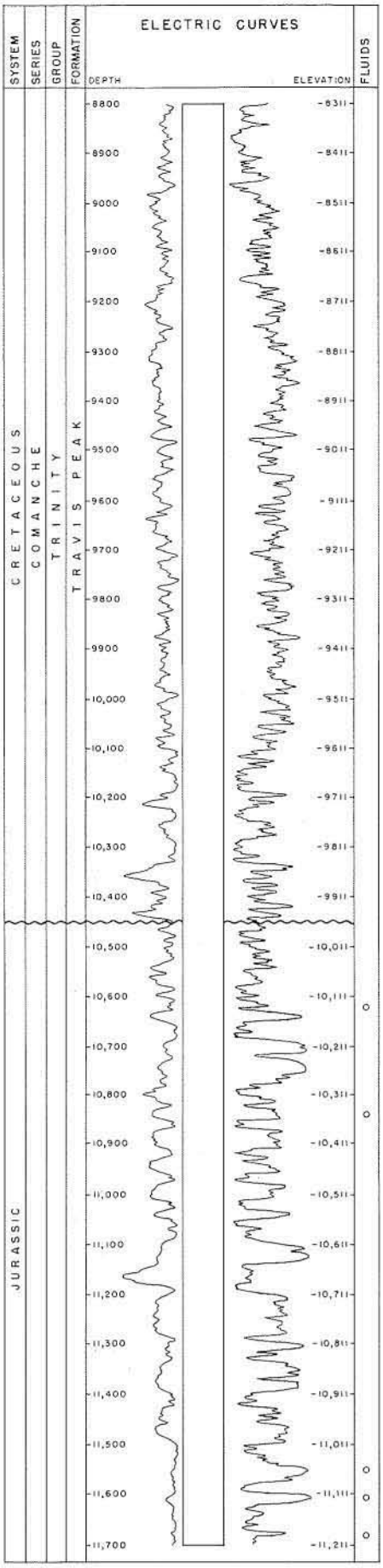
PRODUCTION HISTORY

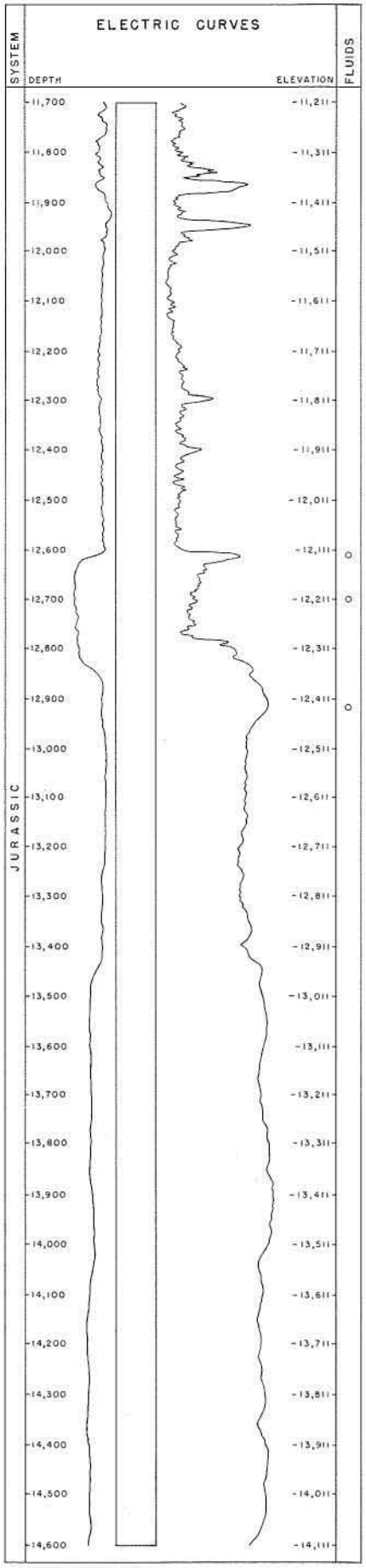
The discovery well is the only well drilled in the field to date. It has been shut in since completion.

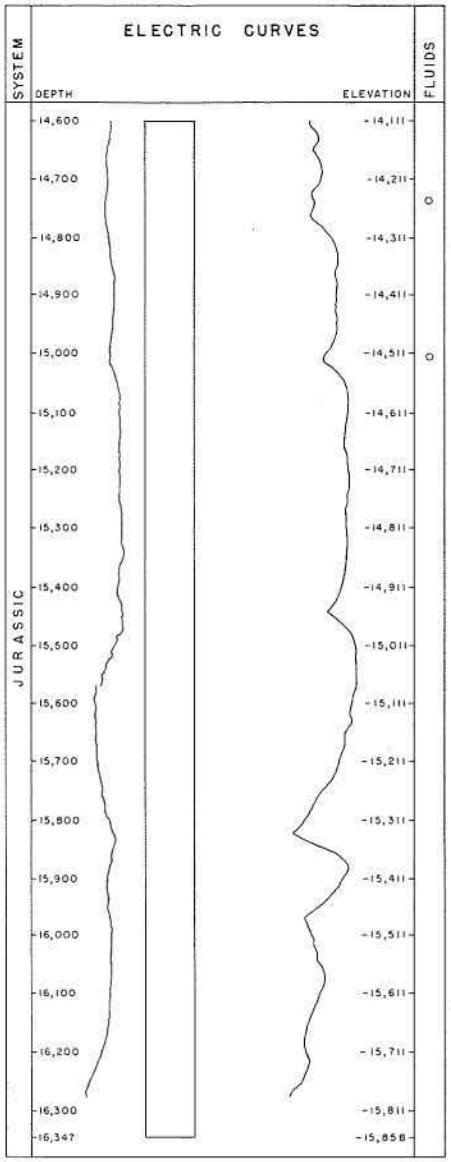
TYPE SECTION OF ROCKS PENETRATED



TYPE SECTION OF ROCKS PENETRATED

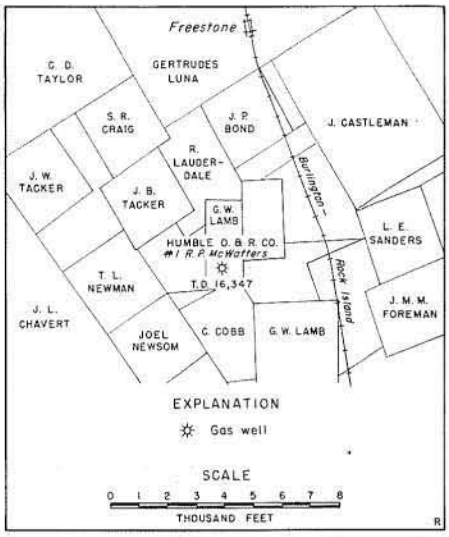






EXPLANATION

- ☼ Commercial gas production
- o Non-commercial showing of oil or gas
- W Salt water



FRUITVALE FIELD
Van Zandt County, Texas*

PHILIP M. ROBERTSON
Geologist, Magnolia Petroleum Company, Tyler, Texas
November 9, 1949

LOCATION

The Fruitvale field is located 3½ miles east of Myrtle Springs in central Van Zandt County. It is on the west flank of the East Texas basin.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Reflection seismograph work by The Superior Oil Co. of California led to the drilling of the discovery well.

DISCOVERY

Groves sand: March 3, 1944; The Superior Oil Co. of California #1 Groves in the E. Van Sickle survey. Pumped 72 barrels of 39° gravity oil in 24 hours from perforations at 8,552 to 8,570 feet opposite an 18-foot sand body, the top of which is 67 feet below the top of the Travis Peak formation.

ELEVATION OF SURFACE

At well locations: Higher, 488 ft., lower, 462 feet.

SURFACE FORMATIONS

Members of Midway and Wilcox groups.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated by either of the two wells is 515 feet below the top of Travis Peak. This horizon was penetrated in the discovery well at its total depth of 9,002 feet.

NATURE OF TRAP

Groves sand: Convex fold on a simple low-relief anticline.

PRODUCTIVE AREA

Groves sand and Field: Productive limits not defined; approximately 80 acres proven.

LITHOLOGY OF RESERVOIR ROCK

Groves sand: Fine-grained argillaceous sandstone with low porosity and permeability.

CONTINUITY OF RESERVOIR ROCK

Groves sand: Although most of the productive sands in the Travis Peak formation are lenticular, this one can be correlated with some assurance throughout most of northern Van Zandt and southern Rains counties. Whether it is continuous as a blanket sand throughout this area is doubtful.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Groves sand	Feet
No gas cap indicated to date	
Elevation of top of oil	-8,090-
Elevation of bottom of oil	-8,138+
Relief	48+

The above figures represent the highest and lowest elevations of oil in wells completed to date.

CHARACTER OF OIL

Groves sand: Gravity, A.P.I. @ 60° F., 39°

CHARACTER OF GAS

Groves sand: The only gas produced is that which comes out of solution as the oil is produced. The quantity is negligible.

WATER PRODUCTION

Each of the two wells showed about 3% salt water and basic sediment on open hole test, but they have produced no water since then.

ACID TREATMENT

The reservoir rock has not been treated with acid.

PRODUCTION HISTORY

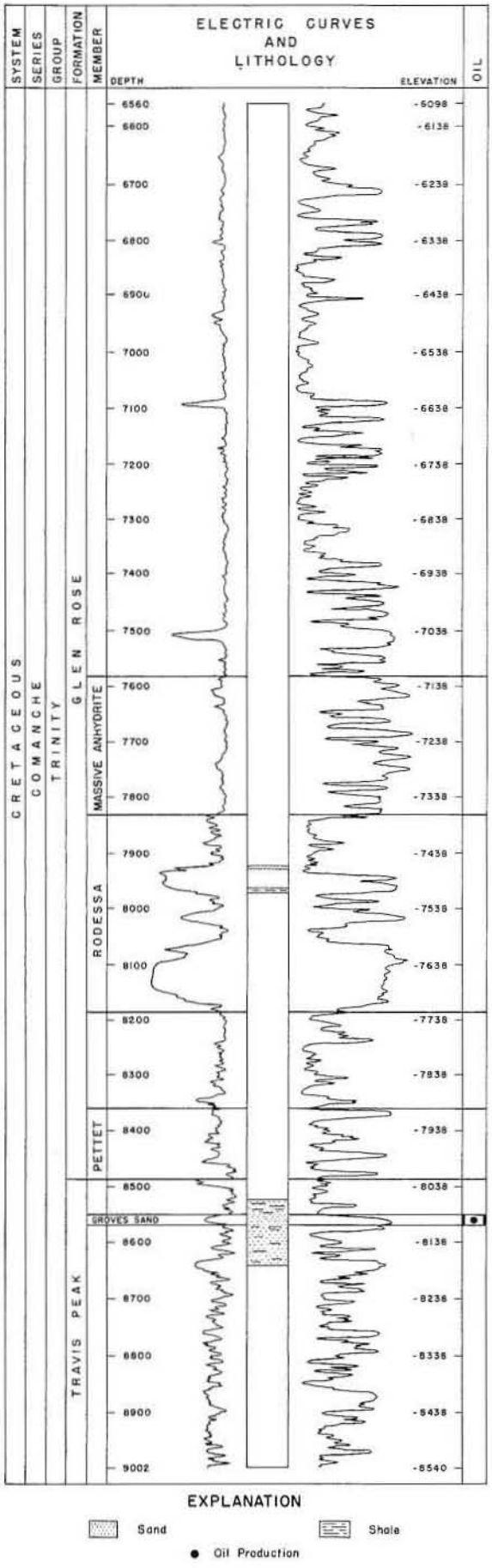
Groves sand and Field total

Year	WELLS PRODUCING at end of year	OIL PRODUCTION (barrels)	
	Pumping	Yearly	Cumulative
1944	1	13,000	13,000
1945	2	21,000	34,000
1946	2	22,475	56,475
1947	2	16,998	73,473
1948	2	15,791	89,264
1949**	2	12,281	101,545

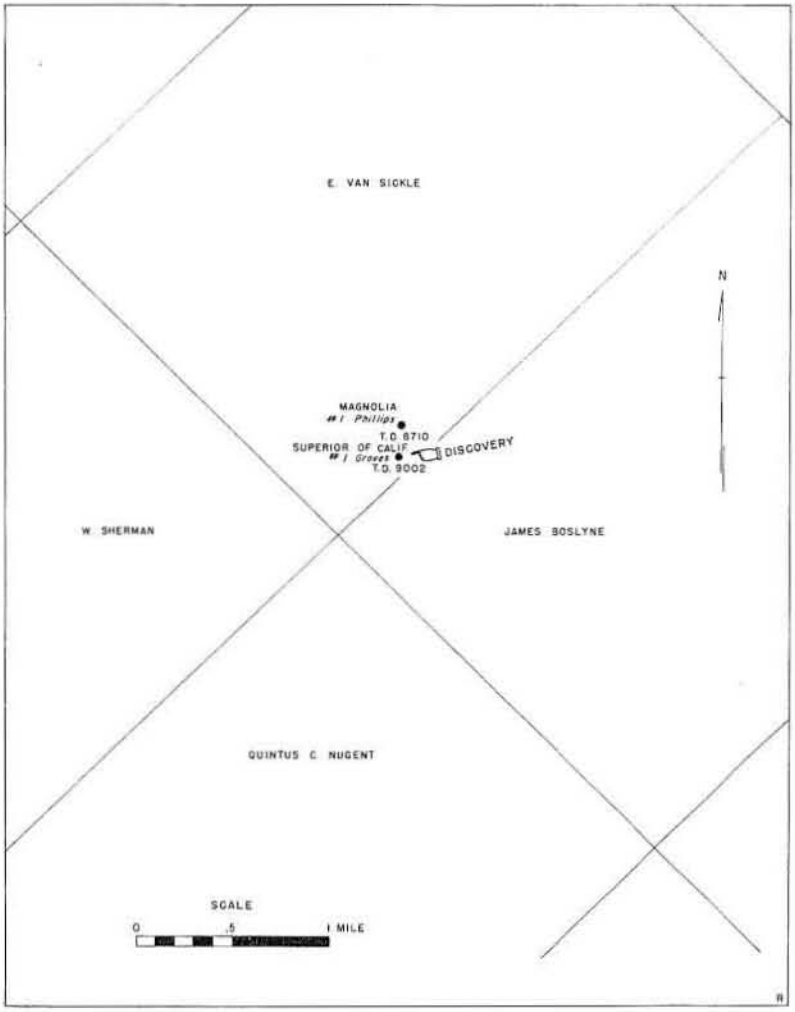
**P.S. - 1949 data added by amendment.

*Published by permission of Magnolia Petroleum Co.

TYPE SECTION OF ROCKS PENETRATED



SYSTEM	SERIES	GROUP	FORMATION	ELEVATION OF TOP	THICKNESS	OIL
TERTIARY	EOCENE	WILCOX		SURFACE		
		MIDWAY		TOP ABSENT		
CRETACEOUS	GULF	NAVARRO		− 773	605	
		TAYLOR		− 1378	1071	
		AUSTIN		− 2449	922	
		EAGLE FORD		− 3371	479	
		WOODBINE		− 3850	815	
	COMANCHE	WASHITA		− 4665	966	
		FREDERICKSBURG		− 5631	145	
		TRINITY	PALUXY	− 5776	320	
			GLEN ROSE	− 6096	1930	
			TRAVIS PEAK	− 8026	900±	●



GARRISON FIELD
Nacogdoches County, Texas

ERWIN K. KRAUSE
Research Assistant, Bureau of Economic Geology, Austin, Texas
August 18, 1950

LOCATION

The one well which occasioned the naming of this field is located in the extreme northeastern part of Nacogdoches County, about 2 miles east of Garrison in the southern part of Harrison Graham survey.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Extensive seismograph work by Arkansas Fuel Oil Co.

DISCOVERY

Pettet lime: November 4, 1948; Arkansas Fuel Oil Co. #1 Sarah B. Adams et al. Flowed 1,310 Mcf gas per day on test through perforations at 7,109-7,119; rock pressure 3,199 pounds. Test not considered entirely successful because of fluctuations of about 8 pounds on all rates of flow.

ELEVATION OF SURFACE

340 feet.

SURFACE FORMATION

Wilcox group (undifferentiated).

OLDEST STRATIGRAPHIC HORIZON PENETRATED

519 feet below the top of the Travis Peak.

STRUCTURE

Anticline.

PRODUCTIVE AREA

Pettet lime: One well; estimated 300 acres.

THICKNESS OF RESERVOIR ROCK

	Feet
Pettet lime:	
Net productive	10

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

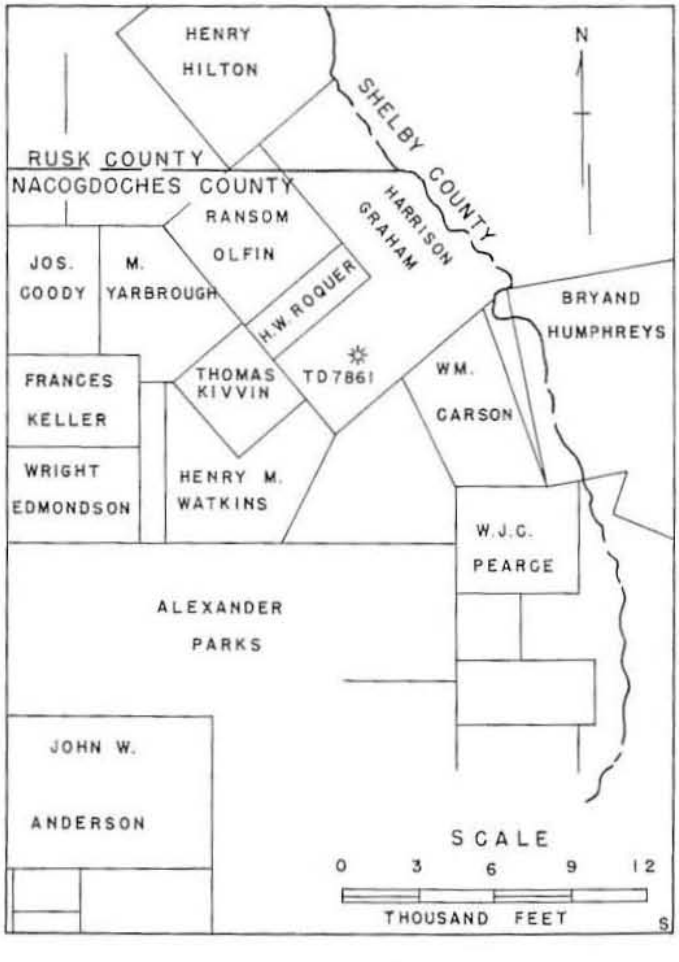
Pettet lime:	
Elevation of top of perforations, feet	-6,769
Elevation of bottom of perforations, feet	-6,779
Relief, feet	10

ACID TREATMENT

The well was acidized with 8,000 gallons.

PRODUCTION HISTORY

Pettet lime: The discovery well is the only well in the field. It was shut-in during November and December 1948. In 1949, the well produced 5,144 Mcf of gas during April, May, and June and 86 barrels of condensate during May and June.



GINTER FIELD
Angelina County, Texas

JULIUS A. BUCHANAN
Geologist, Union Producing Company, Tyler, Texas
March 17, 1951

LOCATION and OTHER NAME

The Ginter field is about 3 miles east of the town of Diboll and 10 miles south of the town of Lufkin, the county seat of Angelina County.

During the first few years after discovery, the field was generally known as the Diboll field. However, during recent years most publications designate the field by the name Ginter.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Surface geology is the method which first revealed structural conditions favorable for the occurrence of oil.

DISCOVERY

Lower Reklaw: May 12, 1936;
George E. Ginter et al #1 Copes Heirs.

ELEVATION OF SURFACE

At well locations: Highest, 216 ft.; lowest, 192 feet.

SURFACE FORMATION

Undifferentiated Jackson group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated in the vicinity of the field is in the Wilcox group 1,125 feet below the top of that group. This penetration was in Gar-Flo Oil Co. #1 Copes, which is the most westward dry hole along the apex of the structural nose portrayed on the accompanying map (T.D. 3,625 feet). Several wells were drilled into the Wilcox group.

NATURE OF TRAP

Lower Reklaw: The accumulation of oil is due to a stratigraphic trap. The sand is porous on the east side of an eastward plunging nose and shales out updip over the top of the nose.

PRODUCTIVE AREA

Lower Reklaw and Field: About 35 acres.

THICKNESS OF RESERVOIR ROCK

Lower Reklaw: Approximately 5 feet.

LITHOLOGY OF RESERVOIR ROCK

Lower Reklaw: Clean, medium-grained sand grading updip into silty, shaly sand.

CONTINUITY OF RESERVOIR ROCK

Lower Reklaw: The reservoir rock is continuous throughout the productive area.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

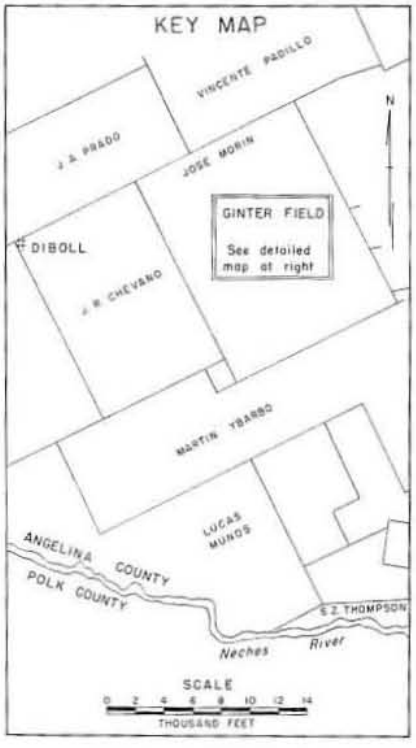
Lower Reklaw:	Feet
Elevation of top of oil	-1,960
Elevation of bottom of oil	-1,975+
Relief	15+

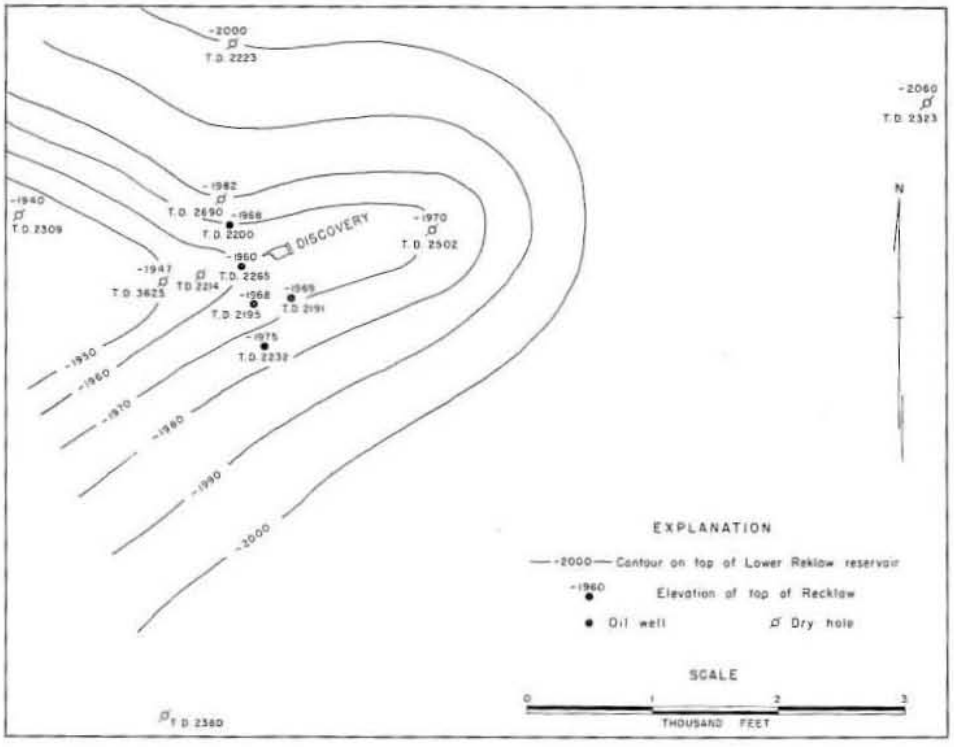
CHARACTER OF OIL

Gravity, A. P. I.: 23.5°

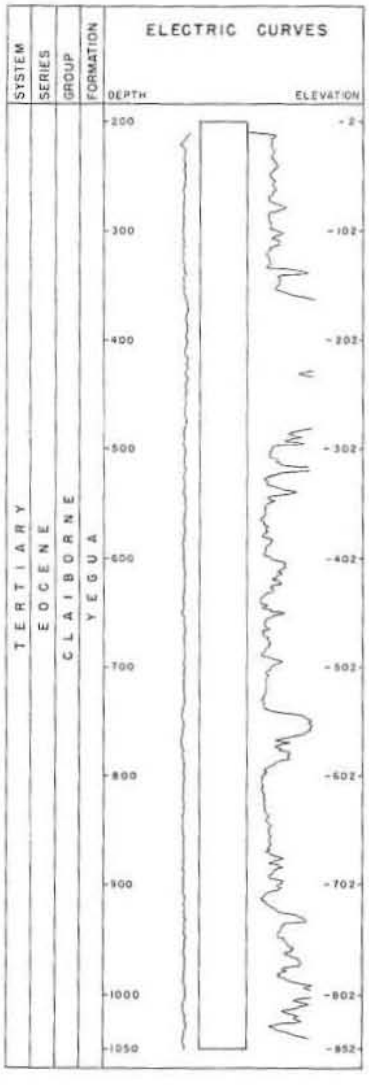
PRODUCTION HISTORY

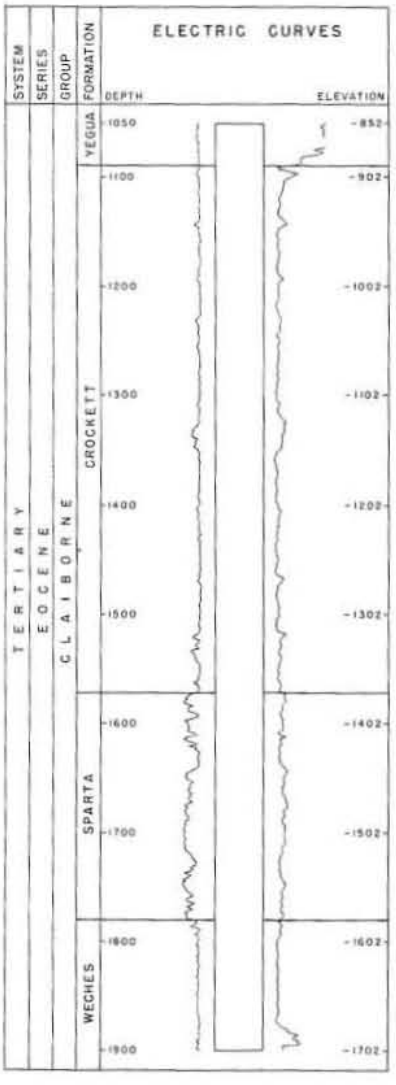
	WELLS PRODUCING at end of year		OIL PRODUCTION (barrels)	
Year	Flowing	Pumping	Yearly	Cumulative
1936	1	0	613	613
1937	1	0	1,500	2,113
1938	2	0	2,112	4,225
1939	5	0	8,860	13,085
1940	5	0	7,650	20,735
1941	4	0	6,776	27,511
1942	4	0	5,500	33,011
1943	4	0	4,890	37,901
1944	4	0	5,114	43,015
1945	4	0	3,130	46,145
1946	3	1	4,496	50,641
1947	3	1	3,696	54,337
1948	3	1	3,560	57,897
1949	2	2	3,711	61,608

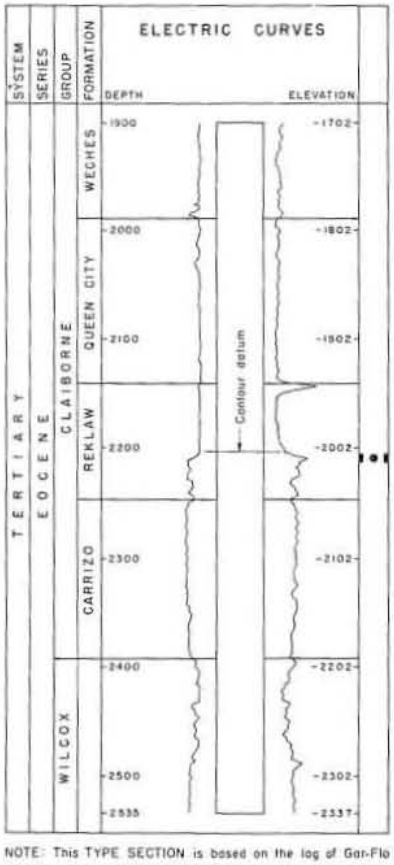




TYPE SECTION OF ROCKS PENETRATED







NOTE: This TYPE SECTION is based on the log of Gar-Flo Oil Co. # 1 Russell (T.D. 2380) from 200 to 2342 feet, and, below that, with adjusted depths and elevations, on the log of Petroleum Heat & Power Co. # 1 Southern Pine Lumber Co. (T.D. 2502).

EXPLANATION

Oil production

GRAPELAND FIELD
Houston County, Texas

E. B. WILSON
District Geologist, Sun Oil Company, Tyler, Texas
November 10, 1949

LOCATION

The Grapeland field is located 1 to 5½ miles west and northwest of the town of Grapeland in Houston County, Texas. It is 1½ miles from the north line and 11 miles from the west line of the county.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Surface geology was the principal method of exploration leading to the discovery of the field. Surface beds show a closed structure in the area. Drilling of Ellison, McBride et al. #1 J. E. Bean resulted in the discovery of the field.

DISCOVERIES

Sub-Clarksville sand: On June 18, 1947, Lone Star Producing Co. #1 Dora Ritchey was completed as the discovery oil well in the sub-Clarksville sand. It was the first well completed in this reservoir, although another well had previously established the presence of oil.

Woodbine sand: Gas: August 6, 1936; Ellison, McBride et al. #1 J. E. Bean.

Oil: October 10, 1937, American Liberty Oil Co. #2 J. A. Bean.

ELEVATION OF SURFACE

At well locations: Highest, 514 ft.; lowest, 335 feet.

SURFACE FORMATIONS

Outcrops of the Sparta and Weches formations cover most of the surface in the field. There are possibly a few outcrops of the Queen City formation exposed at the lower elevations.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest stratigraphic horizon penetrated within the area of the field is 134 feet below the top of the Pettet lime. It was penetrated in Grapeland Oil Co. #1-A Horne Unit, located in the J. Herod survey where the elevation of the top of the Woodbine is indicated as -5,506 feet on an accompanying map. This well is near the top of the structure and near the center of the field. It is the only well in the field which was drilled below the Woodbine.

AREAL DISTRIBUTION OF OIL AND GAS

Sub-Clarksville sand: This sand is not present as an effective reservoir over most of the field. It produces oil in a small area, not yet defined, at the northwest edge of the Woodbine gas producing area.

Woodbine sand: Gas occurs in the Woodbine sand wherever tested over the entire field except on the extreme eastern edge where oil was produced in one well and except at certain locations in the sub-Clarksville producing area in the northwest portion of the field. Most of the wells in that area have not penetrated the Woodbine. It probably contains gas in some portion of that area.

Oil has been found in the Woodbine in only one well, American Liberty Oil Co. #2 J. A. Bean on the extreme eastern edge of the field. This well was completed October 19, 1937 and produced 137,179 barrels of oil before it was plugged and abandoned in 1945.

NATURE OF TRAPS

Sub-Clarksville sand: The oil accumulation in this reservoir was at first thought to be due to an eastward pinchout of the sand. The pinchout does exist, but later development indicates structural closure on the sand, which may be the controlling factor. Structurally, the sub-Clarksville producing area appears to be on a local closure on the larger domal feature. The sub-Clarksville sand production is a new development for the field, and development is still going on. For this reason, full information is not at present available on the sub-Clarksville sand wells. Most of the data on the wells are from drillers logs. Due to lack of information where it is needed most for purposes of a cross-section, no cross-section is included in this paper.

Woodbine sand: The trap in the Woodbine sand is an irregular dome with a slight elongation in a northwest-southeast direction. This dome is located on a regional south dip.

PRODUCTIVE AREAS

The productive area of the sub-Clarksville oil reservoir as developed to date is 700 acres. The Woodbine gas area is 4,500 acres and the Woodbine oil (depleted) area is 40 acres. At present, the total area of the field is about 5,100 acres.

THICKNESSES OF RESERVOIR ROCKS

Sub-Clarksville sand:	13 feet
Woodbine sand:	45 feet

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Sub-Clarksville sand

No gas cap	-5,393
Elevation of top of oil, feet	-5,393
Elevation of bottom of oil, feet	-5,430±
Relief, feet	37±

Woodbine sand	Gas	Oil*
Elevation of top, feet	-5,493	-5,554
Elevation of bottom, feet	-5,560±	-5,562
Relief, feet	67±	8

*Oil found in one well only.

LITHOLOGY OF RESERVOIR ROCKS

Sub-Clarksville sand: Medium- to coarse-grained, porous, firm to soft sand with shale breaks.

Woodbine sand: Firm, medium-grained, porous sand with streaks of sandy shale and shale.

CONTINUITY OF RESERVOIR ROCKS

Sub-Clarksville sand: In that portion of the field developed to date, the sub-Clarksville sand is effective as a reservoir rock in only the area where there are presently producing oil wells. Throughout this area, the reservoir appears to be continuous.

Woodbine sand: This reservoir is continuous throughout the area where gas wells and the abandoned oil well are indicated on accompanying maps. At the locations of the dry holes where the elevations of top of Woodbine are indicated as -5,540, -5,542 and -5,565, the stratigraphic zone of the reservoir consists largely of shale. At the locations of the other dry holes within the area of the maps, the lithology of the zone is favorable but water was the only fluid yielded.

CHARACTER OF OIL

Sub-Clarksville sand

Gravity: 41.9° Sulphur: Less than 1% Base: Paraffin Odor: Sweet Color: Brown green

Woodbine sand

Gravity: 44.3° Sulphur: Less than 1% Base: Paraffin Odor: Sweet Color: Brown green

For analyses of Woodbine oil see:

U. S. Bureau of Mines	Laboratory reference No.	38134	41489	41492
Tabulated Analyses of Texas Crude Oils. T. P. 607 (1939)	Group 4	Item 36		
Analyses of Crude Oils from Some Fields of Texas. R. I. 3699 (1943)		Item	39	40

CHARACTER OF GAS AND CONDENSATE

Woodbine sand:

ANALYSIS OF GAS

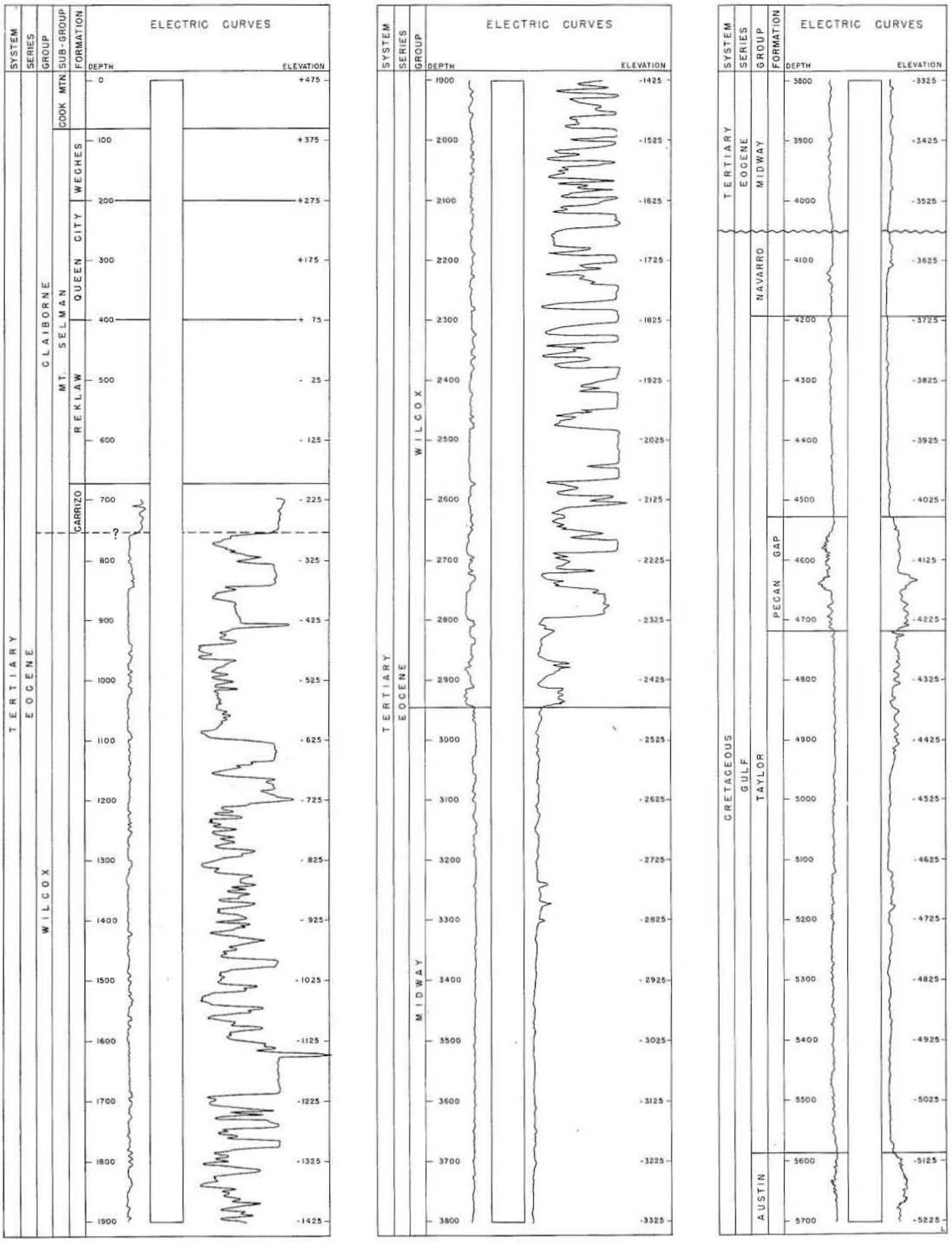
Methane	82.84%
Ethane	7.52%
Propane	4.18%
Iso-butane	.76%
N-butane	1.38%
Pentane	1.14%
Hexanes plus	2.18%

ANALYSIS OF CONDENSATE

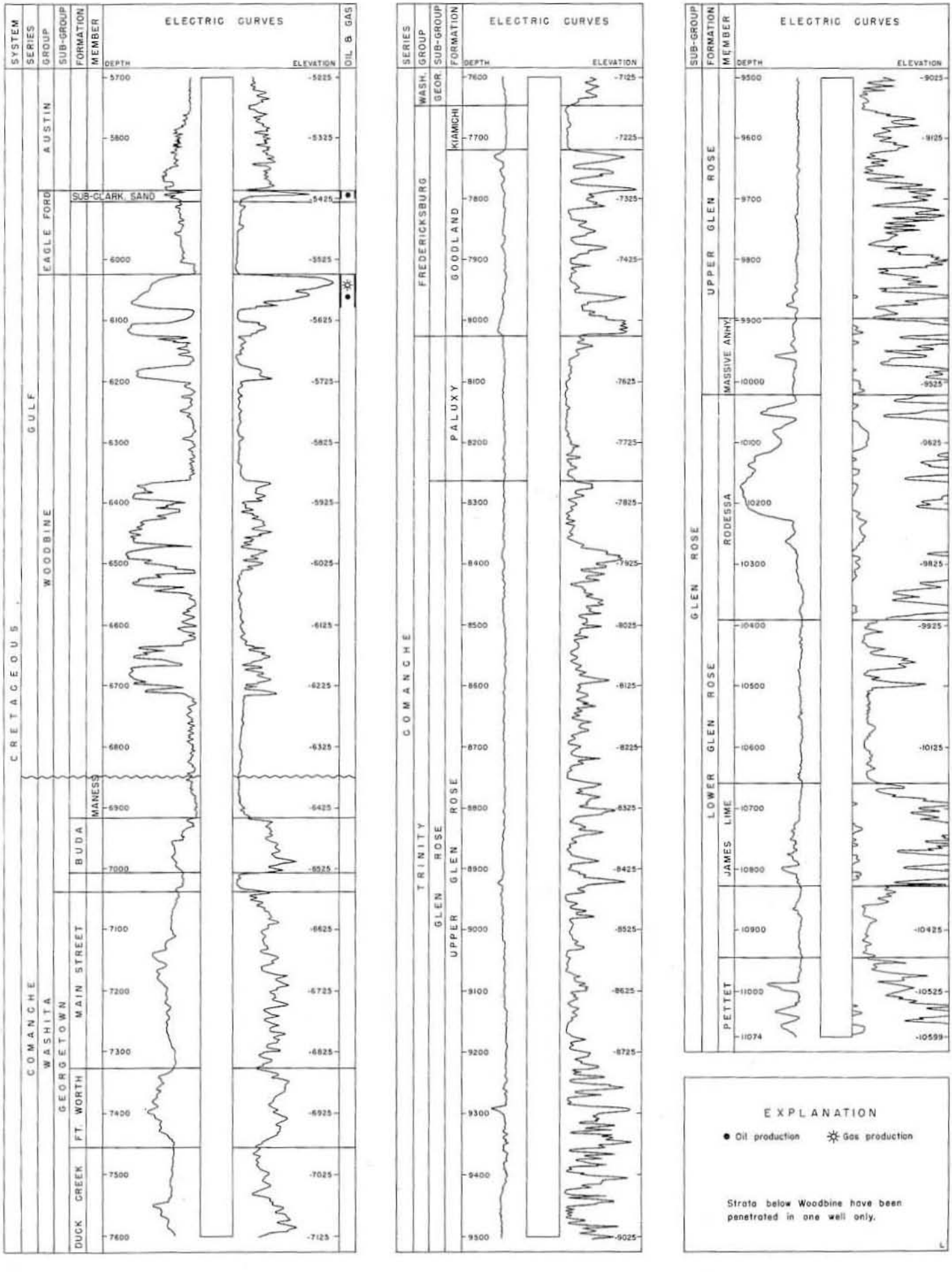
Propane	4.04%
Iso-butane	2.25%
N-butane	6.95%
Pentanes	13.95%
Hexanes plus	72.81%

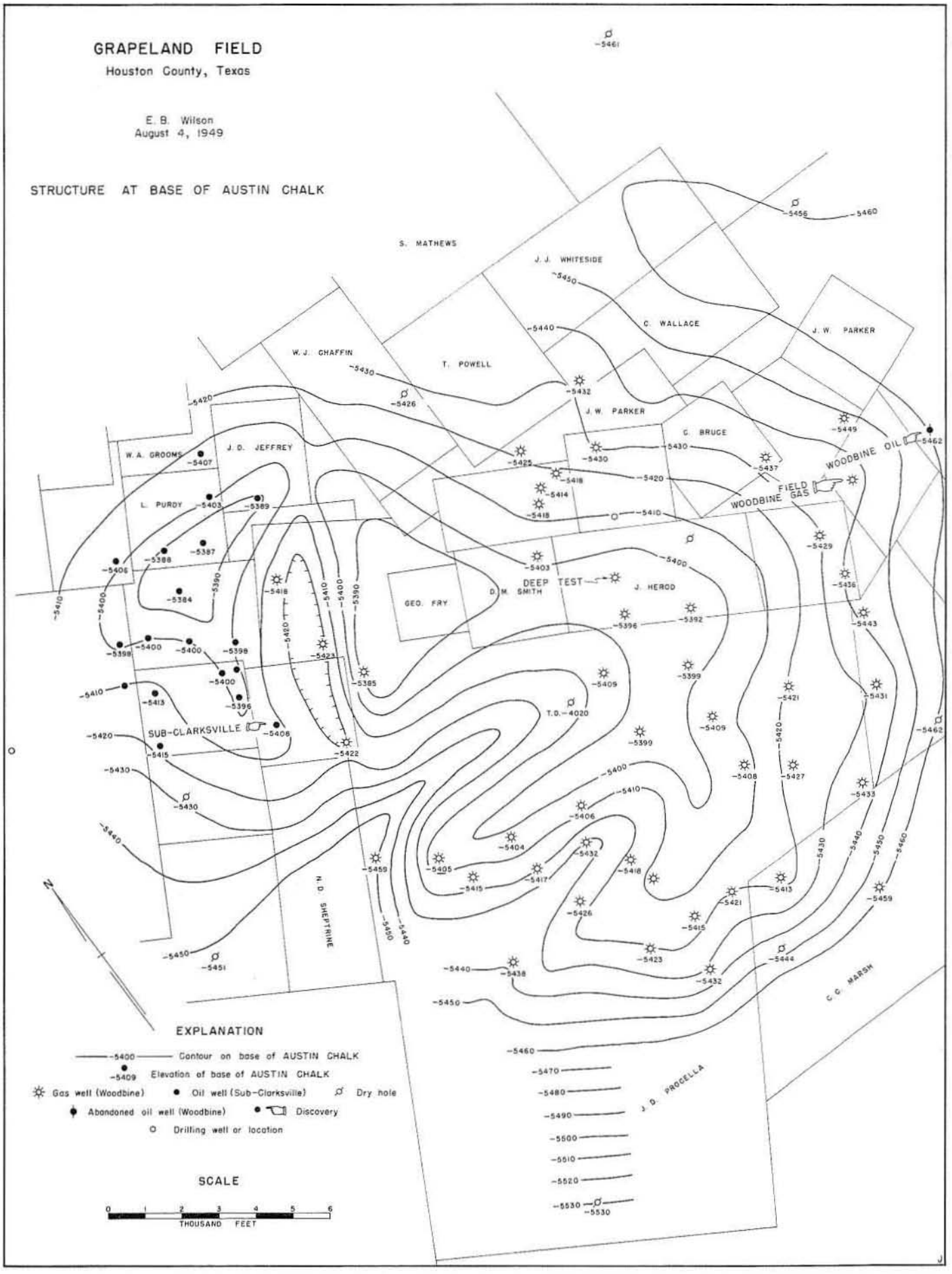
The above analyses were furnished by Lone Star Gas Company.

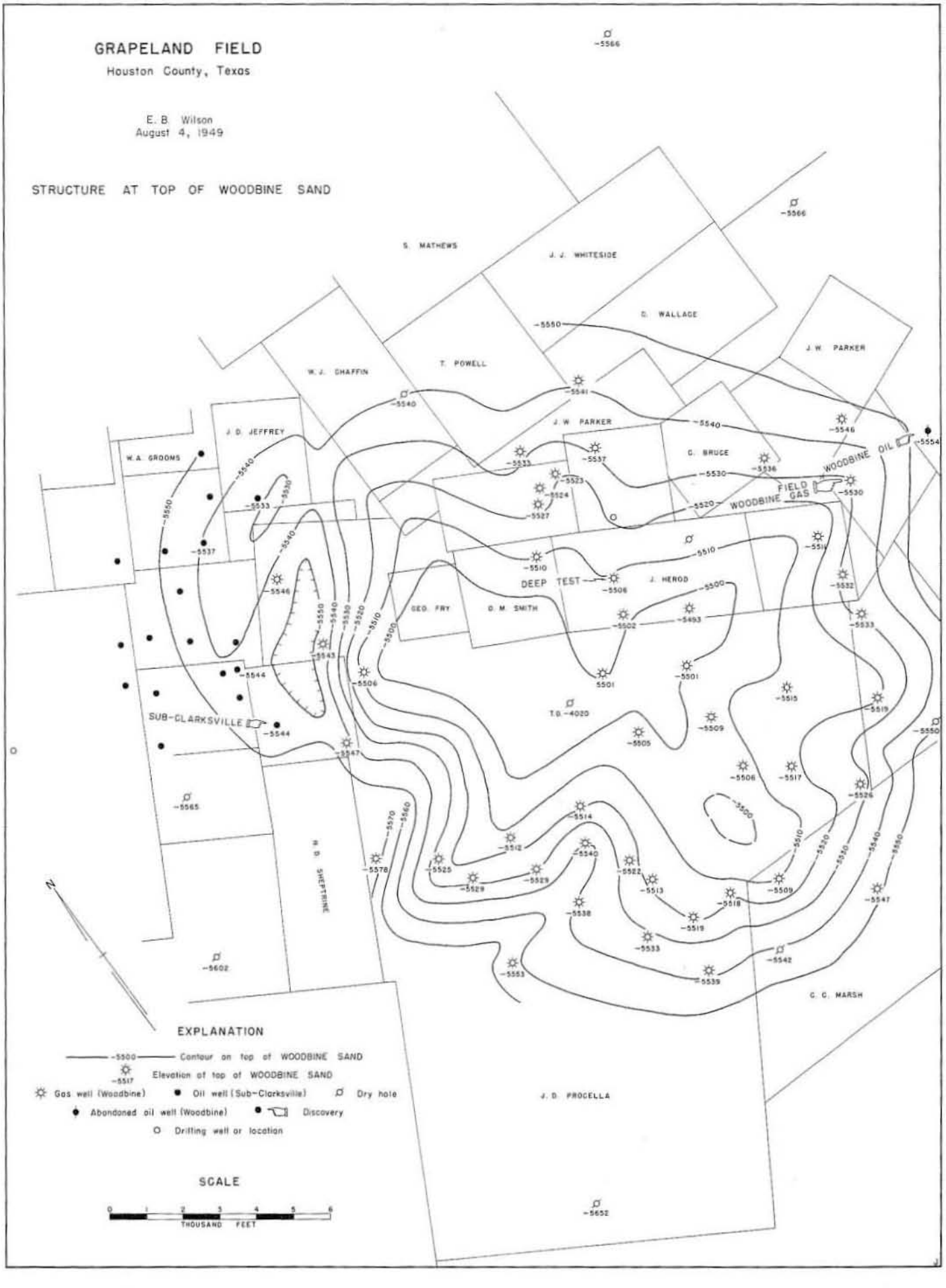
TYPE SECTION OF ROCKS PENETRATED



TYPE SECTION OF ROCKS PENETRATED




GRAPELAND FIELD
Houston County, Texas
E. B. Wilson
August 4, 1949
STRUCTURE AT BASE OF AUSTIN CHALK
S. MATHEWS
J. J. WHITESIDE
C. WALLACE
J. W. PARKER
W. J. GHAFFIN
T. POWELL
W. A. GROOMS
J. D. JEFFREY
L. PURDY
C. BRUCE
WOODBINE OIL FIELD
WOODBINE GAS
DEEP TEST
D. M. SMITH
J. HEROD
GEO. FRY
SUB-CLARKSVILLE
T.D.-4020
N. D. SHEPTRINE
C. C. MARSH
J. D. PROCELLA
EXPLANATION
-5400 Contour on base of AUSTIN CHALK
-5409 Elevation of base of AUSTIN CHALK
Gas well (Woodbine)
Oil well (Sub-Clarksville)
Dry hole
Abandoned oil well (Woodbine)
Discovery
Drilling well or location
SCALE
0 1 2 3 4 5 6
THOUSAND FEET


GRAPELAND FIELD
Houston County, Texas
E. B. Wilson
August 4, 1949
STRUCTURE AT TOP OF WOODBINE SAND
S. MATHEWS
J. J. WHITESIDE
D. WALLACE
J. W. PARKER
W. J. CHAFFIN
T. POWELL
J. D. JEFFREY
W. A. GROOMS
J. W. PARKER
G. BRUCE
WOODBINE OIL
FIELD
WOODBINE GAS
DEEP TEST
J. HEROD
GEO. FRY
O. M. SMITH
SUB-CLARKSVILLE
T.D. -4020
R. D. SHEPTRINE
J. D. PROCELLA
C. C. MARSH
EXPLANATION
-5500- Contour on top of WOODBINE SAND
-5517 Elevation of top of WOODBINE SAND
Gas well (Woodbine)
Oil well (Sub-Clarksville)
Dry hole
Abandoned oil well (Woodbine)
Discovery
Drilling well or location
SCALE
0 1 2 3 4 5 6
THOUSAND FEET

PRODUCTION HISTORY

Year	WELLS PRODUCING at end of year: Oil	WELLS PRODUCING at end of year: Gas & Conds.	OIL AND CONDENSATE PRODUCTION (barrels): Oil: Yearly	Condensate: At wells Yearly	Condensate: At plants Yearly	Condensate: Total Yearly	Total Liquids: Yearly	Total Liquids: Cumulative
Field totals								
1936	0	1		3,584		3,584	3,584	3,584
1937	1	3		7,456		7,456	7,456	11,040
1938	1	3	13,513	4,090		4,090	17,603	28,643
1939	1	9	26,917	1,548	89,702	91,250	118,167	146,810
1940	1	21	32,070	113,495	1,208,289	1,321,784	1,353,854	1,500,664
1941	1	35	25,290	138,355	2,148,779	2,287,134	2,312,424	3,813,088
1942	1	30	23,220	14,889	2,234,045	2,248,934	2,272,154	6,085,242
1943	1	39	1,910	19,333	1,418,860	1,438,193	1,440,103	7,525,345
1944	1	26	9,000	12,517	1,065,083	1,077,600	1,086,600	8,611,945
1945	1	34	5,259	5,143	691,653	696,796	702,055	9,314,000
1946	0	31	0	1,318	488,374	489,692	489,692	9,083,692
1947	6	34	55,442	657	535,648	536,305	591,747	10,395,439
1948	16	34	392,134	307	313,549	313,856	705,990	11,101,429
1949*	23	17	282,475	90	482,944	483,034	765,509	11,866,938
Totals			867,230	322,782	10,676,926	10,999,708	11,866,938	
Sub-Clarksville sand								
1947	6	0	55,442				55,442	55,442
1948	16	0	392,134				392,134	447,576
1949*	23	0	282,475				282,475	730,051
Totals			730,051				730,051	
Woodbine sand								
1936	0	1		3,584		3,584	3,584	3,584
1937	1	3		7,456		7,456	7,456	11,040
1938	1	3	13,513	4,090		4,090	17,603	28,643
1939	1	9	26,917	1,548	89,702	91,250	118,167	146,810
1940	1	21	32,070	113,495	1,208,289	1,321,784	1,353,854	1,500,664
1941	1	35	25,290	138,355	2,148,779	2,287,134	2,312,424	3,813,088
1942	1	30	23,220	14,889	2,234,045	2,248,934	2,272,154	6,085,242
1943	1	39	1,910	19,333	1,418,860	1,438,193	1,440,103	7,525,345
1944	1	26	9,000	12,517	1,065,083	1,077,600	1,086,600	8,611,945
1945	1	34	5,259	5,143	691,653	696,796	702,055	9,314,000
1946	0	31	0	1,318	488,374	489,692	489,692	9,803,692
1947	0	34	0	657	535,648	536,305	536,305	10,339,997
1948	0	34	0	307	313,549	313,856	313,856	10,653,853
1949	0	17	0	90	482,944	483,034	483,034	11,136,887
Totals			137,179	322,782	10,676,926	10,999,708	11,136,887	

Woodbine and Field totals	PRODUCTION (Mcf): Produced	PRODUCTION (Mcf): Injected (dry)	PRODUCTION (Mcf): Net withdrawn	GAS UTILIZATION (Mcf): Total treated	GAS UTILIZATION (Mcf): Marketed or consumed: After treating	GAS UTILIZATION (Mcf): Marketed or consumed: Without treating
1936	41,125		41,125			41,125
1937	88,125		88,125			88,125
1938	47,454		47,454			47,454
1939	3,558,025	3,036,000	522,025	3,300,000	264,000	258,025
1940	29,998,443	25,786,557	4,211,886	28,973,660	3,187,103	1,024,783
1941	70,234,923	61,715,675	8,519,248	69,343,456	7,627,781	891,467
1942	75,193,086	67,230,088	7,962,998	75,145,923	7,915,835	47,163
1943	70,663,073	60,263,073	10,400,000	70,541,913	10,278,840	121,160
1944	68,549,579	55,636,585	12,912,994	68,285,295	12,648,710	264,284
1945	55,632,193	44,593,193	11,039,000	54,067,781	9,474,588	1,564,412
1946	42,530,322	33,730,322	8,800,000	43,120,795	9,390,473	590,473
1947	37,688,566	30,088,566	7,600,000	37,274,413	7,185,847	414,153
1948	36,824,776	29,724,776	7,100,000	35,505,432	5,780,656	1,319,344
1949*	32,630,736	27,065,224	5,565,512	31,661,046	3,258,703 (?)	2,306,803 (?)
Totals	523,680,426	438,870,059	84,810,367	517,219,714	77,012,536 (?)	8,978,777 (?)

GRIMES-PERCILLA FIELD
Houston County, Texas

W. E. LONG
Geologist, Geier-Jackson, Inc., Tyler, Texas
February 15, 1951

LOCATION

The Grimes-Percilla field is immediately west and south of the village of Percilla in north-central Houston County and is about 4 miles northeast of the town of Grapeland.

NAME

The hyphenated name is due to the history of the field. Placid Oil Co. #1 J. E. Elliott was completed as the discovery well of the Percilla field on May 25, 1937, and produced until in November 1940, when it was abandoned. No other well was completed as a producer until October 18, 1942, when Grimes Brothers #1 M. B. Ellis was completed as a gas well. In some publications, this well was treated as discovering a new field, the Grimes field. The Railroad Commission of Texas designated the gas-productive area as the Grimes field; and it continues to report the gas and condensate production under this name. Some publications use merely the earlier name, Percilla field, and use that name to include the gas-productive area.

METHODS OF EXPLORATION LEADING TO DISCOVERY

The nature of the information which led Placid Oil Co. to drill the first discovery well is not known to the writer. Several years before the discovery well was drilled, Shell Oil Co. had taken a large block of leases. It is reported that this block was taken on the basis of surface mapping and that the surface mapping was confirmed by a seismic survey.

Further drilling exploration followed the completion of the discovery well. The deepest test was Shell Oil Co. #1 G. E. Darsey, about a mile to the south. This test was drilled dry to the total depth of 10,900 feet and was abandoned on March 27, 1940.

Surface and subsurface studies made by Russell Grimes led to the drilling of Grimes Brothers #1 M. B. Ellis.

DISCOVERIES

Percilla: Woodbine: May 25, 1937; Placid Oil Co. #1 J. E. Elliott. Flowed at estimated daily rate of 500 Mcf of gas, 10 barrels of oil and 100 barrels of salt water through perforations from 5,838 to 5,870 feet.

Grimes: Woodbine: October 18, 1942; Grimes Brothers #1 M. B. Ellis. Initial daily potential, 29,000 Mcf of gas with $\frac{1}{2}$ barrel of condensate per million; perforations, 5,932 to 5,939 feet.

LITHOLOGY OF RESERVOIR ROCK

Woodbine: Fine- to medium-grained, ashy to clean quartz sandstone.

ELEVATION OF SURFACE

At well locations: Highest, 495 ft.; lowest, 361 feet.

SURFACE FORMATIONS

Sparta, Weches and Queen City.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest stratigraphic horizon penetrated in the vicinity of the field is 242 feet below the top of the Pettet formation. This penetration was in Shell Oil Co. #1 G. E. Darsey at total depth of 10,900 feet.

NATURE OF TRAP

Woodbine: Low relief anticline.

PRODUCTIVE AREA

Woodbine and Field: 2,500 acres.

THICKNESS OF RESERVOIR ROCK

Woodbine: Average net productive, 15 feet.

CONTINUITY OF RESERVOIR ROCK

Woodbine: The productive zone in all productive wells is apparently the same member of the Woodbine group. It appears that this zone is continuous far beyond the limits of the field.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine:	Feet
Elevation of top of gas	-5,474
Elevation of bottom of gas	-5,499
Relief	25

The behavior of the one well which produced oil indicates that the oil column was quite thin.

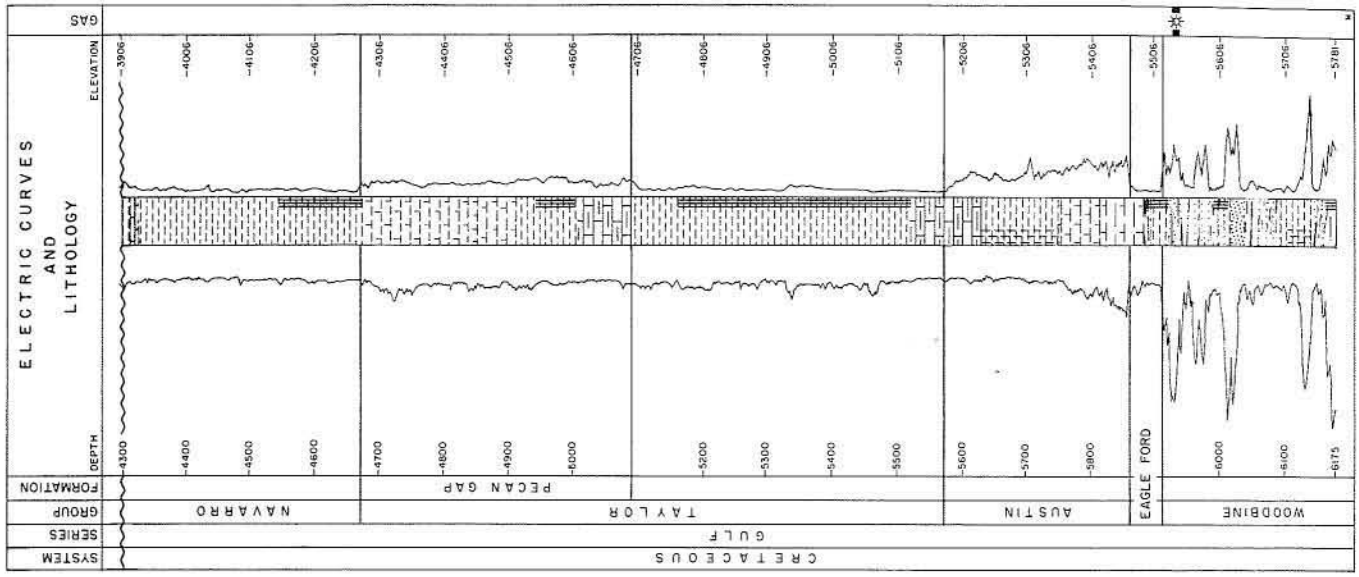
CHARACTER OF OIL

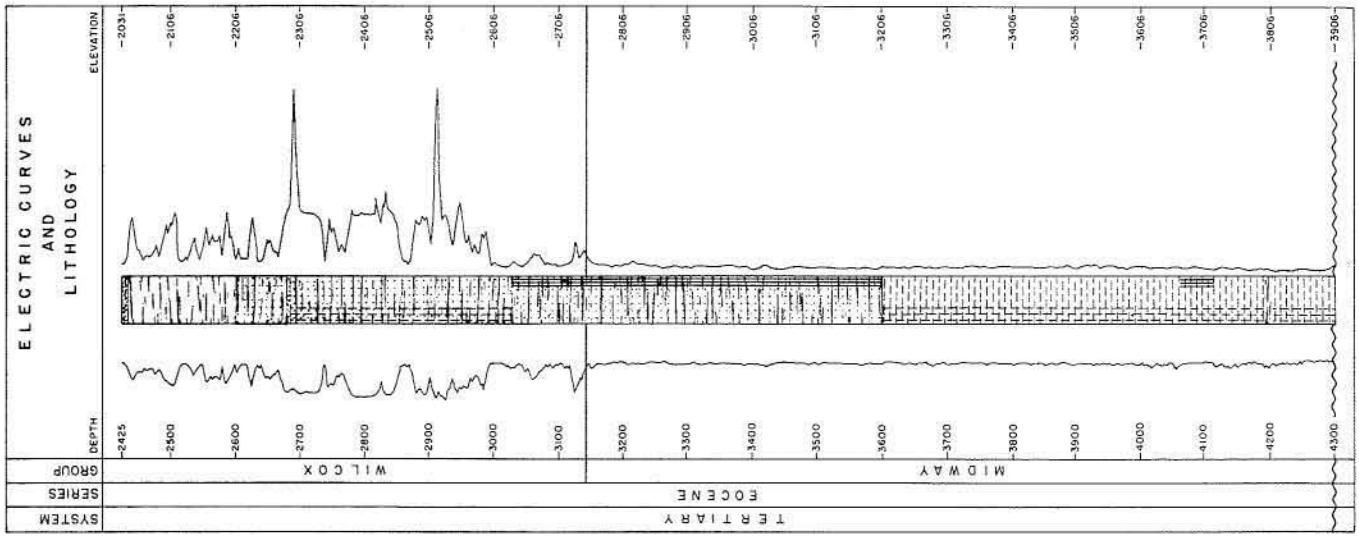
Woodbine:
Gravity, A.P.I. @ 60° F.: 43.6°
Sulphur: Less than 0.1% Base: Paraffin
For analysis see:
U.S. Bureau of Mines Lab. ref. No. 38333
Tabulated Analyses of Texas Crude Oils. T.P. 607 (1939) Grp. 4, Item 44

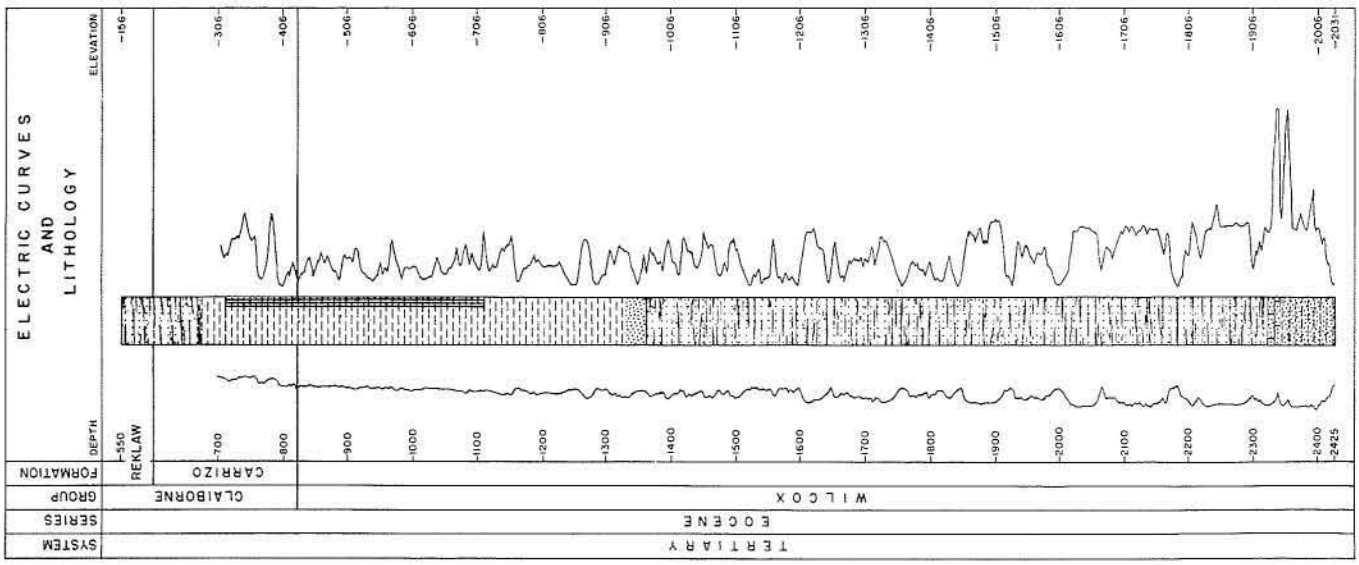
WATER PRODUCTION

Woodbine: During 1949 the field produced 20 barrels of water per day; approximately 30% of gross fluid produced was water.

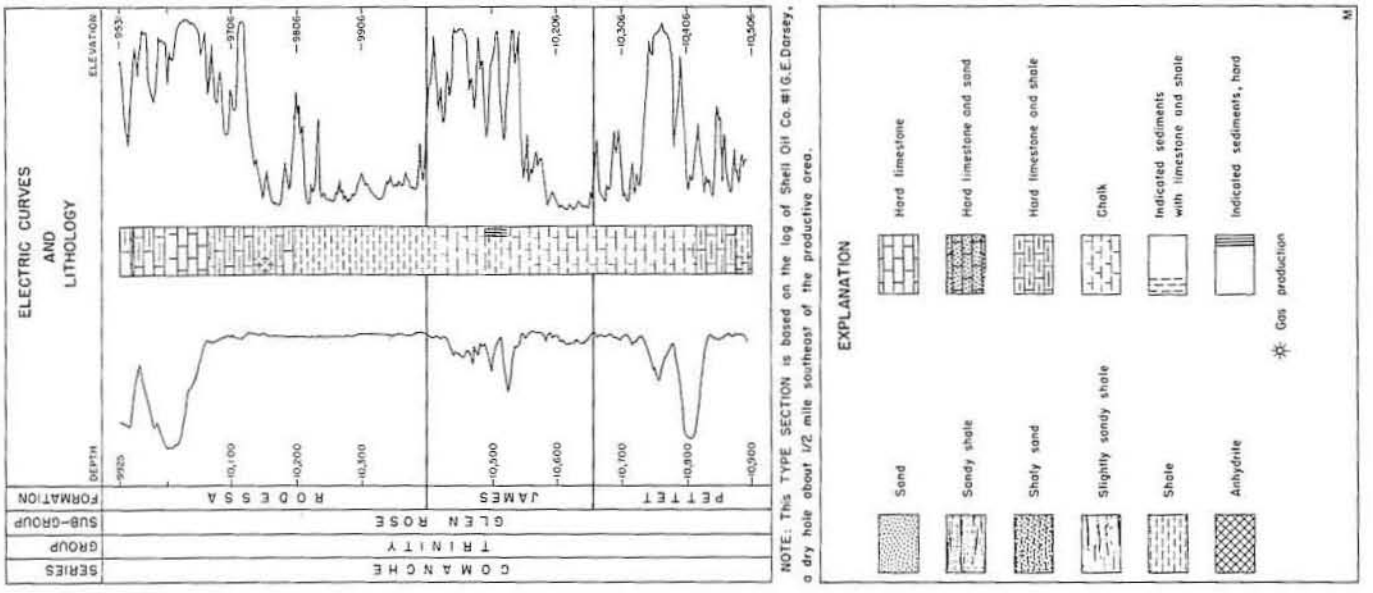
TYPE SECTION OF ROCKS PENETRATED

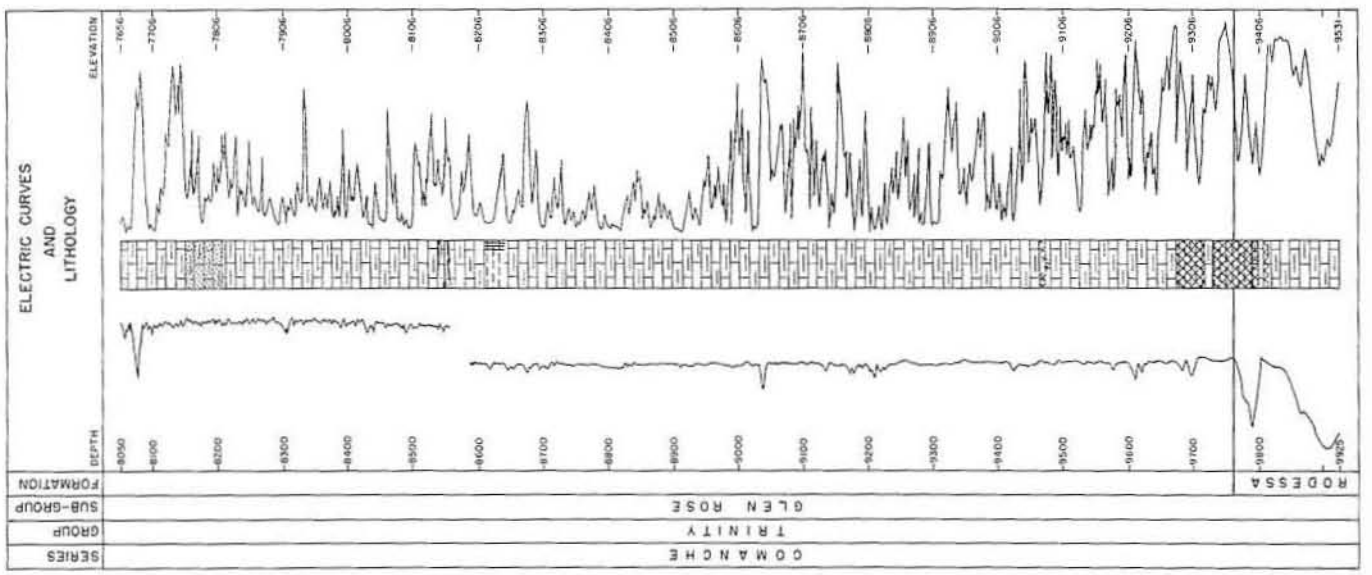


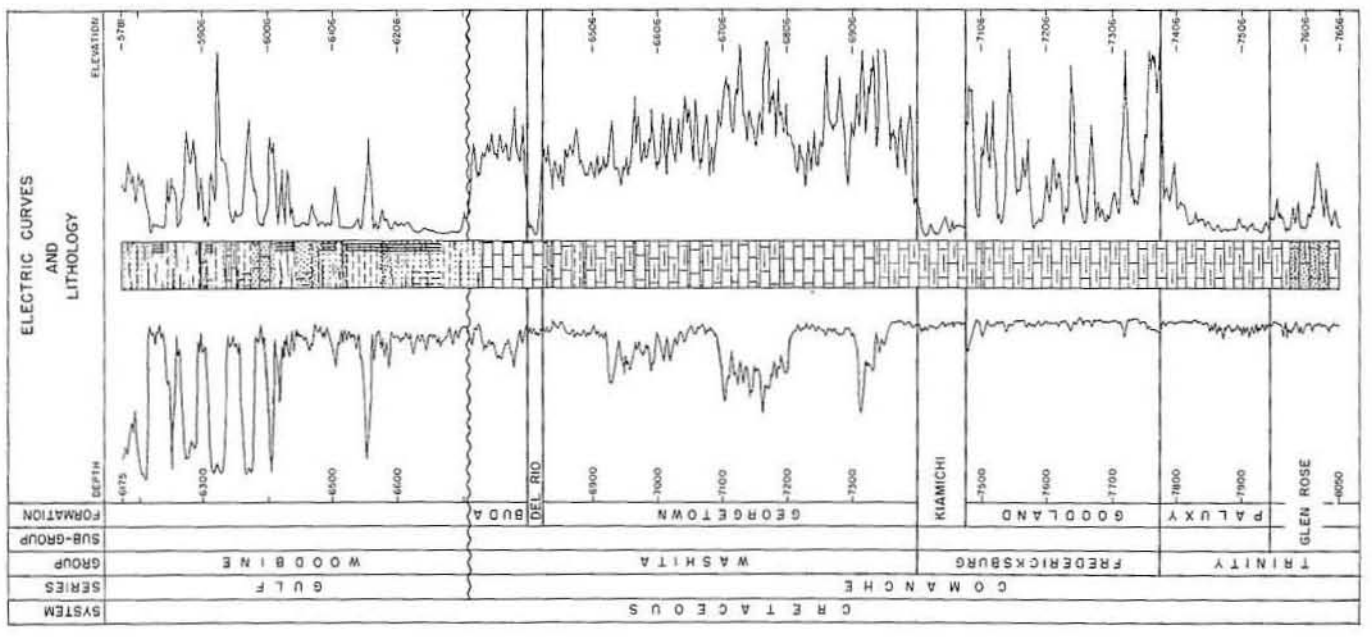




TYPE SECTION OF ROCKS PENETRATED







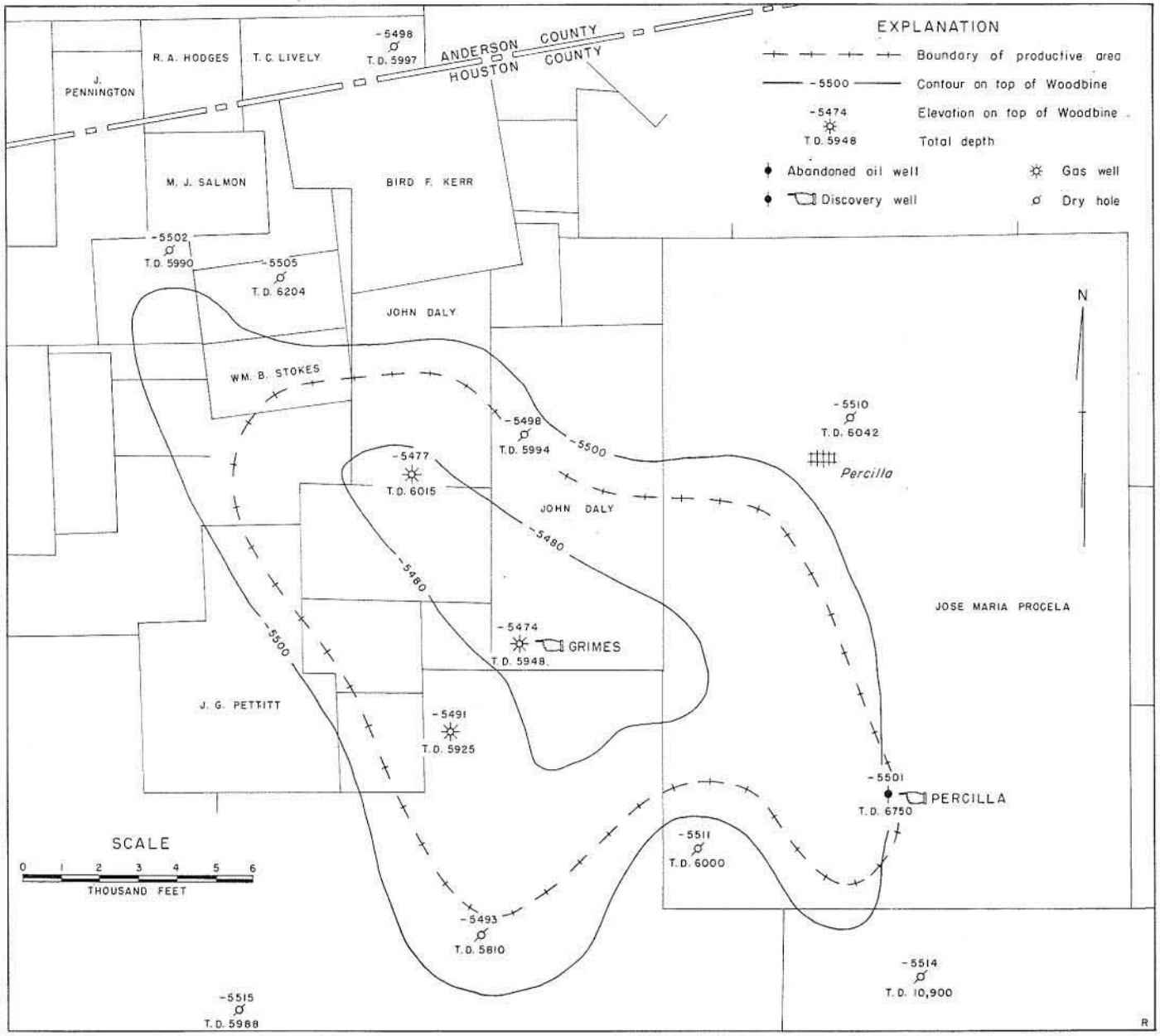
CHARACTER OF GAS

Woodbine:	Mol. %
Component	
Methane	91.61
Ethane	3.87
Propane	2.34
Iso-butane	.48
N-butane	.69
Iso-pentane	.37
N-pentane	.23
Hexanes	.41
Total	100.00

PRODUCTION HISTORY

Year	WELLS PRODUCING at end of year: Oil	Gas & Condensate	OIL PRODUCTION (barrels): Yearly	Cum.	CONDENSATE PRODUCTION (barrels): Yearly	Cumulative	GAS PRODUCTION (Mcf): Yearly	Cumulative
1937	1		12,152	12,152				
1938	1		7,183	19,335				
1939	1		5,272	24,607				
1940	1		5,244	29,851				
1941	0	0						
1942	0	1			787	787		
1943	0	1			899	1,686		
1944	0	3			2,677	4,363		
1945	0	3			1,278	5,641	32,861	32,861
1946	0	3			29,210	34,851	1,169,799	1,202,660
1947	0	3			27,517	62,368	1,048,301	2,260,961
1948	0	3			31,836	94,204	1,517,682	3,768,643
1949	0	2			19,802	114,006	1,021,515	4,790,158
1950	0	2			15,001	129,007	1,512,502	6,302,660

Gas outlet connection made in December 1945. Gas production data for previous years are not available.



HAM GOSSETT FIELD

Kaufman County, Texas

JOHN V. TOWNSEND
Geologist, Tyler, Texas
January 29, 1951

LOCATION

The Ham Gossett field is in southeast Kaufman County 7 miles northwest of Mabank and 2 miles northeast of Gossett.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Early surface mapping along the Luling-Mexia-Talco fault zone revealed the presence of a down-to-the-northwest fault in the Ham Gossett area. Later core drill, subsurface and seismic work suggested closure against the fault. Drilling operations on the discovery well were begun March 4, 1948.

DISCOVERY

Bacon: July 20, 1948; Thomas D. Humphrey #1 Annie Mae Tuggle. Initial production, 68.6 barrels of 38.8° gravity oil plus 5.1 barrels of brackish water through casing perforations from 6,106 to 6,116 feet and from 6,132 to 6,142 feet.

ELEVATION OF SURFACE

At well locations (derrick floor): Highest, 375 feet; lowest, 362 feet.

SURFACE FORMATION

Wills Point formation of the Midway group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

Approximately 252 feet below the top of the Travis Peak formation. This penetration was in the discovery well.

NATURE OF TRAP

Bacon: Closure against fault.

PRODUCTIVE AREA

Bacon and Field: Proven, 80 acres. Future development may prove a somewhat larger area for production.

THICKNESS OF RESERVOIR ROCK

Bacon	Feet		
	Max.	Min.	Avg.
From top to bottom	56	-	-
Net productive	20	0	10

LITHOLOGY OF RESERVOIR ROCK

Bacon: The Bacon producing zone is composed of slightly porous oolitic and crystalline limestone having a low permeability.

CONTINUITY OF RESERVOIR ROCK

Bacon: The Bacon limestone porosity is very erratic and occurs locally in the East Texas basin. The Bacon porosity in the Ham Gossett area does not appear to be continuous or interconnected with any other occurrence of Bacon porosity.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Bacon:	Feet
Elevation of top of oil	-5,736
Elevation of bottom of oil	-5,802
Relief	66

CHARACTER OF OIL

Bacon:
Gravity, A. P. I. @ 60° F., 38.8°
Color, dark greenish-black

ACID TREATMENT

Bacon: In each well, acidization was necessary before production could be obtained.

WATER PRODUCTION

Bacon: On January 1, 1950, the average daily water production was about 114 barrels, most of which was being produced by the discovery well.

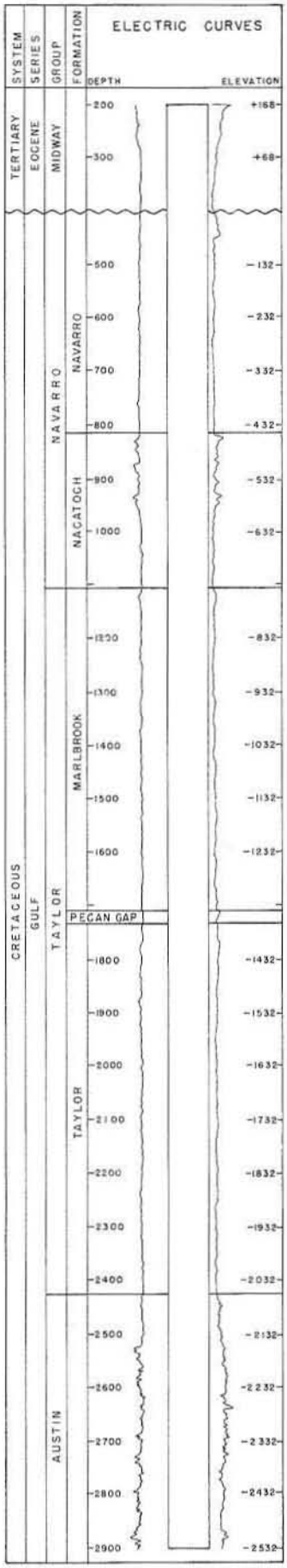
DEVELOPMENT AND PRODUCTION HISTORY

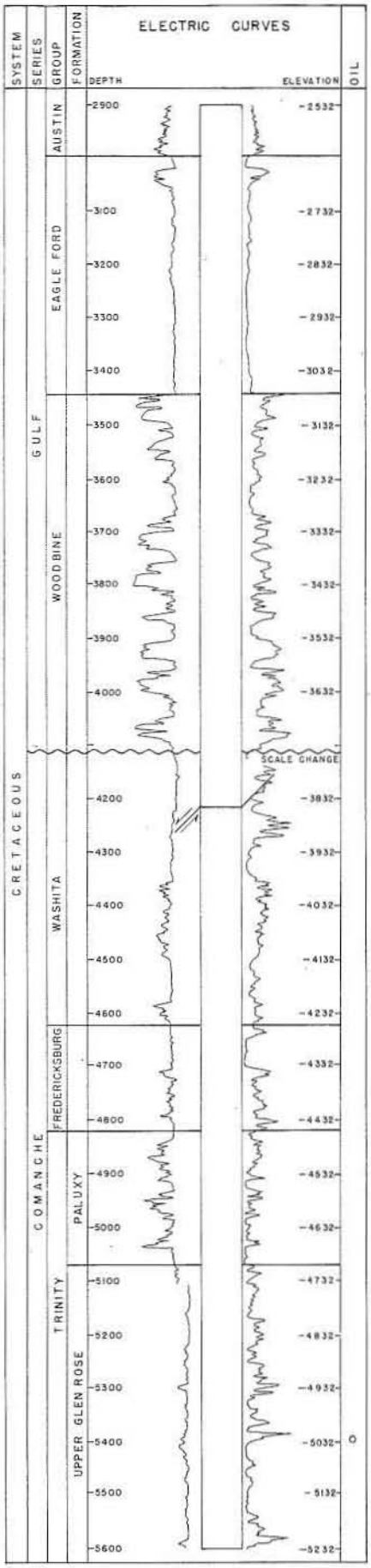
Bacon and Field total

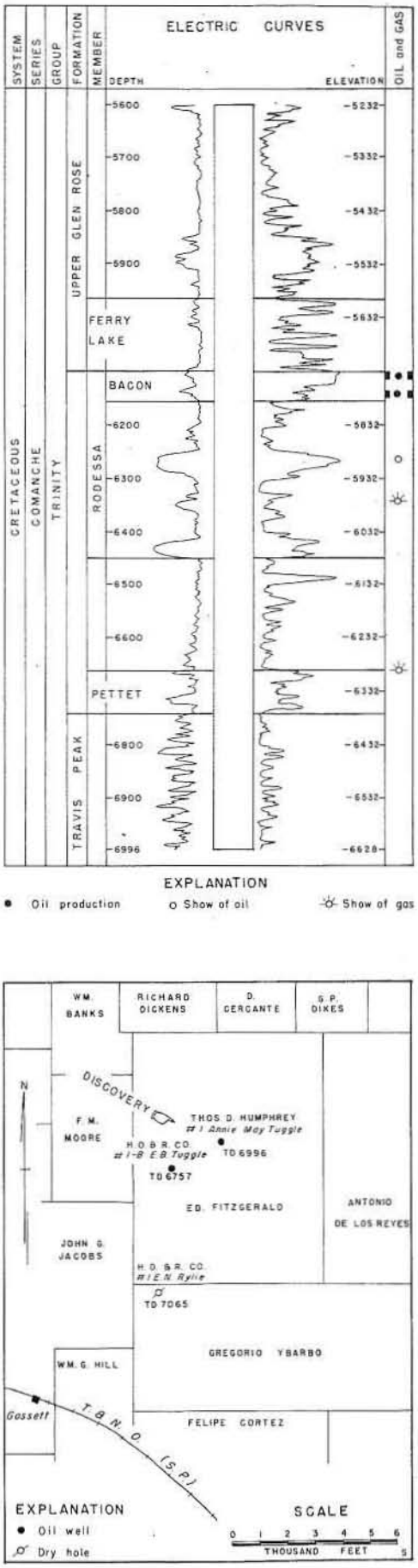
Year	WELLS PRODUCING at end of year	OIL PRODUCTION (barrels)	
		Yearly	Cumulative
1948	1	4,508	4,508
1949	2	8,569	13,077

Each of the three wells shown on the accompanying map was drilled into the Travis Peak formation. Two have been completed as small producers in the Bacon limestone and one was dry and has been abandoned.

TYPE SECTION OF ROCKS PENETRATED







HAWKINS FIELD
Wood County, Texas

E. A. WENDLANDT*
Geologist, Tyler, Texas
October 11, 1949

LOCATION

The Hawkins field is located near the southeast corner of Wood County, approximately 17 miles northeast of Tyler. The small town of Hawkins, from which the field derives its name, is within the south part of the producing area.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Surface geologic work conducted during 1929 and 1930 by Humble Oil & Refining Co. indicated the presence of a structural high in the Hawkins area. During 1934, a lease block was acquired by Humble Oil & Refining Co. covering the surface structure. After attempting a reflection seismic survey during 1935 and obtaining disappointing results, seven core tests were drilled during 1937 to the Navarro group. The core test information confirmed the presence of structure and also indicated additional uplift and a larger area of closure. The lease block was enlarged, and plans were initiated by Humble Oil & Refining Co. to drill a Woodbine test in the block during the early part of 1941. Before these drilling plans materialized, however, Bobby Manziel drilled the discovery well.

DISCOVERY

Woodbine sand: December 20, 1940;
Bobby Manziel #1 Frank Morrison.

ELEVATION OF SURFACE

At well locations (derrick floor): Highest, 480 feet; lowest, 309 feet.

SURFACE FORMATIONS

Queen City, Weches, and Sparta formations are exposed within the area of the field.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

Within the limits of the Woodbine productive area, three wells which were drilled a short distance into the upper Glen Rose encountered porous permeable water sands in penetrating the entire Paluxy section. One of these wells is located on the west flank, one on the north flank, and the third on the east flank of the structure. The latter well, identified on the accompanying map by the symbol "P", is the highest well structurally of this group and encountered the top of the Woodbine about 735 feet lower than the Woodbine crest. The Paluxy possibilities for production therefore, are not condemned throughout the area of the field.

Outside the Woodbine productive area, two wells have been drilled to test horizons below the Paluxy formation. One of these wells, designated by the symbol "R" on the accompanying map, is located on the southwest flank of the structure and penetrated the Rodessa section in drilling to a total depth of 9,518 feet. The other well, Humble Oil & Refining Co. P. H. McKnight et al. #1, located on the north flank of the structure approximately 3,000 feet outside the Woodbine productive area, encountered Jurassic salt from a depth of 14,411 (-14,053) to the total depth of 14,625 feet. This well was subsequently plugged back to 9,040 feet and completed July 18, 1947 as a small gas-condensate well from a hard silty, calcareous sandstone in the Rodessa. It has been shut in since completion.

STRUCTURE AND OROGENIC HISTORY

The Hawkins field occurs on a northeastward trending complexly-faulted anticline, which is located near the north central part of the East Texas geosynclinal basin. Present information suggests that the field is underlain by a deep-seated salt mass, which is believed to account for the structural uplift. The Woodbine sand has been uplifted approximately 1,200 feet above normal.

Structural growth started prior to the deposition of the oldest member of the Woodbine group and continued at varying rates until after the deposition of the Sparta formation, which is the youngest formation within the area of the field. At the crest of the structure, the Woodbine is only 450 feet thick, whereas about 700 feet is the estimated normal thickness for this area, indicating about 250 feet of thinning due to local uplift. The normal sequence of Gulf Cretaceous formations of the East Texas basin is present. Most of the formations display a marked thinning over the apex of the uplift, due to structural growth.

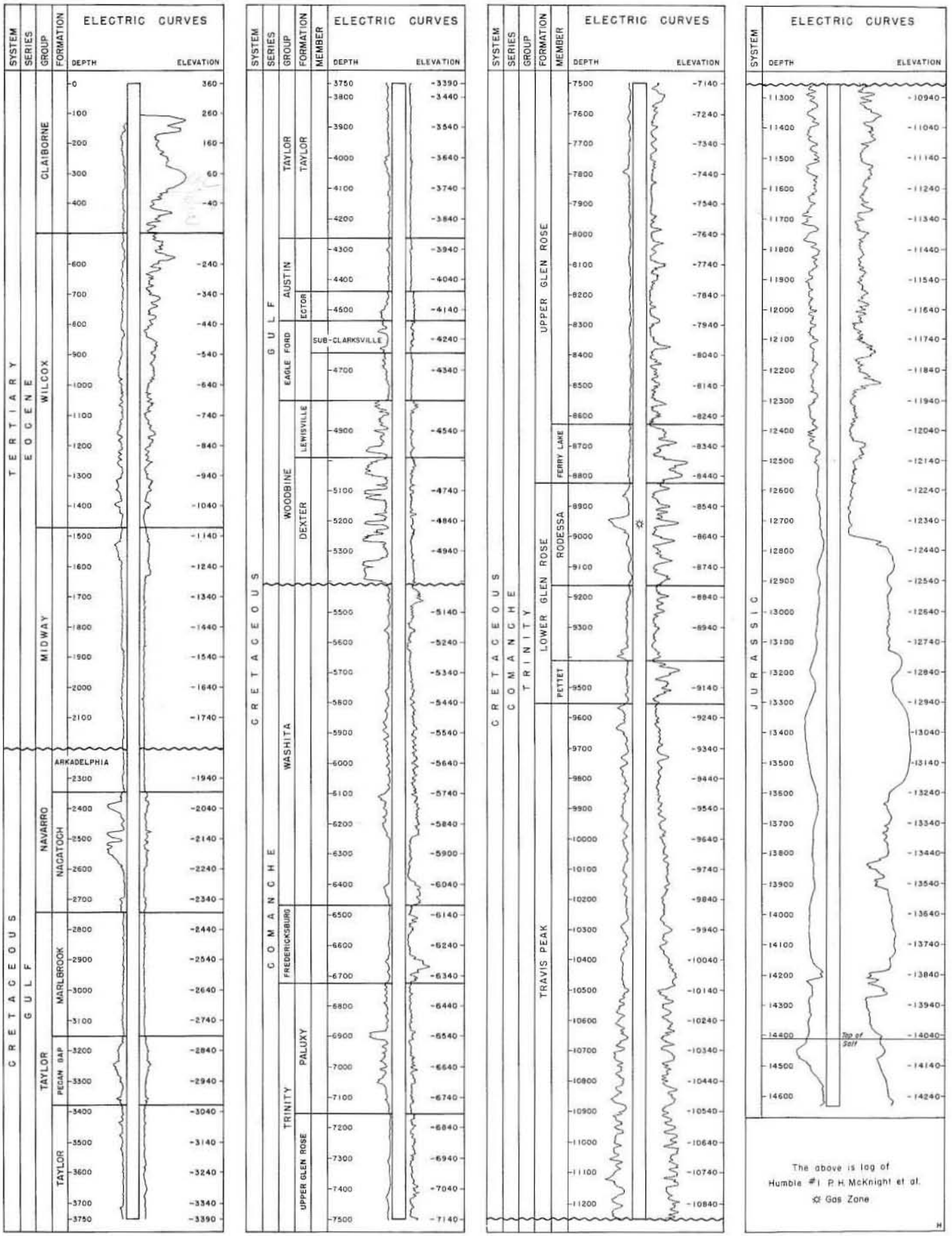
Faulting is predominant in the lower Gulf formations, but most of the faults do not continue upward to the top of the Gulf series. Only a few of the faults extend as high as the lower Eocene formations. The maximum displacement is about 375 feet, which is on the fault which divides the field into two areas having separate reservoir characteristics, designated as West Hawkins and East Hawkins.

NATURE OF TRAP

Woodbine sand: Complexly-faulted anticline with major axis trending northeast-southwest.

*In the preparation of this paper, the author has extracted extensively from the paper cited below under SELECTED REFERENCE.

SECTION OF ROCKS PENETRATED BY DEEPEST WELL



(Attach HAWKINS type section and cross section)

PRODUCTIVE AREA

Woodbine sand: Oil, approximately 9,000 acres; gas, approximately 3,600 acres; total Woodbine productive area, approximately 9,400 acres.

THICKNESS OF RESERVOIR ROCK

Woodbine sand: The thickness of the Woodbine group ranges from 450 to 600 feet; averages 550 feet. Within this section, the maximum effective thickness of oil sand penetrated is about 300 feet, and the maximum effective gas sand penetrated is about 320 feet. The average net thickness of effective oil sand is about 100 feet, and the average net effective gas sand thickness is about 80 feet.

LITHOLOGY OF RESERVOIR ROCK

Woodbine group: The upper 200 feet of section is designated as Lewisville and the lower 350 feet as Dexter. The sand members distributed through these two formations are intercommunicative and constitute a single reservoir.

Lewisville: This formation consists of gray to greenish sandy shale, red beds and ashy chloritic argillaceous sands, the sands constituting about 30% of the total section. The sands have an average porosity of 24.6% and an average permeability of approximately 450 millidarcys. Connate water occupies somewhat in excess of 30% of the pore space. The communication between these sands is poor as compared to the Dexter sands, due to their lenticular nature and low permeability.

Dexter: This formation consists of clean porous sand and sandy shale, red beds and shale, the sands constituting about 70% of the total section. It is essentially a sheet of sand with intercalated lenses of shale. The sands have an average porosity of 27.4% and an average permeability of approximately 3,000 millidarcys. The maximum permeability observed is 21,700 millidarcys. Connate water occupies 30% of the pore space. Pressure communication is excellent throughout both the West Hawkins and the East Hawkins segments of the field.

CONTINUITY OF RESERVOIR ROCK

Woodbine group: The Woodbine is continuous in all directions from the Hawkins field in the East Texas basin. The sand bodies in the Woodbine section are inter-communicative and the reservoir may be considered as of the blanket-sand type.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine sand:	West Hawkins Feet	East Hawkins Feet
Elev. of top of gas	-3,490	-3,750
Elev. of bottom of gas	-4,075	-4,122 to -4,135
Relief	585	372 to 385
Elev. of top of oil	-4,075	-4,122
Elev. of bottom of oil	-4,470	-4,479 to -4,541
Relief	395	357 to 419

The above figures represent conditions at time of discovery.

CHARACTER OF OIL

Woodbine sand:

Gravity, A.P.I.: 16-31°

Sulphur, (combined sulphur): 2%

Color: brownish-black to black

Viscosity at reservoir temperature of 168° F. and at reservoir pressure of 1,710 pounds: 2 - 16 centipoises; average, 3 centipoises.

It has been calculated that the oil at the gas-oil contact is saturated with gas and has a gas-oil ratio of 350 to 400 cubic feet per barrel. The loss in volume of the oil due to shrinkage, after being taken from the reservoir, has been calculated to be about 16.9%.

Gravitational segregation within the sands is evident with the oil becoming heavier and more asphaltic at lower depths, both within individual sand bodies and in the over-all reservoir. This has resulted in the accumulation of a band of extremely heavy, non-producible asphalt at the oil-water contact in thicknesses varying from 3 to 10 feet or more which is too viscous to flow under reservoir conditions in West Hawkins. This asphalt layer is found in both the Lewisville and Dexter sands but is generally thicker in the Dexter sands:

For analysis see:

U. S. Bureau of Mines Lab. ref. No. 43110
Analyses of Crude Oils from
283 Important Oil Fields of the U. S.
R. I. 4289 (1948) Item 211

WATER PRODUCTION

Woodbine sand: From date of discovery in December 1940 to January 1, 1949, a total of 623 oil wells had been drilled at Hawkins. Thirteen oil wells have been abandoned during this period, leaving a total of 610 producing wells, as of January 1, 1949. Of this total, 44 marginal wells were producing over 1% salt water for a daily average of 4,153 barrels during December 1948.

(Attach HAWKINS map)

RESERVOIR ENERGY

(This subject is treated by insertion of the following paragraphs quoted from the paper cited below.)

An unpublished study of the pressure behavior in the Dexter sands of the entire Woodbine basin indicates definitely that the pressure in the water surrounding the Hawkins field at the time of discovery had decreased to 1,710 pounds, corrected to 4,075 feet subsea by using an oil gradient from the oil-water to the gas-oil contact. This decrease in pressure is attributed mainly to the large fluid withdrawals in the East Texas field, although fluid withdrawals at Van and other fields no doubt contributed to some extent. The asphalt seal at the oil-water contact in West Hawkins was sufficiently effective to retain original bottom-hole pressure of 1,990 pounds. In East Hawkins, the seal ruptured, thereby allowing the gas cap in this isolated block to expand, and the oil was forced downward until equilibrium was reached at 1,710 pounds.

It appears that the West Hawkins Dexter oil reservoir is closed and is being produced principally by an expanding gas-cap drive, aided very slightly at this time by a dissolved gas drive. To substantiate this statement, it is pointed out that the original pressure in the West Hawkins Dexter zone was 1,990 pounds as compared with a pressure of 1,710 pounds in the water underlying the Dexter zone. This shows there is an impermeable barrier separating the oil-containing sands of the West Hawkins Dexter from the water-containing sands, which prevented the oil in the Dexter zone from migrating outward under the driving force of the high-pressure gas. Further, there could be no effective water drive acting upon the West Hawkins Dexter zone since the pressure within this zone is still greater than that in the water underlying it. A further clue to the reservoir behavior is given by the fact that a plot of the percentage of pressure depletion versus the percentage of original recoverable oil produced results in a straight-line curve regardless of production rate, which is characteristic of a closed reservoir produced by an expanding gas-cap drive. At a future date, a water drive of some magnitude may develop in the West Hawkins Dexter zone. It would seem, however, since the barrier which prevented movement from the higher-pressured oil- and gas-bearing sands into the water-bearing sands withstood an original differential of 280 pounds, a minimum differential of this amount could be created in a reverse direction before the water could break through the barrier.

Since the Lewisville section is predominantly shale with 30 per cent of the volume occupied by sand lenses, it is unlikely that good communication will be found between all these lenses; and, therefore, neither a satisfactory water nor an expanding gas-cap-type drive is expected. It is interesting to note that all water production to this time is from Lewisville wells, but the pressures in these water-producing wells do not seem to vary markedly from the general pressure trends in the Lewisville zone.

Because of a lack of pressure information, the East Hawkins section of the field has not been studied for a difference in the performance of the Lewisville and Dexter sections. There is considerable evidence that an efficient water drive is acting upon the East Hawkins section of the field.

SELECTED REFERENCES

Wendlandt, E. A., Shelby, T. H., Jr., and Bell, John S. (1946) Hawkins field, Wood County, Texas: Amer. Assoc. Petr. Geol., Bull., vol. 30, pp. 1830-1856.

PRODUCTION HISTORY

Woodbine sand

	WELLS PRODUCING at end of year		OIL PRODUCTION (barrels)		GAS PROCESSED (Mcf)		LIQUID PRODUCTS (barrels)	
	Oil							
Year	Flowing	Pumping	Yearly	Cumulative	Yearly	Cumulative	Yearly	Cumulative
1940	1	0	865	865				
1941	239	5	1,461,052	1,461,917				
1942	356	14	5,476,276	6,938,193				
1943	377	20	14,276,403	21,214,596				
1944	375	26	13,296,280	34,510,876	3,087,707	3,087,707	319,105	319,105
1945	415	25	12,391,045	46,901,921	4,314,817	7,402,524	540,976	860,081
1946	529	47	14,827,666	61,729,587	4,898,438	12,300,962	620,888	1,480,969
1947	554	45	17,045,879	78,775,466	5,790,933	18,091,895	749,938	2,230,907
1948	555	55	17,612,989	96,388,455	5,887,961	23,979,856	821,584	3,052,491
1949 (P.S.)	560	60	11,455,939	107,844,394	4,166,837	28,146,693	574,173	3,626,664

Sub-Clarksville sand: During early development of the field, about 4 wells were completed as gas wells from the sub-Clarksville sand and were used to supply fuel for field drilling. These wells produced a total of 1,841,061 Mcf of gas and 12,296 barrels of condensate. All of them were either abandoned or closed in after Warren Petroleum Company's gas processing plant started operations in 1944.

HENDERSON FIELD
Rusk County, Texas

HASTINGS MOORE
District Geologist, Danciger Oil & Refining Co., Henderson, Texas
June 15, 1949

LOCATION and DEFINITION

The Henderson field is located near the town of Henderson, county seat of Rusk County, Texas. The southern edge of the presently producing area is about 3 miles northwest of the town of Henderson. The boundary of the field is not yet determined, except along the eastern edge of the productive area, where water has been found in each of the productive zones. Further development may extend the field northward, westward, and southward beyond the boundary as indicated on figure 1. The area of the field cannot be definitely defined until after further development.

METHODS OF EXPLORATION LEADING TO DISCOVERY

A structural ridge, with its high point near the south limits of the Henderson townsite and plunging gradually northward past the town of Greggton (formerly Willow Springs) in Gregg County, had been mapped on the basis of surface exposures during the latter part of the 1920's by several observers, including Walter F. Smith, A. E. Oldham, and E. A. Wendlandt.

Several dry holes to the top of the Comanchean were drilled on this ridge. The Texas Co. in 1926 carried its #1 Goodwin at the south edge of the Henderson townsite several hundred feet into the upper Glen Rose.

Following the discovery of large condensate (and later oil) production from the lower Glen Rose at Rodessa, Marion County, Texas, in December 1935, all peripheral features of the Sabine uplift were carefully re-examined.

Humble Oil & Refining Co. and Gulf Oil Corp. promptly shot and blocked the Willow Springs structure in Gregg County, and the Willow Springs gas field was discovered during June of 1938, producing mainly from the Pettet lime of the lower Glen Rose.

Early in 1941, Delta Drilling Co. abandoned its #1 Kangerga, a Travis Peak test, 5 miles north of Henderson, after having substantial showings of oil from the Pettet lime.

Encouraged by the showings in the Delta #1 Kangerga, Beacon Oil & Refining Co. consolidated its holdings southwest from the Kangerga test, and, in conjunction with the American Liberty Oil Co., drilled the discovery well on the J. H. Allen Estate tract in the Taylor Brown survey during the fall of 1943.

DISCOVERIES

Pettet-A, B, C: September 20, 1943; Beacon Oil & Refining Co. and American Liberty Oil Co. #1 J. H. Allen Estate, Taylor Brown survey. Flowed 231 b/d of 43° gravity crude through perforations at 7,250-7,265; G.O.R., 632:1.

Pettet-F: May 1, 1948; Beacon Oil & Refining Co. and American Liberty Oil Co. #1 Arnold, James Whiteman survey. Flowed 13 b/d of 39° gravity crude through perforations at 7,395-7,406 and 7,414-7,418; no gas.

Travis Peak: Gas: August 10, 1945; Danciger Oil & Refining Co. #1 C. C. Dorsey, George Fletcher survey. Flowed 1,500 Mcf and 49 b/d of 62° gravity crude on 3/16-inch choke; G.O.R., 30,500:1; perforated 7,422-7,428.

Oil: January 20, 1947, Beacon Oil & Refining Co. and American Liberty Oil Co. #1 Vise and Fife, James W. Waterberry survey. Flowed 11 b/d of 43° gravity crude through perforations at 7,450-7,468.

NATURE OF TRAPS and STRUCTURE

Accumulation of gas and oil in each of three reservoirs is near the apex of a north-south anticline. The crest of the anticline is characterized by minor folds, as indicated by the accompanying map (fig. 3) showing contours on top of the Pettet lime, to which each of the three reservoirs is nearly parallel. The regional dip is westward. At the top of the Pettet lime there is at least 50 feet of eastward dip from the highest point on the highest minor fold. Because of thinning of the intervening sediments over the crest of the anticline, the eastward dip of the reservoir rocks is slightly greater.

Development has not progressed sufficiently to determine whether the northern and southern boundaries of the field will be determined by elevations of the reservoirs or by decreased porosity and permeability.

While the above discussion applies generally to each of the three reservoirs, the trap (or traps) in Pettet-F is (or are) determined by local fracturing of the reservoir rock. This reservoir is producing at only one well, but it may be capable of producing at other wells, and, if so, the trap, or traps, would not necessarily be the same as that at the producing well, although the nature of the trapping factors would be the same.

PRODUCTIVE AREAS

	Acres
Pettet-A, B, C	4,400
Pettet-F	40
Travis Peak	3,500
Henderson field	4,880

It is probable that further development will warrant increase of the above estimates as to each reservoir and as to the field.

THICKNESSES OF RESERVOIR ROCKS

	Feet		
	Min.	Max.	Avg.
Pettet-A, B, C			
From top to bottom	85	85	85
Net productive (see fig. 4)	15	62	40
Pettet-F			
From top to bottom	15	15	15
Net productive (fissures)	?	?	?
Travis Peak			
From top to bottom	10	20	15
Net productive	10	20	15

LITHOLOGY OF RESERVOIR ROCKS

Pettet-A, B, C: Coarse oolitic to dense limestone, slightly fossiliferous in local areas. Although the three zones are generally distinguishable, they merge at many places so as to constitute a single reservoir. In many wells the three zones are separated by shale partings 1 to 10 feet thick, and in other wells there is no shale between the zones. There are wide variations in both porosity and permeability, even within the short distances between wells. An accompanying map (fig. 4) shows a distinct pattern in the variations in total thickness of effective porosity. The trend of maximum porosities is east-west perpendicular to the structural axis.

Pettet-F: Dense limestone, fractures. The yield of oil appears to depend on the degree of fracturing. So far, this zone is producing at only one well, the only place where it has been carefully tested although it has been penetrated by many wells. More complete testing might have shown that it is lithologically favorable over a greater area than now recognized.

Travis Peak: Fine-grained clean sand. The sand grains are so fine that the rock may properly be classified as a sandy siltstone.

CONTINUITY OF RESERVOIR ROCKS

Pettet-A, B, C: Each of the three zones is continuous throughout the area of the present extent of the field. However, the features (porosity and permeability) which occasion recognition of the three zones vary widely from well to well.

Pettet-F: This zone as a lithologic unit is continuous throughout the area of the present extent of the field. However, as a reservoir capable of yielding oil into bore holes, its extent may be very limited, since it is producing in only one well although penetrated by many. Though penetrated by many wells, it has been carefully tested in only one well, and, therefore, its potentially productive area may be considerably more extensive than indicated on figure 1.

Travis Peak: This reservoir is a member of a formation bearing the same name, which formation is recognized throughout a large portion of northeastern Texas and definitely correlated over a much larger area. The particular reservoir which is productive here is probably continuous throughout the present extent of the field, but its continuity beyond the immediate vicinity of the field is unknown.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Pettet-A, B, C	Pettet-F	Travis Peak
Elevation of top of gas, feet	-6,790		-6,980
Elevation of bottom of gas, feet	-6,805 to -6,823		-6,995
Relief, feet	33*		15
Elevation of top of oil, feet	-6,813 to -6,828	-6,965?	-6,995
Elevation of bottom of oil, feet	-6,825 to -6,870	-6,975?	-7,005
Relief, feet	57*	10+	10

*The maximum gas column at any one place appears to be about 33 feet; the maximum oil column, about 39 feet; the maximum combined gas and oil column, about 51 feet.

While undoubtedly there have been some changes in elevations of fluid contacts because of production to date, the available data do not afford a basis for determining the extent of such changes. The above data represent approximately the conditions in October 1948.

Pettet-A, B, C: The highest elevation at which gas has been found is -6,790. The fluid contacts are very irregular in elevation. In certain cases in offset wells where the permeability is in excess of 1,500 millidarcys, and where the wells flow naturally, the elevation of the oil-water contact varies by as much as 15 feet. In general, the oil-water contact is higher from well to well toward the north and east limits of the field. However, variations in porosity and permeability appear to control locally more than does elevation.

Pettet-F: Due to the little testing in this reservoir, the vertical extent of oil in it is not known. No free gas has been found, and the character of the oil indicates that none will be found. Since this is an open reservoir at only local spots, it seems unlikely that the oil-water contact is at the same elevation at the various places where it may contain both oil and water. At the one well where it is producing, the top of the oil is at -6,965 and the bottom is at -6,975, without water showing at that location. No water has been produced from this reservoir.

Travis Peak: Oil appears to be present on only the east flank of the structure, suggesting that the accumulation may be of stratigraphic nature.

CHARACTER OF OIL

Pettet-A, B, C

Gravity, A.P.I.	41.6°
Odor	Sweet
Base	Paraffinic
Viscosity @ 32° F.	211
@ 70° F.	44
@ 100° F.	37
Pour point	25° F.
Color	Light brown, reflected light.

Yield: Distillation at atmospheric pressure.

398° E. P. gasoline	34.2%
Kerosene, 44.6° gravity	12.8%
Light gas oil, 37.2° gravity	22.4%
Bottoms, 24.3° gravity	28.6%

The above analysis is of a sample from the discovery well, Beacon Oil & Refining Co. and American Liberty Oil Co. #1 J. H. Allen Estate, and was made by Drumwright Laboratory, Tulsa, Oklahoma, September 28, 1943.

Pettet-F

Gravity, A.P.I.	39°

Sweet crude

Distillation analysis not available.

Travis Peak

Gravity, A.P.I.	43.1°
Odor	Sweet
Base	Paraffinic
Viscosity @ 100° F.	36.8°
Color	Dark green

Yield: Distillation at atmospheric pressure.

400° E. P. gasoline	31.17%
Kerosene, 44.7° gravity	20.19%
Gas oil, 38.9° gravity	14.70%
Gas oil and wax, 32.9° gravity	18.84%
Bottoms	14.80%

The above analysis was made by Charles Martin & Co., Houston, Texas, February 19, 1947.

CHARACTER OF GAS

Pettet-A, B, C

Component	Mol.%	G/Mcf
Methane	88.91	
Ethane	5.65	
Propane	2.44	0.669
Iso-butane	0.58	0.189
N-butane	1.18	0.371
Pentane	1.24	0.498
		1.727

The above analysis was made by Clint W. Feller of Arkansas Fuel Oil Co.

Travis Peak

Component	Mol. %	G/Mcf
Carbon dioxide	1.30	
Methane	89.35	
Ethane	3.73	
Propane	1.10	
Iso-butane	0.42	0.136
N-butane	0.44	0.139
Pentanes	0.44	0.160
Hexanes	0.21	0.086
Heptanes	0.05	0.026
Nitrogen	2.95	
		0.547

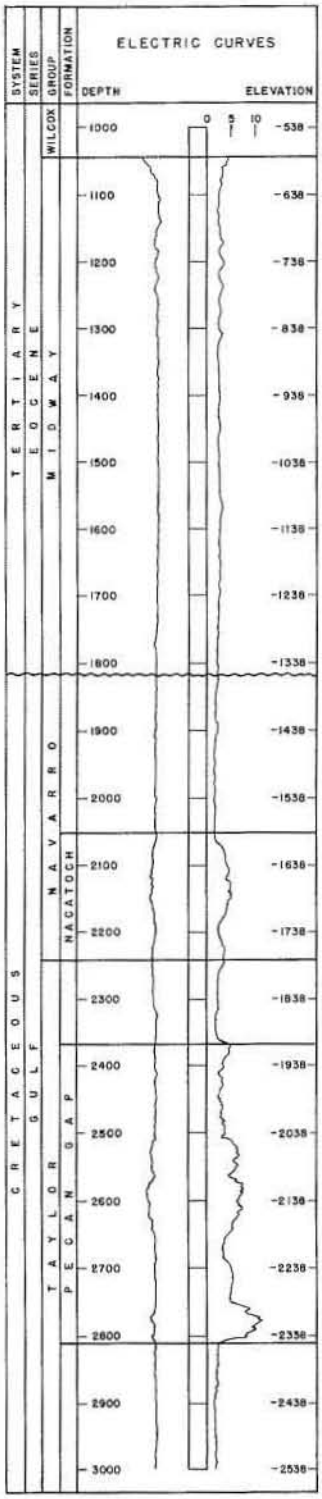
Specific gravity	.6397
Heating value, B.t.u./cf	1,038
Gasoline content based on 26/70 gasoline	.363

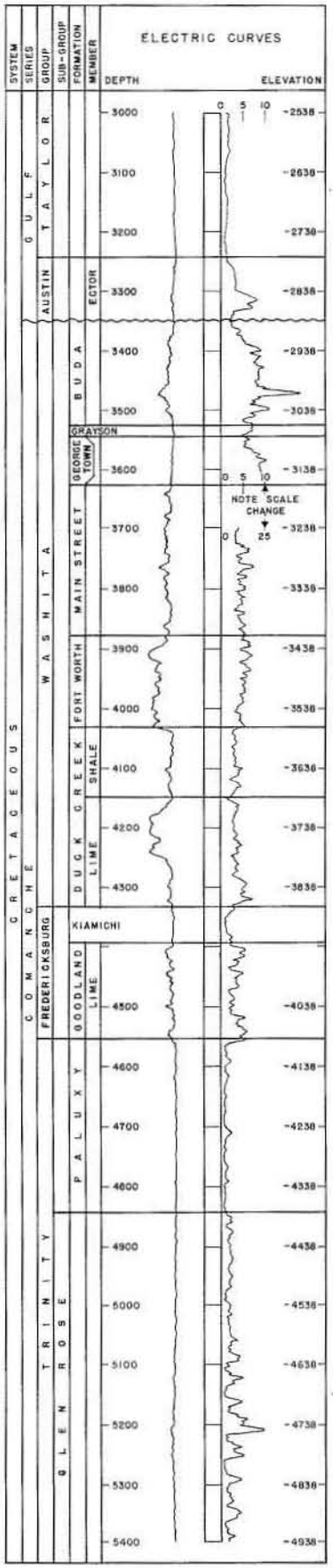
The analysis of the sample from Travis Peak was made by United Gas Pipe Line Co.

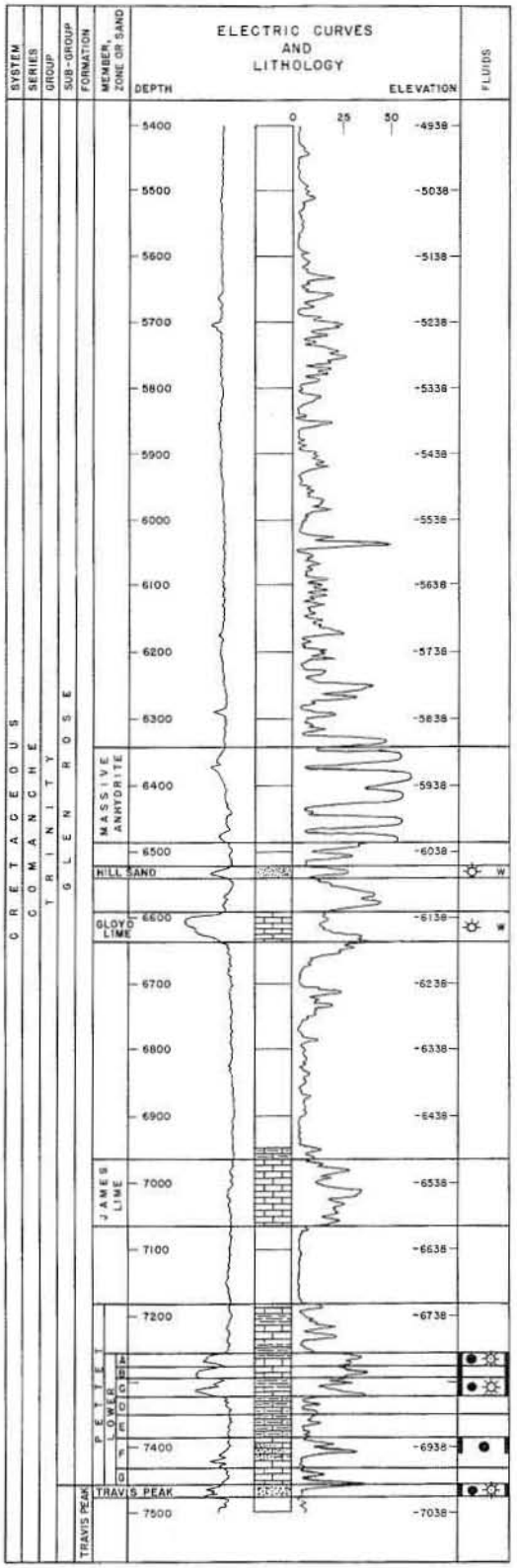
TYPE SECTION OF ROCKS PENETRATED

SURFACE FORMATIONS: WILCOX and REKLAW

ELEVATION OF SURFACE: 410 to 525 feet







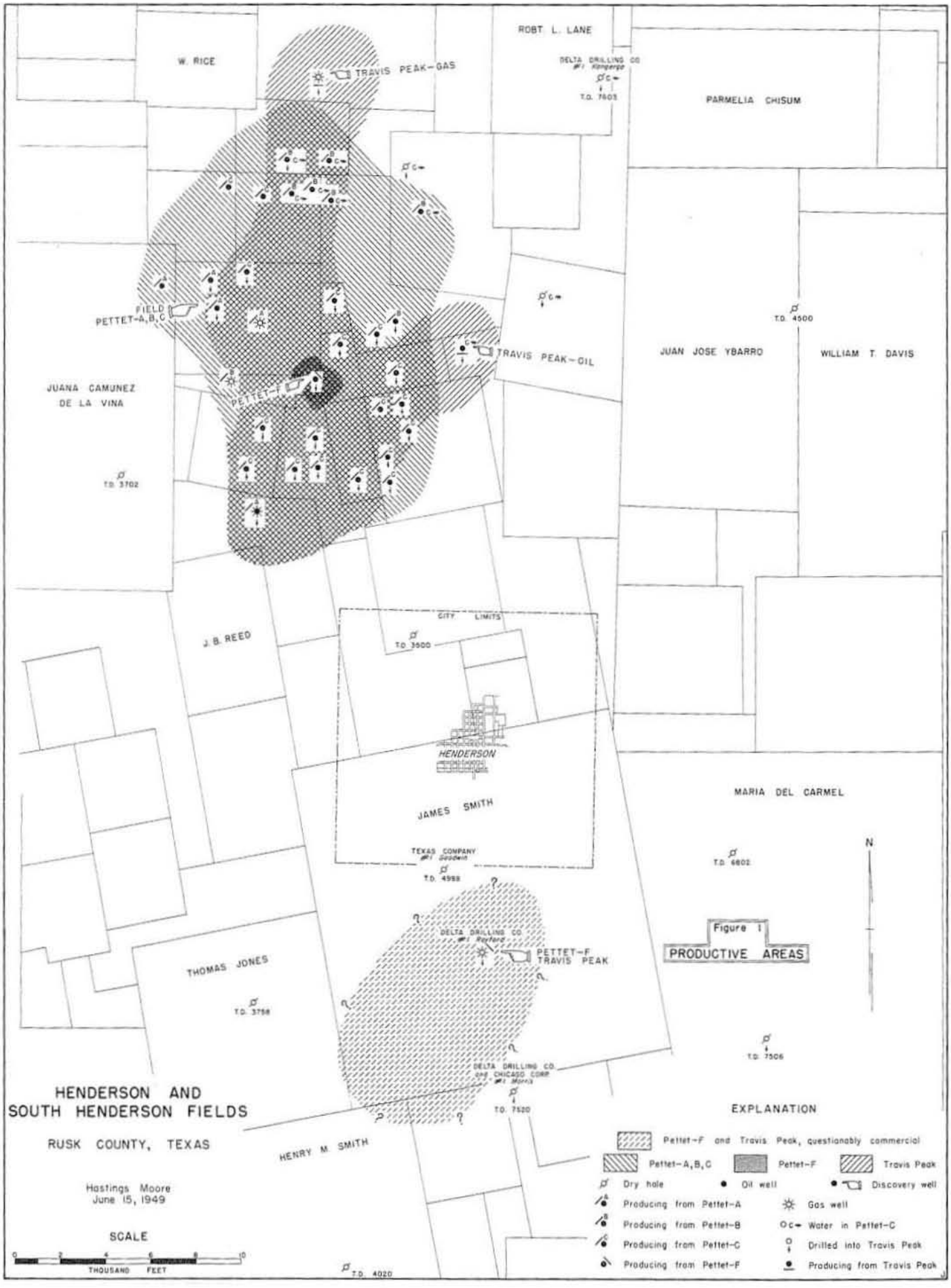
EXPLANATION

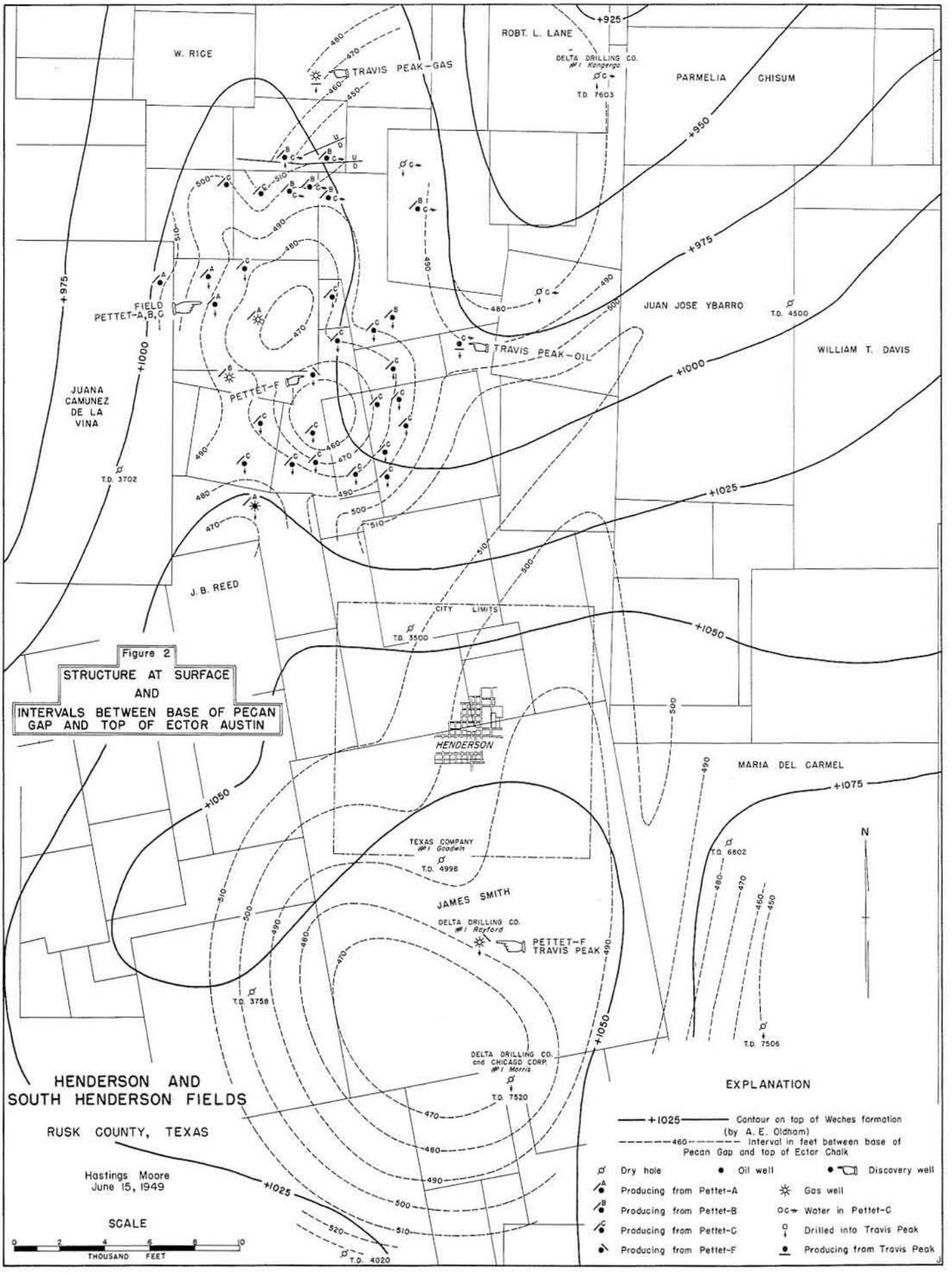
LIMESTONE SAND SHALE

Show of gas Gas production

Oil production W Water

OLDEST HORIZON PENETRATED 100 feet below top of TRAVIS PEAK


W. RICE
TRAVIS PEAK—GAS
ROBT. L. LANE
DELTA DRILLING CO
T.D. 7603
PARMELIA CHISUM
FIELD
PETTET-A,B,C
T.D. 4500
JUAN JOSE YBARRO
WILLIAM T. DAVIS
TRAVIS PEAK—OIL
JUANA CAMUNEZ
DE LA VINA
PETTET-F
T.D. 3702
CITY LIMITS
T.D. 3500
J. B. REED
HENDERSON
MARIA DEL CARMEL
JAMES SMITH
TEXAS COMPANY
T.D. 4998
T.D. 6802
N
Figure 1
PRODUCTIVE AREAS
DELTA DRILLING CO.
PETTET-F
TRAVIS PEAK
THOMAS JONES
T.D. 3758
T.D. 7506
DELTA DRILLING CO.
T.D. 7520
HENRY M. SMITH
HENDERSON AND
SOUTH HENDERSON FIELDS
RUSK COUNTY, TEXAS
Hastings Moore
June 15, 1949
SCALE
THOUSAND FEET
T.D. 4020
EXPLANATION
Pettet-F and Travis Peak, questionably commercial
Pettet-A,B,C
Pettet-F
Travis Peak
Dry hole
Oil well
Discovery well
Producing from Pettet-A
Gas well
Producing from Pettet-B
Water in Pettet-C
Producing from Pettet-C
Drilled into Travis Peak
Producing from Pettet-F
Producing from Travis Peak


W. RICE
TRAVIS PEAK—GAS
ROBT. L. LANE
DELTA DRILLING CO. #1 Kangerga
T.D. 7603
PARMELIA CHISUM
+925
+950
+975
+1000
+1025
+1050
+1075
FIELD PETTET-A,B,C
PETTET-F
TRAVIS PEAK—OIL
JUAN JOSE YBARRO
T.D. 4500
WILLIAM T. DAVIS
JUANA CAMUNEZ DE LA VINA
T.D. 3702
J. B. REED
CITY LIMITS
T.D. 3500
HENDERSON
MARIA DEL CARMEL
T.D. 6802
TEXAS COMPANY #1 Goodwin
T.D. 4998
JAMES SMITH
DELTA DRILLING CO. #1 Rayford
PETTET-F TRAVIS PEAK
T.D. 3758
DELTA DRILLING CO. and CHICAGO CORP. #1 Morris
T.D. 7520
T.D. 7506
T.D. 4020
N
Figure 2
STRUCTURE AT SURFACE AND INTERVALS BETWEEN BASE OF PECAN GAP AND TOP OF ECTOR AUSTIN
HENDERSON AND SOUTH HENDERSON FIELDS
RUSK COUNTY, TEXAS
Hastings Moore
June 15, 1949
SCALE
0 2 4 6 8 10
THOUSAND FEET
EXPLANATION
+1025 Contour on top of Weches formation (by A. E. Oldham)
460 Interval in feet between base of Pecan Gap and top of Ector Chalk
Dry hole
Oil well
Discovery well
Producing from Pettet-A
Producing from Pettet-B
Producing from Pettet-C
Producing from Pettet-F
Gas well
Water in Pettet-C
Drilled into Travis Peak
Producing from Travis Peak

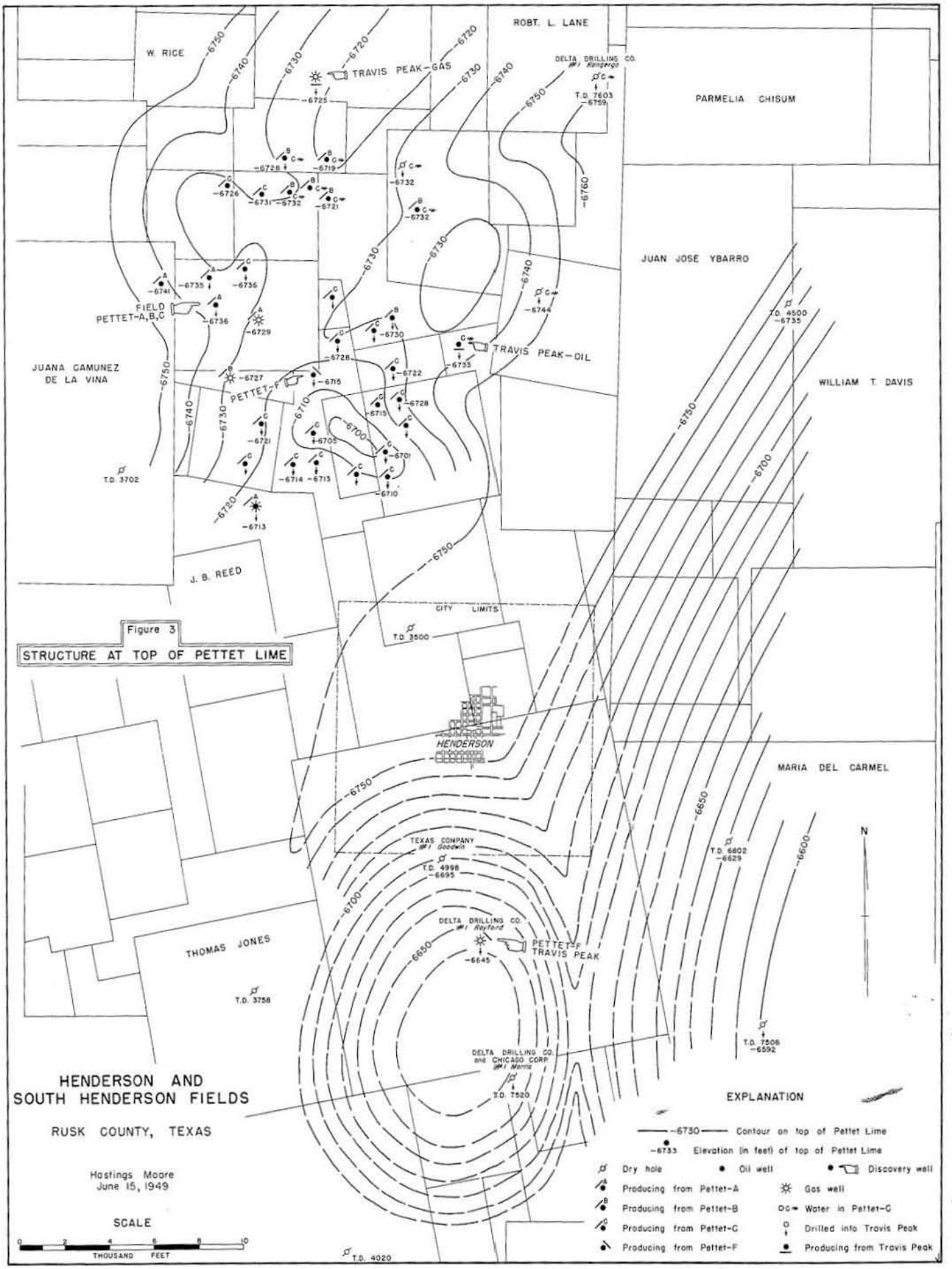


Figure 3

STRUCTURE AT TOP OF PETTET LIME

HENDERSON AND SOUTH HENDERSON FIELDS

RUSK COUNTY, TEXAS

Hastings Moore
June 15, 1949

SCALE

0 2 4 6 8 10
THOUSAND FEET

EXPLANATION

-6730- Contour on top of Pettet Lime

-6733 Elevation (in feet) of top of Pettet Lime

Dry hole
Oil well
Discovery well
Producing from Pettet-A
Gas well
Producing from Pettet-B
Water in Pettet-C
Producing from Pettet-C
Drilled into Travis Peak
Producing from Pettet-F
Producing from Travis Peak

RESERVOIR ENERGY

In each, Pettet-A, B, C and Travis Peak, water is yielded abundantly on the north and east sides of the field but only slowly on the south and west sides. Apparently these reservoirs are energized by a combination of water drive (from the northeast) and gas expansion.

The very limited available data pertaining to Pettet-F indicate water drive as the prime mover, despite the nature of the reservoir rock.

ACID TREATMENT

About two-thirds of the wells have required acid. The usual treatment is one to three thousand gallons. Staging of acid has been used, but with little favorable effect. Pressures required have varied from 0 to 2,700 psi.

WATER PRODUCTION

Production of water has been almost negligible. Disposal has been by means of evaporating pits.

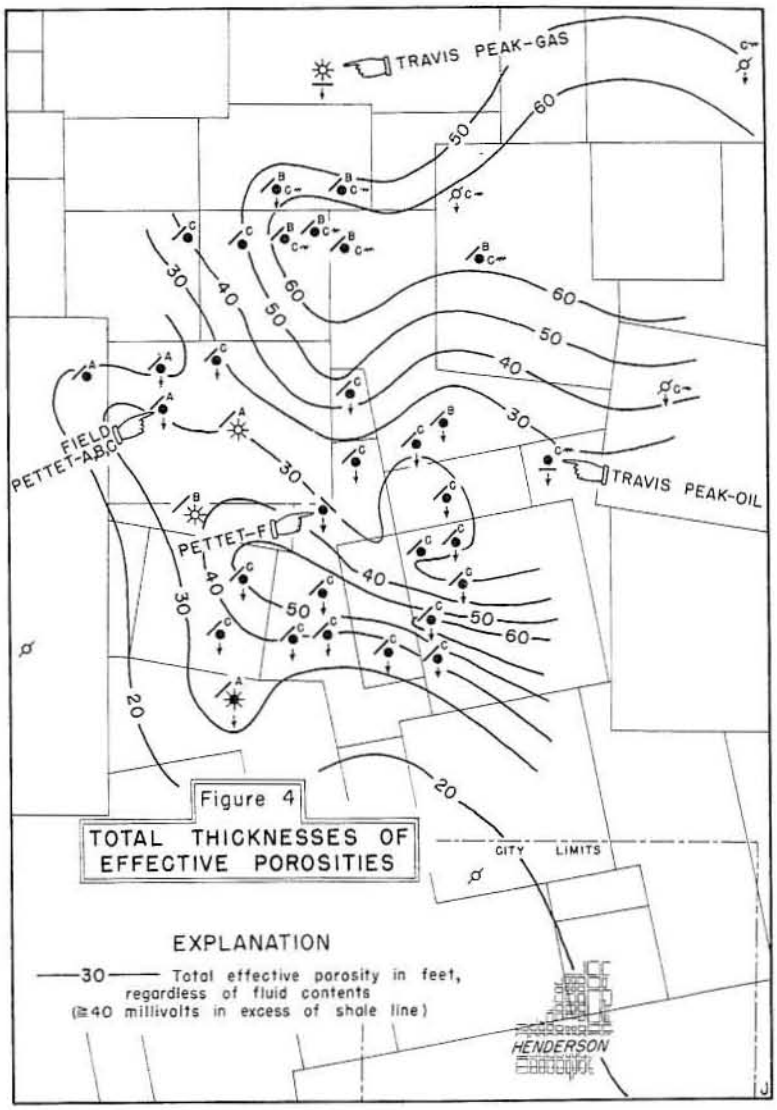


Figure 4
TOTAL THICKNESSES OF EFFECTIVE POROSITIES

PRODUCTION HISTORY
(Amended to include 1949 data)

Field totals

Year	WELLS PRODUCING at end of year: Oil or Oil & Gas Flowing	WELLS PRODUCING at end of year: Gas or Gas & Conds.	OIL PRODUCTION (barrels): Yearly	CONDENSATE PRODUCTION (barrels): Yearly	TOTAL LIQUIDS (barrels): Yearly	TOTAL LIQUIDS (barrels): Cumulative	GAS PRODUCTION (Mcf): Yearly	GAS PRODUCTION (Mcf): Cumulative
1943	1	0	12,490	0	12,490	12,490	0	0
1944	5	1	59,055	12,635	71,690	84,180	180,067	180,067
1945	11	2	144,052	15,234	159,286	243,466	243,199	423,266
1946	19	3	253,280	13,200	266,480	509,946	343,279	766,545
1947	26	3	286,732	8,513	295,245	805,191	364,617	1,131,162
1948	30	2	309,588	10,142	319,730	1,124,921	355,502	1,486,664
1949	32	2	262,055	6,365	268,420	1,393,341	288,043	1,774,707

Cumulative production to and number of wells at end of 1949

	WELLS PRODUCING: Oil	WELLS PRODUCING: Gas & Conds.	WELLS PRODUCING: Total	OIL (barrels)	CONDENSATE (barrels)	TOTAL LIQUIDS (barrels)	GAS (Mcf)
Pettet-A, B, C	30	1	31	1,309,345	44,385	1,353,730	814,624
Pettet-F	1	0	1	6,307	0	6,307	0
Travis Peak	1	1	2	11,590	21,714	33,304	960,083
Total	32	2	34	1,327,242	66,099	1,393,341	1,774,707

HUNTINGTON FIELD
Angelina County, Texas

W. E. RICHARDSON
Geologist, Stanolind Oil and Gas Company, Tyler, Texas
December 20, 1948

LOCATION

The Huntington field is located 1 mile northwest of the town of Huntington and 9 miles southeast of Lufkin, county seat of Angelina County. It is one of several shallow fields on a regional homocline dipping southward toward the Gulf of Mexico.

The isolated abandoned well shown on the following map about one-half mile southwest of the town of Huntington is not considered as within the limits of the field. This well, Brazos Production Co. #1 J. E. Hawkins, produced for a short time only from a very thin sand at -1,193, about 79 feet above the zone productive within the Huntington field.

METHODS OF EXPLORATION LEADING TO DISCOVERY

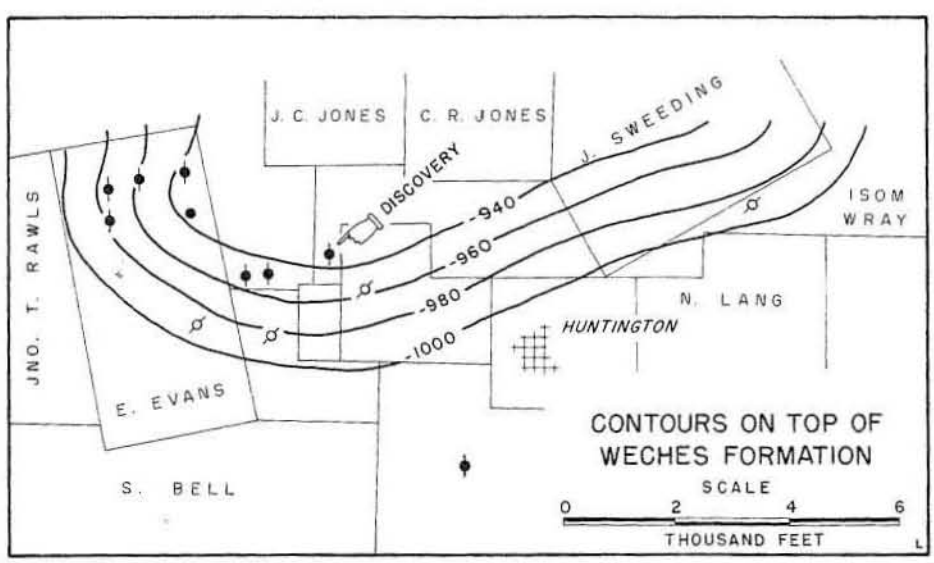
Random drilling led to the discovery of this field. Several shallow wells previously drilled in the vicinity of Huntington had encouraging shows of oil. On September 12, 1935, the Pioneer Exploration Co. commenced the drilling of the #1 Mrs. Willroy, the completion of which resulted in the discovery of the field on October 19, 1935.

DISCOVERY

Queen City sand: October 19, 1935;
Pioneer Exploration Co. #1 Mrs. Willroy.

TYPE SECTION OF ROCKS PENETRATED

Era	System	Series	Group	Formation	Oil	Elevation of top	Thickness (feet)
Cenozoic	Tertiary	Eocene	Claiborne	Yegua		Top absent	650+
				Crockett		-321	443
				Sparta		-764	227
				Weches		-991	124
				Queen City	•	-1,115	213
				Reklaw		-1,328	78
				Carrizo		-1,406	109
			Wilcox			-1,515	3,016
			Midway			-4,531	240+



ELEVATION OF SURFACE

At well locations: Highest, 329 ft.; lowest, 312 feet.

SURFACE FORMATION

Yegua is the only formation exposed within the area of the field.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest stratigraphic horizon penetrated by any well within the field is about 240 feet below the top of the Midway formation.

NATURE OF TRAP

Queen City sand: Reservoir apparently terminated by pinchout of porosity and permeability. A local monoclinal nose on the regional homocline may have contributed to the accumulation of oil.

PRODUCTIVE AREA

Queen City sand and Field: 130 acres.

THICKNESS OF RESERVOIR ROCK

Queen City sand: Average, 5 feet.

LITHOLOGY OF RESERVOIR ROCK

Queen City sand: Clean sand.

CONTINUITY OF RESERVOIR ROCK

Queen City sand: The continuity of the reservoir rock is unknown due to poor logs and incomplete control.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

	Queen City sand
Elevation of top of oil, feet	-1,137
Elevation of bottom of oil, feet	-1,182
Relief, feet	45

The above figures represent conditions as of discovery date. Water is predominant throughout the reservoir now. It appears that there never was a definite oil-water contact.

CHARACTER OF OIL

Queen City sand: Gravity, A.P.I., 23°

WATER PRODUCTION

Queen City sand: From the date of completion, the gross production of each well has been at least 25% fresh water.

PRODUCTION HISTORY

Queen City sand and Field total:

Year	WELLS PRODUCING at end of year	OIL PRODUCTION (barrels)	
	All pumping	Yearly	Cumulative
1935	1	60	60
1936	2	1,440	1,500
1937	4	4,298	5,798
1938	4	2,744	12,956*
1939	4	2,900	15,856
1940	1	1,396	17,252
1941	1	1,226	18,478
1942	1	1,050	19,528
1943	1	734	20,272
1944	1	501	20,773
1945	1	1,291	22,064
1946	1	1,168	23,232
1947	1	1,056	24,288
1948**	1	807	25,095
1949**	1	590	25,685

*Includes adjustment for unallocated prior production.

**P.S. - 1948 and 1949 data added by amendment.

HUXLEY FIELD
Shelby County, Texas

HARRY S. PHILLIPS
Geologist, Tyler, Texas
September 11, 1949

LOCATION

The Huxley field is approximately 17½ miles southeast of Center, county seat of Shelby County.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Leases were initially acquired in the Huxley area by Humble Oil & Refining Co. during 1939 as a result of subsurface and seismic work, which suggested the presence of a low-relief anticline. Subsequent core-drill work, however, indicated that structural conditions were limited to a southeastward plunging nose. Following this exploratory work, Humble Oil & Refining Co. started drilling operations October 12, 1944, on its #1 Pickering Lumber Corp., located near the center of the lease block.

DISCOVERY

Pettet: March 26, 1946; Humble Oil & Refining Co. #1 Pickering Lumber Corp. After testing non-commercial gas shows in Fredericksburg and Travis Peak, this well was completed as a gas-condensate producer in the Pettet. The calculated potential was 15,000,000 cubic feet of gas per day with approximately 15 barrels of condensate per million cubic feet.

ELEVATION OF SURFACE

At well locations: Highest, 289 ft.; lowest, 194 feet.

SURFACE FORMATION

Wilcox.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated is in limestone 3,326 feet below the top of the Jurassic. This penetration was in the discovery well, the log of which is presented in the following TYPE SECTION.

NATURE OF TRAP

Pettet: Porous limestone pinchout on west flank of southeastward plunging nose.

PRODUCTIVE AREA

Pettet and Field: Proven, 2,500 acres.

LITHOLOGY OF RESERVOIR ROCK

Pettet: Porous, permeable, oolitic and coquina-type limestone.

THICKNESS OF RESERVOIR ROCK

	Feet		
Pettet	Max.	Min.	Avg.
From top to bottom	24	0	12
Net productive	24	0	12

CONTINUITY OF RESERVOIR ROCK

The porosity is continuous and interconnecting in a restricted area and over the productive limits of the field, but grades into non-porous limestone eastward.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Pettet	Feet
Highest proven elevation of gas	-6,345
Elevation of gas-water contact	-6,400±
Relief	55±

Salt water underlies the gas in the reservoir on the downdip side.

CHARACTER OF CONDENSATE

Gravity, A.P.I. @ 60° F., 57°.

CHARACTER OF GAS

No analyses available.

ACID TREATMENT

Two wells have been acidized with approximately 8,000 gallons under a maximum pressure of 1,050 psi. resulting in an increased potential of the wells. The other three wells were completed naturally.

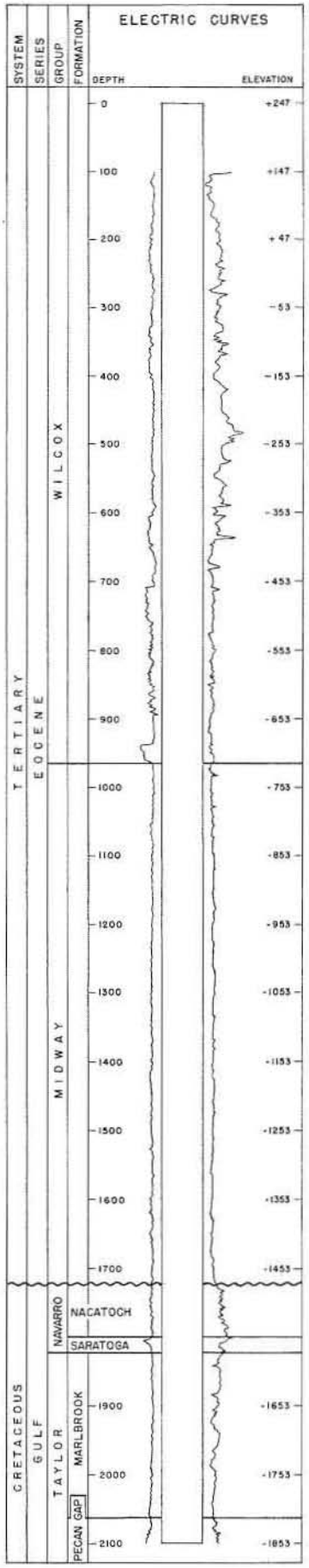
PRODUCTION HISTORY

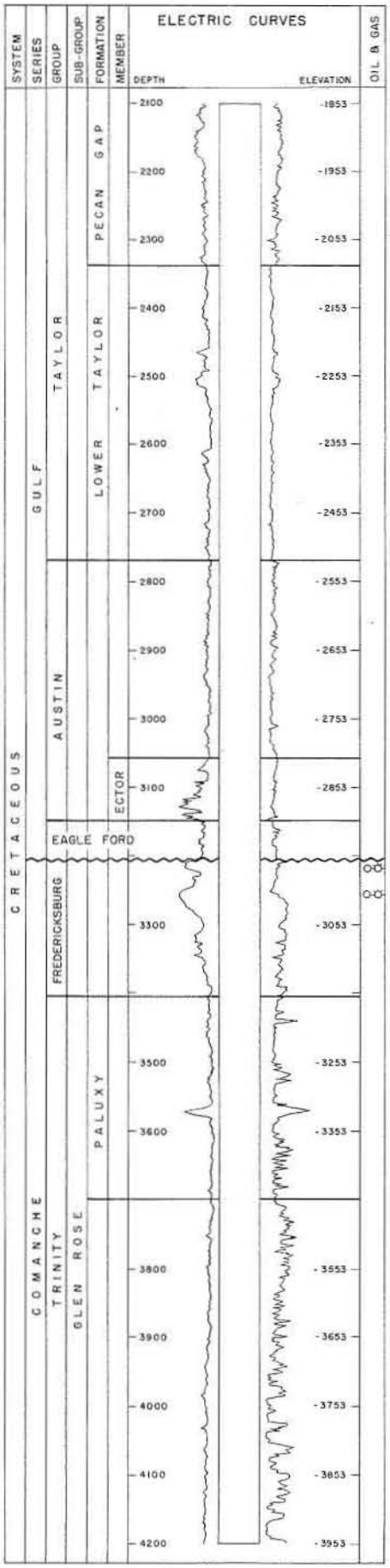
Year	No. of WELLS at end of year Gas	CONDENSATE PRODUCTION (barrels)	GAS PRODUCTION (Mcf)
1946	1	1,160	86,930
1947	2	2,135	149,837
1948	3	3,382	243,559
1949*	4	2,357	171,937
Total		9,034	652,263

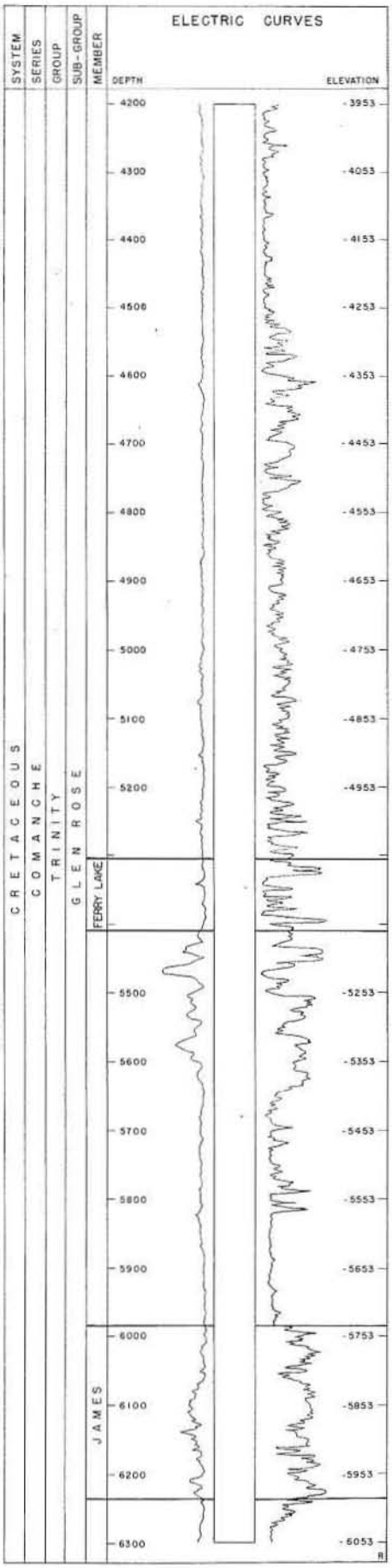
*1949 data added by amendment.

The wells are not yet on regular production since there is no pipeline outlet. All of the gas produced to date has been used as fuel in drilling operations.

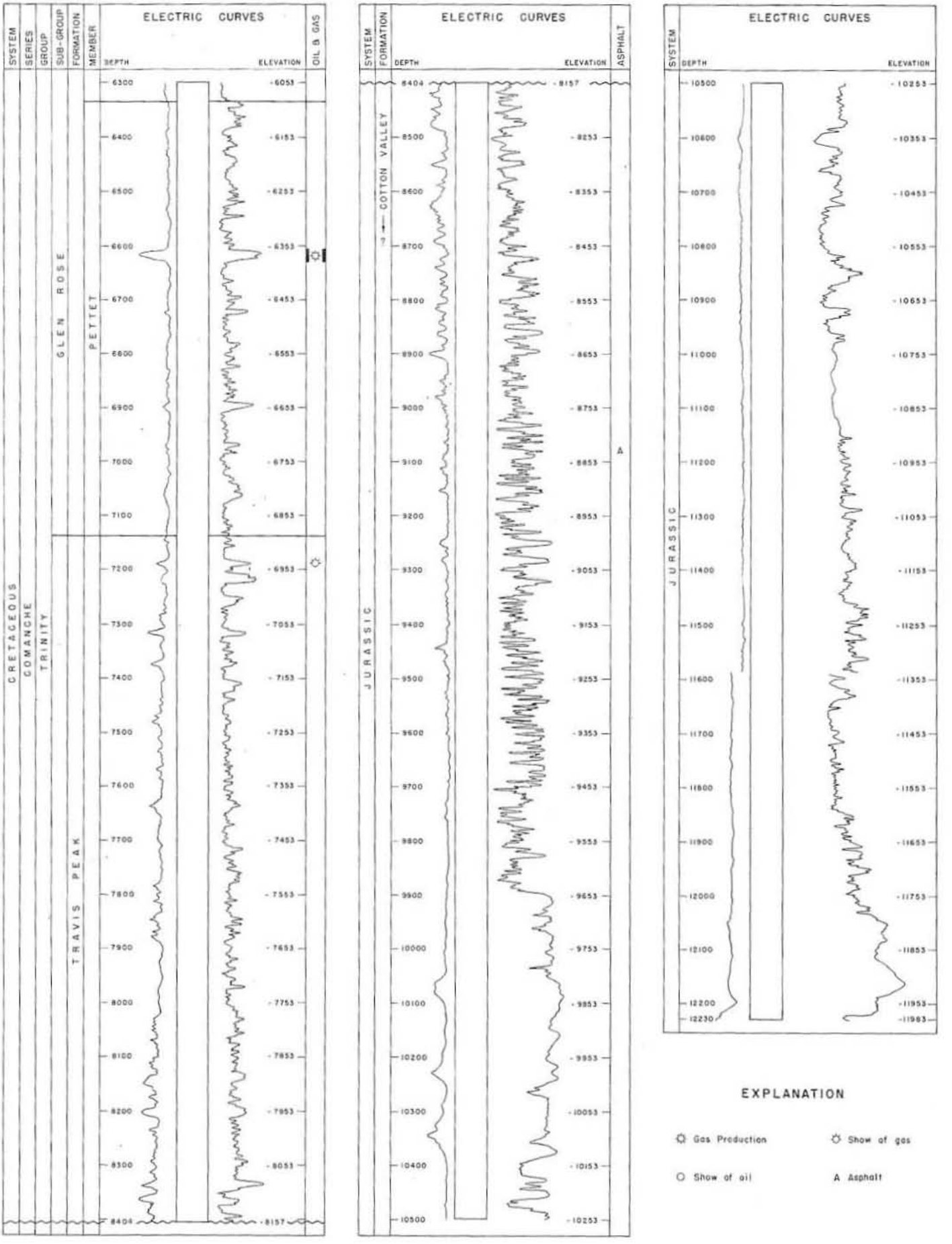
TYPE SECTION OF ROCKS PENETRATED

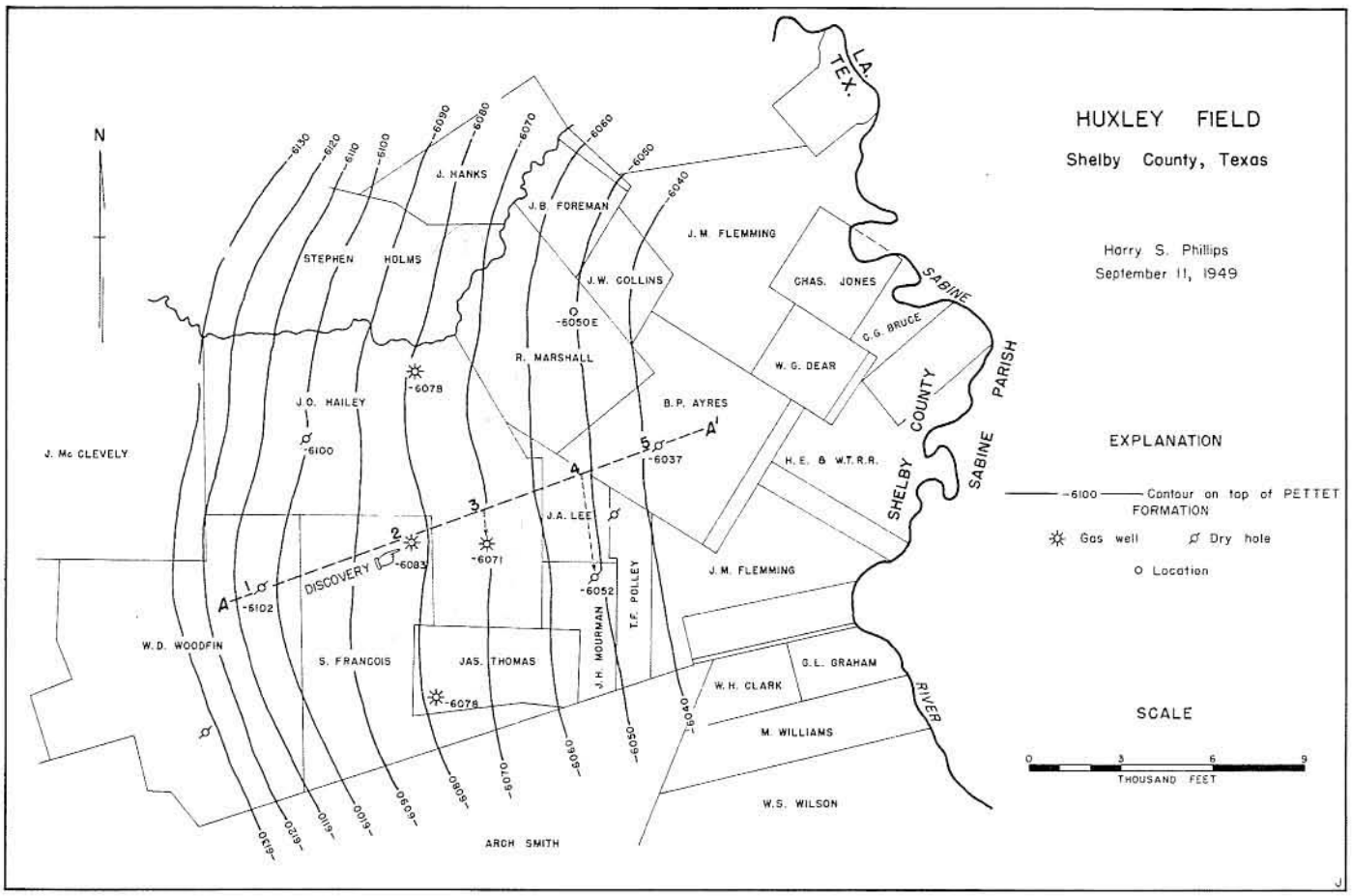


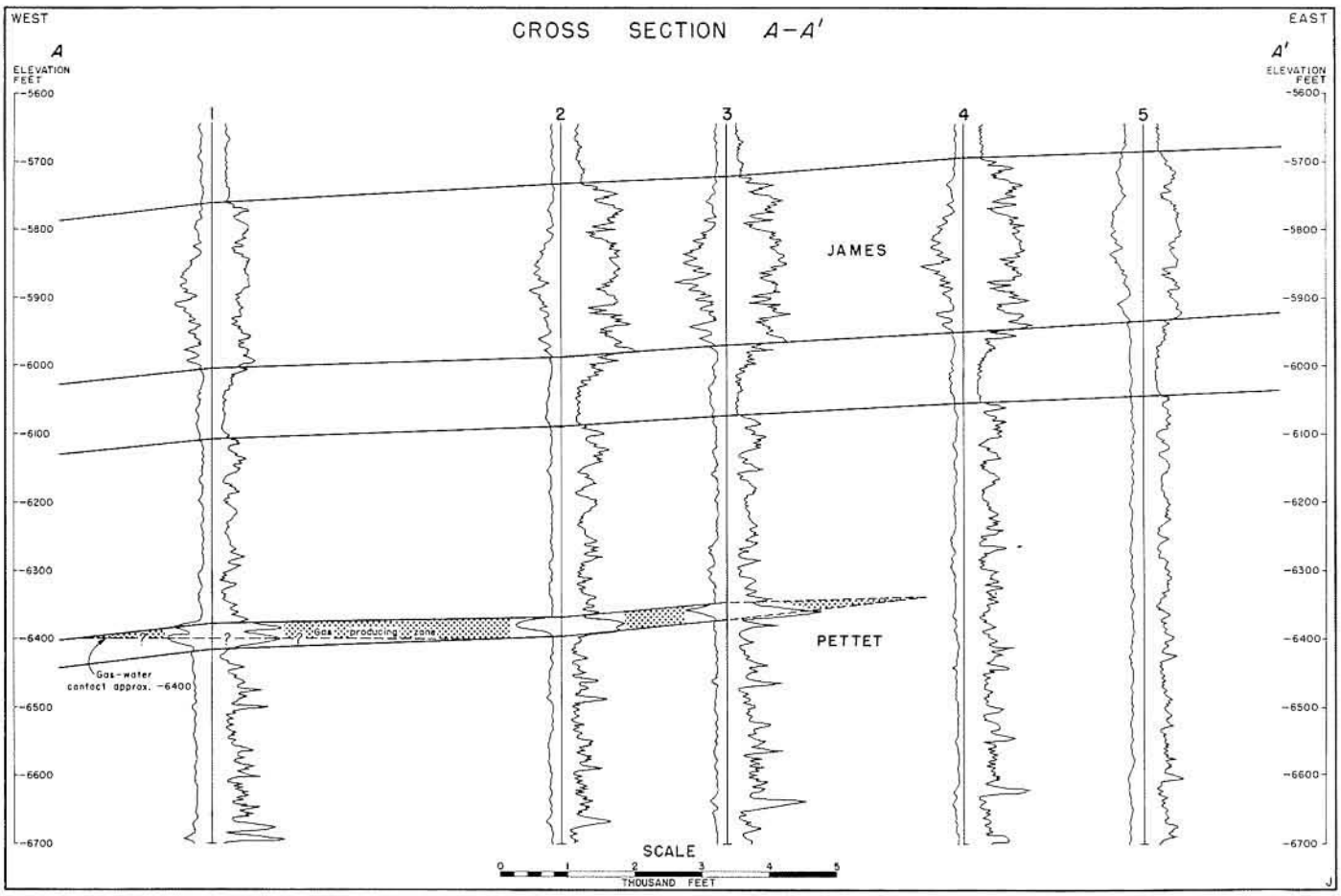




TYPE SECTION OF ROCKS PENETRATED




HUXLEY FIELD
Shelby County, Texas
Harry S. Phillips
September 11, 1949
EXPLANATION
-6100 Contour on top of PETTET FORMATION
Gas well
Dry hole
Location
SCALE
THOUSAND FEET
LA.
TEX.
SABINE
SHELBY COUNTY
SABINE PARISH
RIVER
N
J. HANKS
J.B. FOREMAN
J.M. FLEMMING
STEPHEN HOLMS
J.W. COLLINS
CHAS. JONES
C.G. BRUCE
W.G. DEAR
R. MARSHALL
J.O. HAILEY
B.P. AYRES
J. Mc CLEVELY
H.E. & W.T.R.R.
J.A. LEE
DISCOVERY
W.D. WOODFIN
S. FRANCOIS
JAS. THOMAS
J.H. MOURMAN
T.F. POLLEY
W.H. CLARK
G.L. GRAHAM
M. WILLIAMS
W.S. WILSON
ARCH SMITH
A
A'
-6102
-6100
-6083
-6078
-6071
-6052
-6037
-6050E
-6078
-6040


CROSS SECTION A-A'
WEST
EAST
A
A'
ELEVATION FEET
-5600
-5700
-5800
-5900
-6000
-6100
-6200
-6300
-6400
-6500
-6600
-6700
1
2
3
4
5
JAMES
PETTET
Gas producing zone
Gas-water contact approx. -6400
SCALE
THOUSAND FEET

JOAQUIN-LOGANSPORT FIELD

Shelby and Panola Counties, Texas and De Soto Parish, Louisiana

ROBERT T. TRUEHEART
Geologist, Amerada Petroleum Corp., Tyler, Texas
August 31, 1950

LOCATION

The Joaquin-Logansport field is mainly in northeastern Shelby County, Texas, southeast of the town of Joaquin, and in southwestern De Soto Parish, Louisiana, encompassing the town of Logansport. The southeast corner of Panola County is within the area of the field.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Subsurface mapping of data afforded by shallow wells indicated a structural high. This was followed and confirmed by extensive seismograph exploration.

DISCOVERIES

Paluxy: GAS: May 19, 1950;
Skelly Oil Co. #1 J. M. Fonville.
Rodessa: GAS: October 12, 1936;
H. A. Stebbinger (Portex Oil Co.) #1 Pickering Lumber Co.
Upper Pettet: GAS: July 10, 1948;
Southern Production Co. #1 J. O. Pace.
Lower Pettet: GAS: October 16, 1940;
Union Producing Co. #B-1 Garrett.
OIL: May 26, 1948;
Skelly Oil Co. #1 Levi-Burkett unit.

DATA CONCERNING OTHER RESERVOIRS

There has been some small amount of production of both oil and gas from one or more reservoirs other than those concerning which detailed data are presented in this paper.

On November 16, 1931, E. L. Chapman #1 Pickering Lumber Co., C. E. Henry survey, Shelby County, was completed with an estimated open flow capacity of 12,000 Mcf of gas daily after having been drilled to a total depth of 3,864 feet. The writer has been unable to determine the stratigraphic position of the productive zone, the duration of production and the quantity of gas produced. It appears that the yield was not such as to encourage further development.

Beginning in 1916 with the completion of a shallow oil well, there were operations for shallow oil and gas around the common corner of sections 1, 2, 11 and 12, T. 11N., R. 16W., De Soto Parish. By the end of 1936, a total of 5 oil wells, 1 gas well and 18 dry holes had been drilled in the course of this shallow exploration, the main value of which appears to have been to afford data leading to the discovery of the deeper production. Data as to the stratigraphic position of the productive zone, the duration of production and the quantities of oil and gas produced are not available. The writer has found an indication that the total quantity of oil produced amounted to about 4,000 barrels and that such production was prior to 1947, but definite data are not available.

ELEVATION OF SURFACE

At well locations: Highest, 320 ft.; lowest, 187 feet.

SURFACE FORMATION

Wilcox group, undifferentiated. At well locations throughout the field, the horizons at the surface average 350 feet above the base of the Wilcox.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

Eleven feet below top of Norphlet formation, the lowermost formation of upper Jurassic. This penetration was at the total depth of 11,664 feet in Skelly Oil Co. #1 Thelma Nash located in Sec. 20, T. 12N., R. 16W.

NATURE OF TRAPS

Anticlinal structure is the dominating factor in occasioning accumulation in each of the several reservoirs. In detail, the accumulations have been controlled to a large extent by variations in permeability. Each accumulation is in a convex trap with its periphery determined in part by edge water and in part by lack of permeability.

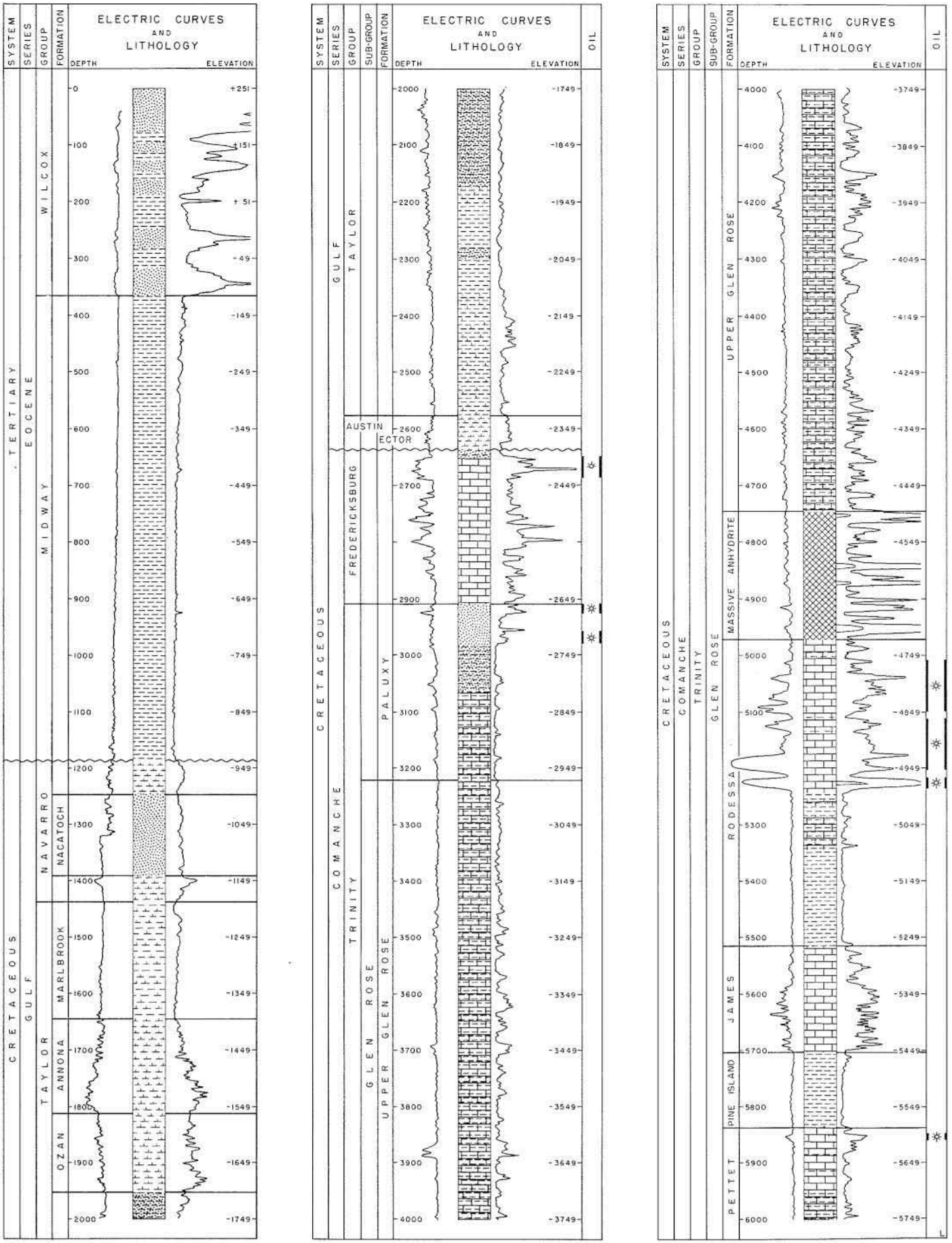
PRODUCTIVE AREAS

	Acres
Paluxy	1,280
Rodessa	30,080
Upper Pettet	640
Lower Pettet	15,360
Joaquin-Logansport field	33,920

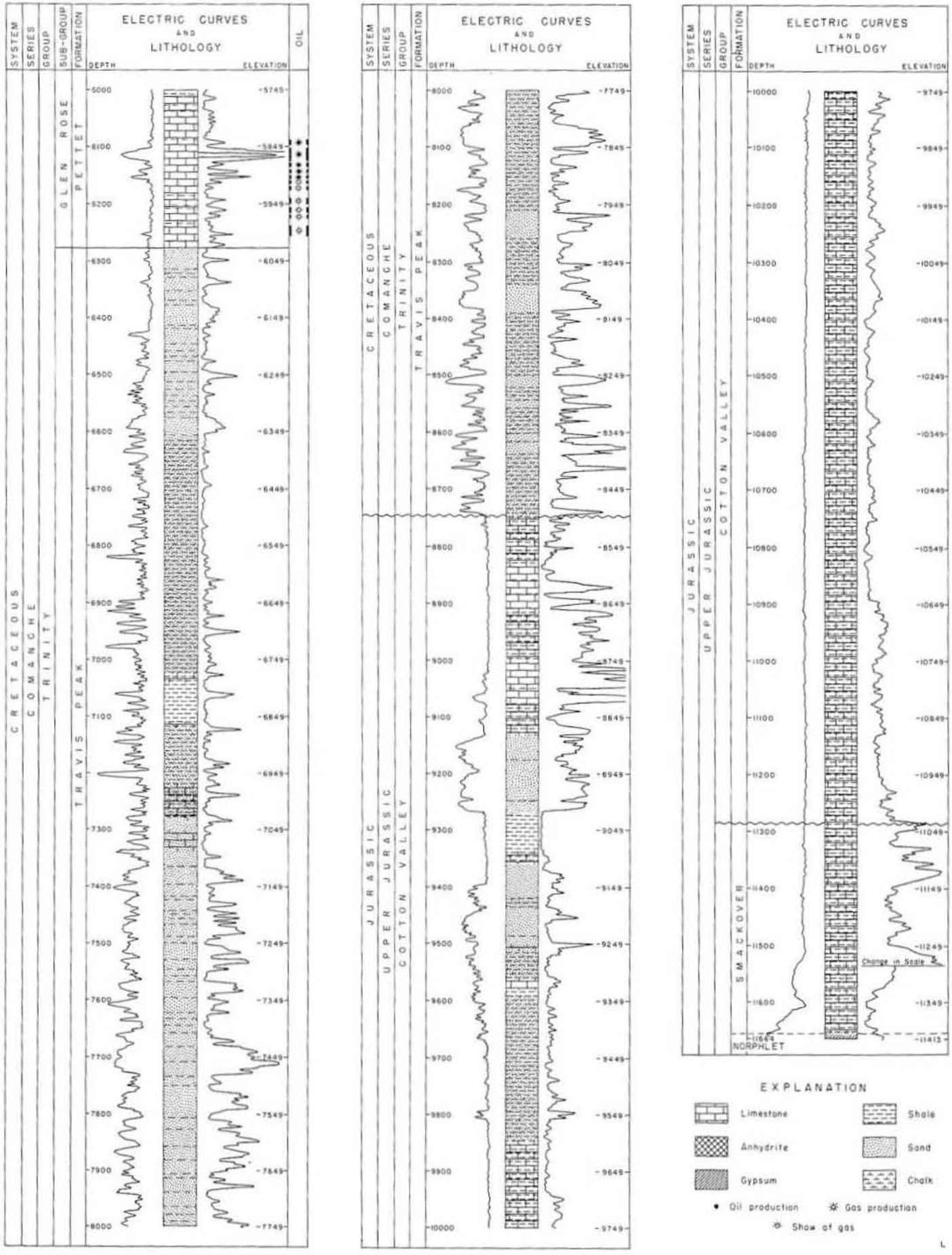
THICKNESSES OF RESERVOIR ROCKS

	Feet		
	Min.	Max.	Avg.
Paluxy			
From top to bottom	72	87	78
Net effective porosity	8	12	10
Rodessa			
From top to bottom	160	310	185
Net effective porosity	20	45	35
Upper Pettet (Only one well)			
From top to bottom			58
Net effective porosity			12?
Lower Pettet			
From top to bottom	180	202	195
Net effective porosity	13	47	30

TYPE SECTION OF ROCKS PENETRATED



TYPE SECTION OF ROCKS PENETRATED



LITHOLOGY OF RESERVOIR ROCKS

Paluxy: Porous, silty, calcareous sandstone.

Rodessa: Gray, crystalline to oolitic, fossiliferous, porous limestone.

Upper Pettet: Gray, crystalline to oolitic, fossiliferous, porous limestone.

Lower Pettet: Gray, crystalline to oolitic, fossiliferous, porous limestone.

CONTINUITY OF RESERVOIR ROCKS

Paluxy: The Paluxy formation is continuous throughout the area of the field. However, the sand lenses which contain hydrocarbons are characterized by lenticularity rather than by continuity. The productive lenses are of only local extent. Only two wells are now producing from this formation. It has been found barren at the locations of many wells which have been drilled through it.

Rodessa and Pettet: The Rodessa and Pettet formations are continuous throughout the area of the field. No one reservoir within either of these formations is of nearly such extent. Within each formation there is great variation both vertically and laterally especially in the lower part of the upper half of the Rodessa formation. There are wide variations in porosity and permeability in reservoir rocks which appear to be at the same stratigraphic positions. It appears that there may be several more or less separate reservoirs at certain stratigraphic positions where porosity and permeability are variable laterally. At such stratigraphic positions there is probably generally actual intercommunication although very slow because of low porosity and permeability.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Paluxy	Rodessa	Upper Pettet	Lower Pettet
Elev. of top of gas, feet	-2,640	-4,589	-5,542	-5,699
Elev. of bottom of gas, feet	-2,754	-4,928	-5,554	-5,995
Relief, feet	114	339	12	296

In the case of each Rodessa and Lower Pettet, the above figures apply to a stratigraphic zone which contains several distinct reservoirs. It appears highly improbable that any one reservoir is productive throughout the indicated interval.

The Upper Pettet figures are based on elevations in the single well where Upper Pettet is productive.

Oil in Lower Pettet: Oil is known in Lower Pettet only, and here in only two wells. The two wells are at the extreme north edge of the field. The highest elevation at which oil occurs in the higher well is -5,833 feet, and the lowest elevation at which oil occurs in the lower well is -6,032 feet. This merely represents a local condition, as gas in known to be in contact with water generally in the Lower Pettet.

CHARACTER OF OIL

Lower Pettet: (Only 2 wells produce oil.)
Gravity, A.P.I.: 39.6°.

Aside from early shallow production, oil has been produced from Lower Pettet only.

CHARACTER OF CONDENSATE

Paluxy: (Only 2 wells.)
Data not available.

Rodessa:
Gravity, A.P.I.: 55°.
Base: Paraffinic Color: Amber
Distillation yield:

Motor fuel (400° E.P.)	62.2%
Kerosene	31.2%
Gas oil	1.5%
N. C. gas and loss	2.3%

Upper Pettet: (Only 1 well.)
Data not available.

Lower Pettet:
Gravity, A.P.I.: 58.2°.
Base: Paraffinic.
Color: Water white with bluish tinge.

CHARACTER OF GAS

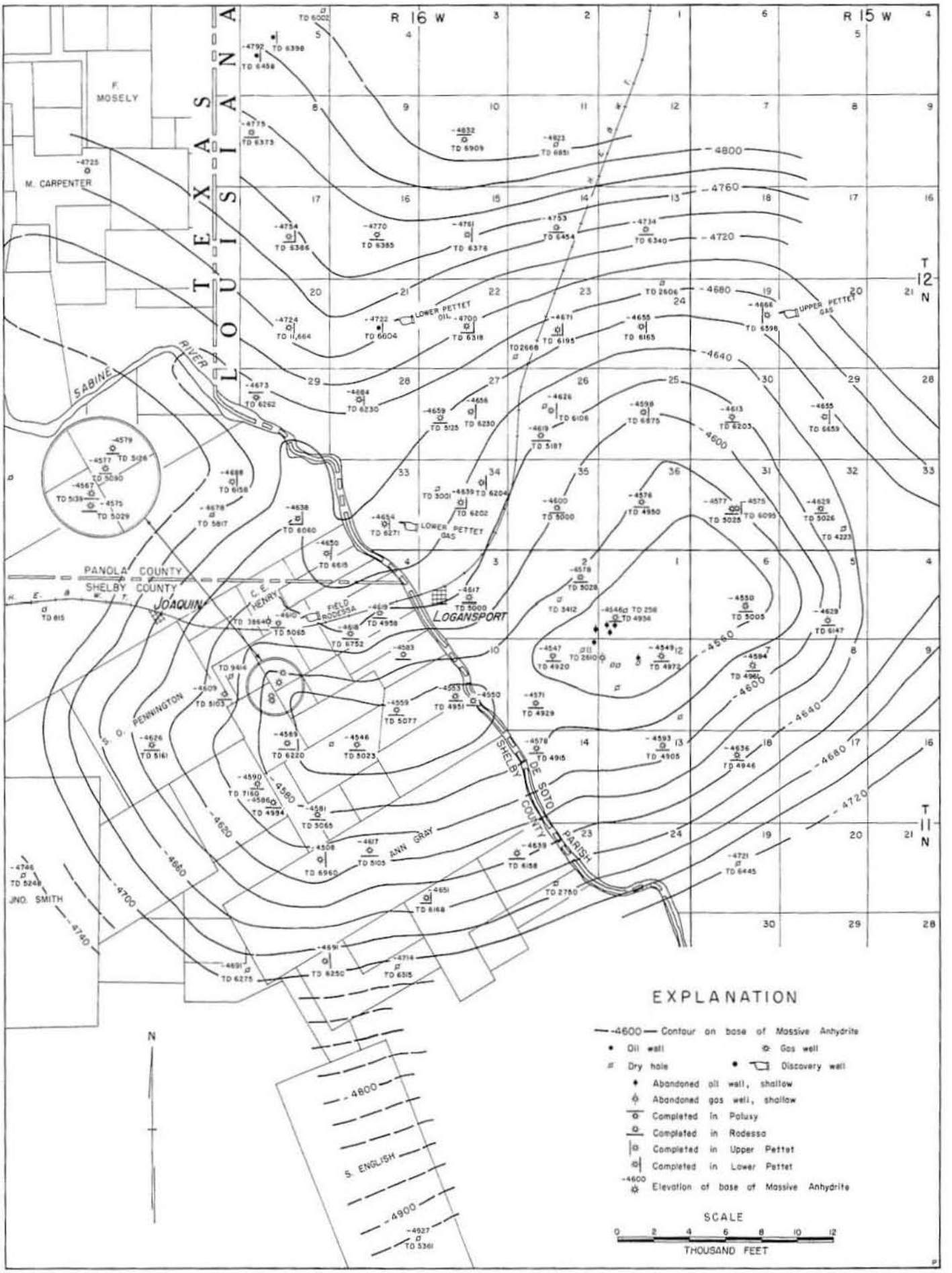
Component	Rodessa Mol.%	Rodessa GPM	Lower Pettet Mol.%	Lower Pettet GPM
Carbon dioxide	.90		.75	
Methane	90.07		92.48	
Ethane	1.50		2.18	
Propane	.48	.132	.56	.154
Iso-butane	.19	.062	.17	.055
N-butane	.31	.098	.31	.098
Iso-pentane	.11	.040	.11	.040
N-pentane	.12	.043	.18	.065
Hexanes	.14	.057	.25	.103
Heptanes	.11	.057	.13	.066
Nitrogen	6.07		2.90	
	100.00	.489	100.02	.581

Specific gravity .6185
Heating value, B.t.u./cf
Dry 988.4
Wet 971.1
Gasoline content based on 26/70 gasoline .263

Data are not available for Paluxy (2 wells) and Upper Pettet (1 well).

WATER PRODUCTION

The operators, in nearly all cases, are able to so complete and operate their wells that water constitutes less than 1% of the gross liquid production.


R 16 W
R 15 W
T 12 N
T 11 N
TEXAS
LOUISIANA
SABINE RIVER
PANOLA COUNTY
SHELBY COUNTY
DE SOTO PARISH
JOAQUIN
LOGANSPORT
F. MOSELY
M. CARPENTER
JNO. SMITH
S. ENGLISH
C. E. HENRY
O. PENNINGTON
ANN GRAY
FIELD
RODESSA
LOWER PETTET OIL
LOWER PETTET GAS
UPPER PETTET GAS
-4600 Contour on base of Massive Anhydrite
Oil well
Gas well
Dry hole
Discovery well
Abandoned oil well, shallow
Abandoned gas well, shallow
Completed in Palusy
Completed in Rodessa
Completed in Upper Pettet
Completed in Lower Pettet
-4600 Elevation of base of Massive Anhydrite
EXPLANATION
N
SCALE
0 2 4 6 8 10 12
THOUSAND FEET

PRODUCTION HISTORY

Year	WELLS PRODUCING at end of year: Flowing**	CONDENSATE PRODUCTION (barrels): Yearly	CONDENSATE PRODUCTION (barrels): Cumulative	GAS PRODUCTION (Mcf @ 16.4#): Yearly	GAS PRODUCTION (Mcf @ 16.4#): Cumulative
Field totals*					
1936	1	1,539	1,539	228,000	228,000
1937	2	5,063	6,602	750,000	978,000
1938	5	4,928	11,530	730,000	1,708,000
1939	7	25,970	37,500	628,005	2,336,005
1940	12	27,493	64,993	1,813,663	4,149,668
1941	23	67,507	132,500	12,931,912	17,081,580
1942	30	94,723	227,223	25,630,701	42,712,281
1943	34	101,601	328,824	27,404,267	70,116,548
1944	36	98,105	426,929	32,419,053	102,535,601
1945	40 (1)	90,838	517,767	28,392,068	130,927,669
1946	42	100,682	618,449	26,283,073	157,210,742
1947	49 (1)	97,573	716,022	26,227,297	183,438,039
1948	56 (1)	96,206	812,228	23,427,342	206,865,381
1949	69 (3)	121,074	933,302	28,086,047	234,951,428

*Exclusive of small quantities produced from other reservoirs mentioned on first page.

**Figures in parentheses indicate number of wells producing from two reservoirs, Rodessa and Pettet.

OIL PRODUCTION: In 1948, one well was completed in Lower Pettet as an oil producer, but no record of the quantity of oil produced during that year has been found. During 1949, that well pumped about 4,000 barrels. In the same reservoir, the second well was completed on June 19, 1950 and the third on August 27, 1950.

Rodessa					
1936	1	1,539	1,539	228,000	228,000
1937	2	5,063	6,602	750,000	978,000
1938	5	4,928	11,530	730,000	1,708,000
1939	7	25,970	37,500	628,005	2,336,005
1940	11	27,493	64,993	1,781,833	4,117,838
1941	22	48,998	113,991	11,145,019	15,262,857
1942	29	83,967	197,958	24,357,582	39,620,439
1943	33	91,754	289,712	26,028,403	65,648,842
1944	35	91,545	381,257	31,206,652	96,855,494
1945	37	76,531	457,788	27,454,283	124,309,777
1946	38	57,973	515,761	23,839,142	148,148,919
1947	40	49,540	565,301	23,233,409	171,382,328
1948	44	40,529	605,830	18,707,780	190,090,108
1949	51	41,623	647,453	22,013,924	212,104,032
Pettet					
1940	1			31,830	31,830
1941	1	18,509	18,509	1,786,893	1,818,723
1942	1	10,756	29,265	1,273,119	3,091,842
1943	1	9,847	39,112	1,375,864	4,467,706
1944	1	6,560	45,672	1,212,401	5,680,107
1945	4	14,307	59,979	937,785	6,617,892
1946	4	42,709	102,688	2,443,931	9,061,823
1947	10	48,033	150,721	2,993,888	12,055,711
1948	13	55,677	206,398	4,719,562	16,775,273
1949	21	79,451	285,849	6,072,123	22,847,396

OIL PRODUCTION: See above note under Field totals.

KERENS FIELD
Navarro County, Texas

W. ALLAN RATCLIFF
Research Assistant, Bureau of Economic Geology, Austin, Texas
December 15, 1950

LOCATION

The Kerens field is located in northeastern Navarro County, 3 miles northeast of Powell.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Subsurface.

DISCOVERY

Woodbine sand: July 13, 1942; John Hooser et al. #1 Mrs. Etta Black. Initial daily production, 37 million cubic feet of dry gas through perforations from 3,234 to 3,252 feet.

ELEVATION OF SURFACE

At well locations: Highest, 395 ft.; lowest, 368 feet.

SURFACE FORMATION

Midway group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

Approximately 120 feet below the top of the Woodbine.

NATURE OF TRAP

Woodbine sand: Fault trap.

PRODUCTIVE AREA

Woodbine sand and Total field: 200 to 300 acres.

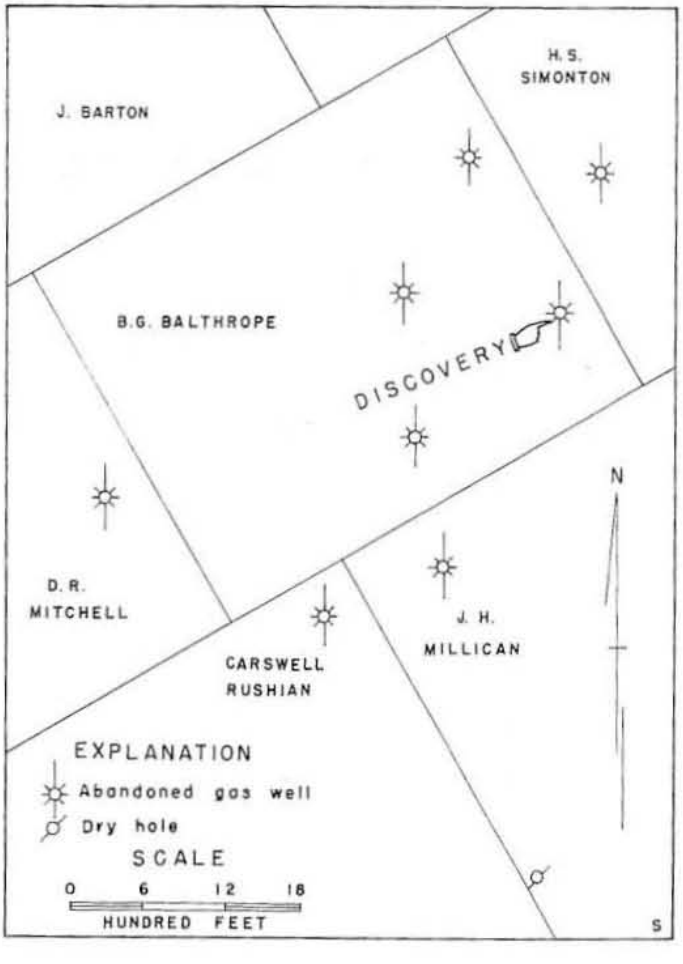
THICKNESS OF RESERVOIR ROCK

Woodbine sand: Net productive, 5 feet.

PRODUCTION HISTORY

Woodbine sand and total field:

Year	WELLS PRODUCING at end of year	GAS PRODUCTION (Mcf) Yearly	Cumulative
1942	1	28,141	28,141
1943	2	201,537	229,678
1944	2	428,316	657,994
1945	2	331,336	989,330
1946	2	217,957	1,207,287
1947	4	332,581	1,539,868
1948	0	459	1,540,327
1949	0	0	1,540,327



KILDARE FIELD
Cass County, Texas

JULIUS A. BUCHANAN
Geologist, Union Producing Company, Tyler, Texas
December 19, 1950

LOCATION

The Kildare field is 1½ miles south of the town of Kildare in the southeast part of Cass County. It is 5 miles west of the southwest end of the Rodessa field.

METHOD OF EXPLORATION LEADING TO DISCOVERY

The favorable structural conditions were first revealed by seismograph work.

DISCOVERY

On March 7, 1942, John Messenger #1 Benefield & Singleton, the discovery well, was completed as an oil well producing from the Henderson zone. Both the Henderson and Gloyd zones had been explored in this well.

ELEVATION OF SURFACE

At well locations: Highest, 330 ft.; lowest, 215 feet.

SURFACE FORMATIONS

Sparta, Weches and Queen City, all in the Claiborne group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated within the area of the field is in the Travis Peak formation about 300 feet below its top. This penetration was at the total depth of 7,128 feet in C. C. Gilger #1 Davis-King Unit in the northwestern part of the John M. Watson survey.

NATURE OF TRAPS

As to each of the reservoirs, the trap is in the form of a convex fold at the apex of a low-relief anticline.

PRODUCTIVE AREAS

Henderson	1,950 acres
Gloyd	1,750 acres
Kildare field	1,990 acres

THICKNESSES OF RESERVOIR ROCKS

	Net productive, feet		
	Min.	Max.	Avg.
Henderson	6	25	10
Gloyd	4	30	15

LITHOLOGY OF RESERVOIR ROCKS

Henderson: The reservoir rock is a porous, oolitic limestone which, in some parts of the field, contains sand streaks.

Gloyd: The reservoir rock is a porous oolitic limestone.

CONTINUITY OF RESERVOIR ROCKS

Henderson: The reservoir rock is continuous throughout the area of the field. However, in a small area within the field the porosity is too low for commercial production, and, furthermore, the northeast boundary of the productive area is determined by degree of porosity. Throughout the productive area, the porosity is sufficiently continuous that it is evident that all production from this stratigraphic position is from one and the same reservoir.

Gloyd: The reservoir rock is continuous and is continuously porous throughout the area where above water level except at the northeast extent of the field where the boundary of the productive area is determined by degree of porosity.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Henderson:	Feet
Elevation of top of gas	-5,736
Elevation of bottom of oil	-5,784
Relief	48

More than half of the productive relief is occupied by gas.

Gloyd:	
Elevation of top of gas	-5,764
Elevation of bottom of gas	-5,778
Relief	14
Elevation of top of oil	-5,778
Elevation of bottom of oil	-5,788
Relief	10

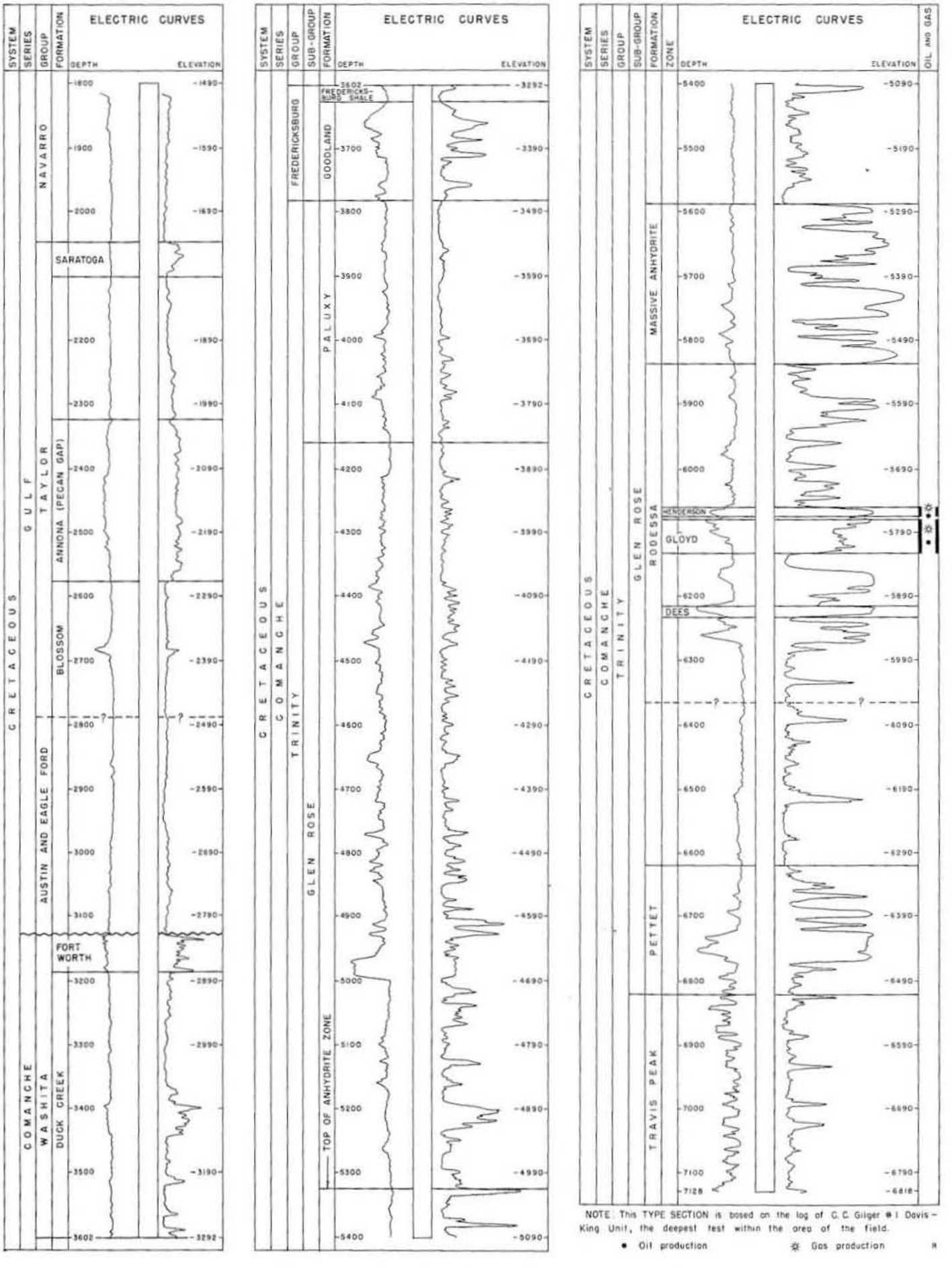
WATER PRODUCTION

Very little water has been produced. Disposal has been by means of evaporating pits.

ACID TREATMENT

Wells in the field were treated with 1,500 to 7,000 gallons; average, 4,000 gallons.

TYPE SECTION OF ROCKS PENETRATED



NOTE: This TYPE SECTION is based on the log of C. C. Gilger # 1 Davis – King Unit, the deepest test within the area of the field.

• Oil production ☼ Gas production

KILDARE FIELD, Cass County, Texas

CHARACTER OF OIL

	Henderson	Gloyd
Gravity, A. P. I.	41° - 61°	41° - 43°

Following is an analysis of a sample from this field. The writer has been unable to determine how the sample was collected or from which reservoir it was produced.

Gravity, A. P. I., 41.8° Color, Dark green

Sulphur, 0.25% B. S. & W., 0.2%

Viscosity, S. U. 40" @ 100° Base, Paraffin

Test on production:

	Kerosene	Gasoline
Gravity, A. P. I.	47.8°	60°
Initial boiling point	362°	120°
Distilled		
10% @	388°	184°
50% @	434°	264°
90% @	502°	355°
End point	535°	400°
Final recovery	98%	98%

For analysis of sample from Gloyd see:

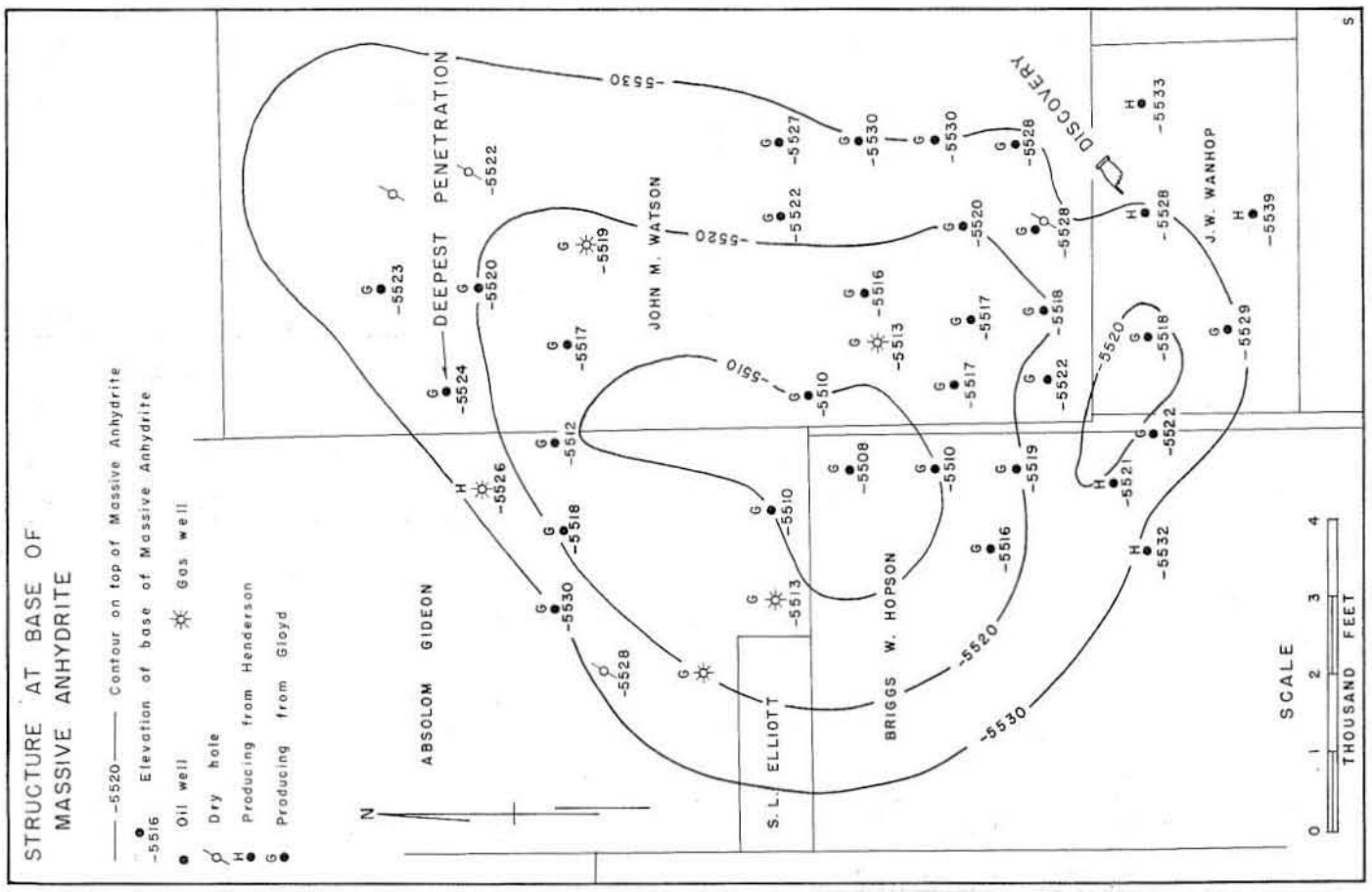
U. S. Bureau of Mines Lab. ref. No. 42053
Analyses of Crude Oils from Some Fields of Texas. R.I. 3699 (1943) Item 90

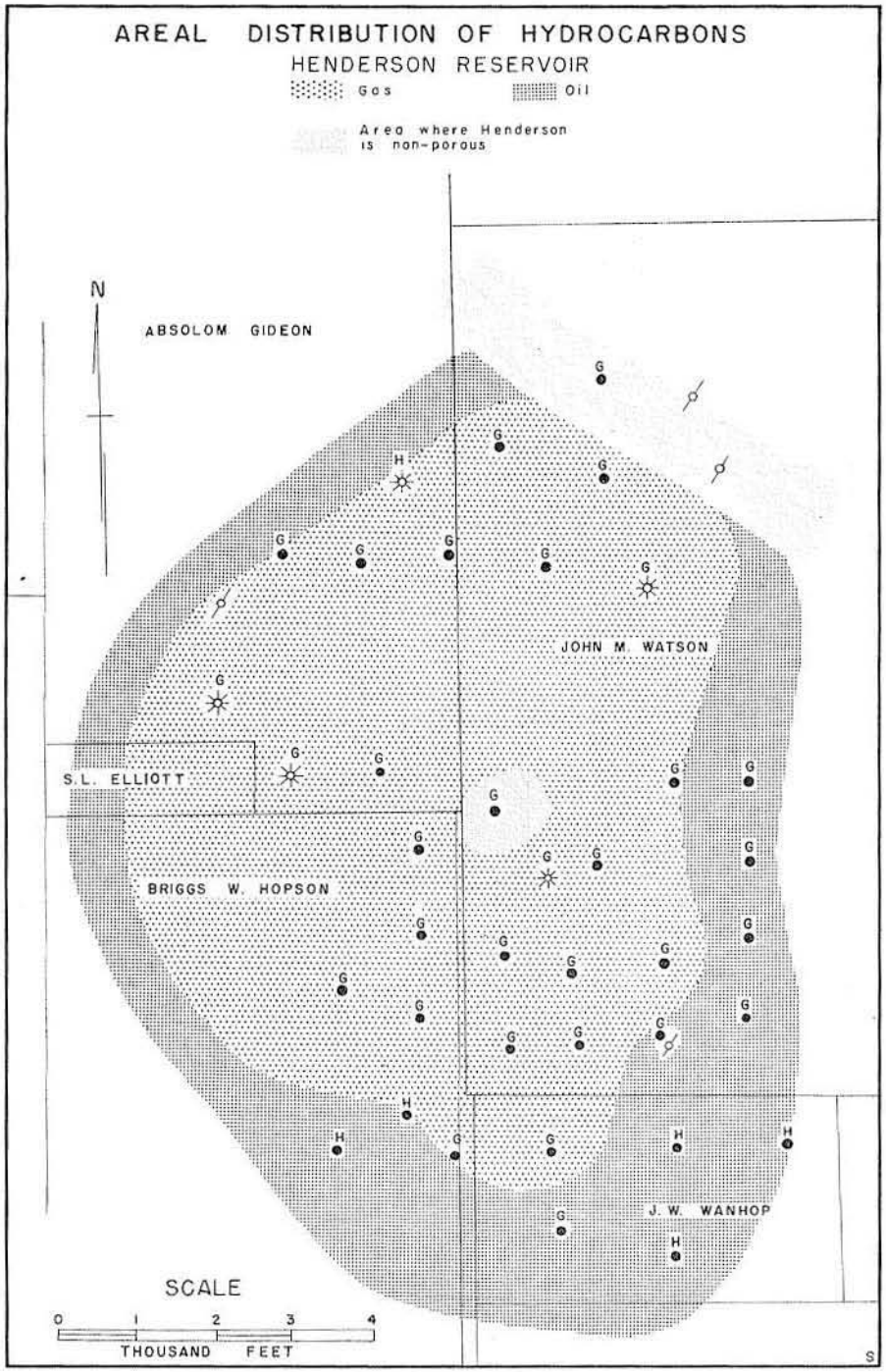
PRODUCTION HISTORY

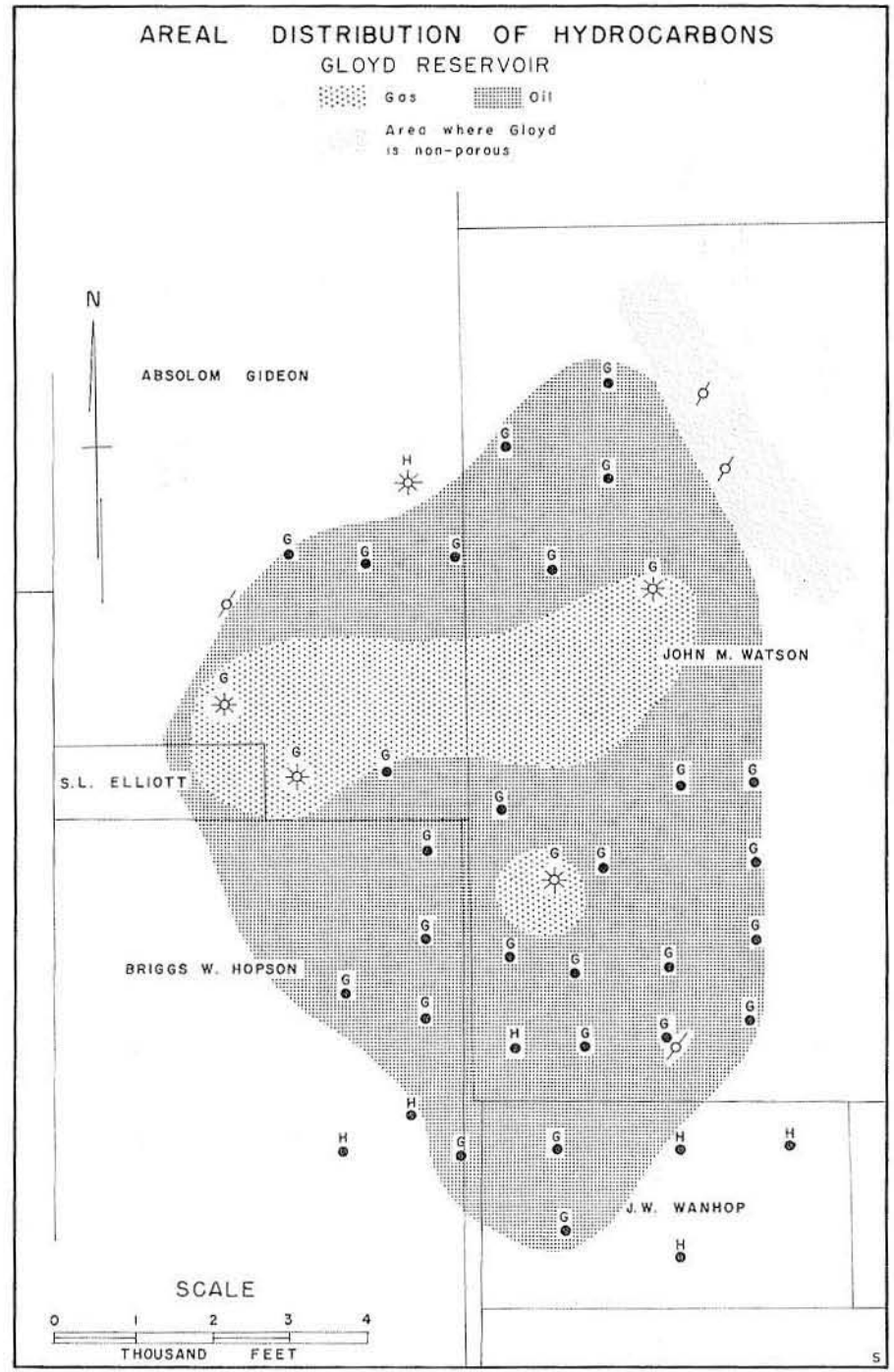
Field totals

Year	WELLS PRODUCING at end of year Oil	Gas	OIL PRODUCTION (barrels) Yearly	Cumulative	GAS PRODUCTION (Mcf) Yearly	Cum.
1942	11	0	116,420	116,420	0	0
1943	28	0	656,980	773,400	0	0
1944	28	0	290,790	1,064,190	0	0
1945	28	0	294,740	1,358,930	0	0
1946	24	5	181,693	1,540,623	7,974	7,974
1947	21	1	169,735	1,710,358	7,650	15,624
1948	25	1	137,169	1,847,527	7,680	23,304
1949	29	0	122,313	1,969,840	0	23,304

Data are not available for presenting separate estimates of production from each of the two reservoirs, both of which are in the Rodessa formation.




AREAL DISTRIBUTION OF HYDROCARBONS
HENDERSON RESERVOIR
Gas
Oil
Area where Henderson is non-porous
N
ABSOLOM GIDEON
JOHN M. WATSON
S.L. ELLIOTT
BRIGGS W. HOPSON
J. W. WANHOP
SCALE
0 1 2 3 4
THOUSAND FEET


AREAL DISTRIBUTION OF HYDROCARBONS
GLOYD RESERVOIR
Gas
Oil
Area where Gloyd is non-porous
N
ABSOLOM GIDEON
JOHN M. WATSON
S.L. ELLIOTT
BRIGGS W. HOPSON
J.W. WANHOP
SCALE
0 1 2 3 4
THOUSAND FEET

KOSSE FIELD
Limestone County, Texas

DONALD T. GIBSON
Geologist, Stanolind Oil and Gas Company, Tyler, Texas
September 20, 1949

LOCATION

The Kosse field (one well) is located $1\frac{1}{2}$ miles northeast of Kosse, in the south corner of Limestone County, and in the Luling-Mexia fault zone.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Surface mapping of north-south fault downthrown to westward.

DISCOVERY

Breccia: August 18, 1922; Humphries #1 Jones.

NATURE OF TRAP

Apparently a crevice in the zone along a fault having a throw of 80 to 100 feet at the Austin chalk. Numerous tests of the stratigraphic unit (Georgetown) occurring at the productive zone were dry.

PRODUCTIVE AREA and THICKNESS

5± acres (one well). Thickness, unknown.

LITHOLOGY OF RESERVOIR ROCK

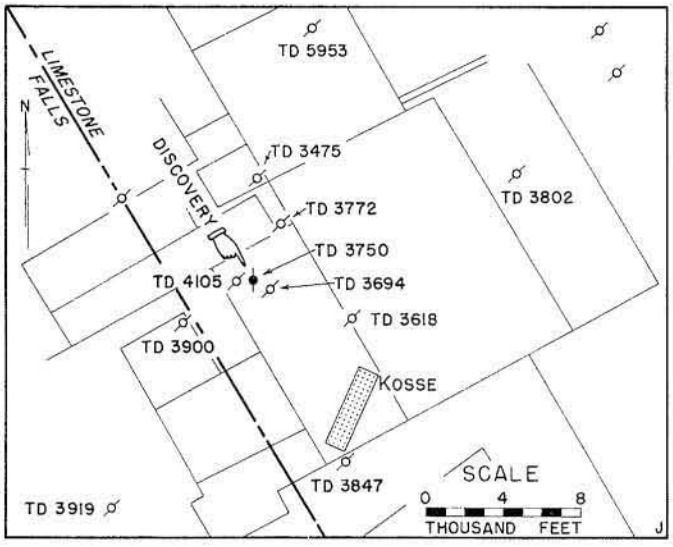
Breccia of hard, dense, white limestone (Georgetown).

CONTINUITY OF RESERVOIR ROCK

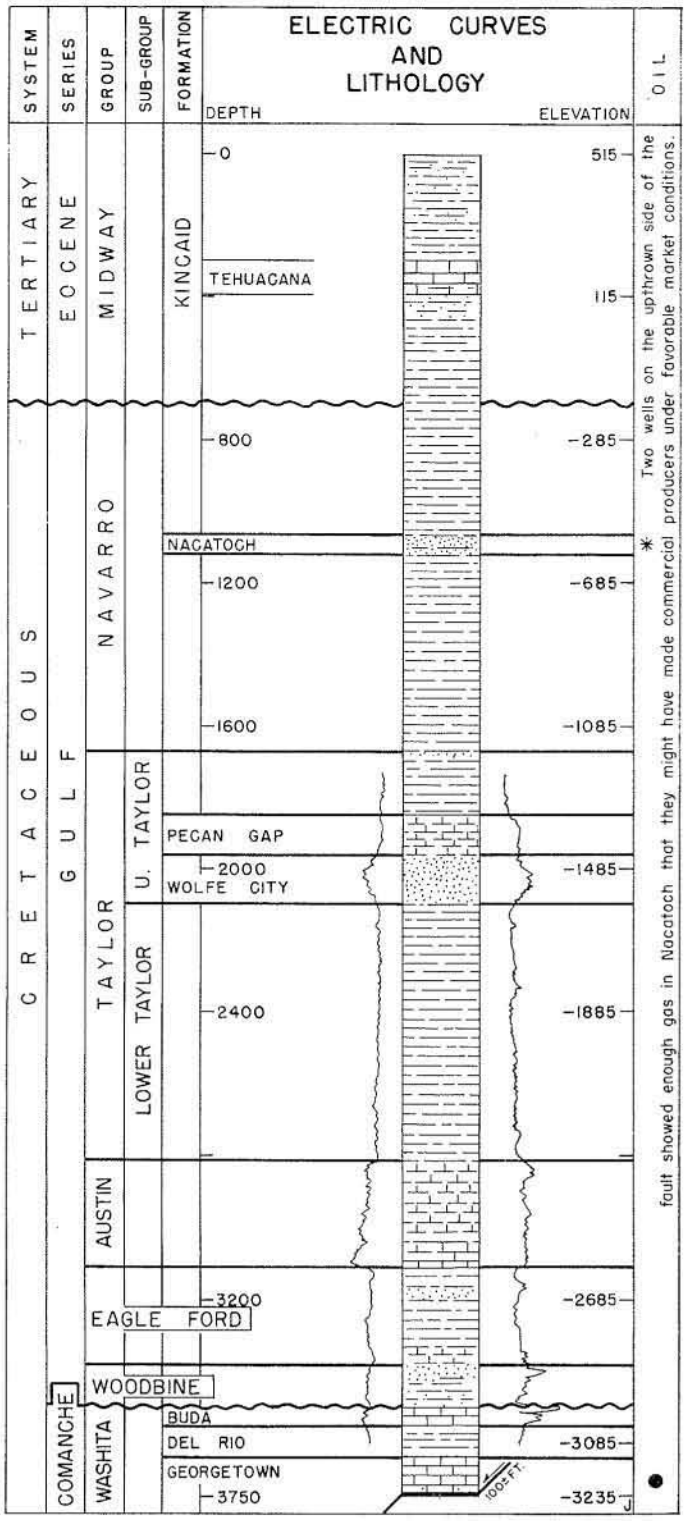
The Georgetown formation is continuous throughout most of northeast Texas. The condition which occasions this oil accumulation is very local.

CHARACTER OF OIL

For references to oil analyses see Information Circular 7470, page 50, U. S. Bureau of Mines, 1948.



SECTION OF ROCKS PENETRATED



PRODUCTION HISTORY

The one well flowed its total production of 33,000 barrels of oil in eight days.

LAKEVIEW FIELD
Franklin County, Texas

W. ALLAN RATCLIFF
Research Assistant, Bureau of Economic Geology, Austin, Texas
August 18, 1950

LOCATION

The Lakeview field is in the S.P.R.R. survey in northern Franklin County about 9 miles north and slightly west of Mount Vernon, the county seat. It is in the zone of the Luling-Mexia-Talco fault system.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Location of the discovery well was made following discovery of Mitchell Creek field, a similar field 4 miles to the southwest. Also, Byars & Peveto #1 A. Tulley, a dry hole near the discovery well, had a favorable indication of production.

DISCOVERY

Paluxy sand: June 6, 1949; B. G Byars & R. L. Peveto et al, #1 Mark Talley. Pumped 138 barrels of 23.7° gravity oil per day through perforations at 4,417½ - 4,421 ft.; G.O.R., 10:1.

ELEVATION OF SURFACE

At well locations: Highest, 395 ft.; lowest, 390 feet.

SURFACE FORMATION

Midway group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated within the limits of the field is 4 feet below the top of the Paluxy. A nearby dry hole penetrated 132 feet of Paluxy.

NATURE OF TRAP

Paluxy sand: Closure against upthrown side of a down-to-the-north fault. The lithology of the sand apparently also influences accumulation.

PRODUCTIVE AREA

Paluxy sand and Field: Approximately 80 acres.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Paluxy sand:	Feet
Elevation of top of oil	-4,017-
Elevation of bottom of oil	-4,031+
Relief	14+

THICKNESS OF RESERVOIR ROCK

Paluxy sand:	Feet
Net productive	5+

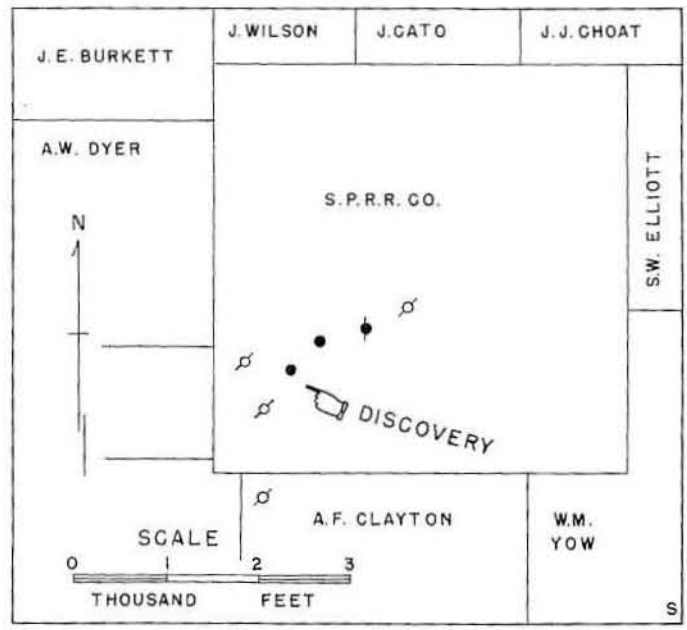
CHARACTER OF OIL

Paluxy sand: Gravity, 23° - 24°

PRODUCTION HISTORY

Paluxy sand and Total field:

	WELLS PRODUCING at end of month		OIL PRODUCTION (barrels)	
	Oil			
Month	Flowing	Pumping	Monthly	Cumulative
1949				
July	1	0	2,548	2,548
Aug.	0	2	3,850	6,398
Sept.	0	2	5,922	12,320
Oct.	0	2	5,582	17,902
Nov.	0	3	3,009	20,911
Dec.	0	3	3,532	24,443
1950				
Jan.	0	3	3,487	27,930
Feb.	0	3	2,738	30,668
Mar.	0	3	2,569	33,237
Apr.	0	3	2,294	35,531
May	0	3	2,079	37,610
June	0	2	1,939	39,549



LARISSA FIELD
Cherokee County, Texas

S. O. BURFORD
Geologist, Tyler, Texas
September 22, 1949

LOCATION

The Larissa field, 10 miles northwest of Jacksonville, county seat of Cherokee County, lies in the south-central part of the Tyler basin.

METHODS OF EXPLORATION LEADING TO DISCOVERY

On the basis of an interpretation of the surface structural geology mapped by E. A. Murchison, Jr., in 1930, the Humble Oil & Refining Co., early in 1934, purchased leases covering 13,000 acres in which the field now centers. In June 1934, the same company conducted a reflection seismograph survey, thereby obtaining information from which the discovery well was located. Previous to the drilling of this test, however, several shallower wells were drilled on the structure which proved the Woodbine formation dry and at the same time indicated about 150 feet of structural closure at the top of the Woodbine. On March 28, 1942, the Humble Oil & Refining Co. commenced the well which resulted in the discovery of oil on September 15 of the same year.

DISCOVERY

Pettet zone: September 15, 1942;
Humble Oil & Refining Co. #1 H. F. Curtis et al.

STRUCTURAL RELIEF and FLUID CONTENTS OF PETTET LIMESTONE

The highest elevation at which the top of the Pettet limestone occurs in wells within the area of the accompanying map is -9,673 feet and the lowest is -10,328 feet, indicating a structural relief of at least 655 feet. In no well within this area does the Pettet limestone yield water.

NATURE OF TRAP

Pettet zone: Isolated porous lens in oolitic limestone on a faulted convex trap.

PRODUCTIVE AREA

Pettet zone: One well; probably 40 to 160 acres.

THICKNESS OF RESERVOIR ROCK

Pettet zone:	Feet
From top to bottom	52
Net productive (Estimated)	10

LITHOLOGY OF RESERVOIR ROCK

Pettet zone: Gray to white sugary oolitic porous to non-porous limestone with few thin partings of dark shale in lower 30 feet. The porosity and permeability of the oolitic limestone are both low.

CONTINUITY OF RESERVOIR ROCK

Pettet zone: The Pettet limestone section is present throughout the Tyler basin but the porosity development is erratic as indicated by the lack of commercial production in two of the three deep tests drilled.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Pettet zone: Due to the fact that the Pettet zone produces in only one well, there is no information as to the thickness of the oil column. No water was encountered in the oil zone in the producing well which was perforated from -9,670 feet to -9,722 feet.

CHARACTER OF OIL

Pettet zone:
Gravity: A.P.I. @ 60° F., 48°
Color: Amber Base: Paraffin

CHARACTER OF GAS

A small amount of solution gas is produced with the oil and burned at the well but no analysis is available.

WATER PRODUCTION

None.

PRODUCTION HISTORY

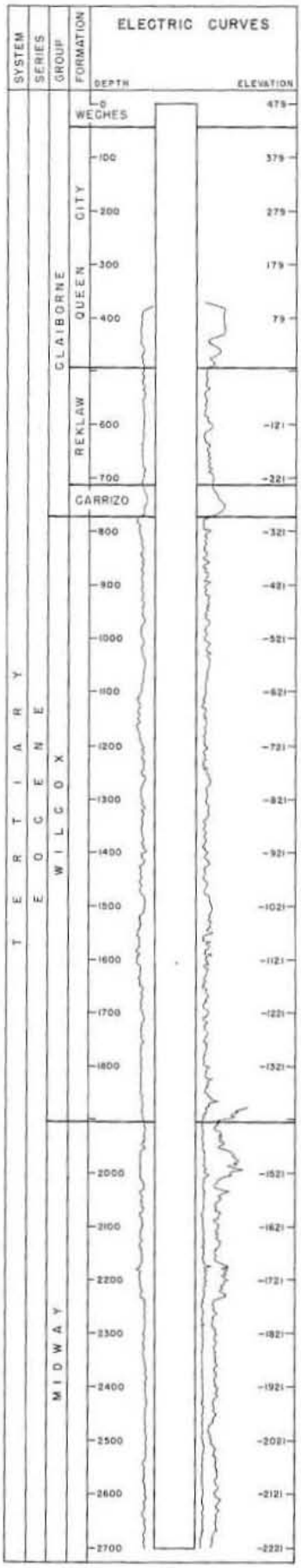
Pettet zone and Total field

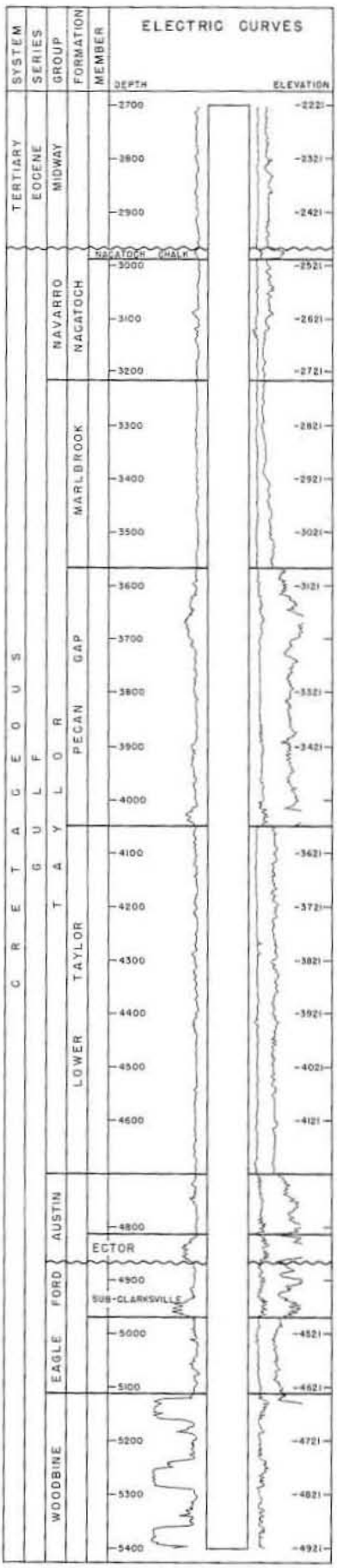
	WELLS PRODUCING at end of year	OIL PRODUCTION (barrels)	
	Oil		
Year	Flowing	Yearly	Cumulative
1942	1	1,883	1,883
1943	1	10,530	12,413
1944	1	10,386	22,799
1945	1	8,660	31,459
1946	1	8,176	39,635
1947	1	7,712	47,347
1948	1	6,978	54,325
1949*	1	6,225	60,550

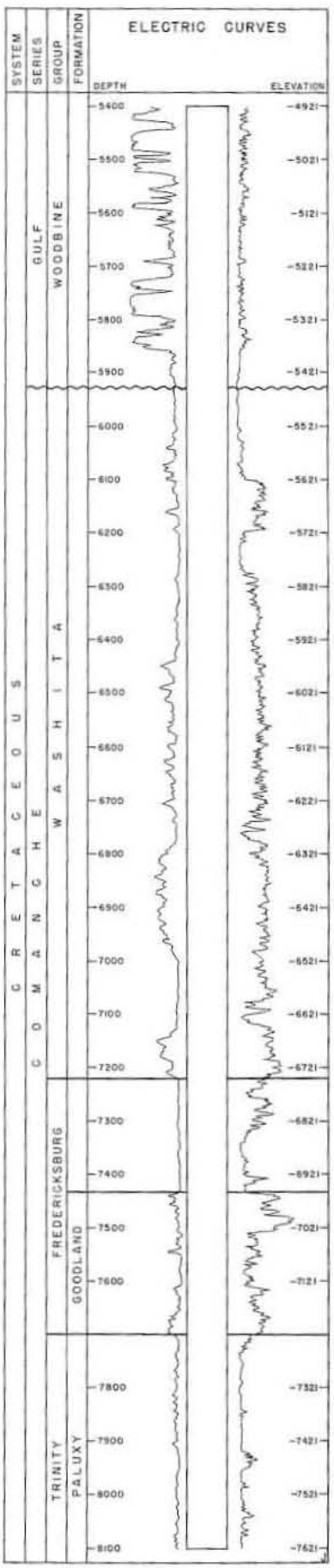
*P.S. - 1949 data added by amendment.

TYPE SECTION OF ROCKS PENETRATED

BY WELLS IN VICINITY OF LARISSA FIELD

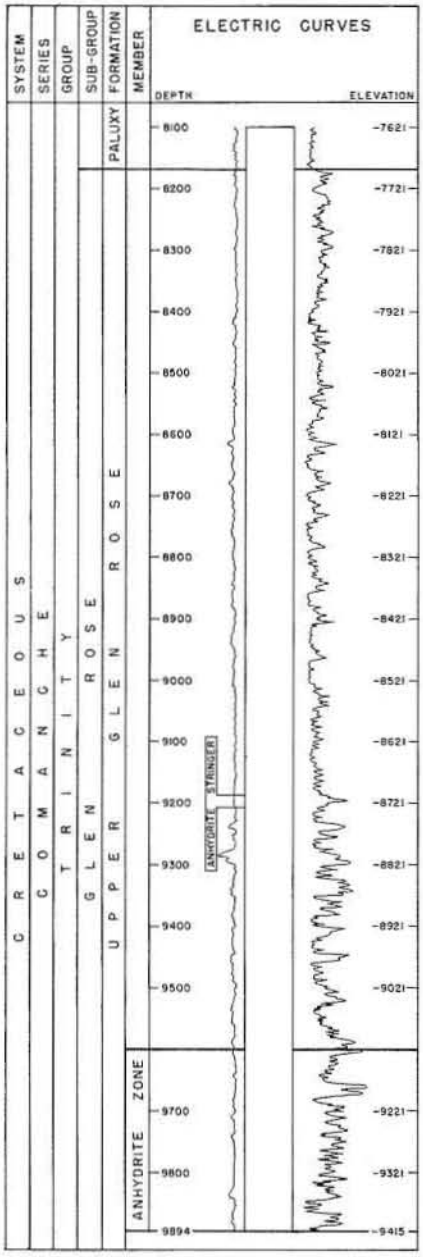


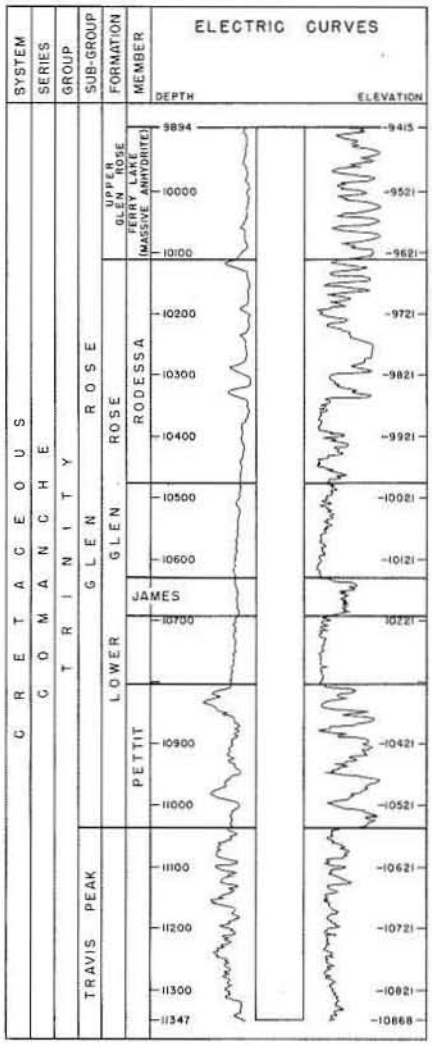




TYPE SECTION OF ROCKS PENETRATED

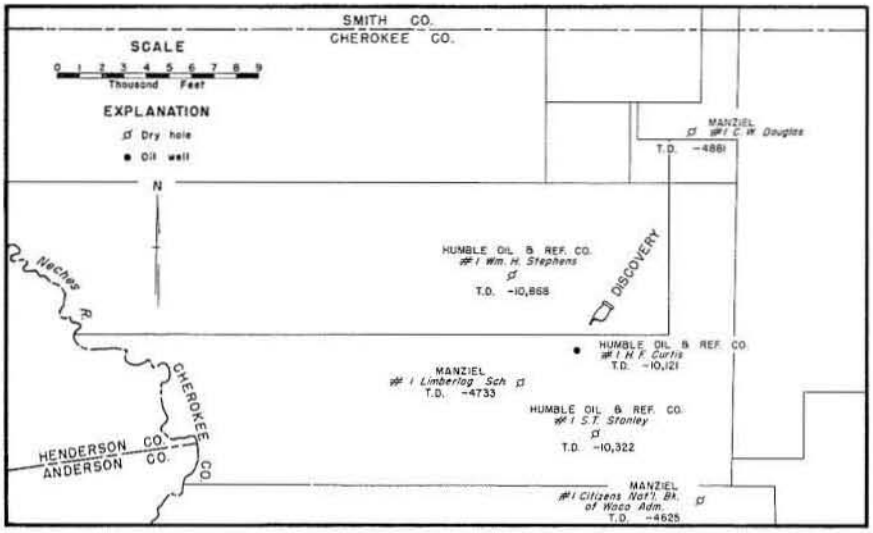
BY WELLS IN VICINITY OF LARISSA FIELD

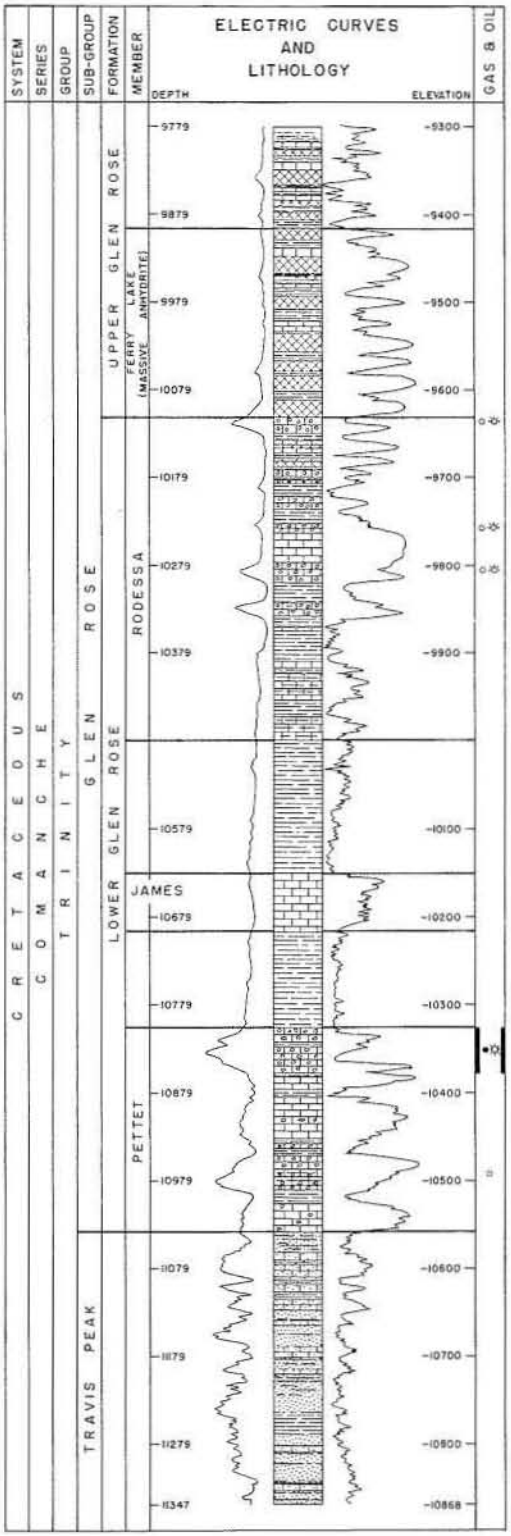




SURFACE FORMATIONS: Queen City, Weches, and Sparta.

ELEVATION OF SURFACE: Highest, 490 feet; lowest, 414 feet.





NOTE: Show of oil at 700' to 750' above Ferry Lake, not shown on this log.

EXPLANATION

Limestone, Chalk, Anhydrite, Shale, Oolitic Limestone, Sand

• Oil production ✲ Gas production

○ Show of oil ✲ Show of gas

LaRUE FIELD
Henderson County, Texas*

D. E. PROCTER
Geologist, Magnolia Petroleum Company, Tyler, Texas
October 11, 1949

LOCATION

The LaRue field, three miles north of Athens, county seat of Henderson County, is the most northerly field on a structural ridge extending from and including the Cayuga field to a point at least six miles north of Athens.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Around 1930 several geologists mapped several small closures on a local nosing of the Wilcox sand, both north and south of the town of Athens. Several Woodbine test wells drilled on the basis of this mapping suggested the presence of a structure in the immediate area of the LaRue field, although the wells found the Woodbine dry.

The Lone Star Producing Co. shot the prospect with the reflection seismograph in April of 1941 and immediately acquired a block of leases covering about 6,000 acres.

DISCOVERY

Bacon limestone: January 4, 1945;
Lone Star Producing Co. #1 R. H. Lee.

ELEVATION OF SURFACE

At well locations: Highest,473 ft.; lowest, 423 feet.

SURFACE FORMATIONS

Carrizo and Wilcox sands of the Eocene series.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

297 feet below the top of the Travis Peak. This penetration was in the discovery well, which was drilled to a total depth of 9,242 feet.

NATURE OF TRAP

Bacon limestone: Probably a local closure on a regional anticlinal fold.

PRODUCTIVE AREA

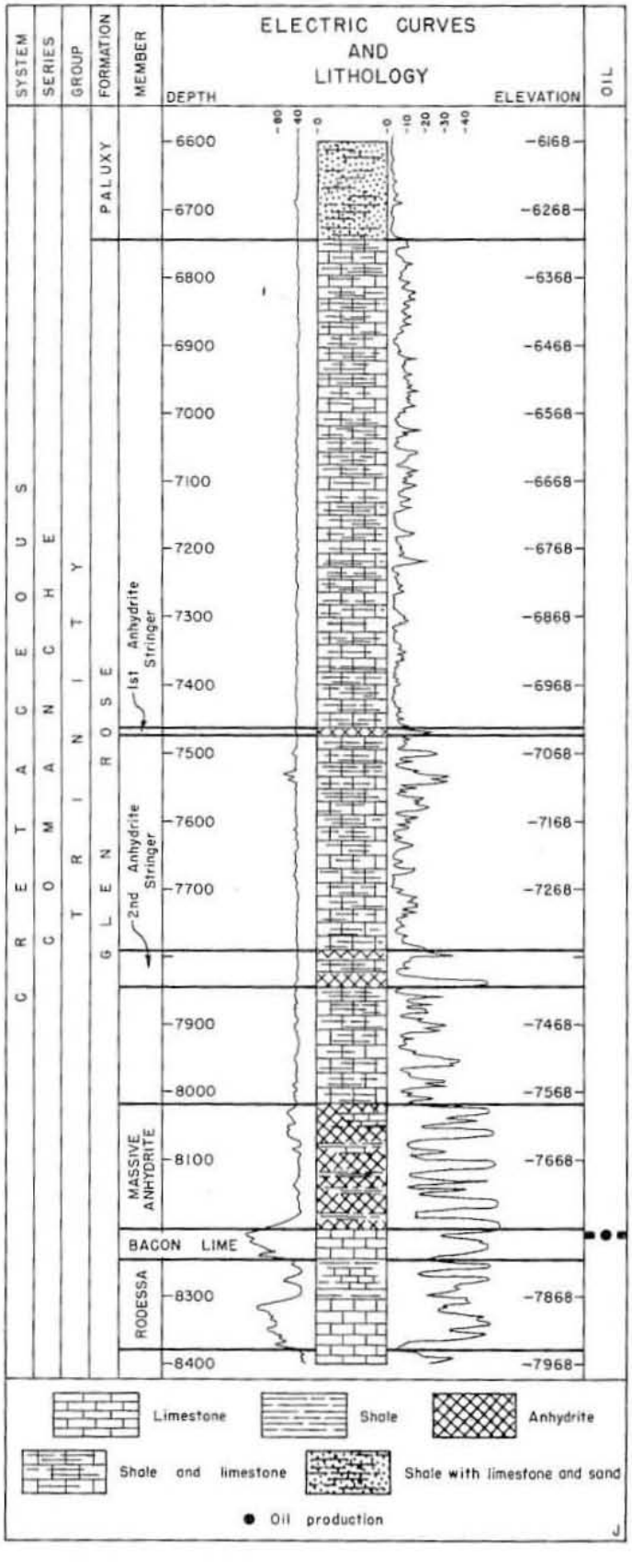
Bacon limestone and Field: 350 acres.

CONTINUITY OF RESERVOIR ROCK

Bacon limestone: Porosity in the Bacon limestone is continuous over the entire field and at least 6 miles north and 12 miles southwest. Productive porosity is not present at a point 8 miles southeast nor at a point 10 miles west of the field.

*Published by permission of Magnolia Petroleum Co.

TYPE SECTION OF ROCKS PENETRATED



THICKNESS OF RESERVOIR ROCK

Bacon limestone:	Min.	Max.	Avg.
Net productive, feet	6	14	10

LITHOLOGY OF RESERVOIR ROCK

Bacon limestone: Hard, brownish-gray, fossiliferous, slightly oolitic limestone with streaks of good porosity; some tight streaks. Most of section has poor to fair capillary porosity.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Bacon limestone:	Feet
No free gas cap	
Elevation of top of oil	-7,758
Elevation of bottom of oil	-7,780
Relief	22

The above figures represent conditions at time of discovery.

The oil-water contact is about 7,780 feet below sea level. However, the elevation of this contact is variable because of prevention of complete gravity adjustment by partings of impermeable limestone.

CHARACTER OF OIL

Gravity @60°F.: Max., 48.9°; Min., 45°; Avg., 47.2°. Sulphur: None. Color: Dark green. Base: Paraffin.

CHARACTER OF GAS

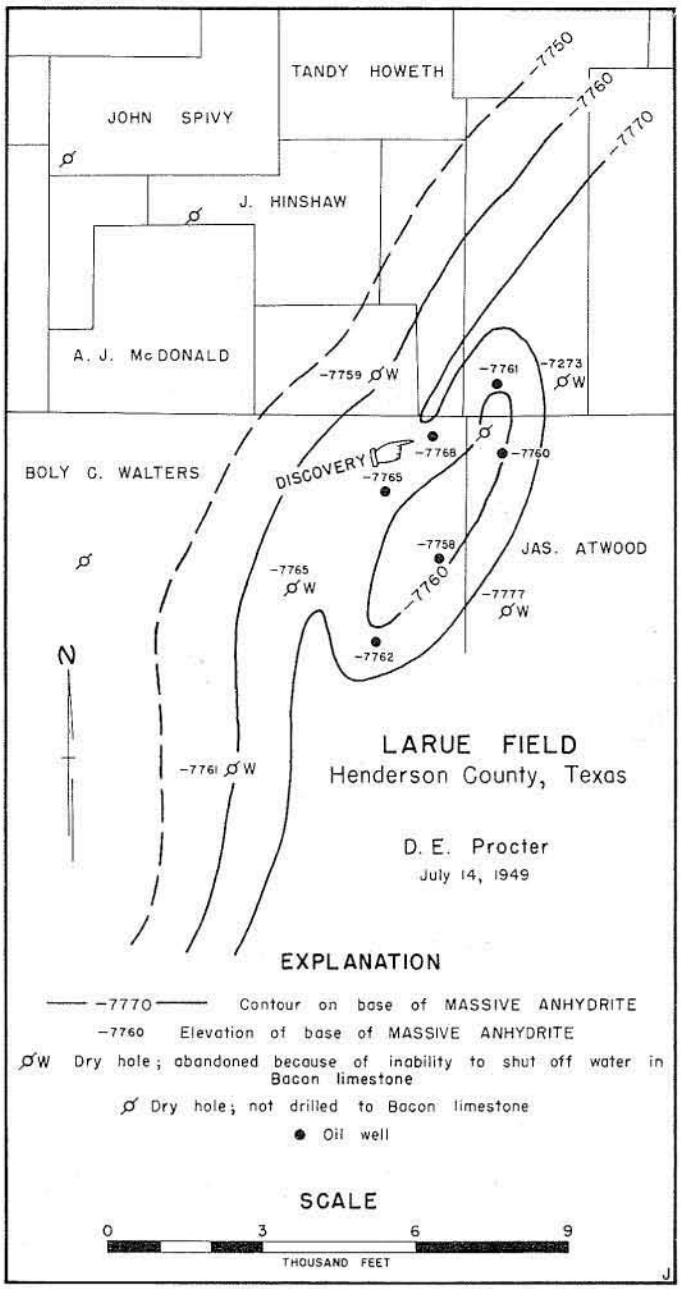
Casinghead type. No sulphur. Analysis not available.

ACID TREATMENT

No wells have been acidized.

RESERVOIR ENERGY

Indications are that the reservoir energy is provided by solution gas drive, with little or no effective water drive.



PRODUCTION HISTORY

Bacon limestone and Field total

Year	WELLS PRODUCING at end of year: Oil Flowing	WELLS PRODUCING at end of year: Oil and Water	OIL PRODUCTION (barrels): Yearly	OIL PRODUCTION (barrels): Cumulative	GAS PRODUCTION (Mcf): Yearly	GAS PRODUCTION (Mcf): Cumulative	WATER PRODUCTION (barrels): Yearly
1945	1	0	48,604	48,604	73,xxx	73,xxx	Neg.
1946	1	0	63,928	112,532	95,xxx	168,xxx	Neg.
1947	4	2	139,924	252,456	210,xxx	378,xxx	70.
1948	6	3	218,769	471,225	330,xxx	708,xxx	2,750
1949*	2	4	104,728	575,953	119,316	827,xxx	?

*N.B. - 1949 data added by amendment.

**Gas production estimated on basis of gas-oil ratio of 1,500:1, except that 1949 is from official reports. A compressor is being installed in an attempt to increase production by use of gas-lift.

LASSATER FIELD
Marion County, Texas

R. M. TROWBRIDGE
Geologist, Trowbridge Sample Service, Tyler, Texas
July 14, 1950

LOCATION

The Lassater field is in the northwest corner of Marion County 15 miles northwest of Jefferson, the county seat.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Seismograph and subsurface.

DISCOVERIES

Upper Travis Peak: June 6, 1946; Magnolia Petroleum Co. and Tidewater Associated - Seaboard Oil Co. #1 F. L. Orr. Through perforations from 7,568 to 7,577 feet pumped 97 barrels of 40.9° gravity oil in 24 hours.

Lower Travis Peak: July 10, 1948; a re-completion of the same well. Through perforations from 9,025 to 9,035 feet flowed 2,540 Mcf of gas per day plus 243.7 barrels of 61.5° condensate; choke, 1/4 inch; tubing pressure, 2,560 psi.; calculated open flow capacity, 9,000 Mcf/d. A positive drill stem test was taken of this same zone as early as April 4, 1946.

ELEVATION OF SURFACE

At well locations: Highest, 401 ft.; lowest, 339 feet.

SURFACE FORMATION

Queen City.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

1,410 feet below top of Cotton Valley formation. This penetration was in the discovery well.

NATURE OF TRAPS

The trap in each reservoir is due to a low-relief anticline.

PRODUCTIVE AREAS

Upper Travis Peak:*	20 acres
Lower Travis Peak:	2,000 acres
Lassater field:	2,000 acres

*Depleted and squeezed July 1948.

LITHOLOGY OF RESERVOIR ROCKS

All of the reservoir rocks are constituted of medium- and fine-grained, hard sandstone.

THICKNESSES OF RESERVOIR ROCKS

Upper Travis Peak	20 feet
Lower Travis Peak:	
Upper zone	15 feet
Lower zone	15 feet

CONTINUITY OF RESERVOIR ROCKS

The Travis Peak formation is continuous throughout the district, consisting of medium-grained and fine-grained sandstone and red shales. Locally the sandstones are lenticular and do not extend for great distances as reservoir rocks.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Upper Travis Peak (1 well)	Lower Travis Peak: Upper zone (1 well)	Lower Travis Peak: Lower zone (2 wells)
Highest proven elev. of gas, feet	Gas cap	-8,335	-8,695
Lowest proven elev. of gas, feet	not	-8,350	-8,730
Proven relief of gas, feet	proven	15	35
Highest proven elev. of oil, feet	-7,229		
Lowest proven elev. of oil, feet	-7,249	*	*
Proven relief of oil, feet	20		

*The liquid hydrocarbons (condensate) produced from these zones are probably all in the form of gas in the reservoirs.

CHARACTER OF OIL AND CONDENSATE

Upper Travis Peak: Oil; gravity, 40.9°
Lower Travis Peak: Condensate; gravity, 61.5°

CHARACTER OF GAS

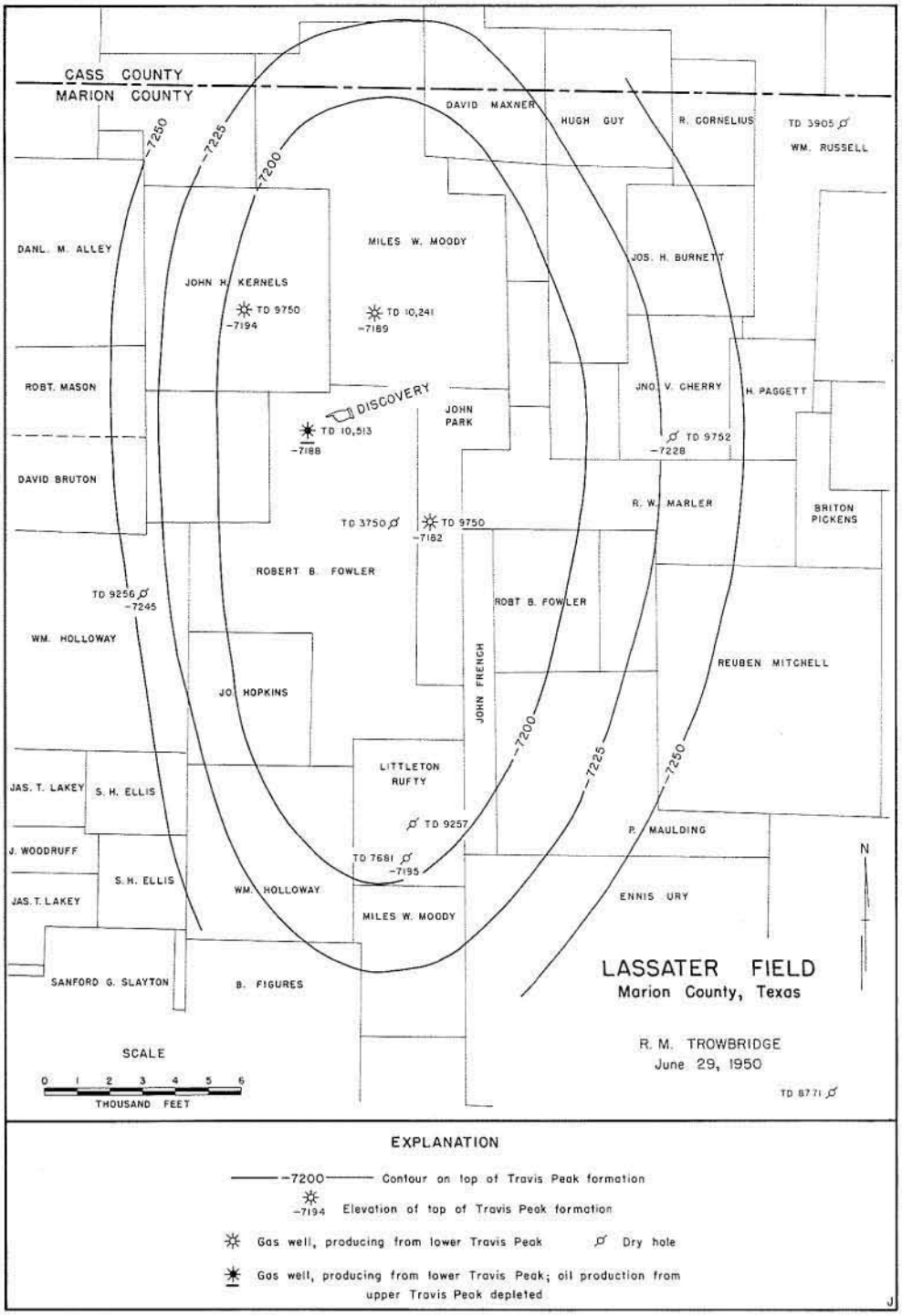
No analysis available.

WATER PRODUCTION

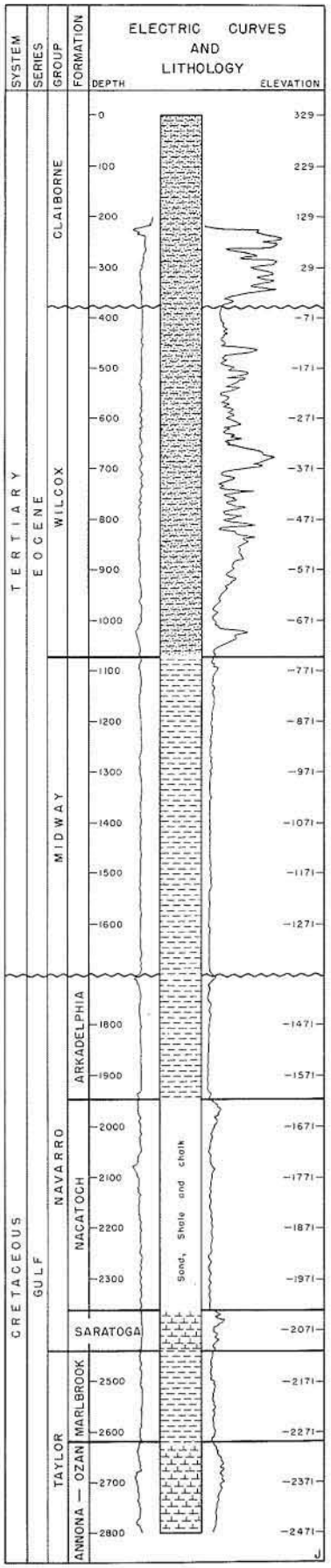
Negligible.

ACID TREATMENT

None.



TYPE SECTION OF ROCKS PENETRATED

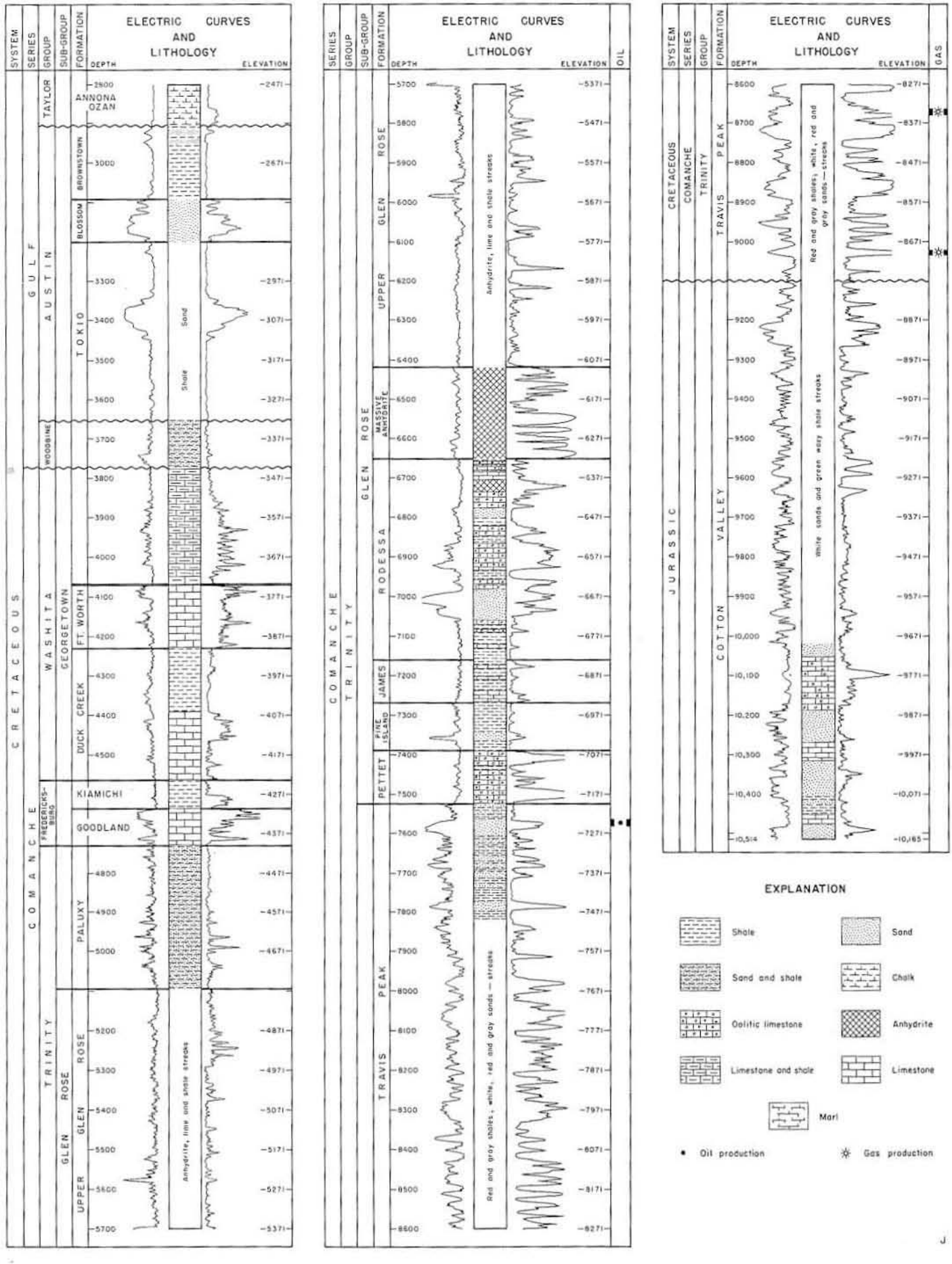


PRODUCTION HISTORY

Total field

Year	WELLS PRODUCING at end of year	OIL PRODUCTION (barrels) Yearly	CONDENSATE PRODUCTION (barrels) Yearly	TOTAL LIQUIDS (barrels) Yearly	TOTAL LIQUIDS (barrels) Cumulative	GAS PRODUCTION (Mcf) Yearly	GAS PRODUCTION (Mcf) Cumulative
1946	1	3,844	0	3,844	3,844	0	0
1947	1	2,719	2,951	5,670	9,514	112,915	112,915
1948	2	390	26,874	27,264	36,778	503,668	616,583
1949	3	0	74,209	74,209	110,987	1,037,393	1,653,976
Total		6,953	104,034	110,987		1,653,976	

TYPE SECTION OF ROCKS PENETRATED



LINDALE FIELD
Smith County, Texas

ERWIN K. KRAUSE
Research Assistant, Bureau of Economic Geology, Austin, Texas
August 18, 1950

LOCATION and OTHER NAME

The one well which is called Lindale field is located in northwestern Smith County in the Wm. Schoefield survey. It is 2 miles north of Mount Sylvan and 3 miles southwest of Lindale.

This field has also been called Fair field (not to be confused with Fairfield field or Walter Fair field).

METHODS OF EXPLORATION LEADING TO DISCOVERY

Early seismic work followed by detailed seismic survey.

DISCOVERY

Rodessa: April 10, 1948; Magnolia Petroleum Co. et al. #1 R. W. Fair. Flowed 850 Mcf gas per day as well as 96 barrels of condensate and 7 barrels of salt water per day on open flow test through perforations at 9,512-9,572; rock pressure, 3,942 pounds; G.O.R., 21,804:1.

ELEVATION OF SURFACE

462 feet.

SURFACE FORMATION

Claiborne group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

338 feet below the top of the Travis Peak.

STRUCTURE

Faulted anticline.

PRODUCTIVE AREA

Rodessa: One well; about 160 acres.

THICKNESS OF RESERVOIR ROCK

Rodessa:	Feet
Net productive	60±

LITHOLOGY OF RESERVOIR ROCK

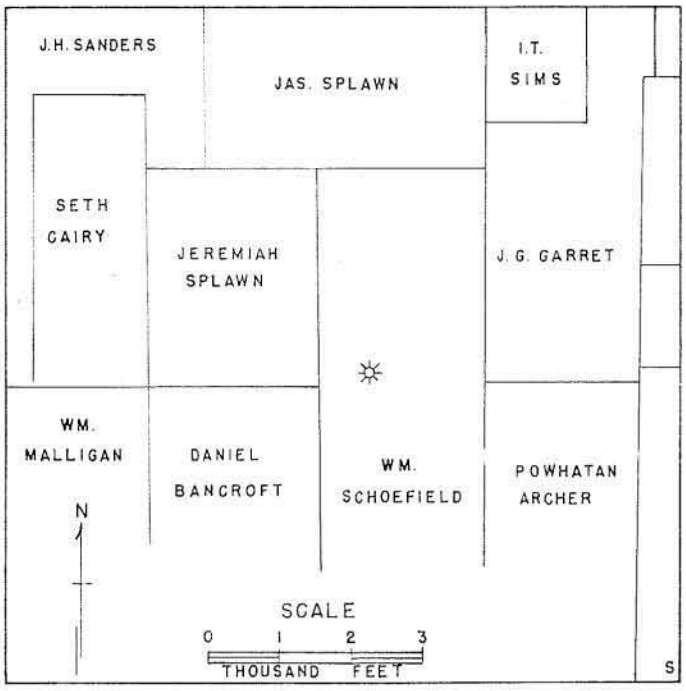
Rodessa: Porous sandy limestone, hard sandy limestone, calcareous sand and clean sand.

CHARACTER OF CONDENSATE

Rodessa: Gravity, 59.3°.

ACID TREATMENT

The well was acidized with 24,000 gallons.



PRODUCTION HISTORY

Rodessa and Total field:

Year	WELLS PRODUCING at end of year	GAS PRODUCTION (Mcf) Yearly	GAS PRODUCTION (Mcf) Cumulative	CONDENSATE PRODUCTION (barrels) Yearly	CONDENSATE PRODUCTION (barrels) Cumulative
1948	1	9,000	9,000	0	0
1949	1	101,878	110,878	6,445	6,445

LONE STAR FIELD
Cherokee County, Texas

JOHN R. BUNN
Consulting Geologist, Tyler, Texas
October 30, 1949

LOCATION and OTHER NAME

The Lone Star field is in Cherokee County immediately west of the eastern boundary 14 miles south of the northeast corner. It is in the Wade H. Walters survey and is 2 miles west of the small village of New Salem, Rusk County. It is approximately 13 miles due south of the southern extremity of the East Texas field. It is known also as the Ponta field, after a town 8 miles southwest.

METHODS OF EXPLORATION LEADING TO DISCOVERY

This area was among the first in East Texas to have been leased following early surface geological work. County records indicate that Louisiana Land & Exploration Co. was the first to acquire oil and gas leases in the area.

The first test for oil and gas, drilled in 1922, was Humphreys Oil Co. #1 A. C. Bowling, which was junked in the Austin chalk. The second well, Humphreys Oil Co. #1 Stafford, was located 1,400 feet north of the first and was drilled to the Woodbine sand. Saturated cores were obtained, casing set, and the well tested. There was a prolific flow of salt water and the well was abandoned. Recent drilling has shown that the Woodbine sand was penetrated 50 feet or more in this well before being cored or tested. The saturated cores were from lower sand breaks in the Woodbine section.

In 1934, on the basis of their respective interpretations of the surface structure, South Gulf Oil Co. and Milhoun Petroleum Co. each drilled a test well to the Woodbine sand on the west flank of the structure. These wells were located 1.5 miles and 2.4 miles, respectively, west of the area covered by the accompanying maps. Cores from the Woodbine sand in both of these wells were saturated with dark oil, but, on testing, the wells produced only salt water.

In 1937, on the basis of an interpretation of the data furnished by the previous wells, Mayo, Rein & Bunn #1 Holmes was drilled to test the Woodbine. Saturated Woodbine cores were cut in this well, but, as in all previous wells, only salt water was produced during production tests.

After careful surface mapping of the area by John R. Bunn, the discovery well was completed in March 1938 for an initial production of 236 barrels of oil and 600 barrels of salt water with 680,000 cubic feet of gas in the Woodbine sand encountered at a depth of 4,013 feet. The total depth was 4,015 feet.

The first worth-while well in the field was Bunn et al. #1 P. I. Bowling. This well was completed October 17, 1938, at a total depth of 4,010 feet for 74,500,000 cubic feet of gas and 180 barrels of oil. This well was located on a combination of surface and subsurface geology.

DISCOVERIES

Nacatoch sand: August 6, 1944; William H. Foster et al. #1 P. I. Bowling.
Woodbine sand: March 31, 1938; John R. Bunn et al. #1 Callie Mae Bounds.

ELEVATION OF SURFACE

At well locations: Highest, 393 ft.; lowest, 287 feet.

SURFACE FORMATIONS

Weches and Queen City formations of Claiborne group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest stratigraphic horizon penetrated by any well within the area of the field is in the upper portion of the Travis Peak formation. This penetration was in W. H. Foster #1 P. I. Bowling, which was drilled to 8,355 feet.

NATURE OF TRAPS

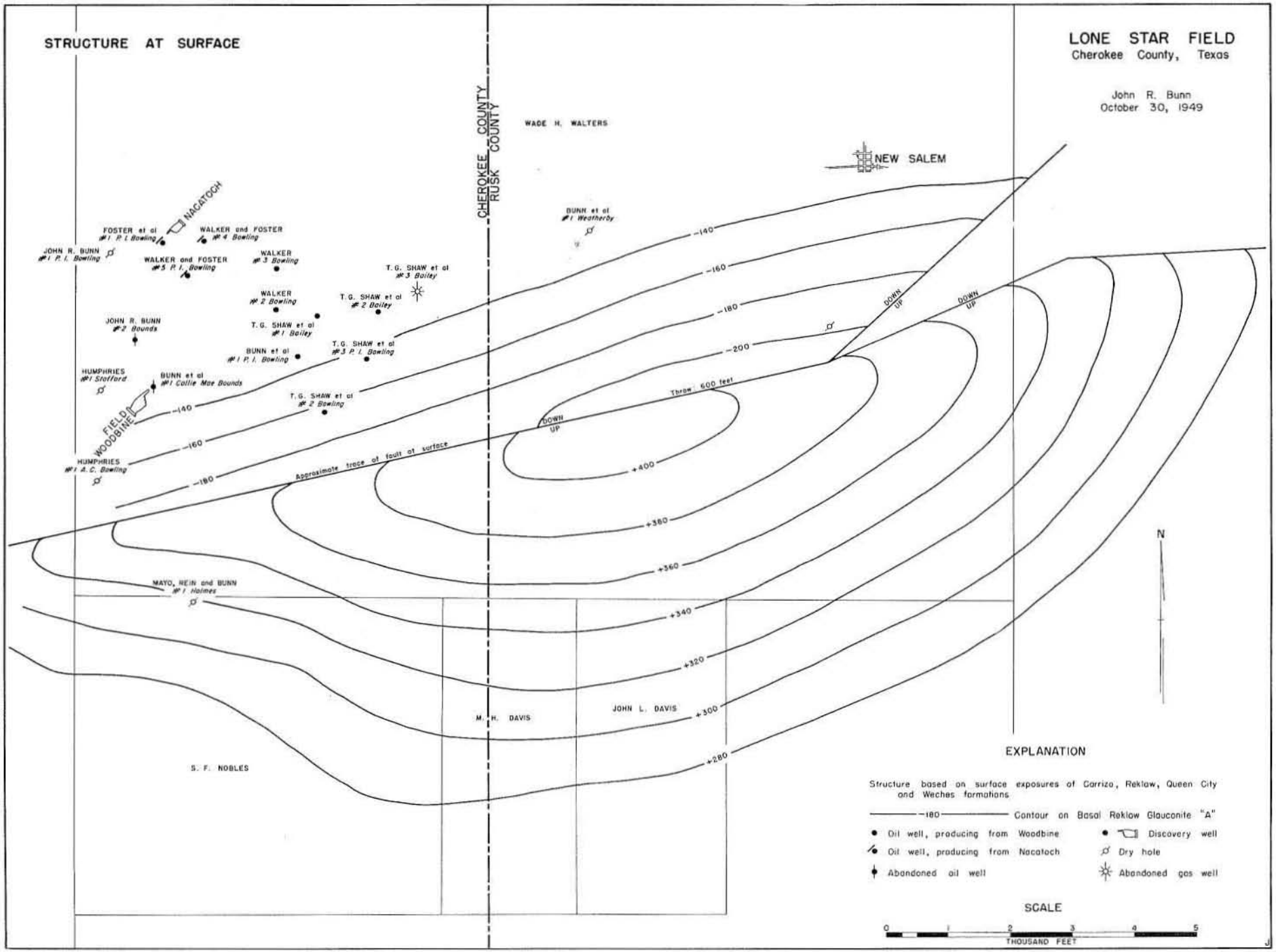
Nacatoch sand: Probable closure against fault on downthrown side.

Woodbine sand: Combination of closure against fault with truncated Woodbine sand members overlapped by Austin chalk in an easterly updip direction. The Austin chalk apparently was laid down as an overlap over the truncated edges of more steeply dipping Woodbine sand members. The contact is at a slight angular unconformity and is marked by 3 to 6 inches of a coarse sand and gravel cemented by chalk. The dip of both the Austin chalk and Woodbine sand members is to the west and southwest.

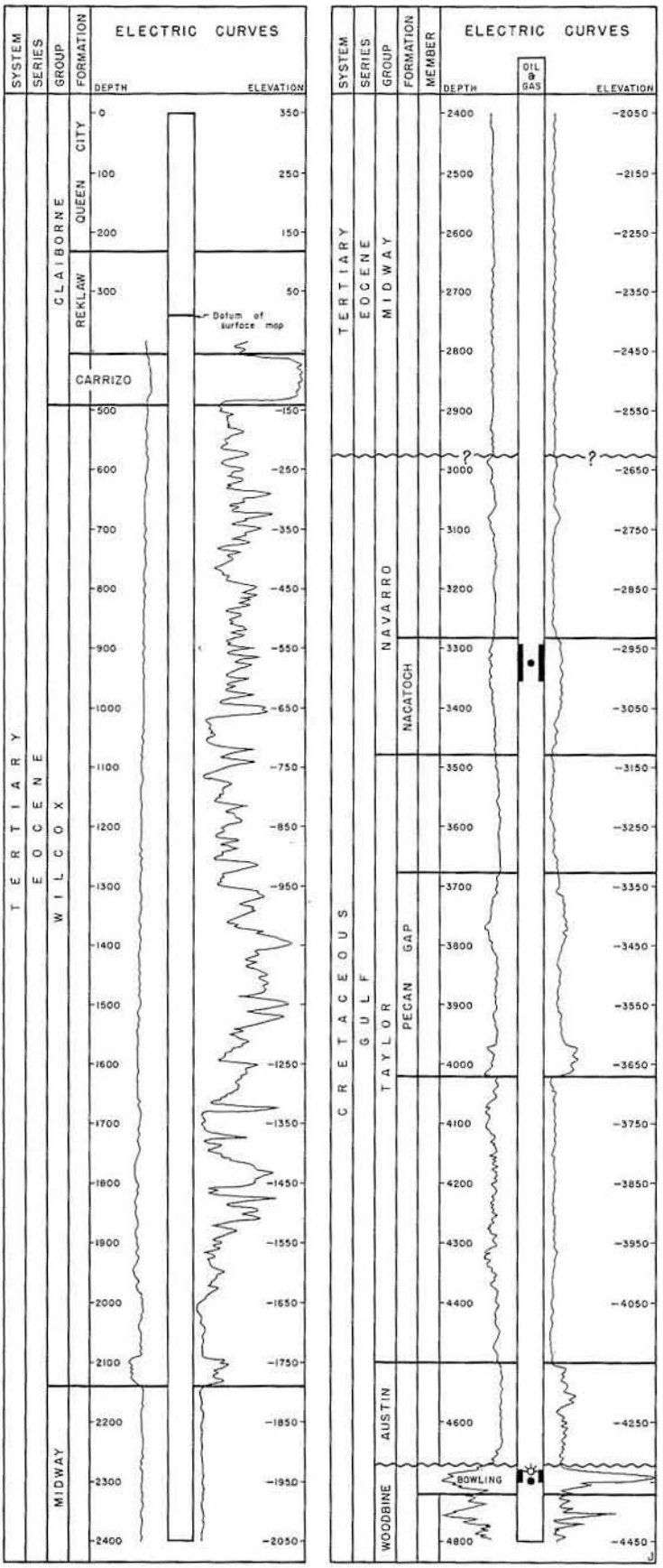
Drilling has shown that there is a possibility of limited production along the overlapped edge of the different sand members, with each sand break apparently having a different oil, gas and water level. The combination of sedimentary and structural conditions occasions very erratic traps. The only commercial accumulation exploited to date is in the Bowling sand member, from which Bunn et al. #1 P. I. Bowling is producing.

PRODUCTIVE AREAS

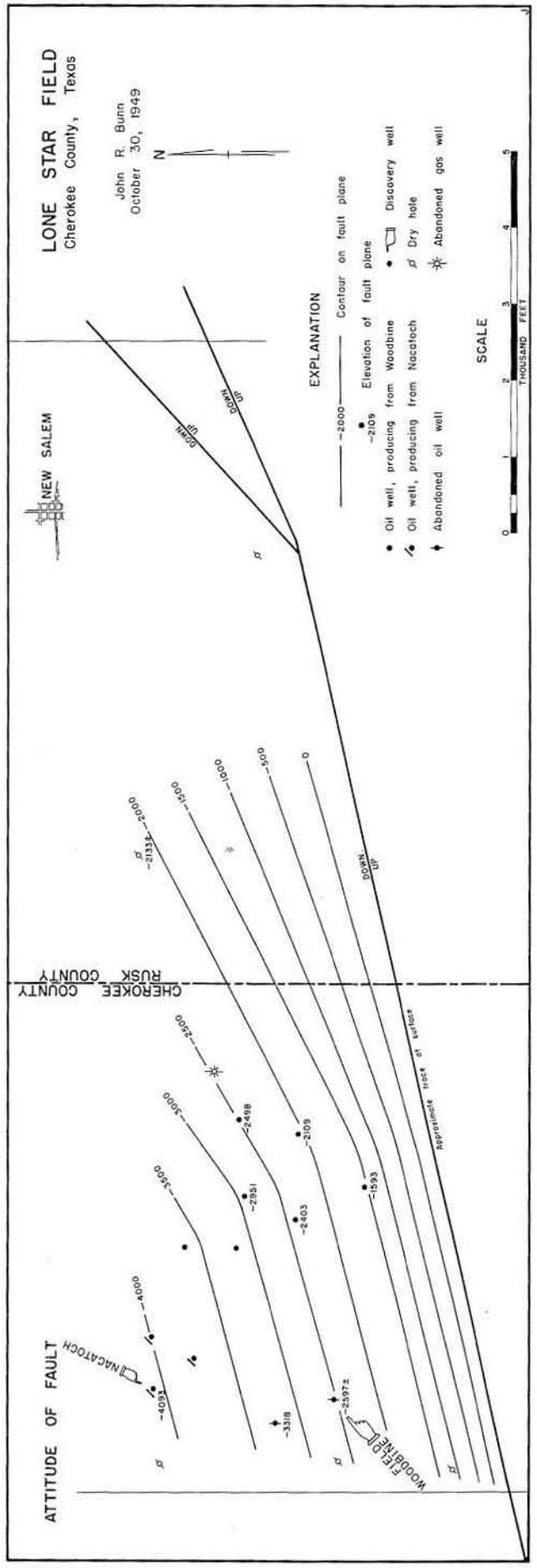
	Acres
Nacatoch sand	20±
Woodbine sand	250±
Lone Star field	270±

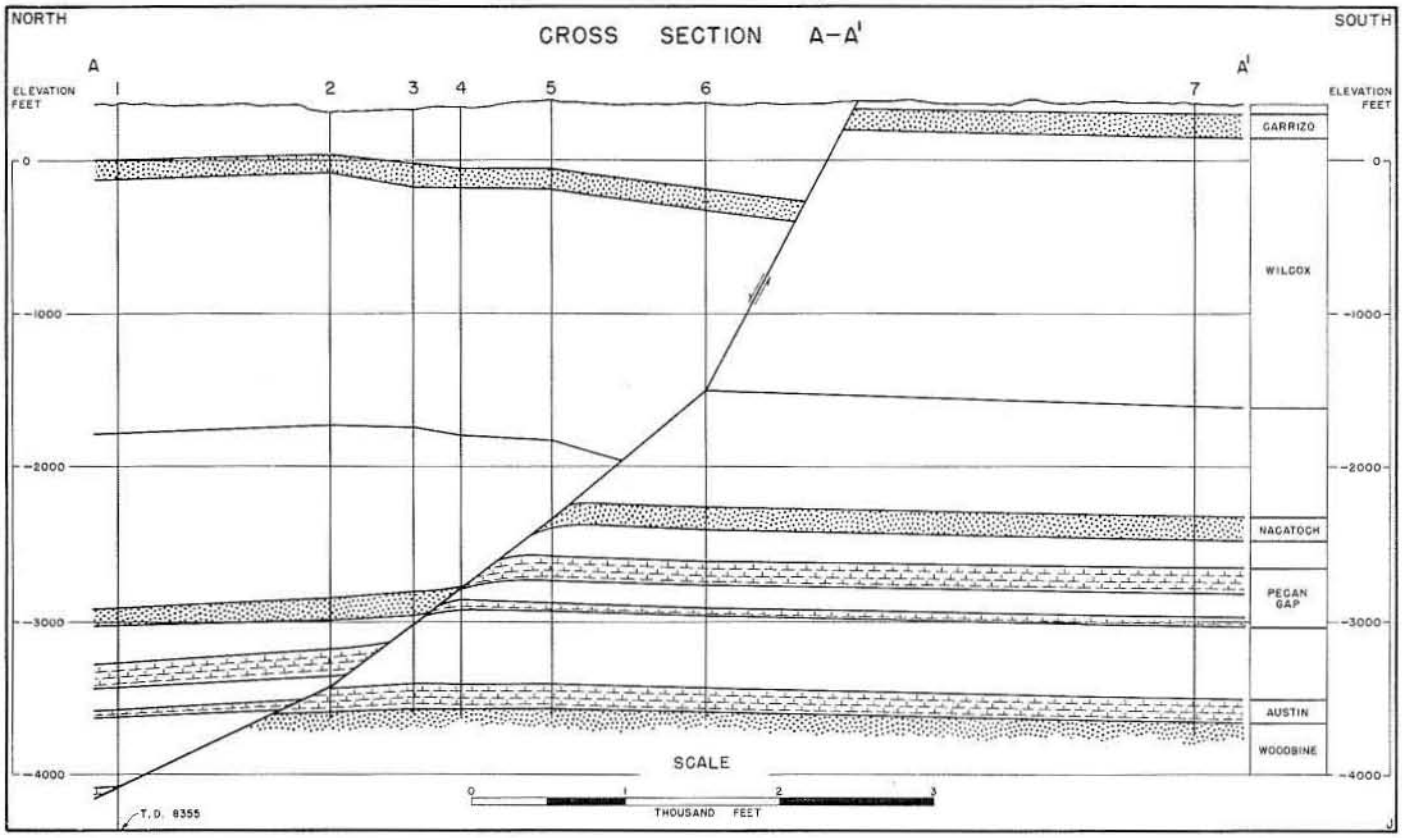

STRUCTURE AT SURFACE
LONE STAR FIELD
Cherokee County, Texas
John R. Bunn
October 30, 1949
CHEROKEE COUNTY
RUSK COUNTY
WADE H. WALTERS
NEW SALEM
BUNN et al #1 Weatherby
NACATOCH
FOSTER et al #1 P. I. Bowling
WALKER and FOSTER #4 Bowling
JOHN R. BUNN #1 P. I. Bowling
WALKER and FOSTER #5 P. I. Bowling
WALKER #3 Bowling
T. G. SHAW et al #3 Bailey
WALKER #2 Bowling
T. G. SHAW et al #2 Bailey
JOHN R. BUNN #2 Bounds
T. G. SHAW et al #1 Bailey
T. G. SHAW et al #3 P. I. Bowling
BUNN et al #1 P. I. Bowling
HUMPHRIES #1 Stafford
BUNN et al #1 Callie Mae Bounds
T. G. SHAW et al #2 Bowling
FIELD WOODBINE
HUMPHRIES #1 A. C. Bowling
Approximate trace of fault at surface
Throw 600 feet
DOWN
UP
-140
-160
-180
-200
+400
+380
+360
+340
+320
+300
+280
MAYO, REIN and BUNN #1 Holmes
M. H. DAVIS
JOHN L. DAVIS
S. F. NOBLES
N
EXPLANATION
Structure based on surface exposures of Carrizo, Reklaw, Queen City and Weches formations
-180 Contour on Basal Reklaw Glauconite "A"
Oil well, producing from Woodbine
Oil well, producing from Nacatoch
Abandoned oil well
Discovery well
Dry hole
Abandoned gas well
SCALE
0 1 2 3 4 5
THOUSAND FEET

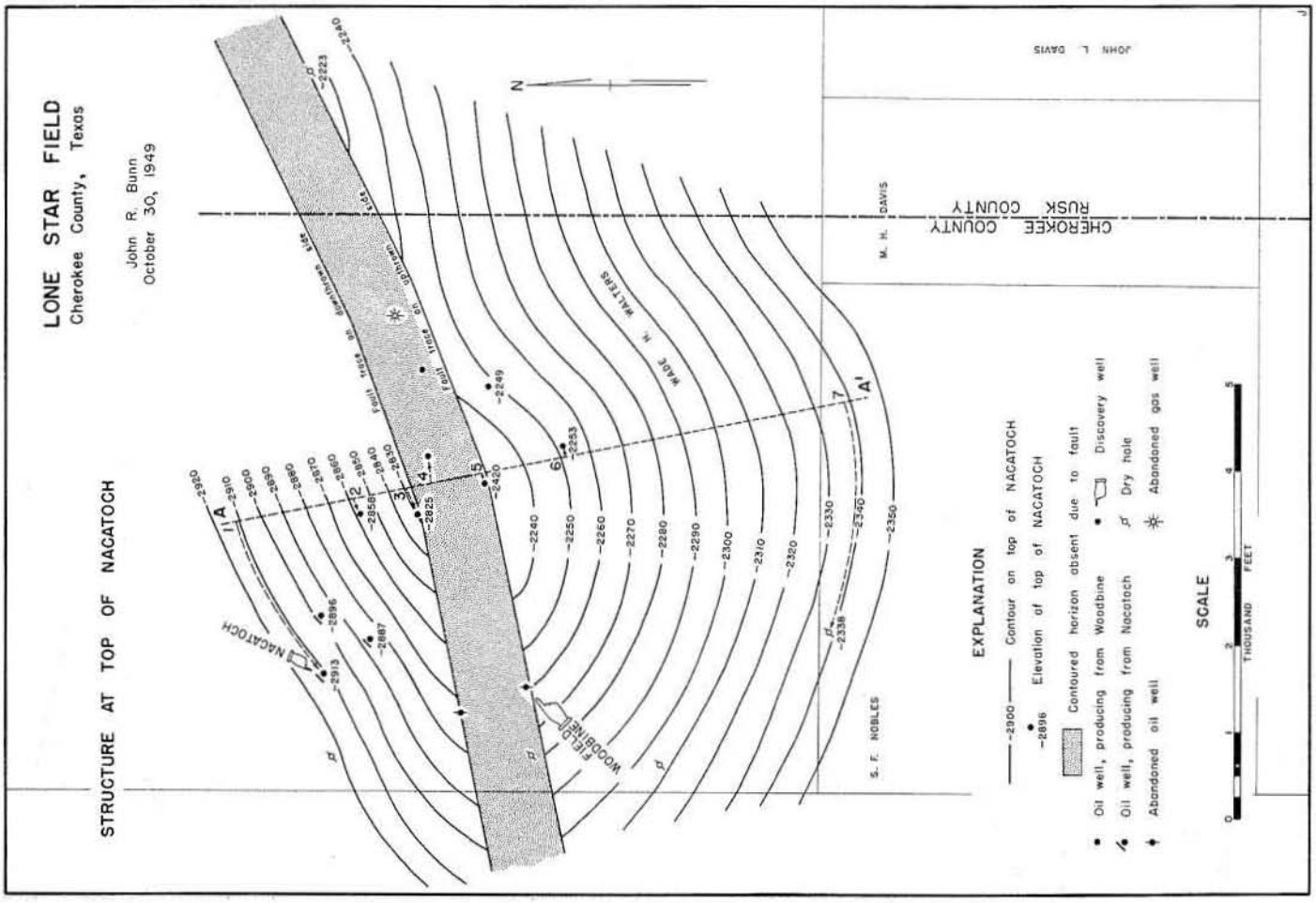
TYPE SECTION OF ROCKS PENETRATED

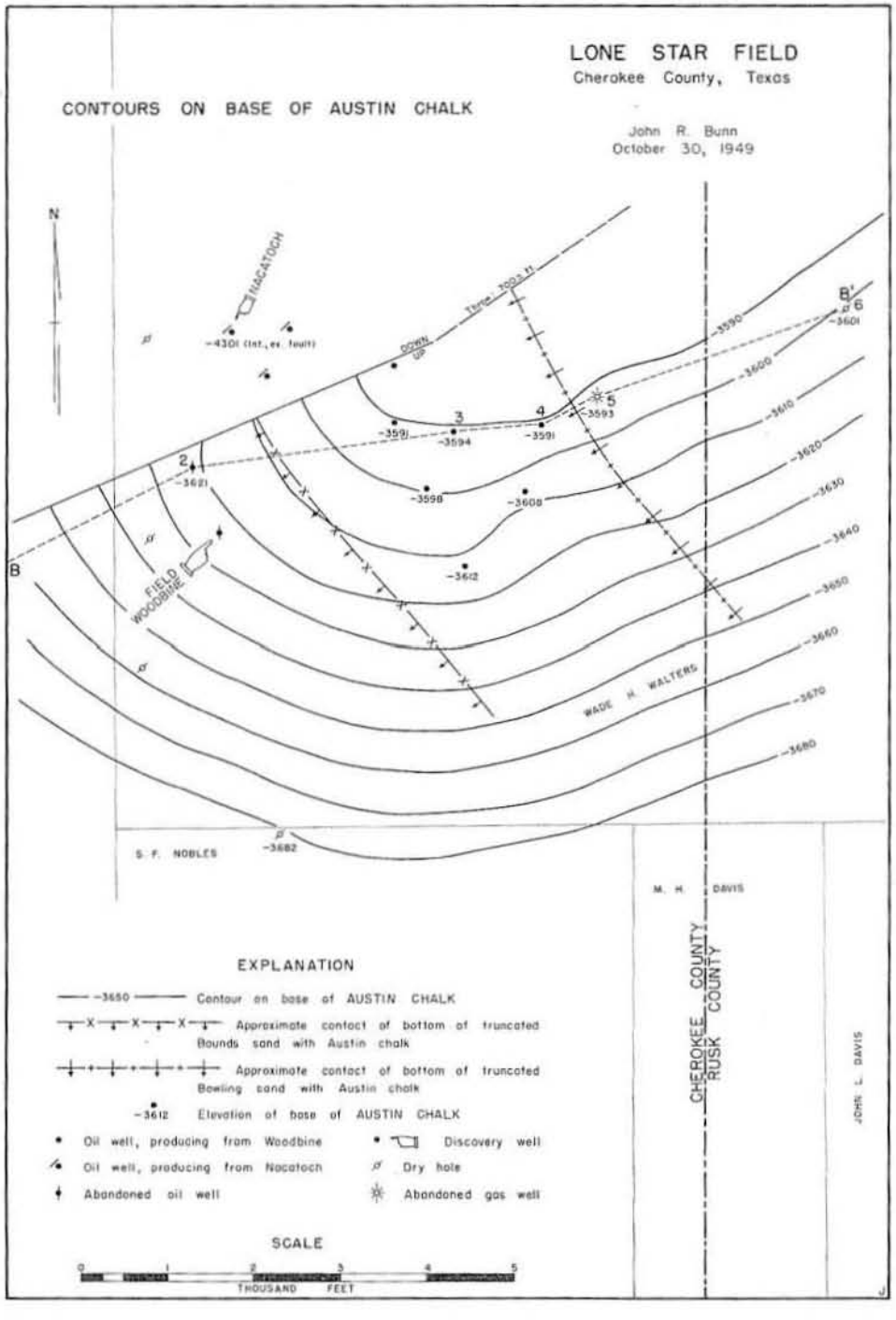


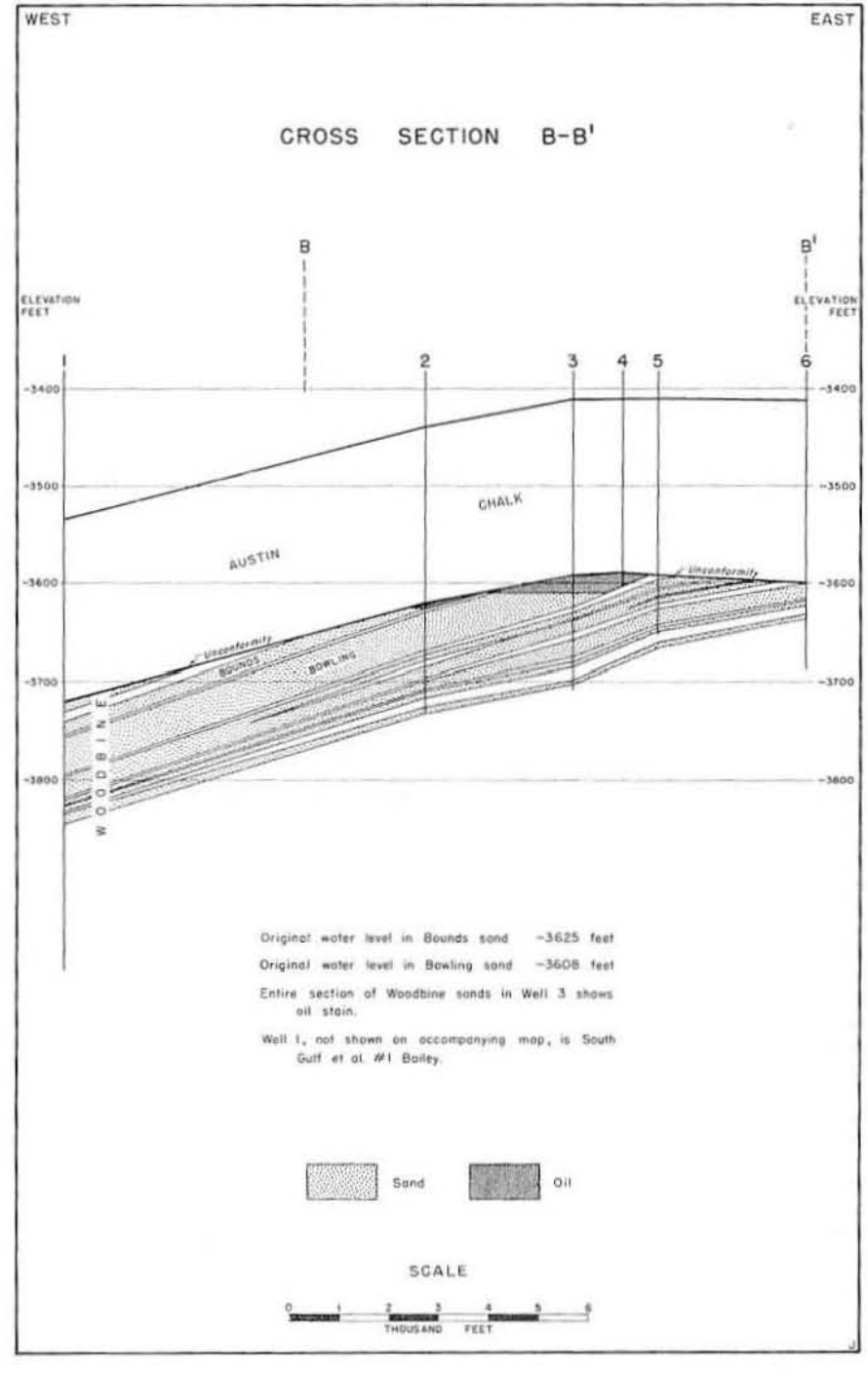
Note: The above is a composite log. As to wells within the Woodbine productive area, generally about 700 feet of strata are cut out by faulting. Inclusion of such strata, of course, leads to indications of depths and elevations which are not typical.




NORTH
CROSS SECTION A-A'
SOUTH
A
A'
ELEVATION FEET
1
2
3
4
5
6
7
0
-1000
-2000
-3000
-4000
GARRIZO
WILCOX
NACATOCH
PEGAN GAP
AUSTIN
WOODBINE
SCALE
0
1
2
3
THOUSAND FEET
T.D. 8355


LONE STAR FIELD
Cherokee County, Texas
John R. Bunn
October 30, 1949
STRUCTURE AT TOP OF NACATOCH
CHEROKEE COUNTY
RUSK COUNTY
JOHN L. DAVIS
M. H. DAVIS
MADE N. WALTERS
S. F. NOBLES
WOODBINE FIELD
NACATOCH
EXPLANATION
Contour on top of NACATOCH
Elevation of top of NACATOCH
Contoured horizon absent due to fault
Oil well, producing from Woodbine
Oil well, producing from Nacatoch
Abandoned oil well
Discovery well
Dry hole
Abandoned gas well
SCALE
THOUSAND FEET


LONE STAR FIELD
Cherokee County, Texas
CONTOURS ON BASE OF AUSTIN CHALK
John R. Bunn
October 30, 1949
N
NACATOCH
-4301 (Int., ex. fault)
Throw 700± ft
DOWN
UP
B
B'
FIELD
WOODBINE
WADE H. WALTERS
S. F. NOBLES
M. H. DAVIS
JOHN L. DAVIS
CHEROKEE COUNTY
RUSK COUNTY
-3590
-3600
-3610
-3620
-3630
-3640
-3650
-3660
-3670
-3680
-3682
EXPLANATION
-3650 Contour on base of AUSTIN CHALK
Approximate contact of bottom of truncated Bounds sand with Austin chalk
Approximate contact of bottom of truncated Bowling sand with Austin chalk
-3612 Elevation of base of AUSTIN CHALK
Oil well, producing from Woodbine
Oil well, producing from Nacatoch
Abandoned oil well
Discovery well
Dry hole
Abandoned gas well
SCALE
0 1 2 3 4 5
THOUSAND FEET


WEST
EAST
CROSS SECTION B-B'
B
B'
ELEVATION FEET
1 2 3 4 5 6
-3400
-3500
-3600
-3700
-3800
CHALK
AUSTIN
Unconformity
BOUNDS
BOWLING
WOODBINE
Original water level in Bounds sand -3625 feet
Original water level in Bowling sand -3608 feet
Entire section of Woodbine sands in Well 3 shows oil stain.
Well 1, not shown on accompanying map, is South Gulf et al. #1 Bailey.
Sand
Oil
SCALE
0 1 2 3 4 5 6
THOUSAND FEET

THICKNESSES OF RESERVOIR ROCKS

Nacatoch sand: From 10 to 80 feet. Uncertain.
Woodbine sand: Net productive, from 2 to 25 ft.

LITHOLOGY OF RESERVOIR ROCKS

Nacatoch sand: Sandy shale and fine shaly sand.
Woodbine sand: Soft but consolidated, highly permeable and massive sandstone.

CONTINUITY OF RESERVOIR ROCKS

Nacatoch sand: The Nacatoch sand is continuous as a porous medium throughout most of northeast Texas.

Woodbine sand: The accumulation is at the truncated eastward termination of the Woodbine sand. To the westward, the Woodbine is continuous throughout a very extensive area. The productive portion here correlates with the Dexter member of the lower Woodbine.

CHARACTER OF OIL

Nacatoch sand: Gravity, A.P.I , 36° to 38°.
Woodbine sand: Gravity, A.P.I., 36° to 37°.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Nacatoch	Woodbine
Elev. of top of gas, feet	No	?
Elev. of bottom of gas, feet	free	?
Relief, feet	gas	?
Elev. of top of oil, feet	-2,918	-3,591
Elev. of bottom of oil, feet	-3,090±	-3,616
Relief, feet	72±	25±

The above figures represent conditions as of respective discovery dates.

WATER PRODUCTION

Nacatoch sand: Very little water has been produced by the three Nacatoch wells.

Woodbine sand: All wells drilled in the Woodbine sand have shown water shortly after completion. The water content gradually increases until the wells make about 65% water, at which point the wells quit flowing and have to be pumped. Production may be carried on economically even though the wells are producing 95% or better of water, due to the high fluid level and high permeability of the massive Woodbine sand.

PRODUCTION HISTORY

	WELLS PRODUCING at end of year		OIL PRODUCTION (barrels)			
	Nacatoch	Woodbine	Nacatoch	Woodbine	Total field	
Year	Oil	Oil	Yearly	Yearly	Yearly	Cumulative
1938	0	2	0	3,308	3,308	3,308
1939	0	2	0	10,148	10,148	13,456
1940	0	2	0	5,954	5,954	19,410
1941	0	1	0	15,198	15,198	34,608
1942	0	1	0	17,791	17,791	52,399
1943	0	1	0	23,843	23,843	76,242
1944	1	2	2,000	44,418	46,418	122,660
1945	1	3	15,000	83,470	98,470	221,130
1946	1	8	7,000	171,657	178,657	399,787
1947	2	8	3,500	133,327	136,827	536,614
1948	3	5	5,400	85,181	90,581	627,195
1949*	3	5	?	?	74,482	701,677

*P.S. - Amended to include the whole of 1949.

There is no gas being produced and sold.

LONG LAKE FIELD

Anderson, Freestone and Leon Counties, Texas

K. A. SCHMIDT
Regional Geologist, Tide Water Associated Oil Company, Houston, Texas
December 15, 1950

LOCATION and DEFINITION

The Long Lake field is mainly in the southwest corner of Anderson County, with very small portions extending across the Trinity River into Freestone and Leon counties. It is 10 miles southwest of Palestine, the county seat of Anderson County. It is in the East Texas salt dome basin and is in close proximity to two well known piercement-type salt domes; $3\frac{1}{2}$ miles east of the Butler dome and 2 miles south of the Palestine dome.

The area here treated as the Long Lake field includes both Long Lake field and East Long Lake field as those names have been used in some publications. As indicated on the accompanying map, the latter name has been applied to a very small portion of the field at its eastern extremity.

METHOD OF EXPLORATION LEADING TO DISCOVERY

In June 1932 the Tide Water Oil Co. and Texas Seaboard Oil Co. (now Tide Water Associated Oil Co. and Seaboard Oil Co.) initiated a reconnaissance reflection seismograph survey in Anderson County to determine the merits of this method of exploration in this portion of the East Texas basin. The Long Lake structure was detected when a traverse was shot along State highways No. 43 and 7 between Palestine and a point 6 miles west of the Trinity River. Using the correlation method with depth points spaced approximately a mile apart, a domal type structure with a slight northeast-southwest axis and 600 feet of closure was mapped on the Georgetown limestone. Tide Water Oil Co. and Texas Seaboard Oil Co. leased approximately 25,000 acres and the discovery well was drilled on the highest point of the structure as mapped by the seismograph.

DISCOVERIES

Long Lake field: Woodbine: October 17, 1933; Tide Water Oil Co. & Texas Seaboard Oil Co. #1 J. O. Monnig.

East Long Lake field: Woodbine: April 13, 1941; Tex-Harvey Oil Co. #1 S. E. J. Cartmel.

ELEVATION OF SURFACE

At well locations: Highest, 362 ft.; lowest, 215 feet.

SURFACE FORMATIONS

Queen City and Reklaw of Claiborne group. Reklaw exposures are limited to immediate vicinity of Trinity River.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated is 41 feet below the top of the Travis Peak formation. This penetration was in a dry hole on the northwest flank of the south dome at the location indicated on the accompanying map.

NATURE OF TRAP and STRUCTURE

Woodbine: The Woodbine sands constitute a common reservoir, with accumulation occurring on a low-relief compound dome complicated by faulting. While the trap is a structural one, the distribution of oil and gas is controlled also by moderate lenticularity of the several producing sands. The several sands are connected by faulting so as to form a single reservoir.

The accompanying map portrays the structure at the top of the Woodbine group. The structure is believed to have been formed by salt movement. It is sometimes referred to as "residual" structure, since it appears to have been formed by downwarping into the rim synclines of the two nearby piercement-type salt domes.

The center of the Palestine salt dome is only two miles north of the northern extent of production in this field. This is the closest known deep-seated closed producing structure to a piercement salt dome in any of the Cretaceous basins. Woodbine is at the surface on the Palestine dome.

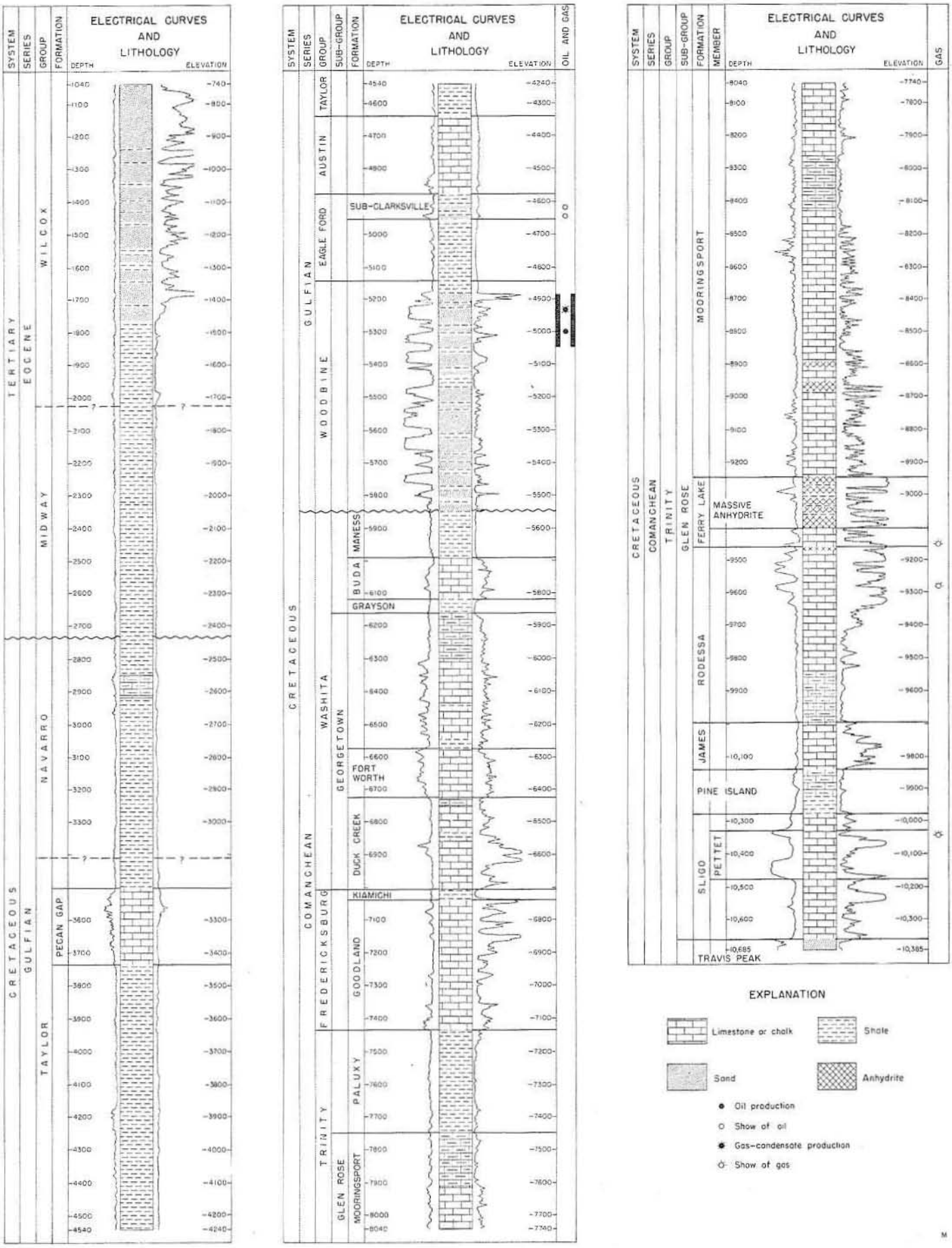
PRODUCTIVE AREA

Woodbine and Field: 13,850 acres.

THICKNESS OF RESERVOIR ROCK

Woodbine:	Max.	Avg.
Net productive, feet	113	47

TYPE SECTION OF ROCKS PENETRATED



LITHOLOGY OF RESERVOIR ROCKS

Woodbine: The electrical log was just being introduced at the time when this field was discovered. Tide Water Oil Co. & Texas Seaboard Oil Co. #2 Monnig was one of the first wells surveyed in the East Texas district. All subsequent wells were electrically logged and, as this procedure gave adequate information for well completion when coupled with a small amount of coring for checking gas-oil and oil-water contacts, no well in the field has cored the Woodbine section in its entirety. As a result, detailed description of the entire section is not possible. Another factor which makes it difficult to describe the section in detail is the fact that it is not possible to correlate with assurance the sands south of the deep saddle in the central part of the field with those north of that saddle. It is quite likely that the first sand of the southern area is the second sand of the northern area.

On both the north (Shaw & Cern) and south (monnig) domes, four main sands are present. The first sand on the south dome is not as clean as the underlying sands. It is a fine- to medium-grained sand and often is ashy, lignitic, and interbedded with black shale partings. The underlying sands are cleaner, medium-grained and have higher porosities and permeabilities. Analyses of cores taken at one-foot intervals from 5,233 to 5,350 feet in the basal or fourth sand in Tide Water Associated Oil Co. & Seaboard Oil Co. #16 Monnig averaged 1,085 millidarcys permeability and 26.7% porosity; permeability ranged from 560 to 1,900 millicarcys; porosity, from 22.4% to 30.4%.

CONTINUITY OF RESERVOIR ROCKS

Woodbine: The Woodbine sands are moderately lenticular but are sufficiently continuous to create consistent reservoir conditions. There is sufficient variation in the thicknesses of the lower sands to provide actual connection between sands. Additional and more numerous connections are provided by bringing the various sands into contact with each other across fault planes. That such connections exist has been demonstrated a number of times in the various cycling operations in the field.

Only the uppermost sand of the Woodbine is productive in the saddle between the north and south domes; all other sands are below the water level in this area. In spite of this, the lower sands on both domes have common fluid levels and obviously are continuous as oil and gas reservoirs through the medium of the one sand that does produce across the saddle.

The gas reservoir of the south dome is completely separated from the gas reservoir of the north dome. There is enough well control to prove the absence of free gas in the saddle, but further proof is afforded by the fact that the liquid content of the gas on the south dome averages 10.8 barrels per million while that of the north dome averages 42.3 barrels per million.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine:	Feet
Elevation of top of gas	-4,876
Elevation of bottom of gas	-5,033
Relief	157
Elevation of top of oil	-5,033
Elevation of bottom of oil	-5,047
Relief	14

The above represents approximate levels at time of discovery. There has been a considerable change in these levels since the field was discovered. They not only are higher but also are out of balance to the extent that they now are not consistent throughout the field.

CHARACTER OF OIL

Woodbine:

Gravity: 41° Color: Dark green
Sulphur: 0.16% Odor: Very good, almost sweet.
Base: Mixed, mostly paraffinic
Pour Point: 60° F.
Saybolt universal viscosity: 86 @ 70° F; 64 @ 90° F; 52 @ 110° F.

Yield	Gravity	%
Gasoline, 400° E.P.	59.8°	36.2
Kerosene, 512° E.P.	43.1°	13.4
Gas oil	33.0°	34.7
Bottoms	18.4°	15.5

The above data are from an analysis of a sample of typical Long Lake oil made on September 10, 1935.

For other analyses see:

Railroad Commission of Texas

Analyses of Texas Crude Oils (1940) pp. 30 and 59.

U. S. Bureau of Mines Lab. ref. No. 34017 37231

Tabulated Analyses of Texas Crude Oils. T. P. 607 (1939) Group 4 Item 39 40

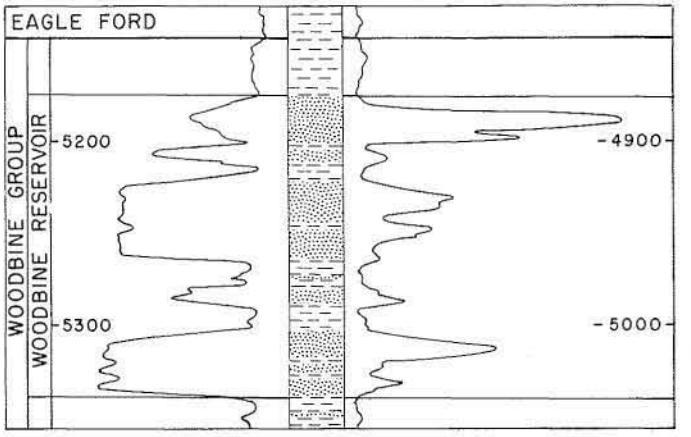
Analyses of Crude Oils from 283 Important Oil Fields of the United States. R.I. 4289 (1948) Item 227

CHARACTER OF GAS

Woodbine	North dome		South dome	
Component	Mol. %	G/Mcf	Mol. %	G/Mcf
Carbon dioxide	.80			
Methane	90.89		97.31	
Ethane	1.85		1.44	
Propane	1.14	.420	.47	.128
Iso-butane	.55	.170	.08	.026
N-butane	.84	.268	.13	.041
Iso-pentane	.56	.153	.09	.033
N-pentane	.50	.138	.06	.022
Hexanes plus	2.87	.627	.42	.204
Totals	100.00	1.776	100.00	.454

Analyses made in laboratory of Tide Water Associated Oil Co. & Seaboard Oil Co.

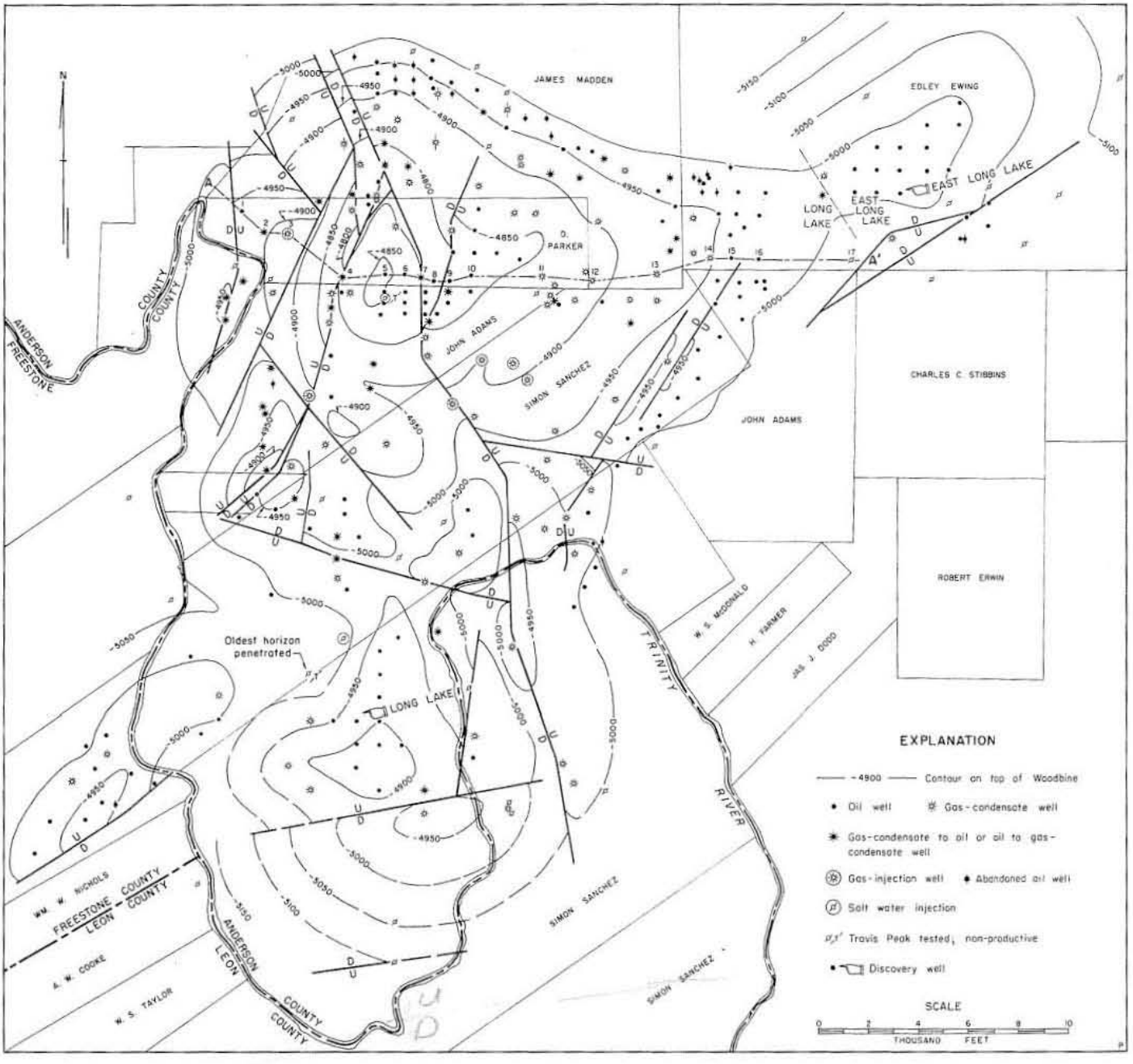
TYPICAL DETAIL OF PRODUCTIVE SECTION

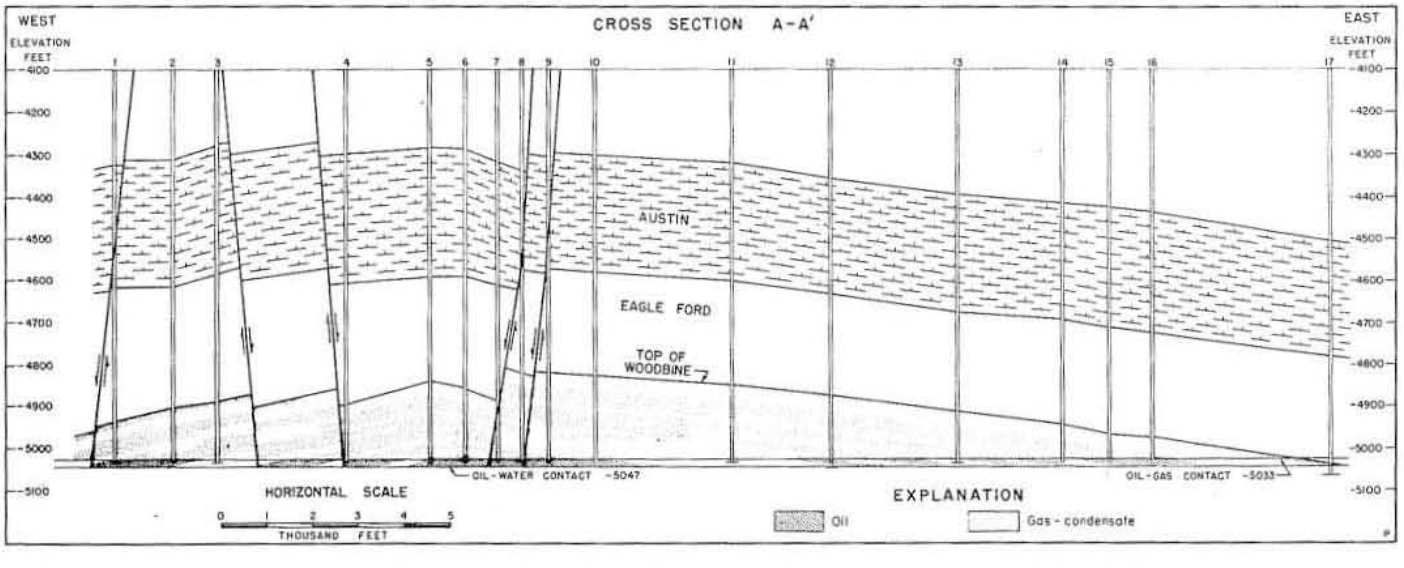


WATER PRODUCTION

Woodbine: In order to dispose of increasing quantities of salt water, Tide Water Associated Oil Co. & Seaboard Oil Co. #4 Frank Evans, in the northern part of the field, was recompleted as a salt water disposal well in April 1946. Another well, #18 Monnig, in the southern part of the field, was recompleted as a salt water disposal well on January 1, 1949. Both wells inject water into Woodbine sand below the oil-water contact. All water other than that injected through these two wells is gathered into pits on individual leases and dissipated by evaporation. Quantities are reported below in terms of barrels.

	LONG LAKE MAIN FIELD						EAST LONG LAKE	
	WATER PRODUCTION		WATER INJECTION		NET WATER PROD.		WATER PRODUCTION	
Year	Yearly	Cumulative	Yearly	Cumulative	Yearly	Cumulative	Yearly	Cumulative
1933	220	220			220	220		
1934	9,125	9,345			9,125	9,345		
1935	22,630	31,975			22,630	31,975		
1936	50,875	82,850			50,875	82,850		
1937	180,815	263,665			180,815	263,665		
1938	136,710	400,375			136,710	400,375		
1939	162,060	562,435			162,060	562,435		
1940	389,290	951,725			389,290	951,725		
1941	959,219	1,910,944			959,219	1,910,944		
1942	822,036	2,732,980			822,036	2,732,980		
1943	980,406	3,713,386			980,406	3,713,386	56,784	56,784
1944	1,149,290	4,862,676			1,149,290	4,862,676	94,535	151,319
1945	1,627,340	6,490,016			1,627,340	6,490,016	172,536	323,855
1946	2,933,140	9,423,156	69,903	69,903	2,863,237	9,353,253	449,540	773,395
1947	4,125,186	13,548,342	701,601	771,504	3,423,585	12,776,838	381,564	1,154,959
1948	5,557,490	19,105,832	864,578	1,636,082	4,692,912	17,469,750	378,140	1,533,099
1949	6,269,240	25,375,072	1,309,510	2,945,592	4,959,730	22,429,480	385,476	1,918,575


N
JAMES MADDEN
EDLEY EWING
EAST LONG LAKE
LONG LAKE
EAST LONG LAKE
D. PARKER
A
A'
JOHN ADAMS
SIMON SANCHEZ
CHARLES C. STIBBINS
JOHN ADAMS
ROBERT ERWIN
W. S. McDONALD
H. FARMER
JAS. J. DOOD
ANDERSON
FREESTONE
COUNTY
COUNTY
Oldest horizon penetrated
LONG LAKE
TRINITY
RIVER
SIMON SANCHEZ
SIMON SANCHEZ
WM. W. NICHOLS
FREESTONE COUNTY
LEON COUNTY
A. W. COOKE
W. S. TAYLOR
ANDERSON
LEON
COUNTY
COUNTY
EXPLANATION
-4900 Contour on top of Woodbine
Oil well
Gas-condensate well
Gas-condensate to oil or oil to gas-condensate well
Gas-injection well
Abandoned oil well
Salt water injection
Travis Peak tested, non-productive
Discovery well
SCALE
0 2 4 6 8 10
THOUSAND FEET


WEST
ELEVATION FEET
CROSS SECTION A-A'
EAST
ELEVATION FEET
AUSTIN
EAGLE FORD
TOP OF WOODBINE
OIL-WATER CONTACT -5047
OIL-GAS CONTACT -5033
HORIZONTAL SCALE
0 1 2 3 4 5
THOUSAND FEET
EXPLANATION
Oil
Gas-condensate

PRODUCTION HISTORY

Main field - Woodbine

Year	NUMBER OF WELLS at end of year: Producing Oil Flow.	Producing Oil Artif.	Producing Gas	Injecting Gas	Injecting Water	OIL PRODUCTION (barrels): Yearly	Cumulative	CONDENSATE PRODUCTION (barrels): On leases Yearly	At plants Yearly	Total Yearly	Total Cumulative	TOTAL LIQUIDS (barrels): Yearly	Cumulative
1933	1	-	-	-	-	6,079	6,079	*	-	-	-	6,079	6,079
1934	3	-	2	-	-	41,029	47,108	*	-	-	-	41,029	47,108
1935	4	-	8	-	-	29,995	77,103	64,844	-	64,844	64,844	94,839	141,947
1936	20	-	16	-	-	337,561	414,664	77,433	-	77,433	142,277	414,994	556,941
1937	47	-	27	-	-	512,144	926,808	83,217	-	83,217	225,494	595,361	1,152,302
1938	74	2	30	-	-	667,776	1,594,584	72,994	38,926	111,920	337,414	779,696	1,931,998
1939	86	-	34	4	-	819,163	2,413,747	44,952	202,826	247,778	585,192	1,066,941	2,998,939
1940	114	-	49	7	-	677,816	3,091,563	57,597	995,279	1,052,876	1,638,068	1,730,692	4,729,631
1941	130	-	50	7	-	1,270,371	4,361,934	38,101	1,513,923	1,552,024	3,190,092	2,822,395	7,552,026
1942	120	18	52	7	-	1,307,222	5,669,156	33,167	1,336,147	1,369,314	4,559,406	2,676,536	10,228,562
1943	116	22	48	7	-	1,378,951	7,048,107	45,882	1,180,004 †	1,225,886	5,785,292	2,604,837	12,833,399
1944	110	35	43	8	-	1,749,718	8,797,825	38,868	1,133,836 †	1,172,704	6,957,996	2,922,422	15,755,821
1945	111	35	44	8	-	1,726,507	10,524,332	26,408	883,105 †‡	909,513	7,867,509	2,636,020	18,391,841
1946	86	57	51	7	1	1,727,917	12,252,249	36,742	673,052 †‡	709,794	8,577,303	2,437,711	20,829,552
1947	84	49	54	7	1	1,754,291	14,006,540	37,138	561,250 ‡	598,388	9,175,691	2,352,679	23,182,231
1948	79	53	46	7	1	1,841,512	15,848,052	32,744	402,015 ‡	434,759	9,610,450	2,276,271	25,458,502
1949	84	55	71	7	2	1,220,140	17,068,192	35,980	360,935 ‡	396,915	10,007,365	1,617,055	27,075,557

*Included with oil production.
†Includes a total of 123,154 barrels processed during pressure maintenance operations 1943-1946.
‡Includes a total of 79,072 barrels processed through gas plant operations 1945-1949.

Main field - Woodbine

Year	GROSS GAS PRODUCTION (Mcf): Unprocessed from Gas wells	Unprocessed from Oil wells	Processed at plant	Total Yearly	Total Cumulative	GAS INJECTED (Mcf) Yearly	NET GAS PRODUCTION (Mcf) Yearly	Cumulative
1933		423,706		423,706	423,706		423,706	423,706
1934	15,329	2,859,575		2,874,904	3,298,610		2,874,904	3,298,610
1935	2,934,287	14,488		2,948,775	6,247,385		2,948,775	6,247,385
1936	5,045,413	842,783		5,888,196	12,135,581		5,888,196	12,135,581
1937	5,253,057	3,079,267		8,332,324	20,467,905		8,332,324	20,467,905
1938	4,873,529	4,977,813	2,204,280	12,055,622	32,523,527	1,828,828	10,226,794	30,694,699
1939	3,668,367	4,535,885	10,904,167	19,108,419	51,631,946	9,744,544	9,363,875	40,058,574
1940	4,878,424	4,067,758	44,678,237	53,624,419	105,256,365	40,885,529	12,738,890	52,797,464
1941	3,248,318	5,868,193	61,834,929	70,951,440	176,207,805	56,057,590	14,893,850	67,691,314
1942	3,266,176	5,692,834	57,499,454	66,458,464	242,666,269	52,320,094	14,138,370	81,829,684
1943	6,068,421	5,434,118	56,756,507 †	68,259,046	310,925,315	52,535,682	15,723,364	97,553,048
1944	7,161,791	7,579,172	55,479,541 †	70,220,504	381,145,819	51,242,553	18,977,951	116,530,999
1945	6,792,899	8,386,975	48,021,055 †‡	63,200,929	444,346,748	43,327,756	19,873,173	136,404,172
1946	3,872,154	7,982,994	39,644,522 †‡	51,499,670	495,846,418	33,407,775	18,091,895	154,496,067
1947	6,074,838	11,946,823	38,126,813 †	56,148,474	551,994,892	31,934,550	24,213,924	178,709,991
1948	6,896,105	9,420,866	28,190,759 ‡	44,507,730	596,502,622	21,318,592	23,189,138	201,899,129
1949	6,110,996	5,234,830	28,250,333 ‡	39,596,159	636,098,781	20,559,659	19,036,500	220,935,629
Total	76,160,104	88,348,080	471,590,597	636,098,781		415,163,152	220,935,629	

†Includes a total of 8,931,521 Mcf processed during pressure maintenance operation 1943-1946.
‡Includes a total of 5,312,668 Mcf processed through gas plant operations 1945-1949.

East Long Lake field - Woodbine

Year	NUMBER OF WELLS at end of year: Producing Oil Flow.	Producing Oil Artif.	Dual Wells Producing Oil	Dual Wells Producing Gas	Injecting Gas	Total	OIL PRODUCTION (barrels): Yearly	Cumulative	GAS PRODUCTION (Mcf): Unprocessed Yearly	Processed Yearly	Total Cumulative
1941	10	-	1	-	-	11	52,082	52,082			
1942	11	-	1	-	-	12	130,531	182,613			
1943	9	2	1	-	-	12	142,355	324,968			
1944	10	3	3	-	2	16*	210,257	535,225			
1945	8	6	-	4	2	18	263,485	798,710	50,760	4,612,912	4,633,672
1946	9	7	-	3	2	19	298,762	1,097,472	-	5,700,312	10,363,984
1947	10	6	-	3	2	19	325,124	1,422,596	-	4,490,707	14,854,691
1948	9	8	-	2	2	19	353,325	1,775,921	66,425	259,620	15,180,736
1949	4	11	-	3	-	18	226,350	2,002,271	744,086	-	15,924,822

*Two dual wells flowing oil through tubing and injecting gas into casing in 1944 not shown in total column.
One oil well plugged and abandoned in 1949.
Processed condensate is not reported for East Long Lake separately. The processed condensate produced here is included in the preceding figures for Long Lake Main field.

LONGWOOD FIELD

Harrison County, Texas and Caddo Parish, Louisiana

JULIUS A. BUCHANAN
Geologist, Union Producing Company, Tyler, Texas
March 19, 1951

LOCATION

The Longwood field occupies an area partly in Texas and partly in Louisiana between two other state-line fields, the Caddo field to the north and the Waskom field to the south. It is about 8 miles east of the town of Leigh, Harrison County, Texas.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Interpretation of seismic and subsurface data.

DISCOVERIES

Edwards: August 1933; Triangle Drilling Co. #1 F. M. Hearne et al.

Pettet: December 1947; Sam E. Wilson, Jr. #1 Hearne Estate.

Travis Peak: February 1948; Arrow Drilling Co. & Sells Petroleum Inc. #1 Fannie Allen.

D sand: December 1948; Phillips Petroleum Co. #1 Hammack.

ELEVATION OF SURFACE

At well locations: Highest, 327 ft.; lowest, 291 feet.

SURFACE FORMATION

Undifferentiated Wilcox group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated is in the Cotton Valley formation 1,690 feet below the top of that formation. This penetration was in Phillips Petroleum Co. #1 Hammack, identified on the accompanying map as the discovery well in the D sand. The accompanying TYPE SECTION is based on the log of that well.

NATURE OF TRAPS

Edwards: Stratigraphic trap. Truncated edge of Edwards overlain by impervious Upper Cretaceous shales.

Pettet: Stratigraphic trap formed by updip decrease in porosity on the west side of a south plunging nose.

Travis Peak: Stratigraphic trap due to occurrence of sand lenses on the west flank of a south plunging nose.

D sand: Stratigraphic trap due to updip shaling out of sand on the west flank of the structural nose.

PRODUCTIVE AREAS

Edwards	750 acres
Pettet	3,500 acres
Travis Peak	350 acres
D sand (one well)	30 acres
Longwood field	4,000 acres

THICKNESSES OF RESERVOIR ROCKS

Average net productive	Feet
Edwards	20
Pettet	30
Travis Peak	45
D sand (one well)	55

LITHOLOGY OF RESERVOIR ROCKS

Edwards: Gray, chalky limestone, varying from dense to porous.

Pettet: Oolitic, fossiliferous, light grey limestone varying from tight to porous.

Travis Peak: Varies from tight, shaly, fine-grained sand to medium-grained, fairly porous, white sandstone.

D sand: Slightly porous, medium- to fine-grained, white sand.

CONTINUITY OF RESERVOIR ROCKS

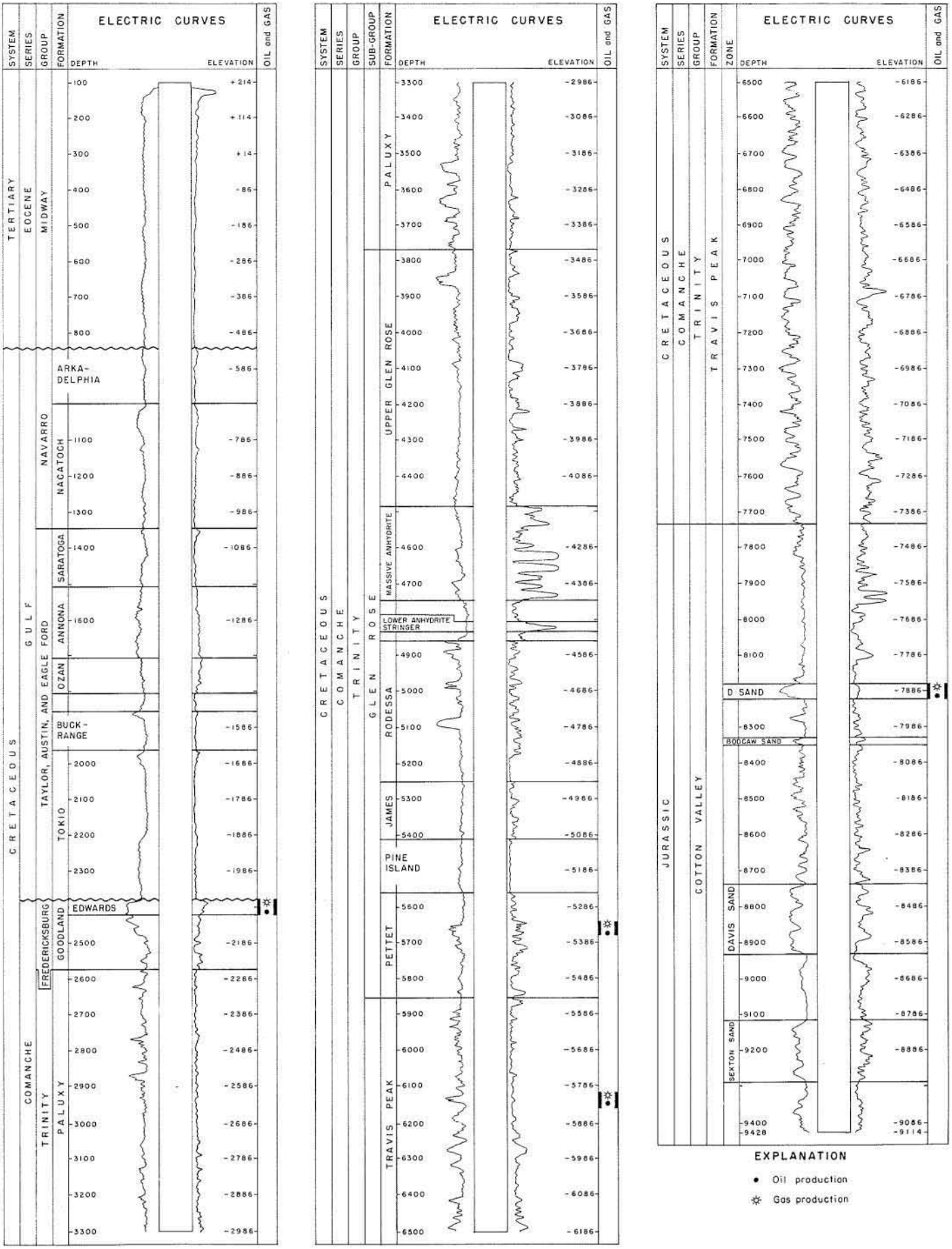
Edwards: The productive portion of the Edwards lime in different parts of the field is in different stratigraphic positions in the Edwards lime. The updip limit of each of the zones is at an unconformable contact with overlying shales. It is doubtful whether the several stratigraphic zones are all interconnected so as to constitute a single reservoir.

Pettet: The Pettet formation is continuous throughout a very large area in northeast Texas and northwest Louisiana. However, the reservoir rock in this field is a mere part of that formation and is quite local in extent. The reservoir consists of several local zones with relatively high porosity. These zones appear to be interconnected so as to constitute a single reservoir.

Travis Peak: The reservoir rock in the Travis Peak formation consists of local sand lenses, none of which is continuous throughout the area of the field.

D sand: Only one well produces from this reservoir. Another well, about a mile away, penetrated this stratigraphic position and disclosed that at that location the zone is not sufficiently porous to yield commercial production. The presently available data indicate that good porosity is so local that the reservoir will probably not yield enough oil to pay for drilling and operation of any additional wells.

TYPE SECTION OF ROCKS PENETRATED



ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Edwards:	Feet
Highest known elevation of gas	?
Elevation of bottom of gas	-1,999
Relief	?
Elevation of top of oil	-1,999
Elevation of bottom of oil	-2,141
Relief	142

Pettet:	
Highest known elevation of oil	-5,323
Elevation of bottom of oil	-5,354
Known relief	31

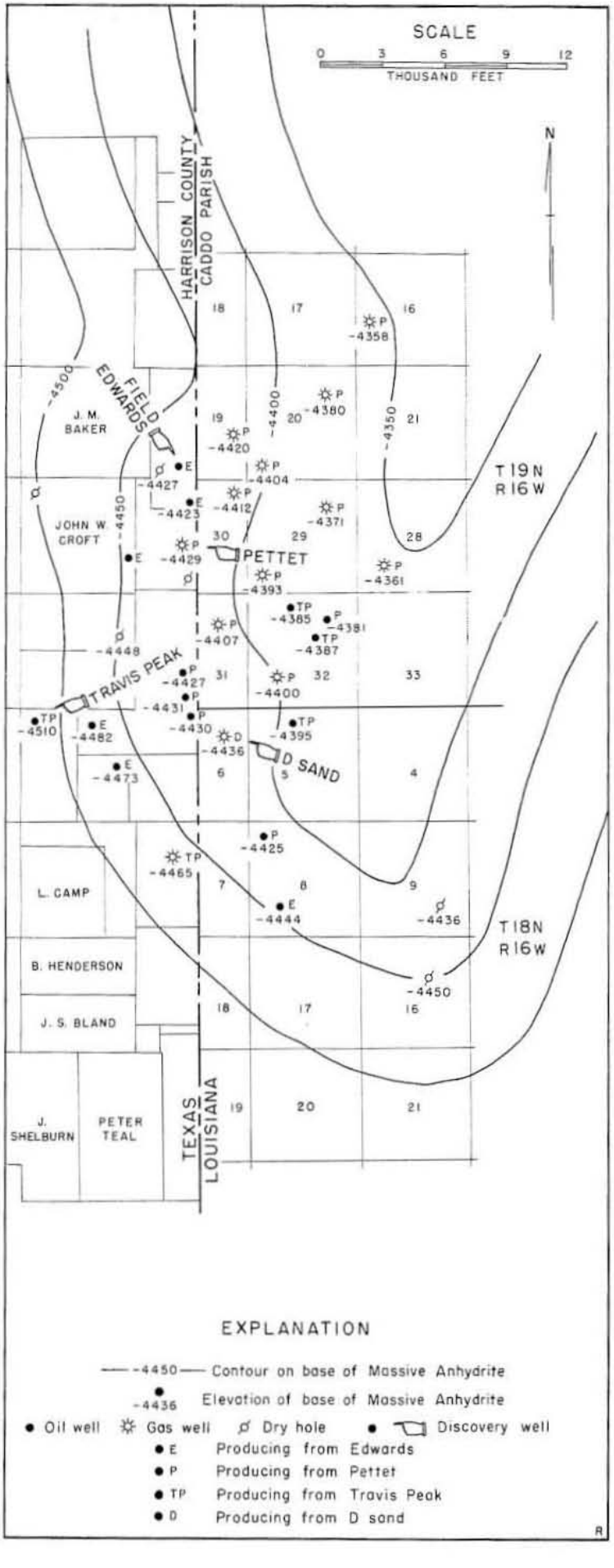
Travis Peak:	
Highest known elevation of gas	?
Lowest known elevation of gas	-5,754
Known relief	?
Highest known, elevation of oil	?
Lowest known elevation of oil	-5,807
Known relief	?

D sand (one well; gas and condensate):	
Elevation of top of productive zone	-7,848
Elev. of bottom of productive zone	-7,896
Relief in the one well	48

PRODUCTION HISTORY

Field totals: Texas portion of field only:

Year	WELLS PRODUCING at end of year: Oil	Gas	OIL PRODUCTION (barrels)	GAS PRODUCTION (barrels)
1948	6	2	45,423	174,152
1949	8	1	42,577	67,948



LOTT FIELD
Falls County, Texas

FORREST W. HOOD
Geologist, The Ohio Oil Company, Shreveport, Louisiana
June 24, 1950

LOCATION

The Lott field is in central Falls County 1½ miles northeast of the town of Lott. It is one of several small fields along faults west of and parallel to the Luling-Mexia-Talco fault system.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Surface mapping of a fault by Marshall A. Hayes in 1935 and acquisition by him of leases covering about 4,000 acres was followed by the drilling of the discovery well by him and A. H. Bell.

DISCOVERY

Buda lime: April 10, 1937; A. H. Bell & M. A. Hayes #1 C. L. Treis, F. Mayhan survey. Pumped and flowed at rate of 36 barrels of oil per day.

ELEVATION OF SURFACE

At well locations: Highest, 519 feet; lowest, 500 feet. The relief in the immediate vicinity of the field amounts to about 60 feet.

SURFACE FORMATIONS

Pecan Gap chalk and Wolfe City sandstone.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

167 feet below top of Travis Peak. This penetration was at the well where the total depth is indicated as 3,025 feet on the accompanying map.

NATURE OF TRAP and STRUCTURE

Accumulation of oil is in a fractured zone along a fault. A combination of fracturing and faulting appears to form a trap for the oil. Closure against the fault may be a factor. Surface strata indicate 25 feet of closure. The few wells do not provide sufficient data for determining the amount of closure at elevation of productive zone.

PRODUCTIVE AREA

Buda lime and Field: 80 acres.

LITHOLOGY OF RESERVOIR ROCK

Buda lime: Chalky limestone. Oil is in crevices in fracture zone only. The limestone is discolored only along fractures.

THICKNESS OF RESERVOIR ROCK

Buda lime: 35 feet.

CONTINUITY OF RESERVOIR ROCK

Buda lime: The fractured condition of the zone is local.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Buda lime:	Feet
Elevation of top of oil	-687 to -719
Elevation of bottom of oil	-722 to -754
Relief	35±

CHARACTER OF OIL

Buda lime:
Gravity, A.P.I.: 29° Base: Paraffin
High kerosene content. Oil congeals at 50° F.

CHARACTER OF GAS

No gas produced.

ACID TREATMENT

Buda lime: Two wells were acidized with 1,000 gallons each at time of completion. Daily production of each was increased; one from 21 to 82 barrels of oil.

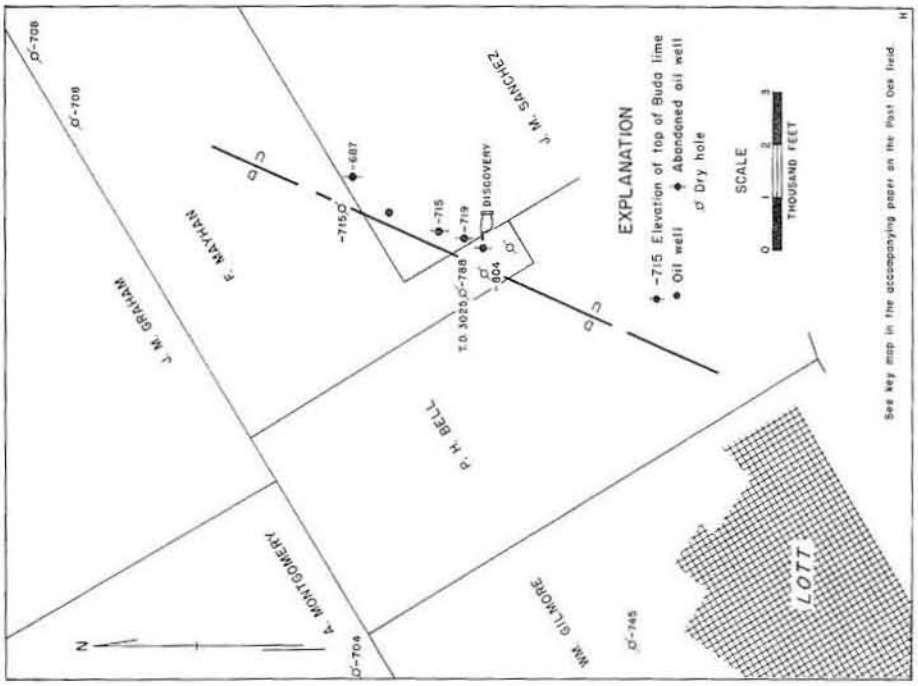
WATER PRODUCTION

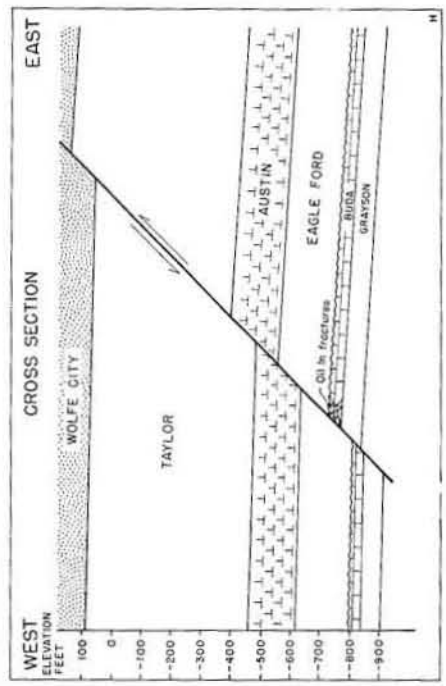
Buda lime: There was no water at first, but soon water appeared and gradually increased. The lone well producing at present produces two barrels of brackish water with each barrel of oil.

PRODUCTION HISTORY

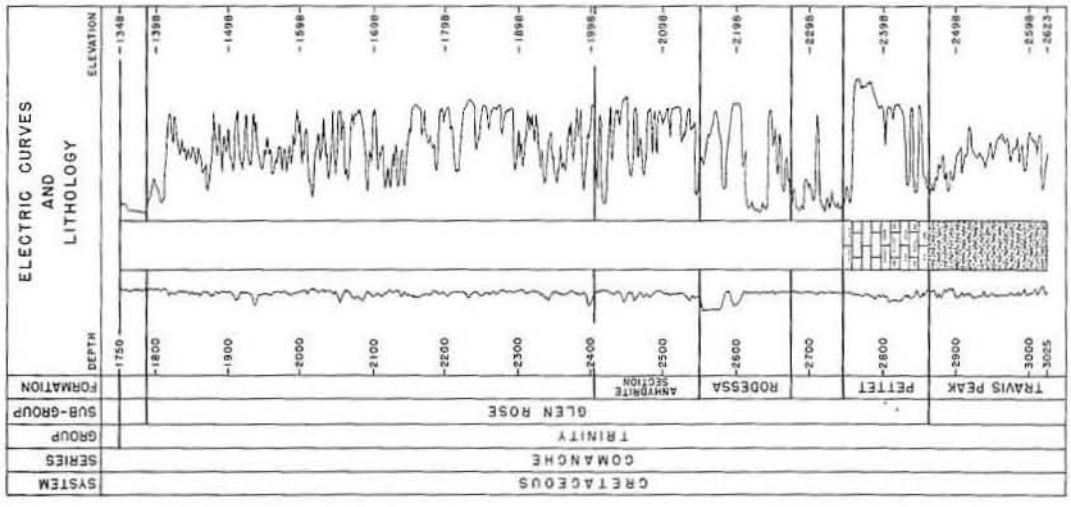
Year	WELLS PRODUCING at end of year: Pumping	OIL PRODUCTION (barrels): Yearly	Cumulative
1937	2	6,078	6,078
1938	3	9,110	15,188
1939	4	7,798	22,986
1940	5	5,663	28,649
1941 & 1942	3	3,250	31,899
1943-1949 incl.	1	5,000±	36,899±

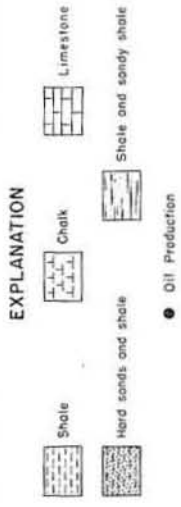
All wells except Yucca Oil Co. #1 Asher (formerly Annie Garrett) had been abandoned by a date early in 1943. This well now averages 10 barrels of oil per day by periodic pumping. The oil is marketed as fuel oil.

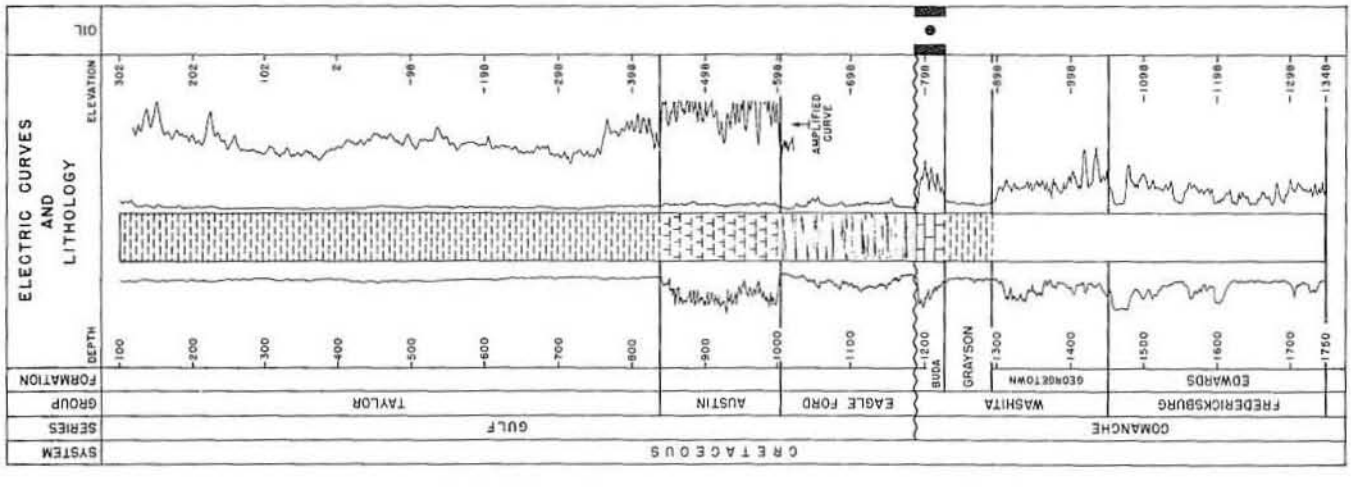




TYPE SECTION OF ROCKS PENETRATED







MANZIEL FIELD
Wood County, Texas

K. A. RING and C. A. WATTS
Exploitation Engineers, Shell Oil Company, Kilgore, Texas
July 14, 1950

LOCATION

The Manziel field is in north-central Wood County 6 miles north-northeast of Quitman, the county seat.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Surface mapping during 1930 indicated a structural nose. A dry Woodbine test drilled in 1934 just outside the present productive area further suggested the presence of structural abnormality. Seismic investigations between 1934 and the drilling of the discovery well (Paluxy, 1943) served to localize the structure. Seismograph work indicated the structure at this location to be a local culmination on the same major structural feature on which the Quitman field is located. Subsequent drilling confirmed the presence of a faulted anticline.

DISCOVERIES

Sub-Clarksville: August 15, 1946;
Rogers Lacy and R. J. Caraway #1-A J. G. Shamburger.
Woodbine: August 14, 1946;
Magnolia Petroleum Co. #2 Malone-Taylor.
Paluxy: April 24, 1943;
Bobby Manziel et al. #1 W. F. Bailey.
Rodessa: March 12, 1944;
Shell Petroleum Corp. #1 J. C. Whatley.
Venters (Pettet): August 31, 1944;
Amerada Petroleum Corp. and Shell Petroleum Corp. #1 Hague-Whatley.

ELEVATION OF SURFACE

At well locations: Highest, 512 ft.; lowest, 423 feet.

SURFACE FORMATIONS

Reklaw, Carrizo and Wilcox beds are exposed within the area of the field.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The deepest test penetrated 445 feet of the Travis Peak formation.

NATURE OF TRAPS

Sub-Clarksville: Composite convex permeability trap.
Woodbine: Fault trap.
Paluxy: Composite convex trap.
Rodessa: Composite convex trap.
Venters (Pettet): Composite convex permeability trap.

STRUCTURE

The structure at the top of the Paluxy formation is indicated on the accompanying map. The structure at the top of the sub-Clarksville sand is parallel, but, of course, the positions of the faults are shifted. The major faults run nearly parallel with the axis of the anticline and dip toward the axis at angles from 45 to 50 degrees. There are several minor faults at the top of the sub-Clarksville sand which die out above the bottom of the Woodbine formation or stop against one of the major faults.

AREAL DISTRIBUTION OF OIL AND GAS

Sub-Clarksville: This zone is productive on the northeast and south-central portions of the anticline where sand development is favorable.

Woodbine: Only one well, located near the apex of the domal anticline, has produced from the Woodbine, and in it Woodbine production has been abandoned.

Paluxy: The Paluxy is productive wherever above water level over the entire area of the field.

Rodessa: The 5 wells which have been completed in the Rodessa formation are on the south and southeast edge of the field. The wells produce from different porous zones. No water levels are apparent.

Venters (Pettet): Only 2 wells produce from this zone and both are at the south edge of the field.

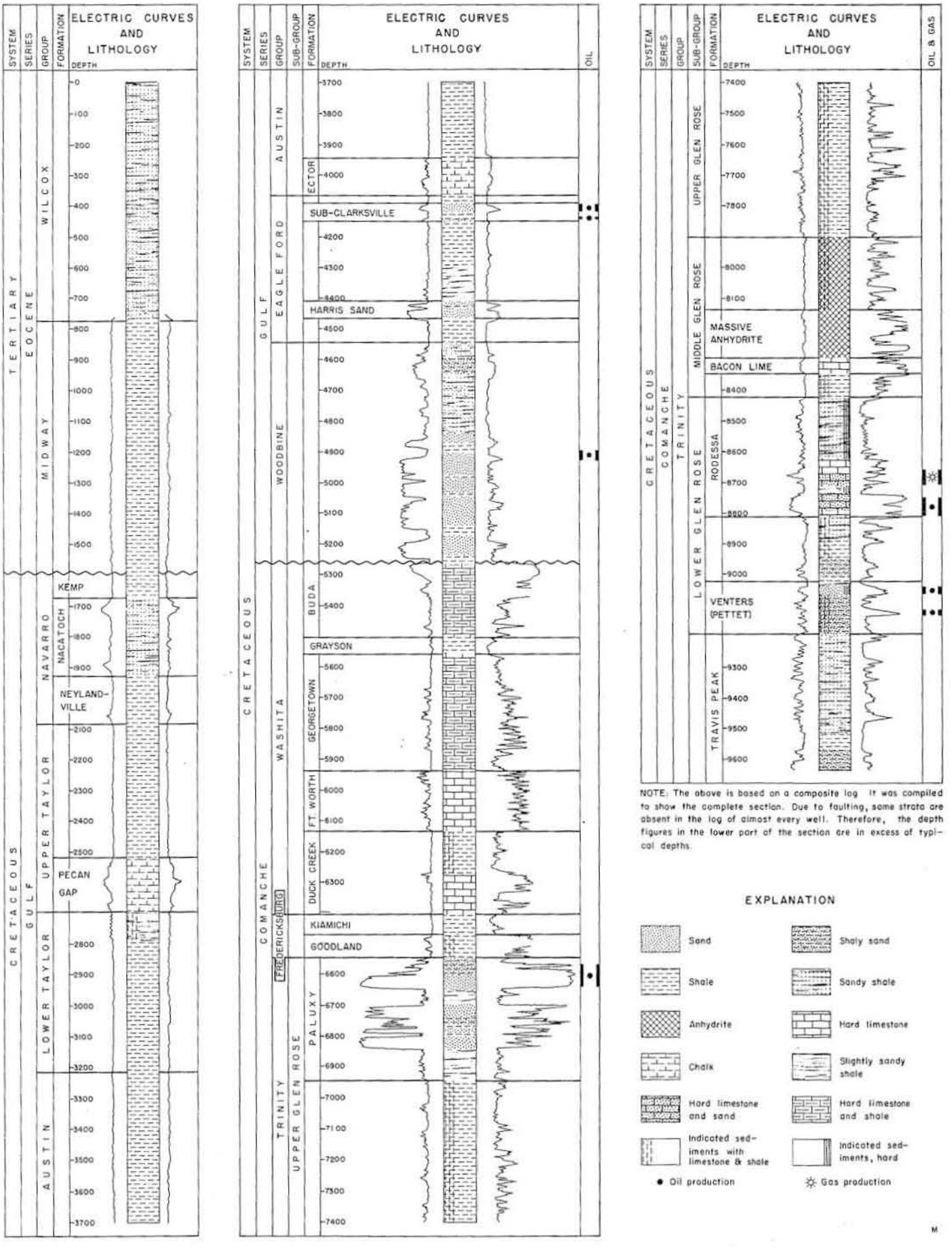
PRODUCTIVE AREAS

	Acres
Sub-Clarksville	800
Woodbine (depleted)	40
Paluxy	1,130
Rodessa	150
Venters (Pettet)	80
Manziel field	1,500

THICKNESSES OF RESERVOIR ROCKS

	Net productive, feet		
	Min.	Max.	Avg.
Sub-Clarksville	0	18	14
Woodbine (one well)			15
Paluxy	4	75	20
Rodessa	24	70	45
Venters (Pettet)	13	24	20

TYPE SECTION OF ROCKS PENETRATED



NOTE: The above is based on a composite log. It was compiled to show the complete section. Due to faulting, some strata are absent in the log of almost every well. Therefore, the depth figures in the lower part of the section are in excess of typical depths.

EXPLANATION

- Sand
- Shaly sand
- Shale
- Sandy shale
- Anhydrite
- Hard limestone
- Chalk
- Slightly sandy shale
- Hard limestone and sand
- Hard limestone and shale
- Indicated sediments with limestone & shale
- Indicated sediments, hard
- Oil production
- Gas production

M

LITHOLOGY OF RESERVOIR ROCKS

Sub-Clarksville: Sand; hard, fine-grained, slightly calcareous and generally very argillaceous to shaly, permeable. Shale occurs in streaks and in spots included in sand. Shale and sand give gray to black mottled appearance. Limy sections are fossiliferous.

Woodbine: Sand; friable, medium-grained, some silty material in pore space, but with good porosity and permeability.

Paluxy: Sand; hard, fine- to medium-grained, well sorted, tight, consolidated, with few shale laminations, carbonaceous inclusions and streaks of fossiliferous limestone, porous and permeable.

Rodessa: Limestone; hard, finely- to medium-crystalline, fossiliferous, with streaks of shaly and sandy limestone, slightly porous.

Venters (Pettet): Sand; very hard, fine-grained, tight, quartzitic, with shale laminations and few limy streaks. Impermeable to slightly permeable.

CONTINUITY OF RESERVOIR ROCKS

Sub-Clarksville: Over most of the field the sand is shaly, non-porous, and rather uniform in thickness; however, on the northeast and south-central portions of the structure there is additional sand development composed of several sand stringers separated by thin streaks of shale.

Woodbine: The Woodbine formation, while continuous throughout the field, is erratically developed, making correlation of the sands difficult. The one Woodbine well produced from a very limited accumulation located against a small fault and in a sand 280 feet below the top of the formation.

Paluxy: The Paluxy formation is characterized by a series of alternating shales and sands and is continuous over the entire field. It has been found to be very erratic and lenticular, lensing out particularly across the crest of the structure and on the south and southeast flanks.

Rodessa: The Rodessa formation contains two major zones of porosity development and as a lithologic unit is indicated to be continuous over the southwestern and south-central portion of the structure where it was tested by 6 wells. However, the position and degree of permeability and porosity development in these zones is highly erratic.

Venters (Pettet): The Venters sand as a lithologic unit is continuous throughout the southwestern and south-central portion of the structure, where it was penetrated by 5 wells. However, the development of permeability, which limits the production, is extremely erratic, as evidenced by the fact that only 2 of these wells found production.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Elevation of oil, feet		Relief,
	Top	Bottom	feet
Sub-Clarksville	-3,561	-3,717	156
Woodbine (one well)	-4,309	-4,329	20
Paluxy	-5,774	-5,939	165
Rodessa	-7,846	?	?
Venters (Pettet)	-8,274	?	?

CHARACTER OF GAS

Rodessa

Component	Mol. %	Gals/Mcf
Methane	88.45	
Ethane	5.46	
Propane	2.23	
Iso-butane	0.79	
N-butane	0.70	
Iso-pentane	0.51	
N-pentane	0.27	
Hexane	0.21	
Heptane plus	0.18	
Carbon dioxide	1.20	
Total	100.00	3.15
Specific Gravity	0.678	

WATER PRODUCTION

Sub-Clarksville and Paluxy: Water encroachment in the fault blocks has been uniform.

Rodessa: No salt water production has been reported from any of the Rodessa completions.

Venters (Pettet): Salt water constitutes about 40% of the current gross production of the one Venters well.

Water disposal: Salt water is injected into the Woodbine sand through a disposal well on the northwest flank of the anticline.

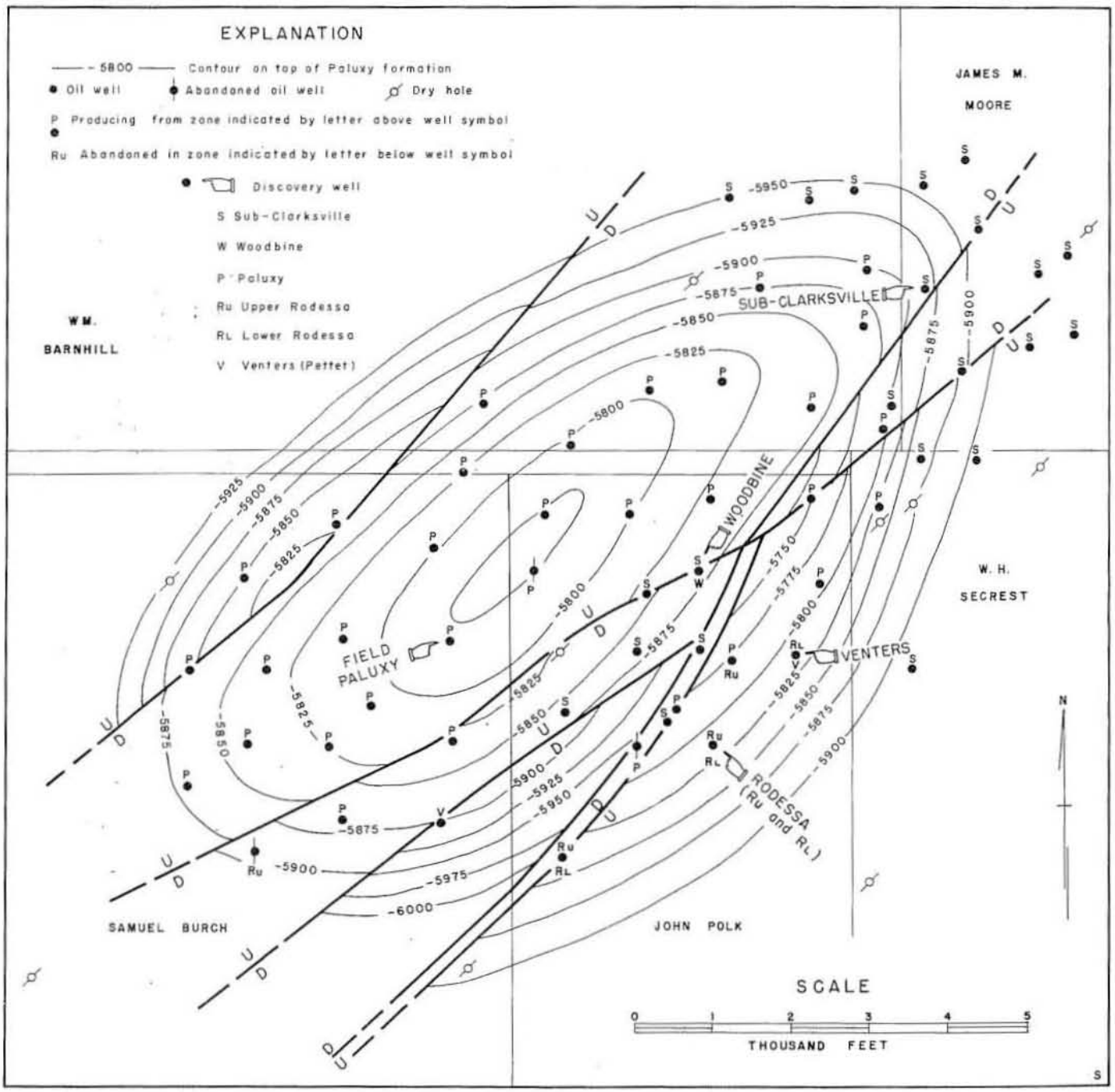
Chloride content, average: Sub-Clarksville, 48,000 ppm.; Woodbine, 55,000 ppm.; Paluxy, 77,000 ppm.

ACID TREATMENT

Acid treatments of from 1,500 to 20,250 gallons have been made on the Rodessa reservoir with no appreciable improvement in productive capacity.

CHARACTER OF OIL

	Gravity (°A.P.I.)	Color	Sulphur (% by wt.)	Viscosity (SU@60°)	Yield (% and gravity) Gasoline	Kerosene	Gas Oil	Residue	Loss
Sub-Clarksville	16.3	Black	3.74	Too visc.	7.8::56.7°	6.2::38.1°	4.1	81.0::10.7°	0.9
Woodbine	26.0								
Paluxy	31.2	Drk. green	1.75	135.1	21.6::61.4°	7.6::44.6°	11.6::36.9°	57.0::19.4°	2.3
Rodessa Cond.	61.1	Colorless	0.02	28.2	90.1::63.2°	8.9::46.2°		1.0::38.1°	0.0
Rodessa Oil	41.8	0.15	0.15	515.0	15.2::58.6°	22.9::48.1°	12.1::42.3°	49.2::34.9°	0.6
Venters (Pettet)	44.1								



DEVELOPMENT AND PRODUCTION HISTORY

Year	NUMBER OF WELLS Completed	Producing oil at end of year Flow.	Artif.	OIL PRODUCTION (barrels) Yearly	Cumulative	GAS PRODUCTION (Mcf) Yearly	Cumulative
Field totals:							
1943	10	7	3	80,568	80,568		
1944	19	18	11	485,666	566,234	30,xxx	30,xxx
1945	3	19	11	537,048	1,103,282	160,709	190,xxx
1946	9	19	19	593,597	1,696,879	176,039	366,xxx
1947	15	17	34	954,687	2,651,566	342,373	709,xxx
1948	3	18	35	946,806	3,598,372	256,175	965,xxx
1949	3	17	38	634,923	4,233,295	432,390	1,397,xxx
Sub-Clarksville							
1946	5	0	5	23,100	23,100		
1947	13	0	18	211,978	235,078		
1948	2	0	18	180,197	415,275		
1949	2	0	20	124,138	539,413		
Woodbine							
1946	1	0	1	4,529	4,529		
1947	0	0	0	3,615	8,144		
1948	0	0	0	0	8,144		
1949	0	0	0	0	8,144		
Paluxy							
1943	10	7	3	80,568	80,568		
1944	16	15	11	474,038	554,606		
1945	1	15	10	509,408	1,064,014		
1946	3	15	13	542,981	1,606,995		
1947	2	15	16	716,561	2,323,556		
1948	1	14	17	749,149	3,072,705		
1949	0	14	17	488,116	3,560,821		
Rodessa							
1944	2	2	0	4,535	4,535	30,xxx	30,xxx
1945	1	2	1	10,772	15,307	160,709	190,xxx
1946	0	2	0	9,746	25,053	176,036	366,xxx
1947	0	0	0	8,733	33,786	342,373	709,xxx
1948	0	2	0	7,114	40,900	256,175	965,xxx
1949	1	3	0	18,291	59,191	432,390	1,397,xxx
Venters (Pettet)							
1944	1	1	0	7,093	7,093		
1945	1	2	0	16,868	23,961		
1946	0	2	0	13,241	37,202		
1947	0	2	0	13,800	51,002		
1948	0	2	0	10,346	61,348		
1949	0	0	1	4,378	65,726		

MARSHALL FIELD
Harrison County, Texas

GERALD H. TEFFT
Geologist, Stanolind Oil and Gas Company, Tyler, Texas
March 15, 1950

LOCATION

The Marshall field is located 3 miles north of Marshall, county seat of Harrison County.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Reflection seismograph by Rogers Lacy led to the purchase of acreage and drilling of the discovery well. It is not known whether other methods of exploration were used by the operator prior to the discovery.

DISCOVERY

Pettet lime: August 15, 1945;
Rogers Lacy #1 J. R. Tuttle.

NATURE OF TRAP

Pettet lime: Unknown. Probably an anticlinal fold.

PRODUCTIVE AREA

One well; area not restricted by dry holes.

THICKNESS OF RESERVOIR ROCK

Pettet lime:	Feet
Top to bottom	273
Net productive	16

LITHOLOGY OF RESERVOIR ROCK

Pettet lime: Gray to tan oolitic and crystalline limestone with streaks of porosity. Shale partings abundant in lower 100 feet.

CONTINUITY OF RESERVOIR ROCK

Pettet lime: Extent of local porosity unknown; however, Pettet lime is commonly a reservoir rock in the general region.

CHARACTER OF OIL

Gravity: 59°

WATER PRODUCTION

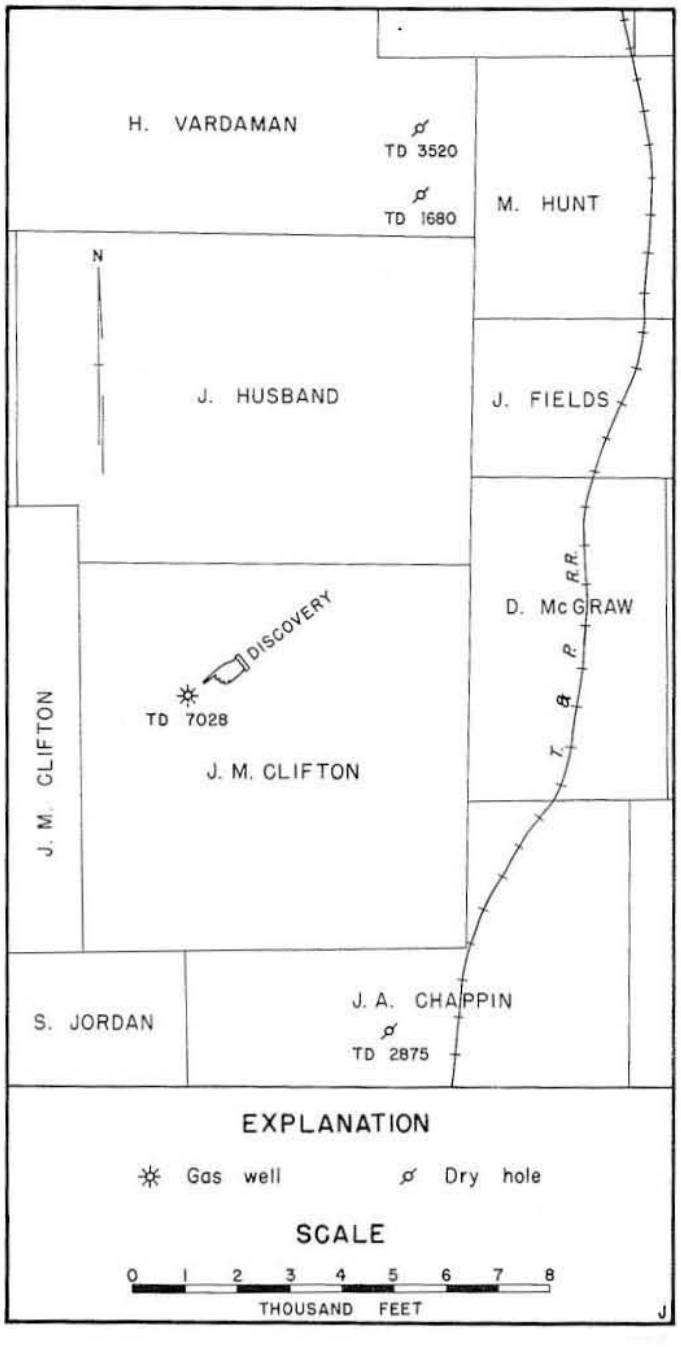
No water has been produced.

ACID TREATMENT

Acidized with 6,000 gallons.

PRODUCTION HISTORY

Through December 31, 1949, a cumulative total of 1,969 barrels of condensate and 174,806 Mcf of gas had been produced.

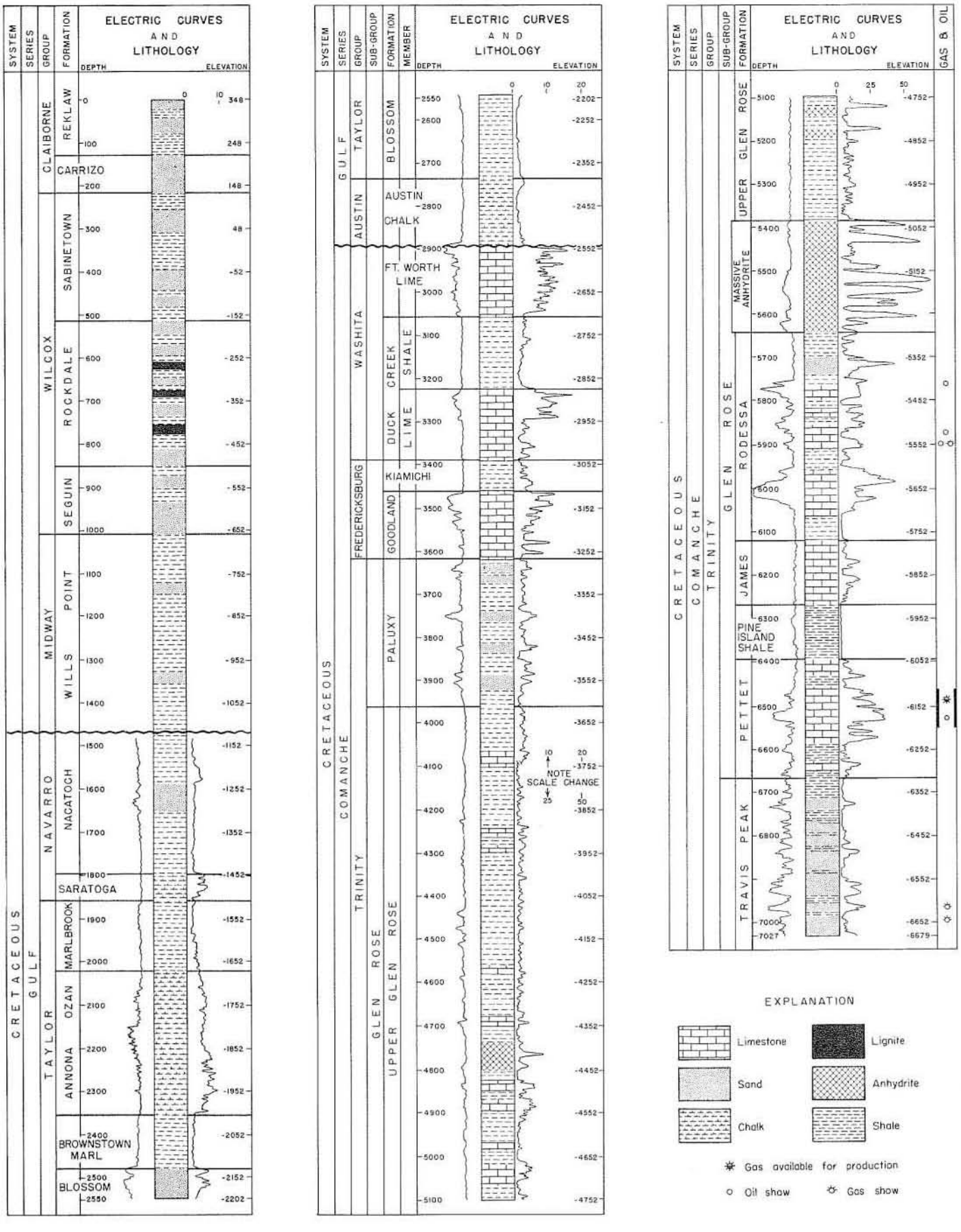


SECTION OF ROCKS PENETRATED

SURFACE FORMATION: Reklaw

OLDEST HORIZON PENETRATED: 359 feet below top of Travis Peak

ELEVATION OF SURFACE: 348 feet



MAYDELLE FIELD
Cherokee County, Texas

N. R. PARK
Geologist, Standard Oil Company of Texas, Dallas, Texas
February 27, 1950

LOCATION

The Maydelle field is situated in the west-central part of Cherokee County 11 miles west of Rusk, the county seat, and 9 miles south-southwest of Jacksonville.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Surface geology and shallow subsurface mapping in 1937 indicated a favorable anticlinal structure having a small amount of closure. A preliminary seismic survey in 1943 confirmed this structure which was further delineated by seismic work during portions of 1944, 1945 and 1946. Leases covering 22,000 acres were acquired in 1944, 1945 and 1946, prior to drilling the discovery well which was supported by dry hole contributions from five other oil companies owning leases in the vicinity of the well.

DISCOVERY

Rodessa limestone: April 24, 1947;
Standard Oil Co. of Texas #1 New Birmingham Development Co.

ELEVATION OF SURFACE

From a detailed topographic map of the area, the field is located on the western slope of a north-south ridge. Maximum and minimum elevations are 680 and 320 feet, respectively.

SURFACE FORMATIONS

Capping the ridges and hills are the red beds of the Weches formation. At both well locations and in the valleys, the Queen City sand outcrops.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The deepest well in the field and near vicinity, Standard Oil Co. of Texas #1 New Birmingham Development Co., was drilled 425 feet into the Travis Peak formation to a total depth of 10,015 feet.

NATURE OF TRAP

Rodessa limestone: The exact nature of the trap is not fully known, since the field is not sufficiently developed as yet to provide all the necessary information. From the two wells drilled to date, the trap is presumed to be a simple convex trap reservoir along an anticlinal fold. It is not yet known whether the numerous small faults in the shallow horizons affect the reservoir or whether porosity variations within the reservoir are trap forming factors. Furthermore, with only two wells having been drilled, the accompanying structure map is largely conjectural. Additional drilling is necessary to determine the shape and size of the structure.

PRODUCTIVE AREA

Rodessa limestone and Field: At present, the productive area appears to be approximately 1,200 acres, but further development will probably increase this estimate.

THICKNESS OF RESERVOIR ROCK

Rodessa limestone: The thickness of the Rodessa limestone in the one well completely penetrating it is 466 feet. Of this, it is estimated that there is a net average of 20 feet of gas-producing, porous limestone above water level.

LITHOLOGY OF RESERVOIR ROCK

Rodessa limestone: Predominantly gray to brownish-gray, dense to crystalline, non-porous, fossiliferous limestone, slightly oolitic in places, with thin, dark gray, interbedded shales. The porous zones consist of tan to brownish-gray, crystalline, porous to slightly porous, fossiliferous, slightly oolitic limestone, having cellular solution type porosity.

CONTINUITY OF RESERVOIR ROCK

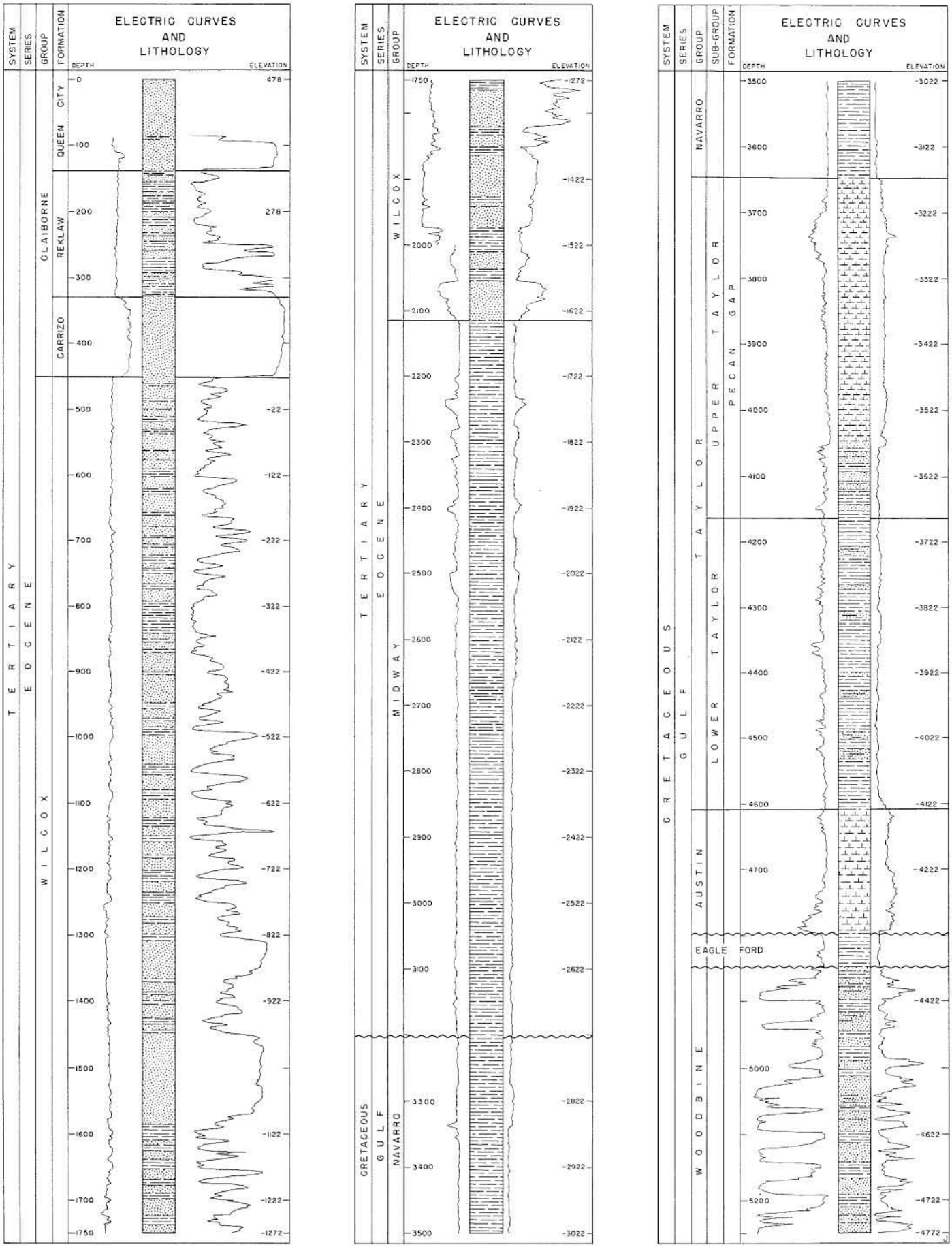
Rodessa limestone: This limestone is continuous over the entire area of the field and is believed to vary only slightly in thickness. However, the porosity and permeability are presumed to be extremely variable.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

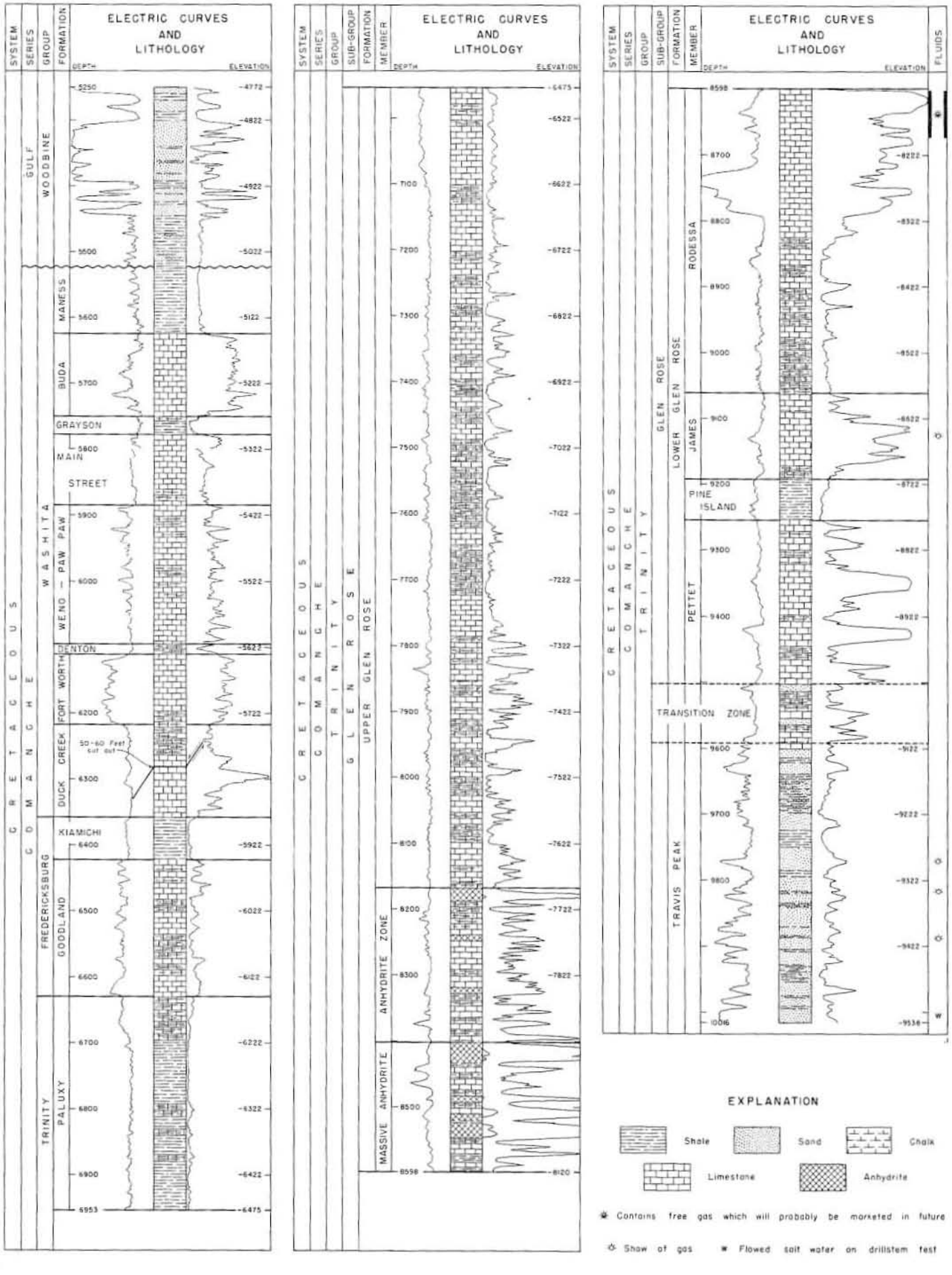
Rodessa limestone	Feet
Elevation of top of gas	-8,108
Elevation of bottom of gas	-8,250
Relief	142

The bottom 100 feet of this column consists chiefly of non-porous limestone with a few thin, porous, gas-bearing limestone beds which, on the basis of the present two-well control, are not indicated to be of commercial value.

TYPE SECTION OF ROCKS PENETRATED



TYPE SECTION OF ROCKS PENETRATED



CHARACTER OF OIL

Condensate; 52° gravity.

CHARACTER OF GAS

The following analysis of a sample of gas taken from Standard Oil Co. of Texas #1 New Birmingham Development Co. is representative of the gas in this field.

Component	%
Carbon dioxide	1.60
Methane	95.49
Ethane	1.78
Propane	0.39
Iso-butane	0.11
N-butane	0.12
Pentanes	0.13
Hexanes	0.13
Heptanes (plus)	0.25

Recoverable liquid	
Propane	?
Iso-butane, g/M	0.036
Heating value	
B.t.u./cf	?
Specific gravity	
at 60° F.	?

WATER PRODUCTION

A small amount of salt water was produced with the gas on flow tests.

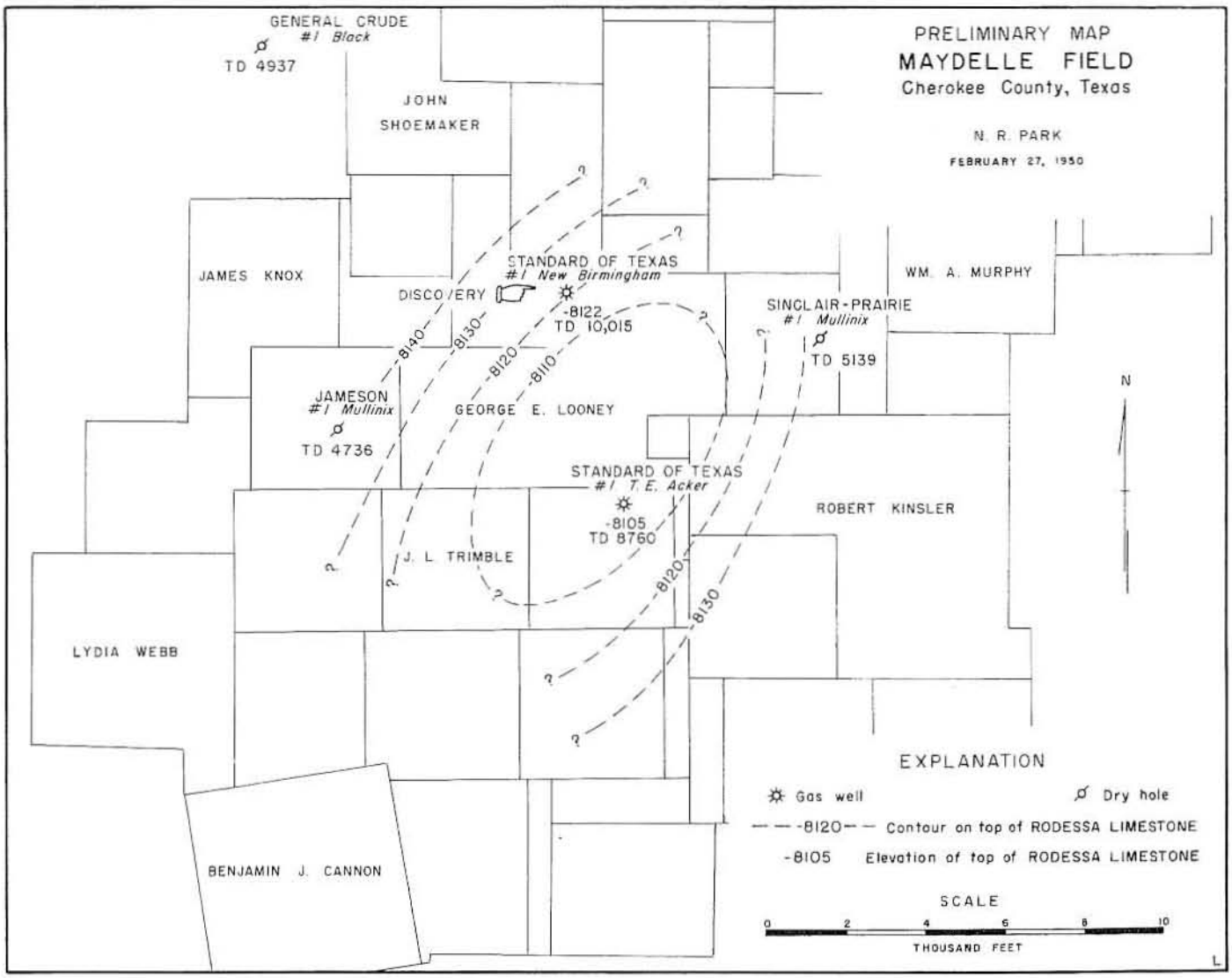
ACID TREATMENT

Rodessa limestone: Acid treatment is necessary to obtain suitable gas production. A minimum of 5,000 gallons has been successfully used in wells completed to date.

PRODUCTION HISTORY

During an initial production test on 5/16-inch tubing choke, the discovery well produced 6,550,000 cubic feet of gas per day; flowing tubing pressure, 3,068 psi.; bottom hole flowing pressure, 4,035 psi. From additional tests, the well indicated a calculated open flow capacity of 147 million cubic feet of gas per day with 3 barrels of condensate per million.

Since completion, both wells have been shut in.



MERIGALE-PAUL FIELD
Wood County, Texas

HASTINGS MOORE
District Geologist, Danciger Oil & Refining Co., Henderson, Texas
July 8, 1949

LOCATION and DEFINITION

The Merigale-Paul field is located in central Wood County and extends, at present, from 4 miles southwest of Quitman, Texas, in a northeasterly direction a distance of 9 miles. The field averages 1/4 mile in width and is 1/2 mile wide at its widest part. The Merigale-Paul field is not completely defined as yet on the northeast end. It includes what was formerly considered as two fields, the Merigale field and the Norman-Paul field.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Following the discovery of Paluxy oil in the Coke field, northern Wood County, in June of 1942, Hugh Millis interested Danciger Oil & Refining Co. in the Oak Grove prospect. Millis used an electrical method of soil analysis which was checked for Danciger by Arnold & Stubenbord using an electrical reflection method. Danciger leased 4,000 acres through the late T. A. Key from the A. Davey survey northeastward including a large part of the Hazard Anderson survey, the greater part of the Seth W. Mitchell survey, and a few leases joining the Mitchell survey to the north and east.

While the Danciger leasing program was progressing, Paluxy oil was also discovered in the Quitman field, 6 miles west, in December of 1942, and in the Manziel field, 3 miles north, in April of 1943, adding greatly to the interest in the area.

Danciger Oil & Refining Co. farmed out a portion of its block to F. R. Jackson and Roy L. Fisher, and, with the help of Barnsdall Oil Co., Phillips Petroleum Co. and Sun Oil Co., Jackson & Fisher drilled #1 O. M. McCarley to a total depth of 7,506 feet, topping the Paluxy sand at 7,283 feet. While the Jackson & Fisher #1 O. M. McCarley was abandoned eventually, it was a very significant test for the area. This test was the first to cut the main Merigale-Paul fault and it had oil showings in the downthrown sub-Clarksville and 130 feet of upthrown Woodbine section saturated with asphaltic oil.

In June of 1944, Allied Oil Co. drilled the second Paluxy dry hole, 1 mile southeast of Quitman on the Reba Chrietzberg land in the J. Ethridge survey. This well was also significant in that it cut the main Merigale-Paul fault between the sub-Clarksville and Woodbine with a throw of 360 feet, as compared with 227 feet throw in the Jackson & Fisher #1 O. M. McCarley.

Bobby Manziel of Tyler, Texas, was the first to become active in playing the trend between the Jackson & Fisher #1 O. M. McCarley and the Allied Oil Co. #1 Chrietzberg. These wells are 4½ miles apart and there was at that time divergence of opinion whether the faults cut in each well were indeed the same. After acquiring acreage through purchase and by farm out, Manziel drilled his #1 V. L. Evans to 6,100 feet, having topped the Comanche lime at 5,995 feet, in December of 1944. Although the electric log was not encouraging, Manziel set pipe and brought in the first sub-Clarksville well in the East Texas district from 4,860-4,944 feet.

Manziel also discovered the Norman-Paul (east) end of the field with his #1 A. L. Amason, drilled on a farm out from Danciger Oil & Refining Co., which resulted in the only successful Woodbine completion in the field to date.

DISCOVERIES

Sub-Clarksville: December 17, 1944;
Bobby Manziel #1 V. L. Evans, J. Stark survey. Pumped 32.4 bbls. oil per day; gravity, 26.2°; gas-oil ratio, 280:1; perforations, 4,860-4,944.
December 3, 1946;
Sun Oil Co. #1 G. L. Clanton, Allen Davey survey. Flowed 180 bbls. oil per day; gravity, 33°; perforations, 4,833-4,850.

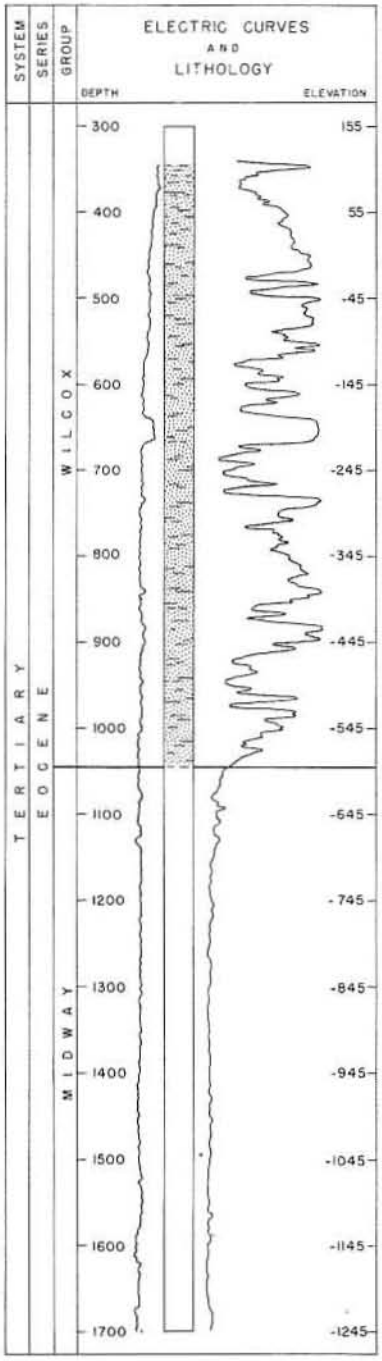
Woodbine: August 29, 1946;
Bobby Manziel #1 A. L. Amason, Hazard Anderson survey. Pumped 264 bbls. oil per day; gravity, 17.5°; gas-oil ratio, 20:1 estimated; perforations, 5,235-5,245 and 5,466-5,488.

STRUCTURE

The dominant feature of the Merigale-Paul field is a system of northeast-southwest faulting on an almost perfect southeast dipping monocline. The main fault against which production occurs is a low-angle down-to-north fault with the hade varying from 48° to 64° and averaging 58° (dip, 32°). There are several gulfward faults, although there is only one such fault on the line of the accompanying cross section, which accurately depicts the structural conditions where the field is widest (note that horizontal and vertical scales are equal).

The strata dip away from the main fault at rates from 500 to 550 feet per mile. Such high dips are abnormal for the district and are probably largely due to the proximity of the rim syncline around the Hainesville salt dome, the rim of the salt intrusive mass being only 4.25 miles southeast of the Merigale-Paul field at its closest point.

TYPE SECTION OF ROCKS PENETRATED



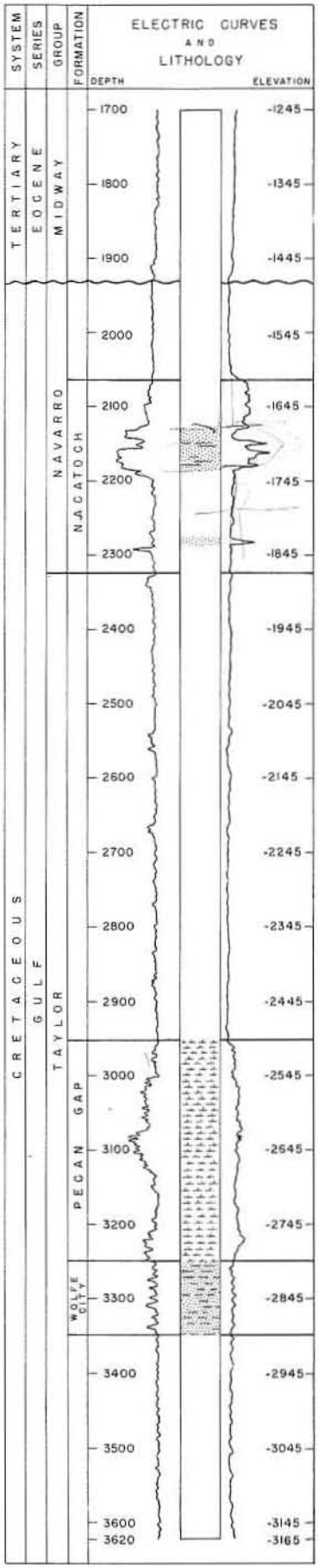
EXPLANATION

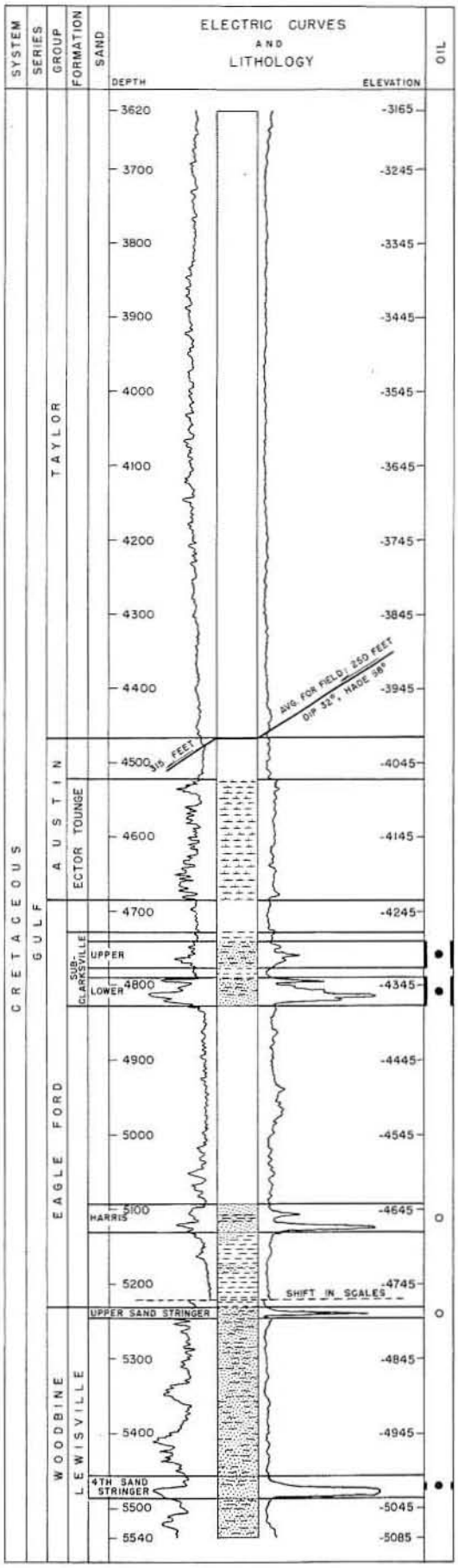
Shale | Sand | Chalk

● Oil production ○ Show of oil

SURFACE FORMATION: Queen City

ELEVATION OF SURFACE: Highest, 505 feet; lowest, 335 feet





NATURE OF TRAPS

Sub-Clarksville: The primary trapping factor is updip termination of reservoir by faulting. At the southwest end, the trap is closed by decrease of porosity and permeability due to presence of ash in the reservoir rock. The trapping factor at the northeast limit is the water table meeting the fault zone as the fault zone strike turns eastward.

Woodbine: The trap is formed by (a) updip termination of reservoir by faulting, and (b) decrease of porosity and permeability.

PRODUCTIVE AREAS

	Acres
Sub-Clarksville	1,100+
Woodbine	10
Merigale-Paul field	1,110+

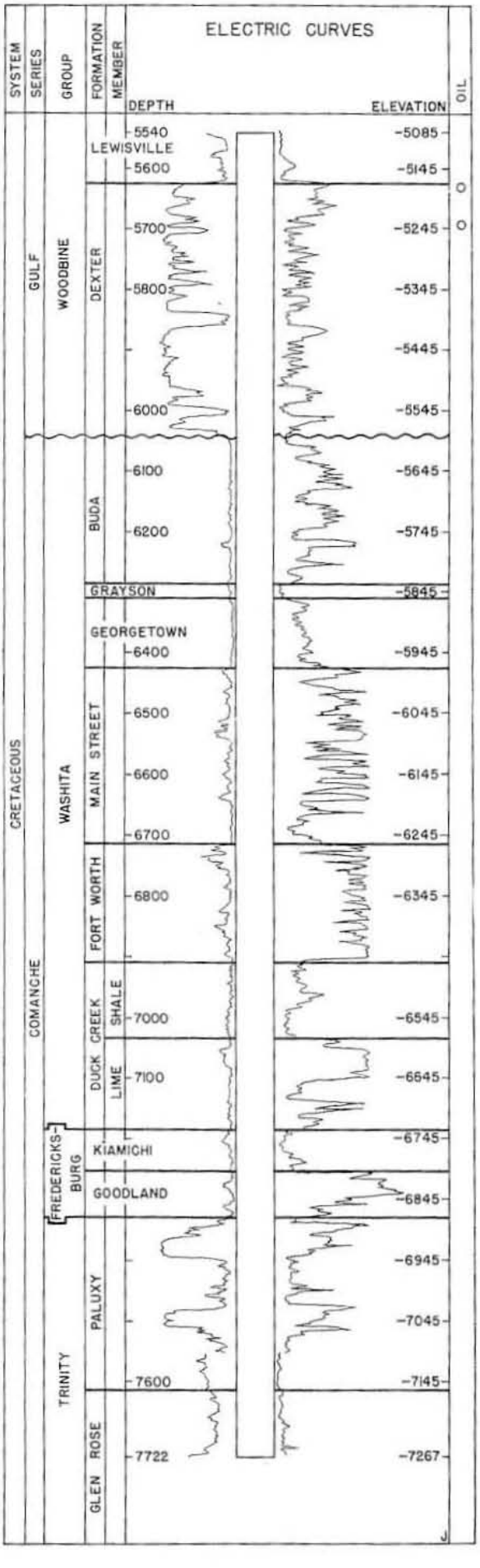
While the productive area of the sub-Clarksville reservoir is now approximately 1,100 acres, it must be understood that this field is not yet completely defined at the northeast end and that some acreage will be added as development occurs

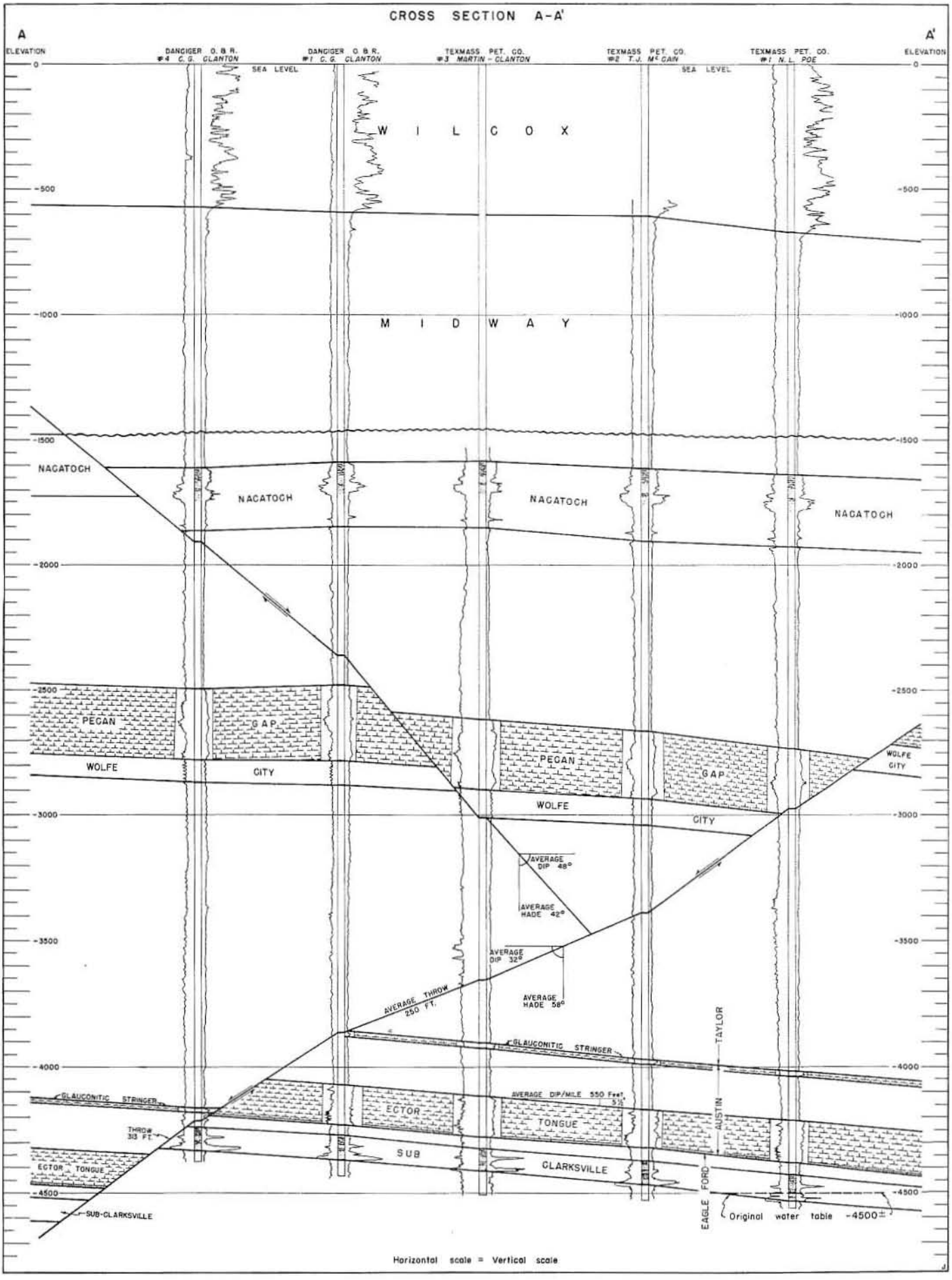
While several tests of the Woodbine sand in the vicinity of the one productive well have been failures, the writer feels that different completion methods will result in successful Woodbine wells covering several hundred acres. At present, however, 10 acres is the correct figure for proven area in the Woodbine sand.

ADDITIONAL SECTION PENETRATED

Three wells outside the area of the field, but within a half mile of its northwest boundary, have tested, at structurally favorable locations, strata down to about 2,200 feet below the oldest horizon shown in the type section on the opposite page. Two of these wells (Jackson & Fisher #1 O. M. McCarley and Allied Oil Co #1 Reba Chrietzberg) were drilled about 200 feet into the Paluxy formation and the other (Weiner et al. #1 E. P. Fouse), after crossing a fault in the Paluxy, was drilled 98 feet into rocks of Glen Rose age. In one or the other of these wells, each penetrated horizon below the top of the Woodbine group was encountered on the upthrown side of the main fault.

The additional section penetrated by these wells is illustrated in the following graph, which was composed from the logs of Jackson & Fisher #1 O. M. McCarley and Weiner et al. #1 E. P. Fouse. The indicated depths and elevations are such as would result in continuing downward the type section on the opposite page. Actually, the rocks indicated as between the elevations of -5,085 feet and -7,106 feet were encountered between the elevations of -5,005 feet and -7,026 feet (elevation of total depth) in Jackson & Fisher #1 O. M. McCarley, and the rocks indicated as between the elevations of -7,106 feet and -7,267 feet were encountered between the elevations of -6,898 feet and -7,059 feet (elevation of total depth) in Weiner et al. #1 E. P. Fouse.




CROSS SECTION A-A'
A
A'
ELEVATION
DANCIGER O. & R. #4 C. G. CLANTON
DANCIGER O. & R. #1 C. G. CLANTON
TEXMASS PET. CO. #3 MARTIN - CLANTON
TEXMASS PET. CO. #2 T.J. McCAIN
TEXMASS PET. CO. #1 N.L. POE
SEA LEVEL
WILCOX
MIDWAY
NACATOCH
PEGAN
GAP
WOLFE CITY
AVERAGE DIP 48°
AVERAGE HADE 42°
AVERAGE DIP 32°
AVERAGE HADE 58°
AVERAGE THROW 250 FT.
GLAUCONITIC STRINGER
AVERAGE DIP/MILE 550 Feet, 5½
ECTOR TONGUE
SUB CLARKSVILLE
THROW 313 FT.
SUB-CLARKSVILLE
TAYLOR
AUSTIN
EAGLE FORD
Original water table -4500±
Horizontal scale = Vertical scale

(Attach folded page No. 227)

LITHOLOGY OF RESERVOIR ROCKS

Sub-Clarksville:

Upper sand: Streaks of sandy shale and coarse clean sand, saturated throughout, carrying streaks of pyrite locally. The clean sand streaks are for the most part a foot or less in thickness but are present in all wells. In a few wells several of these streaks of clean sand merge into a solid body as much as 12 feet in thickness, but this is the exception rather than the rule.

Lower sand: Medium-grained fine sand grading laterally to sandy shale in certain areas.

Woodbine:

Upper sand stringer: Fine tight hard light brown calcareous sand. This stringer is characterized by high resistivity throughout the district, and has been non-productive, and for that reason the writer considers it non-productive in the Manziel #1 A. L. Amason, despite the amber color of the sand.

4th sand stringer: Medium-grained dark brown sand heavily saturated with black oil. While this stringer is productive in only Manziel #1 A. L. Amason, it occurs in nearby wells, where it is highly bentonitic and saturated. It appears that generally the ash content precludes commercial production and that at the location of the only producer the ash content is abnormally low.

RESERVOIR ENERGY

Sub-Clarksville: Expansion of gas in solution, plus possibly a limited water drive.

Woodbine: The nature of energy in this reservoir is difficult to determine because of lack of data. Because of abundant water in nearby Woodbine tests, it is believed that this reservoir enjoys at least some water drive as well as expansion of solution gas.

THICKNESSES OF RESERVOIR ROCKS

	Feet		
	Min.	Max.	Avg.
Sub-Clarksville			
Upper sand			
From top to bottom	10	25	15
Net productive	0	25	8
Lower sand			
From top to bottom	10	30	20
Net productive	0	30	15
Woodbine			
Upper sand stringer			
From top to bottom	8	8	8
Net productive	0	0	0
4th sand stringer			
From top to bottom	17	17	17
Net productive	17	17	17

CONTINUITY OF RESERVOIR ROCKS

Sub-Clarksville: Both the upper and lower sands grade laterally into sandy shales as shown by the electric curves on an accompanying folded plate, where the electric logs are adjusted to the Austin-Eagle Ford contact so that the lithologic changes in the sub-Clarksville may be seen diagrammatically.

Woodbine: The Lewisville Woodbine is a blanket formation present in all the surrounding district. However, the lithologic feature which occasions one of its members being a reservoir rock appears to be quite local.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Sub-Clarksville	Woodbine
Elevation of top of oil, feet	-4,275	-4,983
Elevation of bottom of oil, feet	-4,500	-5,003
Relief, feet	225	20

The above figures represent conditions at time of discovery. Encroachment of water in the sub-Clarksville reservoir varies widely in the different sand lentils because of widely varying porosities and permeabilities.

There is no gas cap, but two or three wells in the Shamburger area, John Ethridge survey, which were perforated in the upper sand in the sub-Clarksville reservoir are high-ratio wells.

(Attach folded page No. 229)

CHARACTER OF OIL

Sub-Clarksville: The gravity varies from 23° to 35° A.P.I., the lower gravities being found in the structurally lower wells.

Woodbine: The gravity of the Woodbine oil is 15.5° A.P.I.

ACTUAL REFINERY BREAKDOWN OF 29.8° A.P.I. MERIGALE-PAUL CRUDE OIL*

Yields while making straight-run gasoline

Product	Yield %
Straight-run gasoline	25.60
Range oil (kerosene)	11.90
Regular gasoline	12.70
Premium gasoline	4.00
Fuel	13.00
Asphalt	28.80
Loss	4.00

Yields while making naphtha

Product	Yield %
Natural gasoline	2.28
210 naphtha	4.56
Light VM&P naphtha	4.73
Special VM&P naphtha	4.92
80 special naphtha	3.43
Stoddard naphtha	5.68
Range oil (kerosene)	11.90
Regular gasoline	12.70
Premium gasoline	4.00
Fuel	13.00
Asphalt	28.80
Loss	4.00

ACTUAL REFINERY BREAKDOWN OF 15.5° A.P.I. WOODBINE CRUDE OIL FROM WOOD COUNTY*

Yields while making straight-run gasoline

Product	Yield %
Straight-run gasoline	7.00
Range oil (kerosene)	7.80
Regular gasoline	8.30
Ethyl gasoline	2.60
Fuel	8.70
Asphalt	61.60
Loss	4.00

Yields while making naphtha

Product	Yield %
Natural gasoline	0.61
Textile naphtha	1.25
Light VM&P naphtha	1.31
Special VM&P naphtha	1.34
80 special naphtha	0.95
Stoddard naphtha	1.54
Range oil (kerosene)	7.80
Regular gasoline	8.30
Ethyl gasoline	2.60
Fuel	8.70
Asphalt	61.60
Loss	4.00

*Furnished by Mr. M. R. Ryan, Talco Refinery, Mt. Pleasant, Texas.

CHARACTER OF GAS

Gas-oil ratios are so low, about 200:1, that it is not practical to save the small amounts of gas produced. Analysis of the flared gas is not available at this time.

WATER PRODUCTION

Approximately half of the wells were producing some water as of January 1, 1949. Records of quantities of water produced are not available. The quantities are so small that small evaporating pits serve adequately for disposition.

ACID TREATMENT

No acid has been required in this field.

PRODUCTION HISTORY

	WELLS PRODUCING at end of year		OIL PRODUCTION (barrels)	
	Flowing	Pumping	Yearly	Cumulative
Field totals				
1944	0	1	730	730
1945	6	2	90,832	91,562
1946	15	10	343,243	434,805
1947	18	77	767,631	1,202,436
1948	0	137	1,616,254	2,818,690
1949(P.S.)	0	166	998,265	3,816,955
Sub-Clarksville				
1944	0	1	730	730
1945	6	2	90,832	91,562
1946	15	9	328,221	419,783
1947	18	76	746,200	1,165,982
1948	0	136	1,595,347	2,761,329
1949(P.S.)	0	165	986,062	3,747,391
Woodbine				
1946	0	1	15,023	15,023
1947	0	1	21,431	36,454
1948	0	1	20,907	57,361
1949(P.S.)	0	1	12,203	69,564

MEXIA FIELD
Limestone County, Texas

JAMES S. HUDNALL
Geologist, Hudnall & Pirtle, Tyler, Texas
July 6, 1950

LOCATION

The Mexia field is in northern Limestone County near the town of Mexia. It is one of the many fields in the Luling-Mexia-Talco fault zone.

DATA CONCERNING NACATOCH PRODUCTION

The Nacatoch sand was an important producer of gas prior to the discovery of oil in the Woodbine. Gas was discovered in the Nacatoch in 1912 and, although it appeared to be essentially depleted when oil was discovered in the Woodbine in 1920, a few wells have continued to produce even to this date. There are approximately 8 wells still producing gas from the Nacatoch sand. Within about two years after discovery, there were approximately 50 wells producing from this shallow sand, and from time to time since then a few additional wells have been added.

Since the data concerning Nacatoch are meagre and commonly confused through combining with Nacatoch data for nearby fields, particularly North Groesbeck and South Groesbeck, the treatment of Nacatoch is neglected under the following headings. For data concerning the Nacatoch, the reader is referred to the papers by Lahee, Ley & Willson and Matson listed below under SELECTED REFERENCES.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Woodbine sand: The discovery well was located as a result of surface and sub-surface mapping.

DISCOVERIES

Woodbine - Main sand: October 1920; Mexia Oil & Gas Co. and A. E. Humphreys #1 L. W. Rogers. Completed as a pumper making about 150 barrels of oil per day, with 35 barrels of water, from sand between 3,065 to 3,117 feet below the surface.

Woodbine - Kollman sand: August 1922; Humphreys Oil Co. #9 Kollman. In the process of deepening, this well found the lower Woodbine "pay" at 3,193 feet, about 280 feet below the top of the Woodbine formation. Subsequent development showed that this, the lower of the two oil-bearing Woodbine sandstones, was productive of oil and gas over only a small part of the field and no attempt was made to separate production in this zone from that in the main producing sand.

Glen Rose limestone: June 1927; E. L. Smith #1 Jake Steubenrauch. This well blew in while drilling at a depth of 5,732 feet and produced wet gas for a short time at the rate of approximately 10,000 Mcf per day. No wells however, produced oil or gas at commercial rates from any zone below the Kollman sand in the Woodbine formation.

ELEVATION OF SURFACE

Surface elevations vary from 503 to 576 feet.

SURFACE FORMATION

The Tehuacana limestone of the Kincaid formation of the Midway group outcrops at the surface.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest stratigraphic horizon penetrated within the area of the field is 27 feet below the top of the Smackover. This penetration was in Jack Frazier et al. & Wm. A. Reiter #1 Steubenrauch at its total depth of 9,157 feet.

NATURE OF TRAP

Woodbine sand: The trap is due to a combination of convex folding and termination of reservoir against a fault. The dominating structural feature is a down-to-the-west fault with 600 feet of displacement. Hydrocarbons have accumulated in the reservoir rocks on the upthrown side of the fault where fluid migration is influenced by folding and faulting.

PRODUCTIVE AREA

Woodbine sand: 3,800 acres.

THICKNESS OF RESERVOIR ROCK

	Feet		
Woodbine - Main sand:	Min.	Max.	Avg.
Net productive	12	78	40

LITHOLOGY OF RESERVOIR ROCKS

Woodbine sand: There are two sand stringers 5 to 7 feet thick separated from the main pay zone by shale breaks. One of these is at the top of the Woodbine formation and the other is 30 feet below the top of the Woodbine formation. These upper pay zones have low permeability and little or no water drive. They yielded oil in commercial quantities in some wells on the flank of the structure. The main pay sand occurs 60 feet below the top of the Woodbine formation, has an average porosity of 28% and a high permeability. Although electrical logs indicate that shale partings constitute 10 to 20% of the main sand zone, it is evident that it is a fairly uniform body of sand averaging about 41 feet in thickness. The Kollman sand is in the lower part of the Woodbine formation 280 feet below its top and is separated from the main pay zone by a shale bed approximately 110 feet thick. It has very high porosity and permeability. It was productive of oil and gas over only a small part of the field.

CHARACTER OF OIL

Woodbine sand: Gravity, A.P.I.: 35 - 37° Base: Paraffin-intermediate.

Following is a transcription of data presented on page 70 of the U. S. Bureau of Mines R.I. 3712:

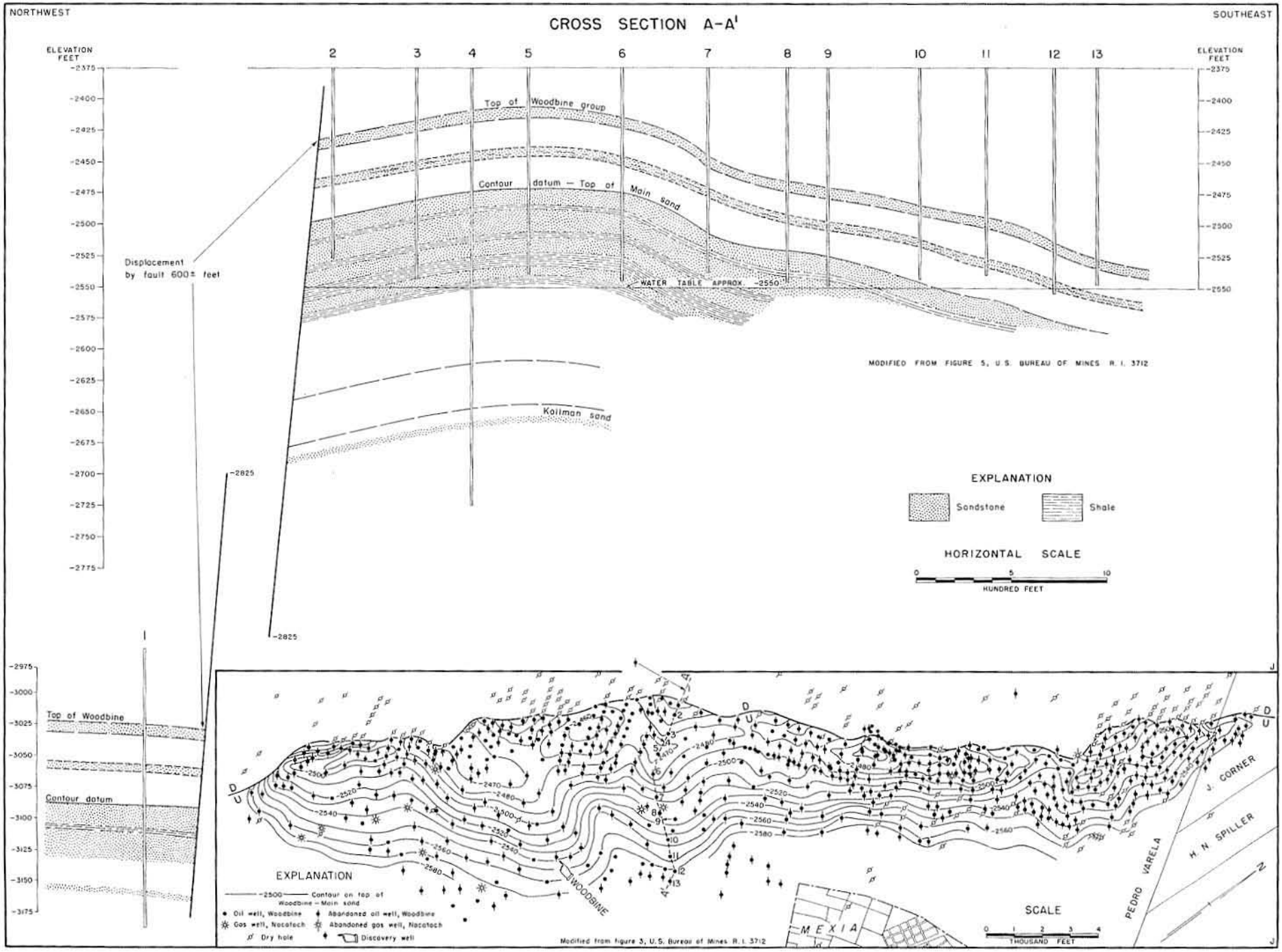
TABLE 25. - Condensed analyses* of crude oil from the Woodbine formation, Mexia oil field, Limestone County, Texas

Sample No. Bu. Mines	244**	38,332***
Date sample obtained	Apr. 1921	July 1938
Depth of well, feet below surface	3,000-3,100	3,027
Specific gravity	0.847	0.841
Sulfur, percent	.190	.23
Saybolt universal viscosity at 100° F., sec.	46.0	44.0
Gravity, A.P.I.	35.6	36.8
Pour point, °F	21.0	
Color	Brownish black	Greenish black
Base of crude	Paraffin - inter	
Total gasoline and naphtha, percent	17.3	17.9
Kerosene distillate, percent	28.4	28.5
Gas-Oil, percent	14.8	15.9
Nonviscous lubricating distillate, percent	12.5	12.1
Medium lubricating distillate, percent	7.2	6.3
Viscous lubricating distillate, percent	-	-
Residuum, percent	16.8	18.3
Distillation loss, percent	7.0	1.0

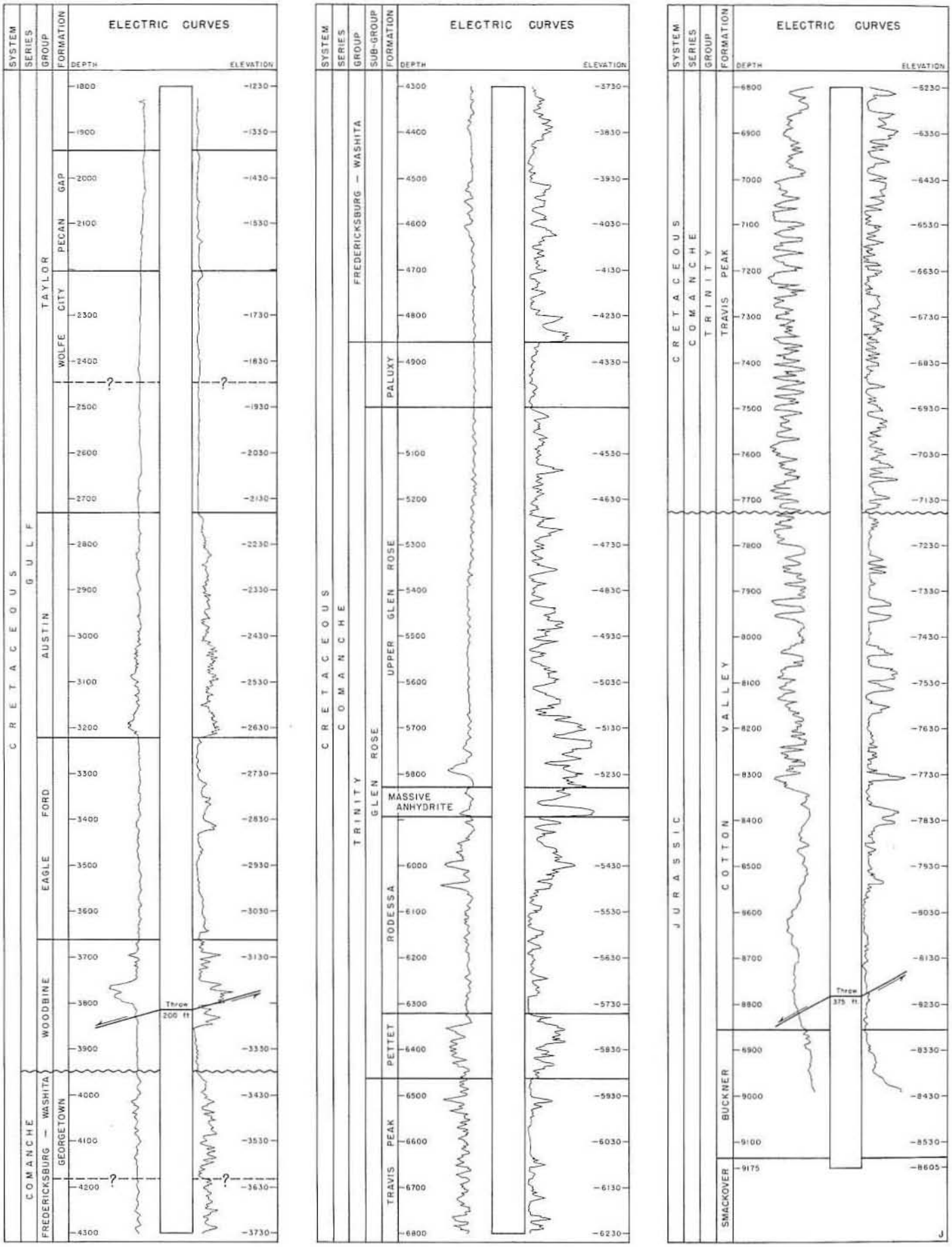
*Analyses by Bureau of Mines Experimental Laboratory, Bartlesville, Oklahoma.
**Composite sample (Bu. Mines Bull. 291, 1928, p. 19).
***Pure Oil Co., West Bertheleson No. 21.

For analyses see:

U. S. Bureau of Mines	Laboratory reference No.	705 & 244	38332
Properties of Typical Crude Oils from the Producing Fields of Northern Texas, Northern Louisiana and Arkansas. R. I. 2293 (1921)	Item	705	
Tabulated Analyses of Representative Crude Petroleums of the United States. Bulletin 291 (1928)	Item	244	
Tabulated Analyses of Texas Crude Oils. R. I. 3252 (1934)	Group 4, Item	31	
Tabulated Analyses of Texas Crude Oils. T.P. 607 (1939)	Group 4, Item	41	42


NORTHWEST
SOUTHEAST
CROSS SECTION A-A'
ELEVATION FEET
Top of Woodbine group
Contour datum — Top of Main sand
Displacement by fault 600± feet
WATER TABLE APPROX. -2550'
Kolliman sand
MODIFIED FROM FIGURE 5, U.S. BUREAU OF MINES R.I. 3712
EXPLANATION
Sandstone
Shale
HORIZONTAL SCALE
HUNDRED FEET
Top of Woodbine
Contour datum
EXPLANATION
Contour on top of Woodbine — Main sand
Oil well, Woodbine
Gas well, Nacatoch
Dry hole
Abandoned oil well, Woodbine
Abandoned gas well, Nacatoch
Discovery well
WOODBINE
MEXIA
PEDRO VARELA
J. CORNER
H. N. SPILLER
SCALE
THOUSAND FEET
Modified from figure 3, U.S. Bureau of Mines R.I. 3712

TYPE SECTION OF ROCKS PENETRATED



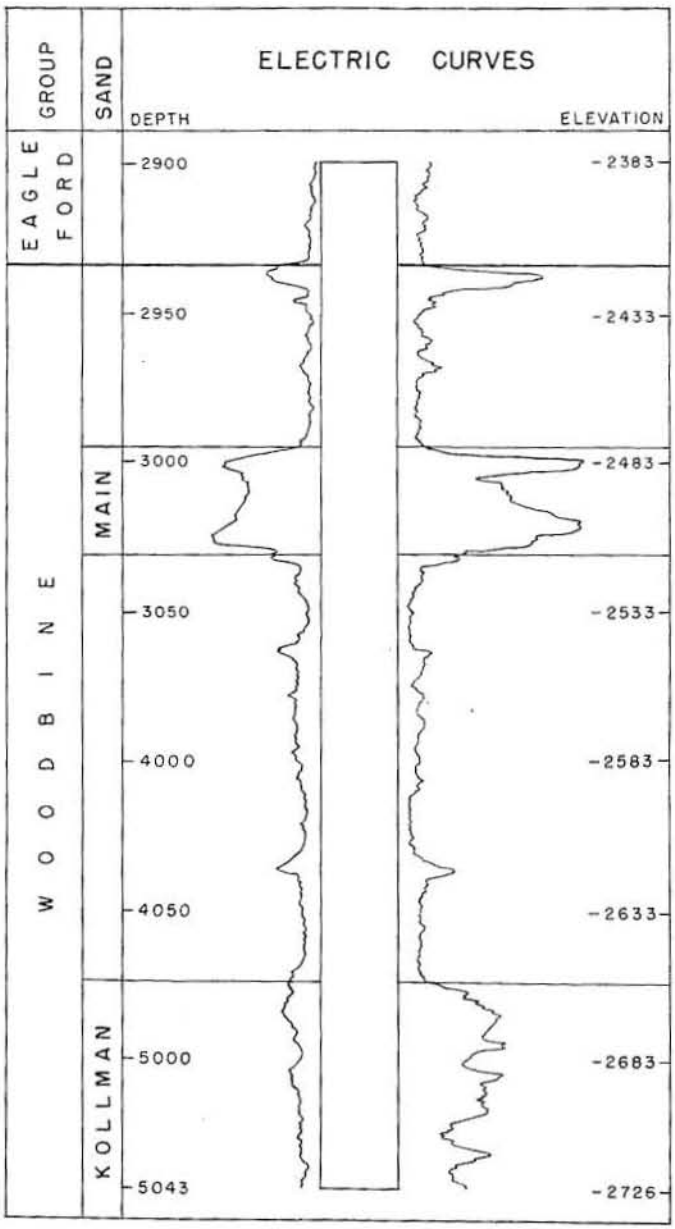
ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine - Main sand:	Feet
Elevation of top of oil	2,440
Elevation of bottom of oil	2,550
Relief	110

RESERVOIR ENERGY

Woodbine sand: With exception as to the two sand stringers above the main pay sand, the chief source of energy was through encroachment of water. There was some gas in solution.

TYPICAL WOODBINE SECTION



SELECTED REFERENCES

Hill, H. B., and Guthrie, R. K. (1943) Analysis of oil production in the near-depleted Mexia-Powell fault-line fields of Texas: U. S. Bureau of Mines, R. I. 3712, 83 pages, 30 figures.

Lahee, Frederic H. (1929) Oil and gas fields of the Mexia and Tehuacana fault zones, Texas: Amer. Assoc. Petr. Geol., Structure of Typical American Oil Fields, vol. 1, pp. 304 - 388.

Ley, H. A., and Willson, K. M. (1935) Gas fields in northeast Texas embayment: Amer. Assoc. Petr. Geol., Geology of Natural Gas. pp. 651-681.

Matson, George C. (1916) Gas prospects south and southeast of Dallas: U. S. Geol. Survey, Bull. 629, pp. 77 - 119.

PRODUCTION HISTORY

Woodbine sand:

Year	WELLS PRODUCING Average number	OIL PRODUCTION (barrels) Yearly	Cumulative
1921		5,783,236	5,783,236
1922	417	33,937,513	39,720,749
1923	532	18,054,276	57,775,025
1924	503	10,466,567	68,241,592
1925	455	6,700,466	74,942,058
1926	432	4,769,731	79,711,789
1927	428	3,622,390	83,334,179
1928	423	2,517,744	85,851,923
1929	409	1,908,247	87,760,170
1930	380	1,532,178	89,292,348
1931	355	1,156,379	90,488,727
1932	322	950,362	91,399,089
1933	294	839,273	92,238,362
1934	287	783,173	93,021,535
1935	278	800,208	93,821,743
1936	266	766,284	94,588,027
1937	263	701,583	95,289,610
1938	250	669,752	95,959,362
1939	236	607,075	96,566,437
1940	219	567,229	97,133,666
1941	217	575,532	97,709,198
1942	211	569,560	98,278,758
1943	203	516,409	98,795,167
1944	188	502,687	99,297,854
1945	186	486,731	99,784,585
1946	163	474,148	100,258,733
1947	155	475,439	100,734,172
1948	149	414,640	101,148,812
1949	138	378,604	101,527,416

MINEOLA FIELD
Wood County, Texas

HASTINGS MOORE
District Geologist, Danciger Oil & Refining Company, Henderson, Texas
June 20, 1950

LOCATION

The Mineola field is in southwestern Wood County 4½ miles west of Mineola. It is 2 miles southwest of the Nolan Edward field. It is near the trend of the Merigale-Paul field.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Seismograph and subsurface mapping.

DISCOVERY

Sub-Clarksville: July 14, 1949; F. R. Jackson et al. #1 Joe Carr, James Colson survey. On initial test pumped 30 barrels per day of 18° gravity crude through perforations at 4,612 to 4,638 feet and at 4,644 to 4,656 feet. Plugged back from total depth of 4,740 feet.

ELEVATION OF SURFACE

The elevation of the surface at the location of the single productive well is 379 feet above sea-level.

SURFACE FORMATION

Queen City.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated in the one productive well is in undifferentiated Eagle Ford a few feet below the sub-Clarksville. However, penetration in a nearby dry hole, Humble Oil & Refining Co. #1 H. Watts, extended to a horizon 218 feet below the top of the Paluxy. The accompanying TYPE SECTION is based on the log of that well, the location of which is indicated by the T.D. 8,176 on the accompanying map.

STRUCTURE

The one producer and the two nearby dry holes indicate a down-to-the-northwest fault with a throw of 165 feet. The meager data are not adequate to determine the surrounding structural conditions in detail.

PRODUCTIVE AREA

Sub-Clarksville and Field: 10 acres.

THICKNESS OF RESERVOIR ROCK

Sub-Clarksville: 44 feet.

LITHOLOGY OF RESERVOIR ROCK

Sub-Clarksville: Sandy ash.

CONTINUITY OF RESERVOIR ROCK

The sub-Clarksville formation occurs as a blanket deposit over all of Wood County and parts or all of several adjoining counties. Over most of this area, the sands are quite ashy or are entirely ash. Areas of clean sand are quite local.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Sub-Clarksville:	Feet
Elevation of top of oil	-4,233
Elevation of bottom of oil	-4,277
Relief	44

CHARACTER OF OIL

Sub-Clarksville:

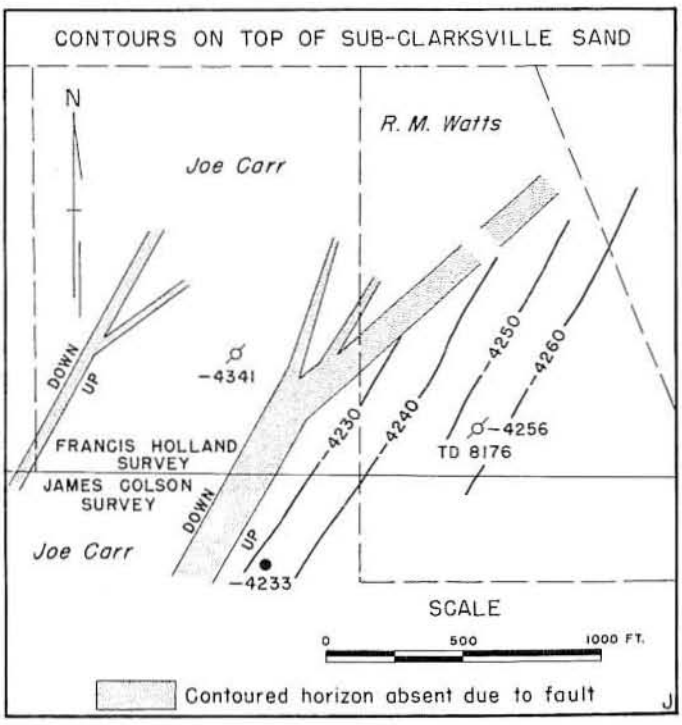
Gravity, A.P.I., @ 60° F.:	18°
Odor:	Sweet
Color:	Black

CHARACTER OF GAS

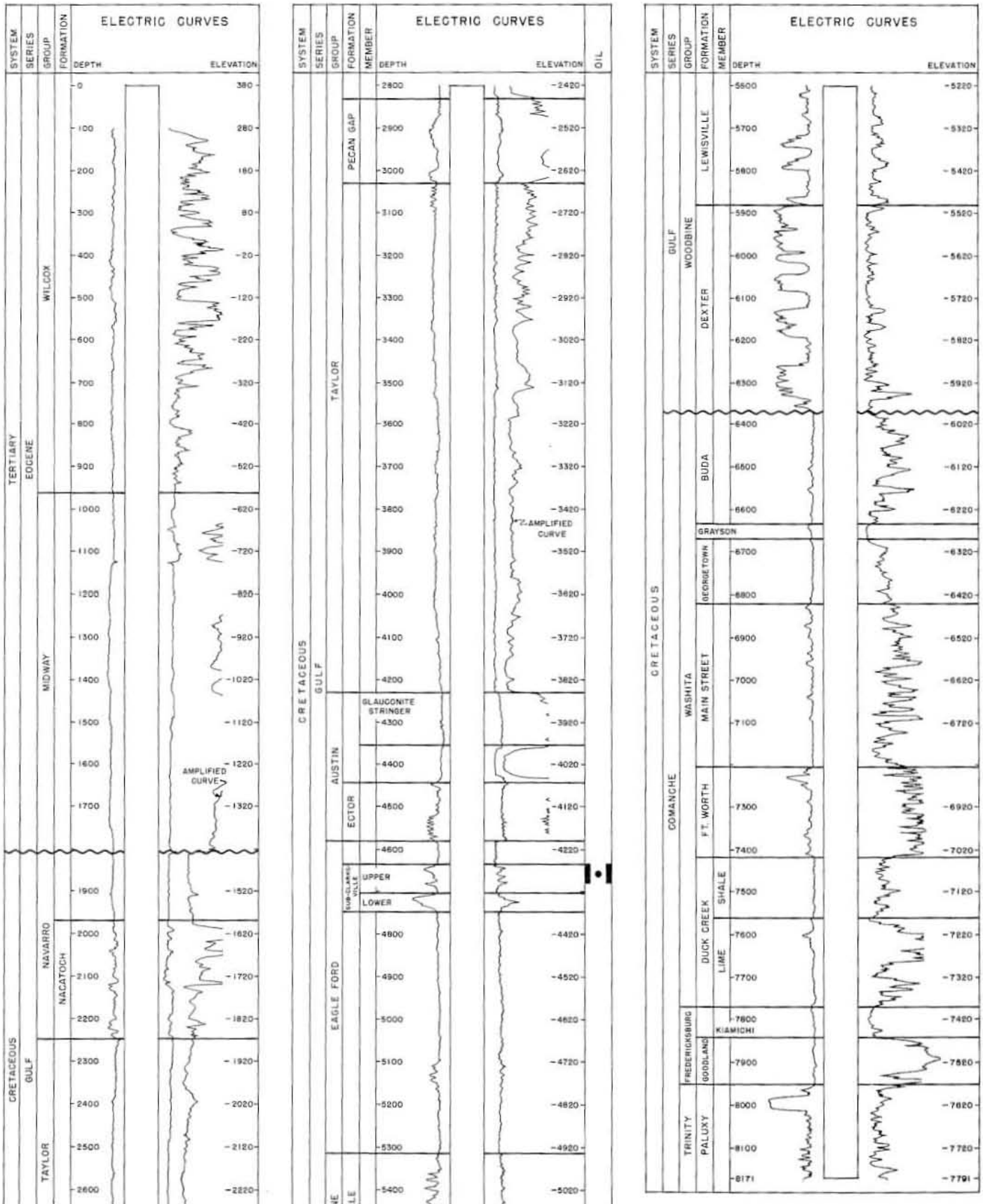
Sub-Clarksville: Due to the negligible quantity of gas produced, no analysis has been made.

PRODUCTION HISTORY

From the date of discovery in July to the end of the year 1949, the single productive well pumped 1,476 barrels of oil. During May 1950, the well pumped 130 barrels of oil.



TYPE SECTION OF ROCKS PENETRATED



The above is based on the log of Humble No.1 Watts, a dry hole 920 feet northeast of the discovery well.

MITCHELL CREEK FIELD
Hopkins County, Texas

W. K. SMITH
Exploitation Engineer, Shell Oil Company, Kilgore, Texas
July 12, 1950

LOCATION

The Mitchell Creek field is in northeastern Hopkins County 8 miles northwest of the town of Mt. Vernon, the county seat of Franklin County.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Seismograph work led to the discovery of this field.

DISCOVERY

Paluxy sand: July 23, 1948;
Shell Oil Co. #1 J. L. Hedrick.

NATURE OF TRAP

Paluxy sand: Closure against fault.

PRODUCTIVE AREA

Paluxy sand and Field: 200 acres. However, the limits of production have not been defined to the northeast nor to the southwest.

THICKNESS OF RESERVOIR ROCK

Paluxy sand:	Max.	Min.	Avg.
Net productive, feet	39	17	27

LITHOLOGY OF RESERVOIR ROCK

Paluxy sand: Fine- to coarse-grained, clean, friable, porous sand. Near the water level the sand contains asphalt.

CONTINUITY OF RESERVOIR ROCK

Paluxy sand: The Paluxy formation is made up of a series of alternating shales and sands. Sand development is erratic and lenticular with extremely rapid lateral variation. However, the main producing sand body is believed to be continuous throughout the area containing the present seven wells.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Paluxy sand:	Feet
Elevation of top of oil	-4,080
Elevation of bottom of oil	-4,165
Relief	85

CHARACTER OF OIL

Paluxy sand:

Gravity, A.P.I., 15° - 20°	Sulphur, 3.3%w
Color, Dark green	Pour point, 25°F.
Viscosity, S.U. @ 80°F., 2,892 sec.	

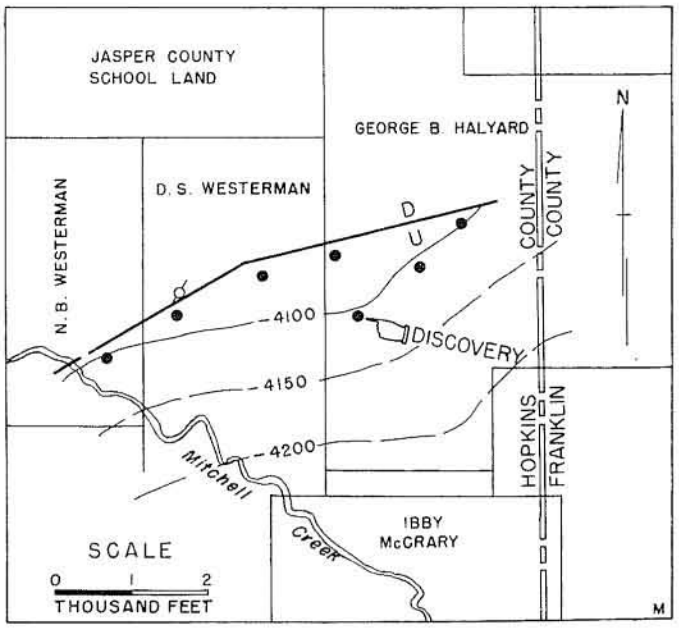
Yield:	%
225° E.P. gasoline, 82.9° gravity	3.2
400° E.P. naphtha, 52.8° gravity	6.0
Light gas oil, 42.3° gravity	6.1
Heavy gas oil	2.6
Asphalt	81.6
Loss	0.5

WATER PRODUCTION

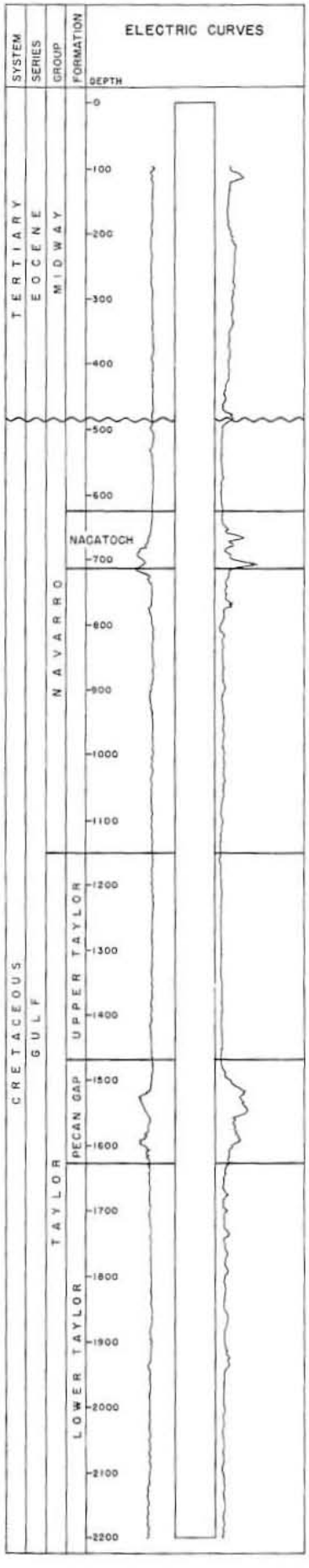
Water encroachment is erratic as evidenced by the fact that structurally high wells produce water. All of the wells in the field produce water in varying amounts from 6 per cent to 90 per cent of total fluid. The average titration of the salt water is 8,000 ppm. chlorides. All of the water produced is injected into the Woodbine sand through a salt water disposal well.

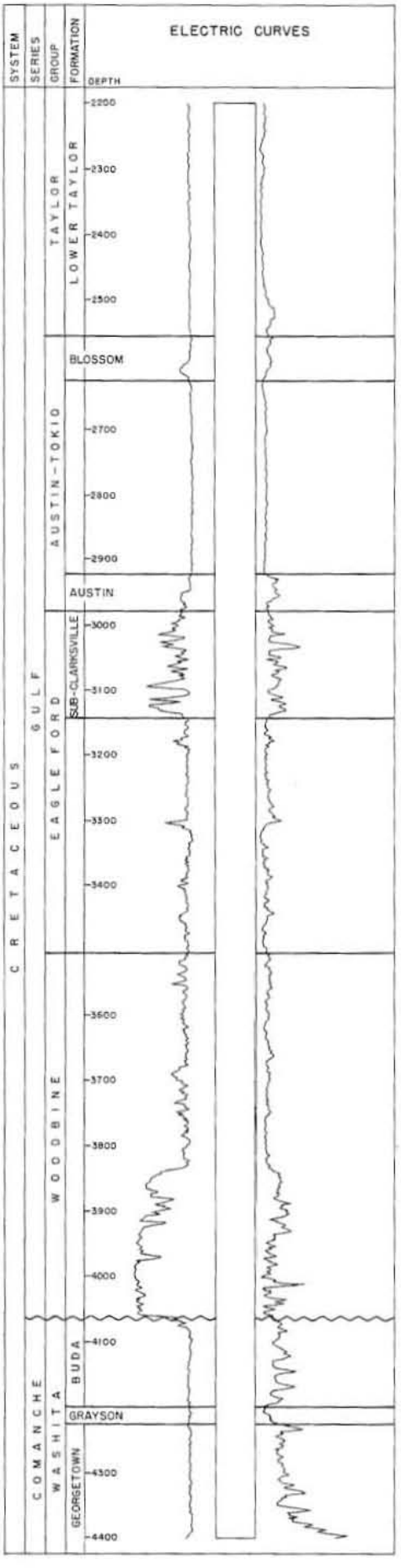
DEVELOPMENT AND PRODUCTION HISTORY

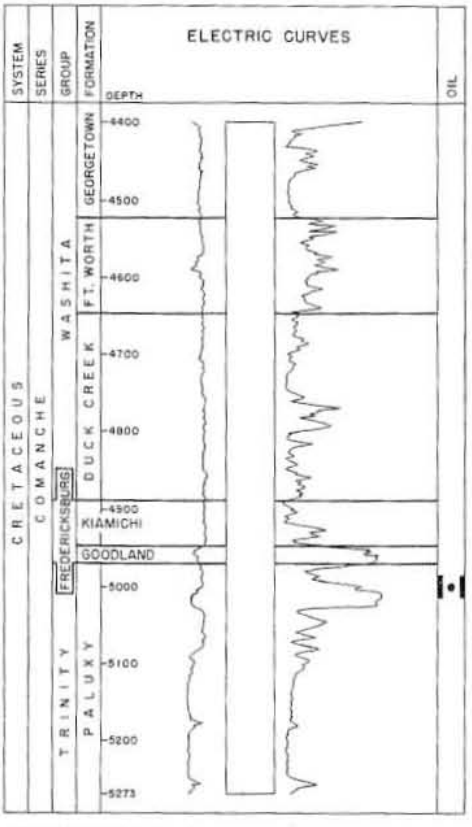
	NUMBER OF WELLS		OIL PRODUCTION (barrels)	
	Completed	Producing oil at end of year		
Year		All pumping	Yearly	Cumulative
1948	4	4	20,162	20,162
1949	3	7	85,059	105,221



TYPE SECTION OF ROCKS PENETRATED







NOTE: The above is based on a composite log. It was compiled to show the complete section. Due to faulting, some strata are absent in the log of each well. The inclusion of such strata, of course, leads to indications of depths and elevations which are not typical and to a total depth in excess of the total depth of the deepest well in the field.

ELEVATION OF SURFACE

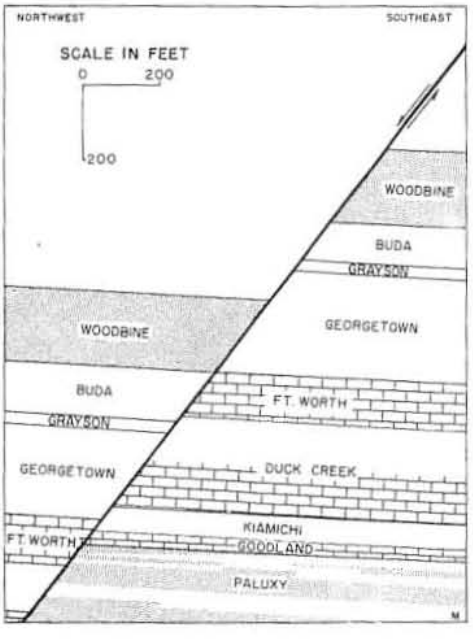
At well locations: Highest, 412 feet, lowest, 375 feet.

SURFACE FORMATION

Midway clay

OLDEST HORIZON PENETRATED

300 feet below the top of the Paluxy formation. This penetration was in the discovery well at its total depth of 4,800 ft.



MOUNT CALM FIELD
Hill County, Texas

FORREST W. HOOD
Geologist, The Ohio Oil Co., Tyler, Texas
April 28, 1950

LOCATION

The Mount Calm field is ½ mile west of the town of Mount Calm, near the most southern corner of Hill County.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Surface mapping by Wood Stanley, Gulf Refining Co., led to leasing and discovery.

DISCOVERY

Austin chalk: 1928; Latson #1 Jones.

ELEVATION OF SURFACE

Elevations at well locations range from 600 to 630 feet.

SURFACE FORMATION

Wolfe City sandstone of Upper Cretaceous is the only formation exposed in the field.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated is 78 feet in schist, the top of which was found at a depth of 3,320 feet, (about -2,700 feet). Travis Peak immediately overlies the schist at the location of the deepest penetration, Humble #1 Holderman in C. Sullivan survey (T. D. 3,398).

NATURE OF TRAP

Austin chalk: Fractures in brecciated chalk along fault plane.

THICKNESS OF RESERVOIR ROCK

Austin chalk: The vertical extent of breccia is about 80 feet.

PRODUCTIVE AREA

Austin chalk and Field: 10 acres.

LITHOLOGY OF RESERVOIR ROCK

Austin chalk: Chalky limestone, brecciated.

CONTINUITY OF RESERVOIR ROCK

The Austin chalk is continuous over much of Texas. However, the condition which occasions a productive reservoir in this field is quite local.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Austin chalk:	Feet
No free gas	
Elevation of top of oil	Sea level
Elevation of bottom of oil	-60
Relief	60

CHARACTER OF OIL

Gravity, A.P.I., 31° Base, paraffin.

WATER PRODUCTION

None of the wells produced water.

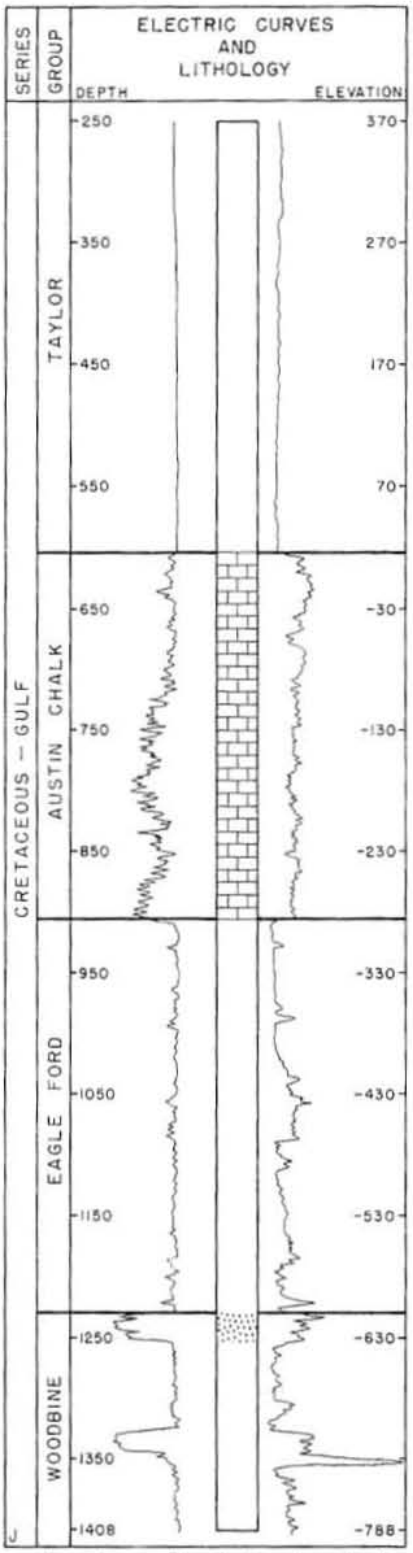
ACID TREATMENT

Acid treatment was tried without favorable results.

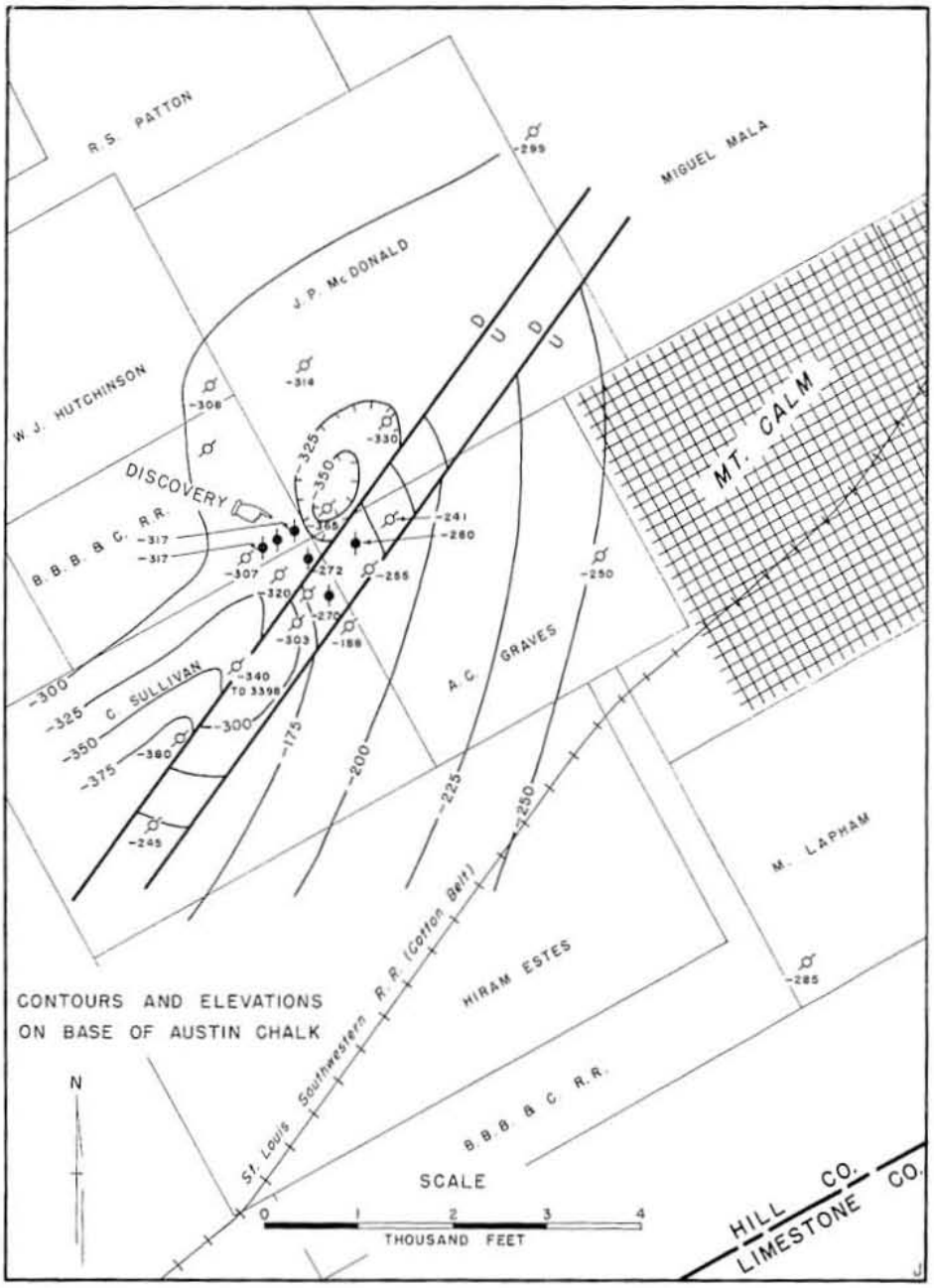
PRODUCTION HISTORY

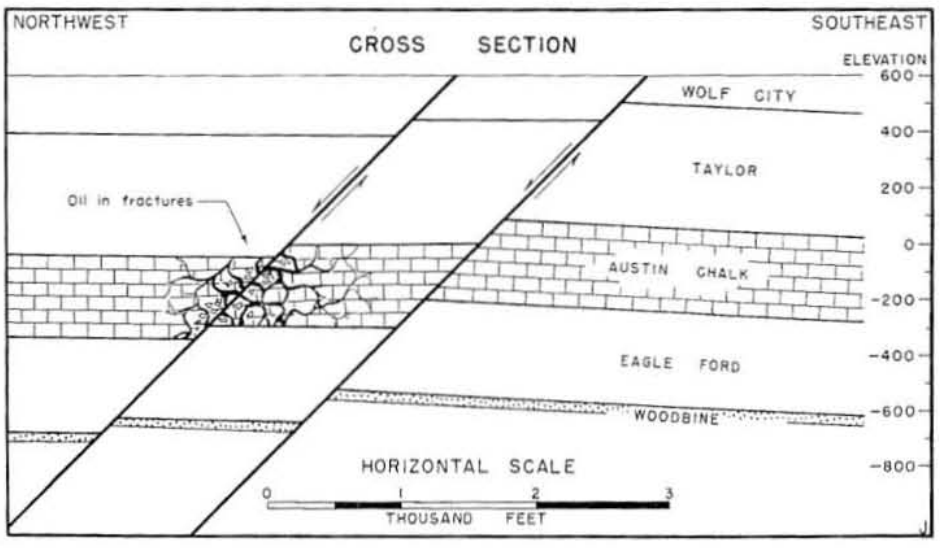
From the time of its completion in 1928 until its abandonment in March 1933, Latson #1 Jones produced 65,000 barrels of oil on pump. Five other wells have pumped small amounts of oil at various times. The latest well was completed June 1, 1949 and produced 85 barrels of oil in June but has not produced since June. It is estimated that the total production of the field has amounted to 80,000 barrels.

TYPE SECTION OF ROCKS PENETRATED



The above section is based on the log of an unfaulted well which is not within the area of the accompanying map. Depths and elevations are arbitrarily adapted to show base of Austin Chalk at about its elevation within the field.





MOUNT SYLVAN FIELD
Smith County, Texas

MACK HAYS, Jr.
Geologist, Tyler, Texas
September 9, 1949

LOCATION

The Mount Sylvan field is located 15 miles northwest of Tyler, county seat of Smith County. It is near the center of the East Texas basin and near the southernmost extent of production from the Paluxy sands.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Results of surface mapping in 1939, which was supplemented by core-drilling in 1942, led the Humble Oil & Refining Co. to acquire leases which include all of the producing acreage in the area. A reflection seismograph survey was made in the area in 1943.

DISCOVERY

Paluxy sand: May 1, 1946;
Humble Oil & Refining Co. #1 T. J. Pool.

ELEVATION OF SURFACE

At well locations: Highest, 466 ft.; lowest, 391 feet.

SURFACE FORMATION

Queen City sands of Eocene age.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

About 60 feet below the top of the upper Glen Rose limestone.

NATURE OF TRAP

Paluxy sand: Depositional pinchout trap; stratigraphic wedging-out of Paluxy porous sand.

PRODUCTIVE AREA

Paluxy sand and Field: Approximately 120 acres.

THICKNESS OF RESERVOIR ROCK

Paluxy sand:	Feet		
	Min.	Max.	Avg.
From top to bottom	0	53	18.5
Net productive	0	53	18.5

LITHOLOGY OF RESERVOIR ROCK

Paluxy sand: Clean porous sandstone.

CONTINUITY OF RESERVOIR ROCK

Paluxy sand: The accumulation is at the updip edge of a locally developed sand lens which is known to pinch out rapidly to the north, south and west. The downdip extent of the porosity to the east is not known, due to lack of control, but is believed to be limited.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Paluxy sand	Feet
Elevation of top of oil	-6,883
Elevation of bottom of oil	-6,950±
Relief	67±

CHARACTER OF OIL

Paluxy sand:	
Gravity, A.P.I. @ 60° F.:	33.4°
Base:	Asphaltic
Color:	Dark brown

WATER PRODUCTION

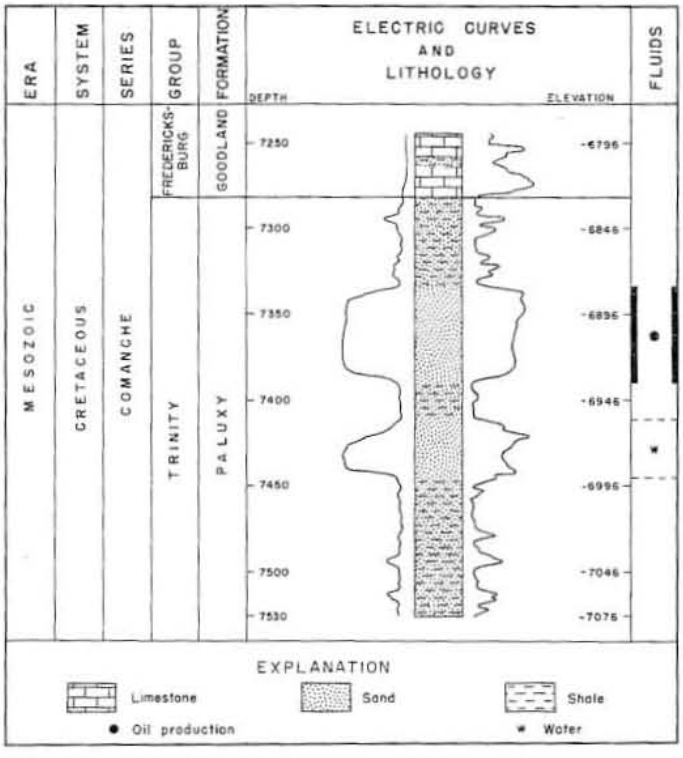
Paluxy sand: As of January 1, 1949, one of the three producing wells was making 75% water, another 10% water, and the third was producing no water. Prior to January 1, 1949, 106,962 barrels of water had been produced.

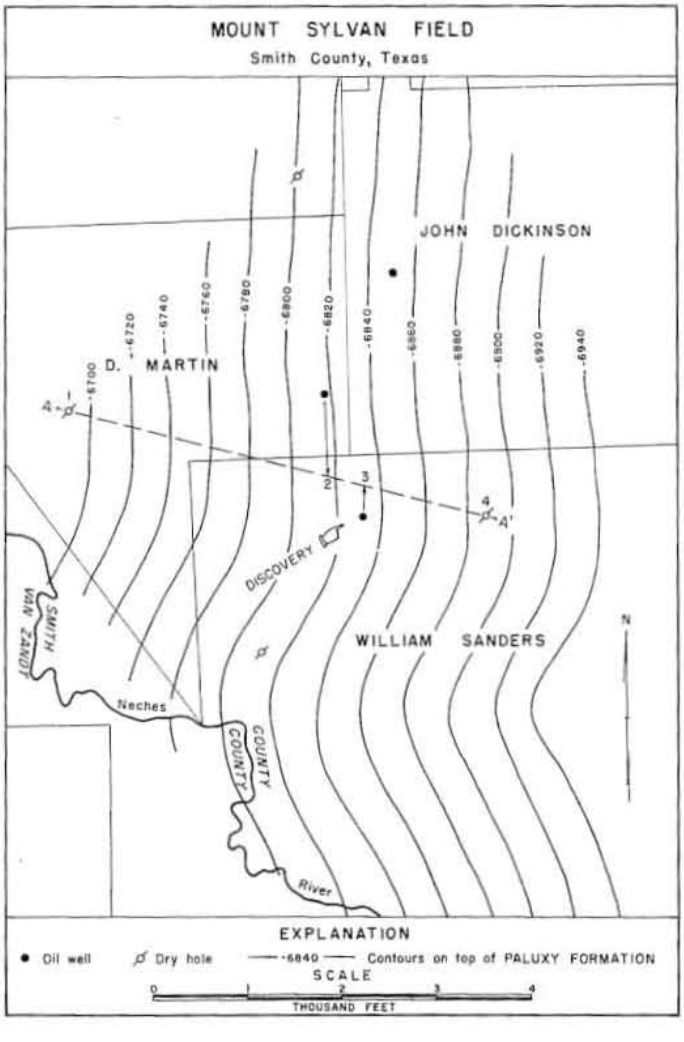
PRODUCTION HISTORY

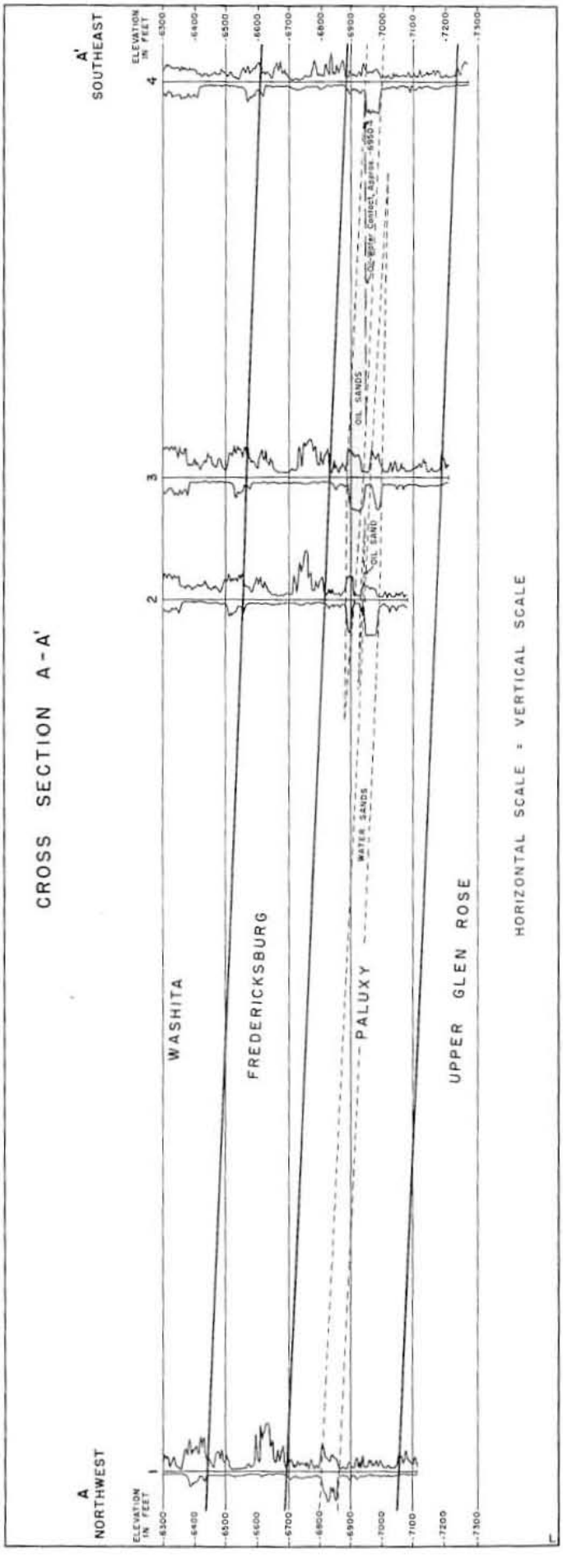
	WELLS PRODUCING at end of year		OIL PRODUCTION (barrels)	
	Oil			
Year	Flowing	Artif. lift	Yearly	Cumulative
1946	2	0	49,864	49,864
1947	2	1	101,770	151,634
1948	0	3	92,634	244,268
1949*	0	3	70,874	315,142

*P.S. - 1949 data added by amendment.

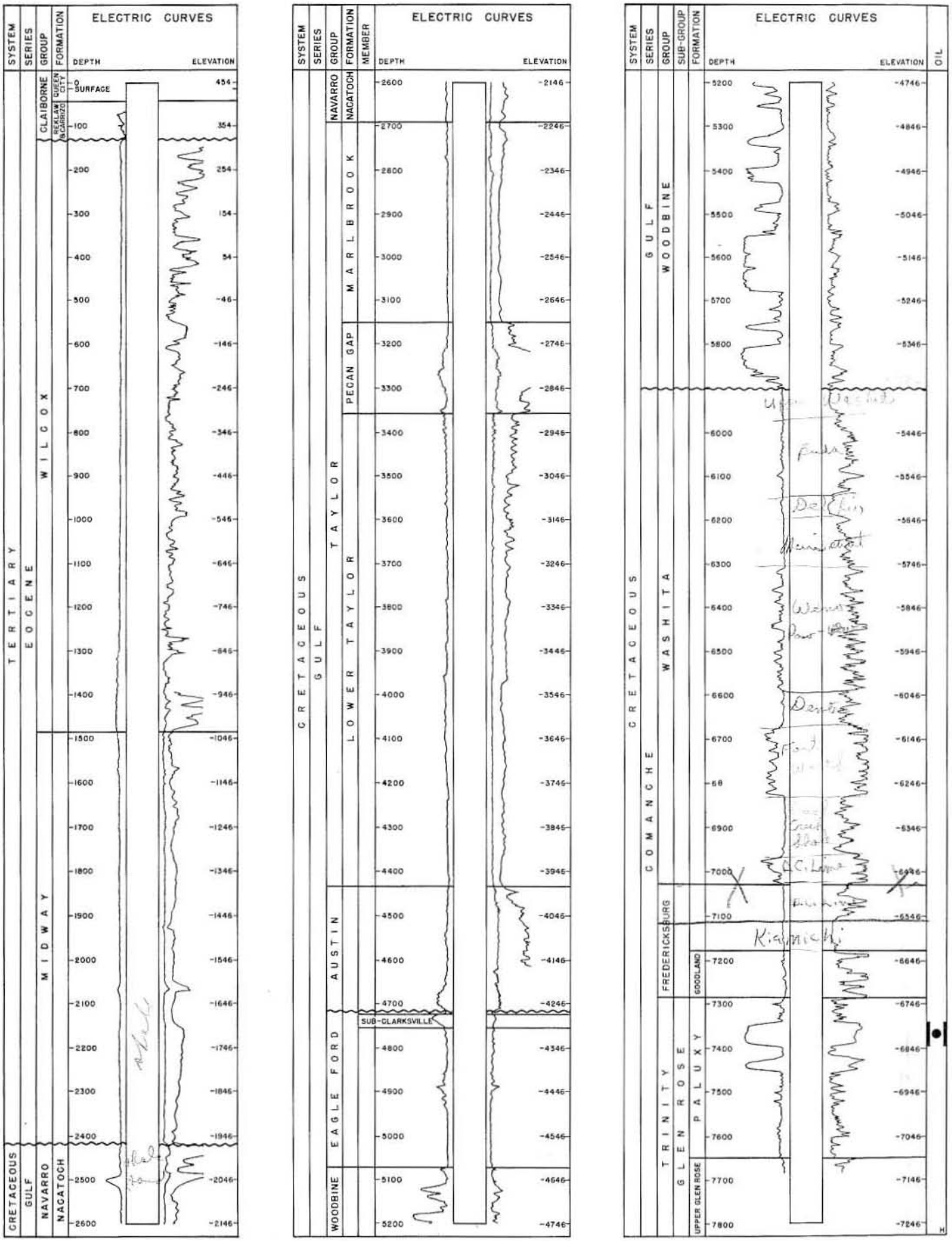
TYPE SECTION OF ROCKS PENETRATED IN VICINITY OF RESERVOIR







TYPE SECTION OF ROCKS PENETRATED



MYRTLE SPRINGS FIELD
Van Zandt County, Texas

RICHARD R. SCURLOCK
Geologist, Tyler, Texas
October 11, 1949

LOCATION

The Myrtle Springs field is located 6 miles northwest of Canton, the county seat of Van Zandt County, Texas.

METHOD OF EXPLORATION LEADING TO DISCOVERY

A low-relief dome was indicated in this area by seismic work which was conducted by Humble Oil & Refining Co. during 1943. Drilling operations on the discovery well, Humble Oil & Refining Co. #1 B. W. Bruce, Jr., were initiated early in 1944.

DISCOVERY

Travis Peak sand: December 29, 1944;
Humble Oil & Refining Co. #1 B. W. Bruce, Jr.

NATURE OF TRAP

Travis Peak sand: Porous sandstone lens in simple convex trap.

PRODUCTIVE AREA

Travis Peak sand and Field: Actual productive area probably did not exceed 80 acres.

THICKNESS OF RESERVOIR ROCK

Travis Peak sand: Net productive (estimated), 7 feet.

LITHOLOGY OF RESERVOIR ROCK

Travis Peak sand: Slightly porous fine-grained sandstone with some sandy and silty shale.

CONTINUITY OF RESERVOIR ROCK

Travis Peak sand: The Travis Peak formation occurs throughout the East Texas basin. The sand sections of this formation are irregular, however, and generally cannot be correlated over widespread areas.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Travis Peak sand:	Feet
Elevation of top of oil	-8,019
Elevation of bottom of oil	-8,033
Relief	14

CHARACTER OF OIL

Travis Peak sand: Gravity, A.P.I. @ 60° F., 37.4°.

CHARACTER OF GAS

No data available.

WATER PRODUCTION

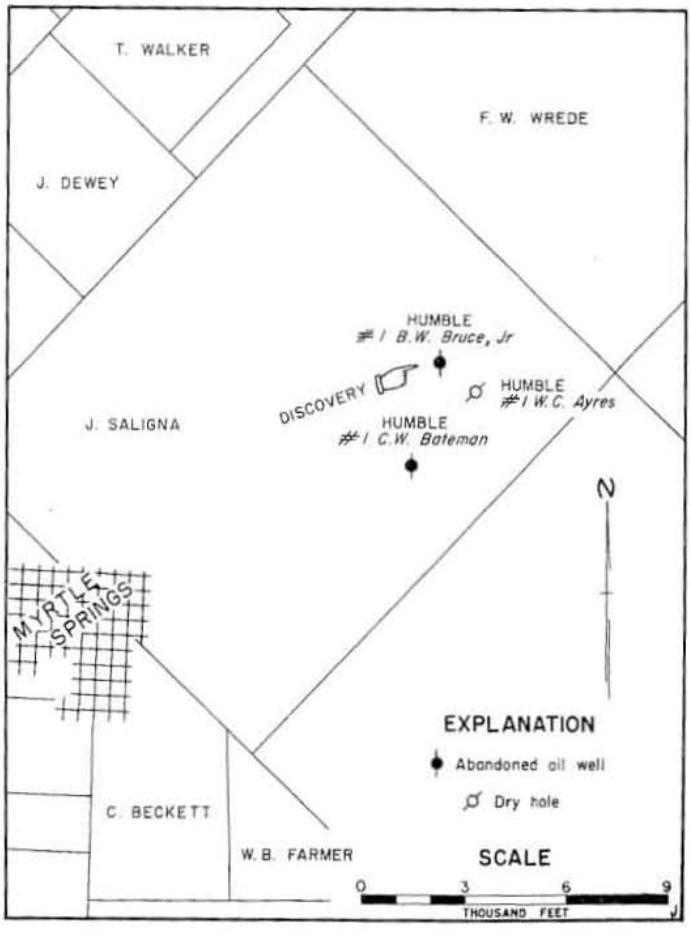
None.

PRODUCTION HISTORY

Travis Peak sand and Total field

Year	WELLS PRODUCING at end of year — Oil: Flowing	Oil: Artif. lift	OIL PRODUCTION (barrels): Yearly	Cumulative
1944	1	0	385	385
1945	0	2	9,331	9,716
1946	0	2	8,770	18,486
1947	0	0	2,651	21,137

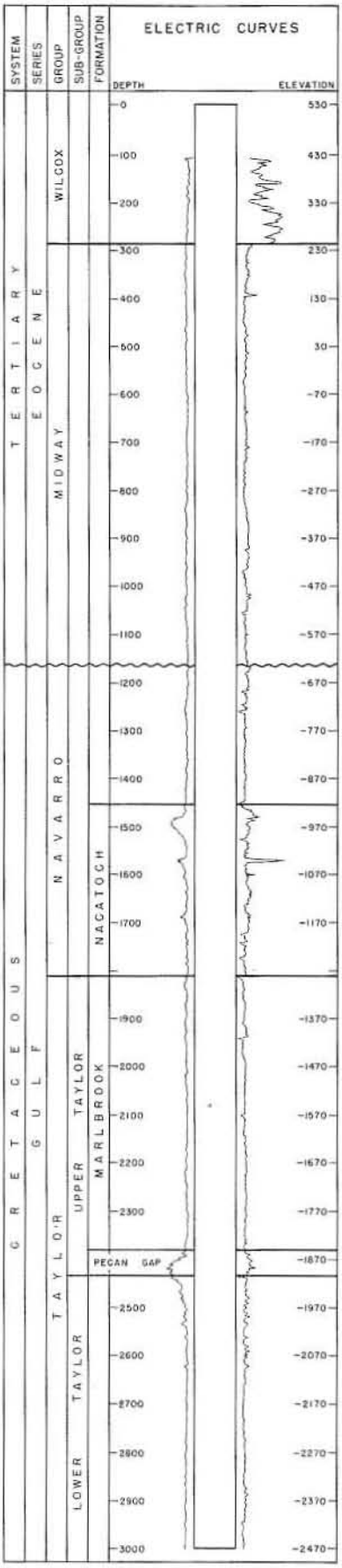
This field was abandoned in July 1947.

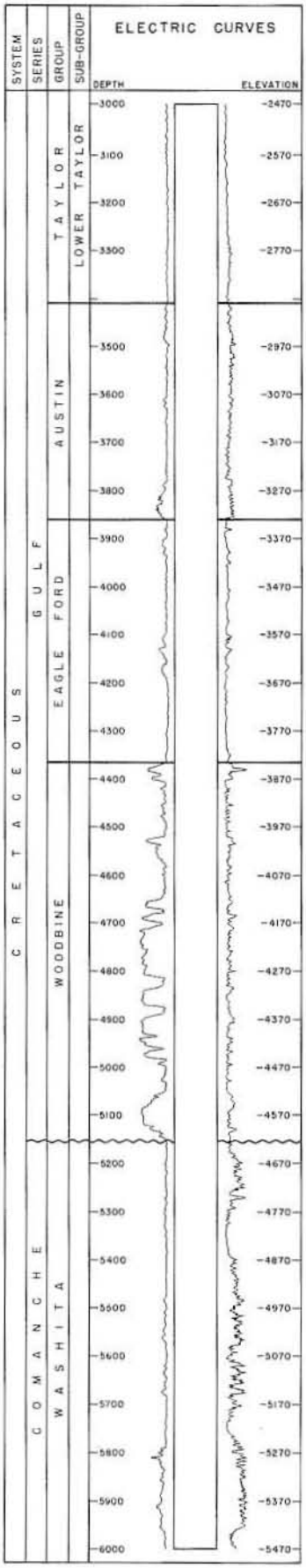


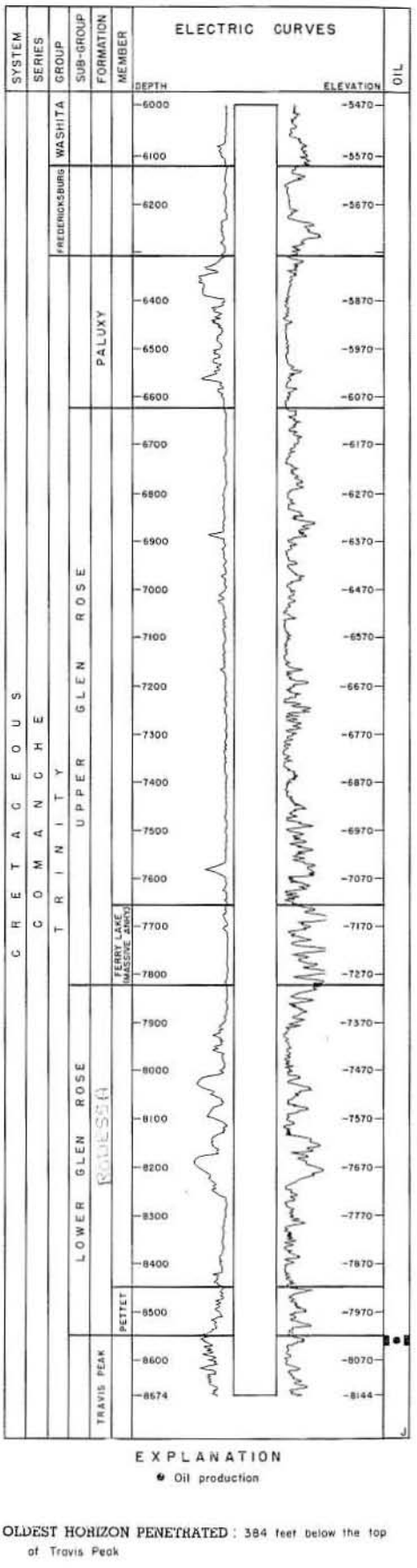
TYPE SECTION OF ROCKS PENETRATED

SURFACE FORMATION: Wilcox

ELEVATION OF SURFACE: Highest, 530 feet, lowest, 510 feet







EXPLANATION

● Oil production

OLDEST HORIZON PENETRATED: 384 feet below the top of Travis Peak

NACOGDOCHES FIELD
Nacogdoches County, Texas

RAY F. YOUNGMEYER* and ROY I. JINDRA**
November 27, 1950

LOCATION

The Nacogdoches field, the oldest field in Texas, is located approximately 15 miles southeast of Nacogdoches, between and southward from the small towns of Woden and Chireno. Most of the wells were located along Bayou Visitador in the vicinity of Oil Springs.

HISTORY

As early as 1790, an oily substance found at the surface in this area was used to grease axles of wagons moving along the Spanish Trail. Early settlers were said to have used the oil as a medicine for rheumatism, skin eruptions, cuts and burns.

In 1859, Lynis T. Barrett, a resident of the nearby village of Melrose, leased the Lucy W. Skillern tract, located in the Jose Antonio Chireno survey near Oil Springs, and started operations during the summer of that year. However, the advent of the Civil War disrupted his plans and he entered the Confederate Army. After the war, he returned and with his associates, Benjamin P. Hollingsworth, Charles A. Hamilton and John B. Earle, obtained a new lease on the Skillern tract, organized the Melrose Petroleum Co. and started operations December 20, 1865. An auger, eight feet long and eight inches in diameter, clamped to a joint of pipe was rotated by means of a large wheel actuated by cogs from the drive shaft of a steam engine. On September 12, 1866, the auger reached a depth of 106 feet and when it was withdrawn oil reached the surface. This well was credited with being the first oil producer in the State of Texas. However, it appears that the operations were not profitable and that the operating company failed. Barrett vainly sought financial assistance elsewhere. It appears that the Nacogdoches field remained dormant for about two decades after the failure of the Melrose Petroleum Co.

According to one authority, the "first authentic prospecting for oil" was in about 1868 when Emory Starr and Peyton F. Edwards, while on a hunting excursion, dug a few holes with spades in the sandy soil on the margin of Oil Spring Branch and left them for the night. When they returned the next day they found that oil and water had collected in the holes. Some of the oil was skimmed off and taken to Nacogdoches where it was tested on shoe leather and harness and for domestic purposes. There appears to be no evidence of further efforts to exploit the discovery. The writers are unable to determine whether there was an error in dating this prospecting.

By the year 1890, ninety wells had been drilled, each to a depth of approximately 100 feet. Five different companies had operated in the field since 1887, but only two of them remained active in 1890. Drilling was accomplished by both the spudder type machine and by boring or driving. The wells are reported to have produced about ten barrels of oil per day each initially. A number of wells were drilled near Chireno, one of which produced a few barrels of oil from a depth of only 14 feet.

From 1867 to 1936 development of the field progressed and declined according to the price of oil.

The first oil refinery in Texas was a primitive one operated by the Lubricating Oil Co. in the valley of Bayou Visitador. Its supply of crude was obtained by semi-weekly bailing of oil and water from each oil-bearing well. The oil was skimmed from the water and delivered by gravity through pipes to an evaporating pan where it was heated to drive off the remaining water and the small amount of naphtha. While still hot, it was forced by steam through a specially woven cloth to filter out grit. It was then placed in iron shipping drums for delivery by wagon to Nacogdoches for shipment by railway.

In 1890 a pipeline for transporting oil $14\frac{1}{2}$ miles from the wells in the field to the railroad at Nacogdoches had been built but had not yet been put into operation.

In 1918, following the completion of an eight barrel well located $1\frac{1}{2}$ miles southeast of Oil Springs, work was started on a 150 barrel refinery at Nacogdoches which was completed in 1920 and operated by the Yuba Oil Co. This refinery operated only a short time and then shut down. There was a local market for the oil, which is reported to have had 70% lubricating content.

In 1935, the Nagdo Oil Co. dug a shaft 6 feet wide, 7 feet long, and 115 feet deep. During excavation about fifteen barrels of oil per day flowed from the shaft. After completion of the shaft, the mine was pumped with conventional rods and tubing with an automobile engine for power, but water was produced in such large quantities that operations were abandoned. During the same year, H. M. Prince dug a 5 by 7 foot shaft with closed cribbing to 26 feet and loose cribbing to 250 feet, total depth, with oil shows encountered at 56 feet, 110 feet, and 236 feet. Drilling was accomplished by using pneumatic air drills; compressed air operated bucket hoists, a procedure which closely resembled coal mining operations. Stopes about 5 by 7 feet were dug horizontally into the sand, but, as little oil was found, the venture was soon abandoned. These oil mining operations were the last actual developments in the field.

*District Geologist, Amerada Petroleum Corp., Tyler, Texas.
**Geologist, Amerada Petroleum Corp., San Antonio, Texas.

CHARACTER OF OIL

The oil in its crude state was a good lubricant. It was not adapted to the production of illuminating oil. The paraffin content was very low.

A sample collected by the U. S. Bureau of Mines in August 1922 was of 21.8° A.P.I. gravity, contained .39% sulphur and was of naphthene-intermediate base. The analysis of that sample is presented in each of the four Bureau of Mines publications listed below.

For analyses see:

U. S. Bureau of Mines	Lab. ref. No.	247 & 1036
Properties of Typical Oils from the Producing Fields of Southern Louisiana and Southern Texas, R. I. 2416 (1922)	Page	53
Tabulated Analyses of Representative Crude Petroleums of the U. S. Bulletin 291 (1928)	Item	247
Tabulated Analyses of Texas Crude Oils. R. I. 3252 (1934)	Grp. 5, Item	53
Tabulated Analyses of Texas Crude Oils. T. P. 607 (1939)	Grp. 5, Item	110

Geological Survey of Texas

Second Annual Report of the Geological Survey of Texas, (1891) pp. 275-276.

STRATIGRAPHIC POSITIONS OF OIL and NATURE OF TRAPS

The accumulations of oil appear to occur in sand lenses which are irregularly distributed in the Mt. Selman formation of the Claiborne group.

SOURCES OF DATA

The writers were unable to find any well logs or any maps showing accurately the locations of the wells. The information herein presented was obtained from the references listed below, from personal communication with Mr. H. M. Prince, from newspaper articles, and from personal conversations with old settlers and Nacogdoches amateur historians. Much of the information is not calculated to present a definite understanding of the conditions of nature but rather to afford an interesting historical account of the oldest field in the State of Texas.

SELECTED REFERENCES

Dumble, E. T. (1891) Mineral Resources of Texas: Second Annual Report of the Geological Survey of Texas (for the year 1890), p. xlv.

Rister, C. C. (1949) Oil! Titan of the Southwest: University of Oklahoma Press, Norman, pp. 3-11.

Walker, J. B. (1891) Mineral oil in Nacogdoches County: Second Annual Report of the Geological Survey of Texas (for the year 1890) pp. 270-286.

Warner, C. A. (1939) Texas oil and gas since 1543: Gulf Publishing Co., Houston, pp. 1-17, 80-81, 112-114, 122, 162, 164, 183, 340-342 and 366.

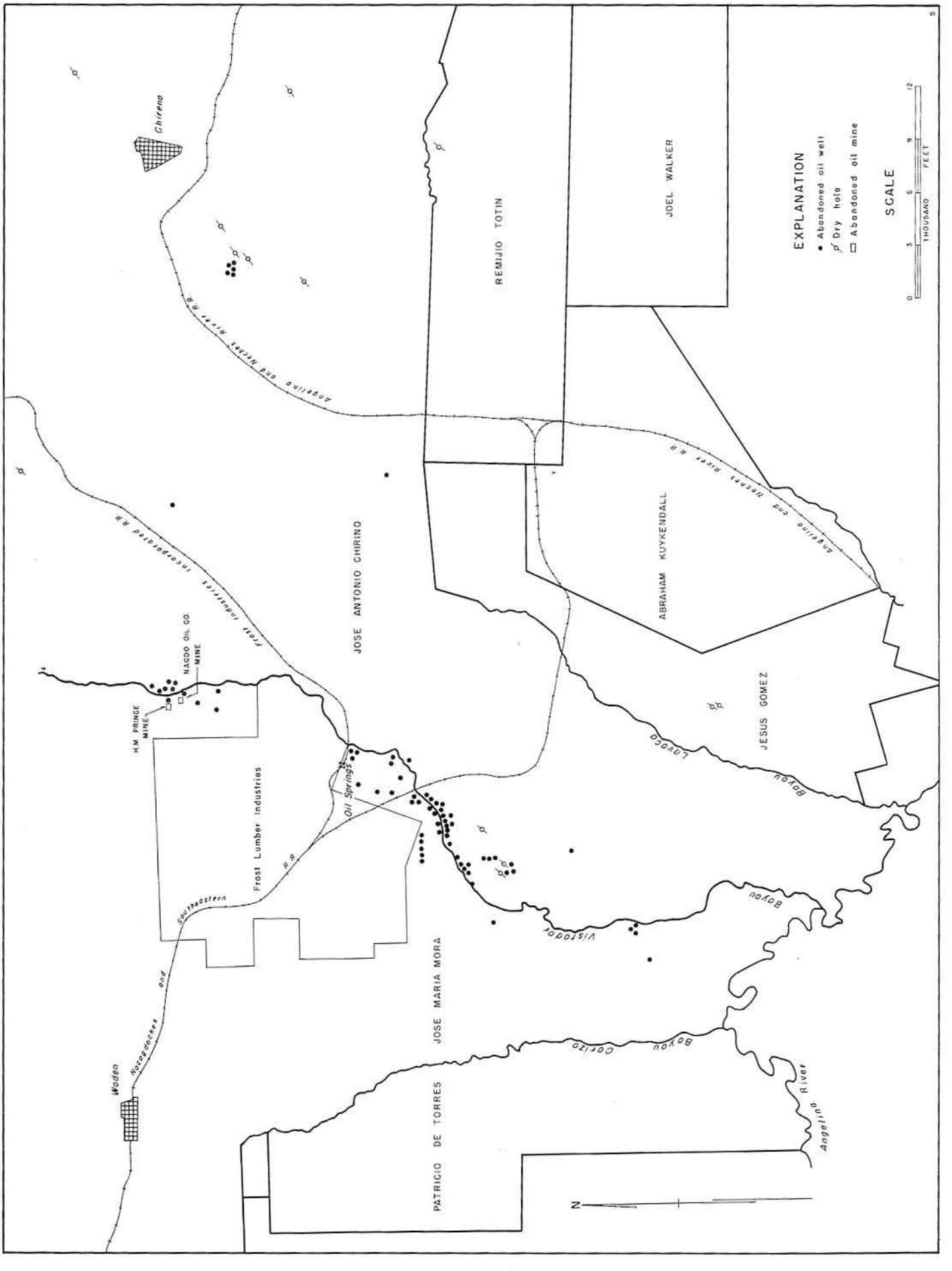
PRODUCTION HISTORY

While negligible amounts of oil were skimmed from surface seepages much earlier, it appears that our production history should appropriately begin in 1866, the year of completion of the first productive oil well. However, early production data are meager. The field produced intermittently from 1890 to 1918, inclusive, but we do not find records of the quantities produced during that period. For the years 1921 to 1925, inclusive, and the year 1937, we present figures representing the number of barrels of oil produced monthly.

Month	1921	1922	1923	1924	1925	1937
January	9,300	7,750	3,100	3,350	1,920	0
February	8,400	7,000	2,800	3,190	616	0
March	9,200	7,950	3,100	3,130	930	0
April	9,000	7,050	3,300	3,300	900	0
May	9,300	6,200	3,255	3,410	930	0
June	9,000	3,750	3,240	3,300	900	150
July	9,300	3,875	3,410	3,410	930	20
August	8,525	3,100	3,410	1,410	930	0
September	7,980	3,000	3,300	3,300	930	115
October	7,780	3,100	3,410	3,410	930	116
November	7,500	3,000	3,300	3,300	900	112
December	7,750	3,100	3,410	3,410	930	0
	103,035	58,875	39,035	37,920	11,746	513

OIL PRODUCTION (barrels)	
1866-1885	? ?
1886-1889	4,000
1890-1918	?
1919	95,000
1920	75,000
1921	103,035
1922	58,875
1923	39,035
1924	37,920
1925	11,746
1926-1935	12,000
1936	?
1937	513
1938-1950	Negligible
Total	437,124+?

Entries on page 581 of National Oil Scouts & Landmen's Association 1950 Year Book (Review of 1949) indicate cumulative production of 495,258 barrels of oil; 265 oil wells, all abandoned; area productive, 1,000 acres.


EXPLANATION
Abandoned oil well
Dry hole
Abandoned oil mine
SCALE
THOUSAND FEET
REMIJIO TOTIN
JOEL WALKER
ABRAHAM KUYKENDALL
JOSE ANTONIO CHIRINO
JESUS GOMEZ
JOSE MARIA MORA
PATRICIO DE TORRES
Chireno
Angelina and Neches River R.R.
Angelina and Neches River R.R.
Frost Industries Incorporated R.R.
NAGDO OIL CO MINE
H.M. PRINCE MINE
Frost Lumber Industries
Oil Springs
R.R.
Southeastern
and
Nacogdoches
Woden
Bayou Loroco
Bayou Vistador
Bayou Cortizo
Angelina River
N

NAVARRO CROSSING FIELD

Houston and Leon Counties, Texas

T. C. CASH
Geologist, Tyler, Texas
September 9, 1949

LOCATION

The Navarro Crossing field is in the northwest part of Houston County, 17 miles northwest of Crockett, the county seat, and 12 miles west of the town of Grapeland.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Leases were acquired in this area during 1933 by Humble Oil & Refining Co. following both surface and core-drill geological work. In 1935, a reflection seismograph survey by Humble Oil & Refining Co. confirmed the presence of structure in this area.

DISCOVERY

Woodbine sand: April 23, 1938;
Humble Oil & Refining Co. #1 H. H. Dailey.

ELEVATION OF SURFACE

At well locations: Highest, 273 ft.; lowest, 197 feet.

SURFACE FORMATION

Alluvial river deposits with isolated outcrops of upper Reklaw.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated on this structure is 261 feet below the top of the Woodbine.

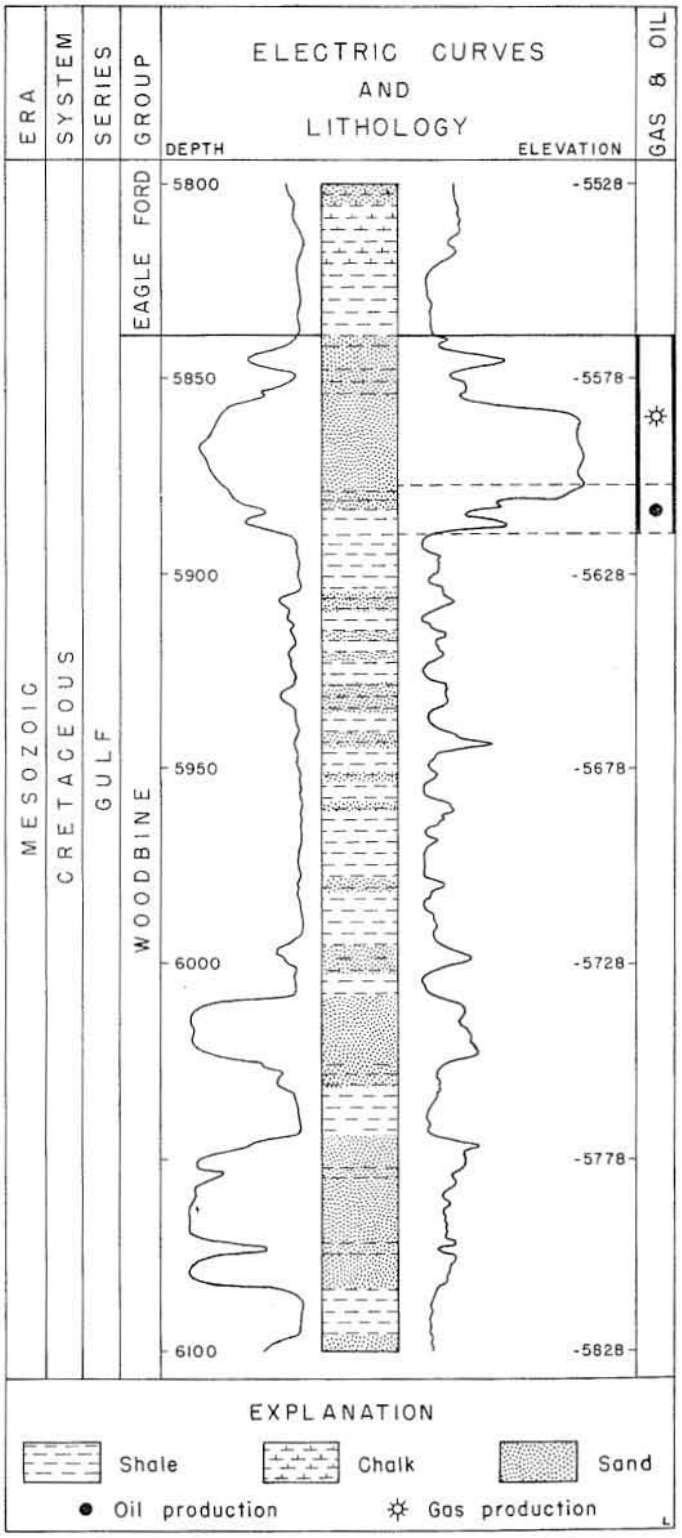
NATURE OF TRAP

Woodbine sand: Convex trap on a faulted anticline or oval-shaped dome. The fault with greatest displacement has a maximum throw of approximately 90 feet.

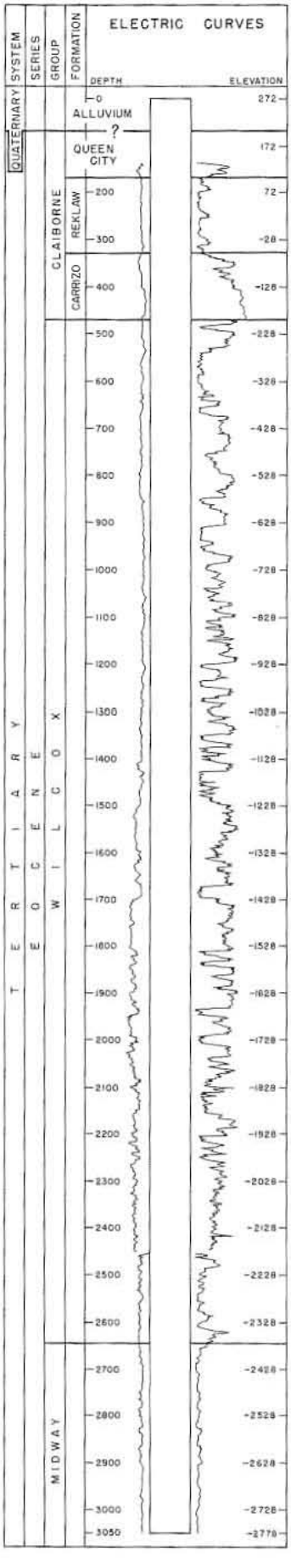
PRODUCTIVE AREAS

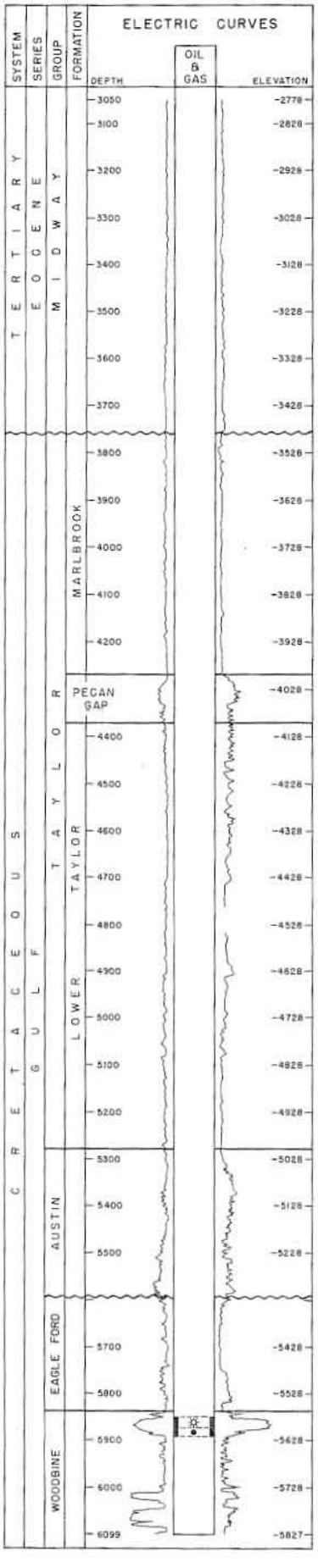
Woodbine sand:	Acres
Gas, approximate	4,000
Oil, approximate	800
Navarro Crossing field	4,800

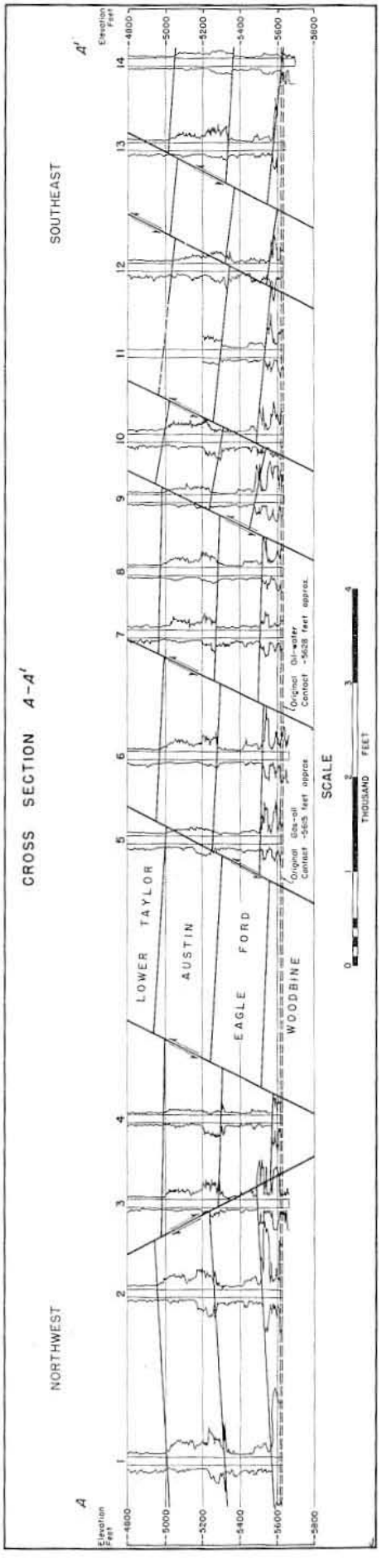
TYPE SECTION OF ROCKS PENETRATED IN VICINITY OF RESERVOIR

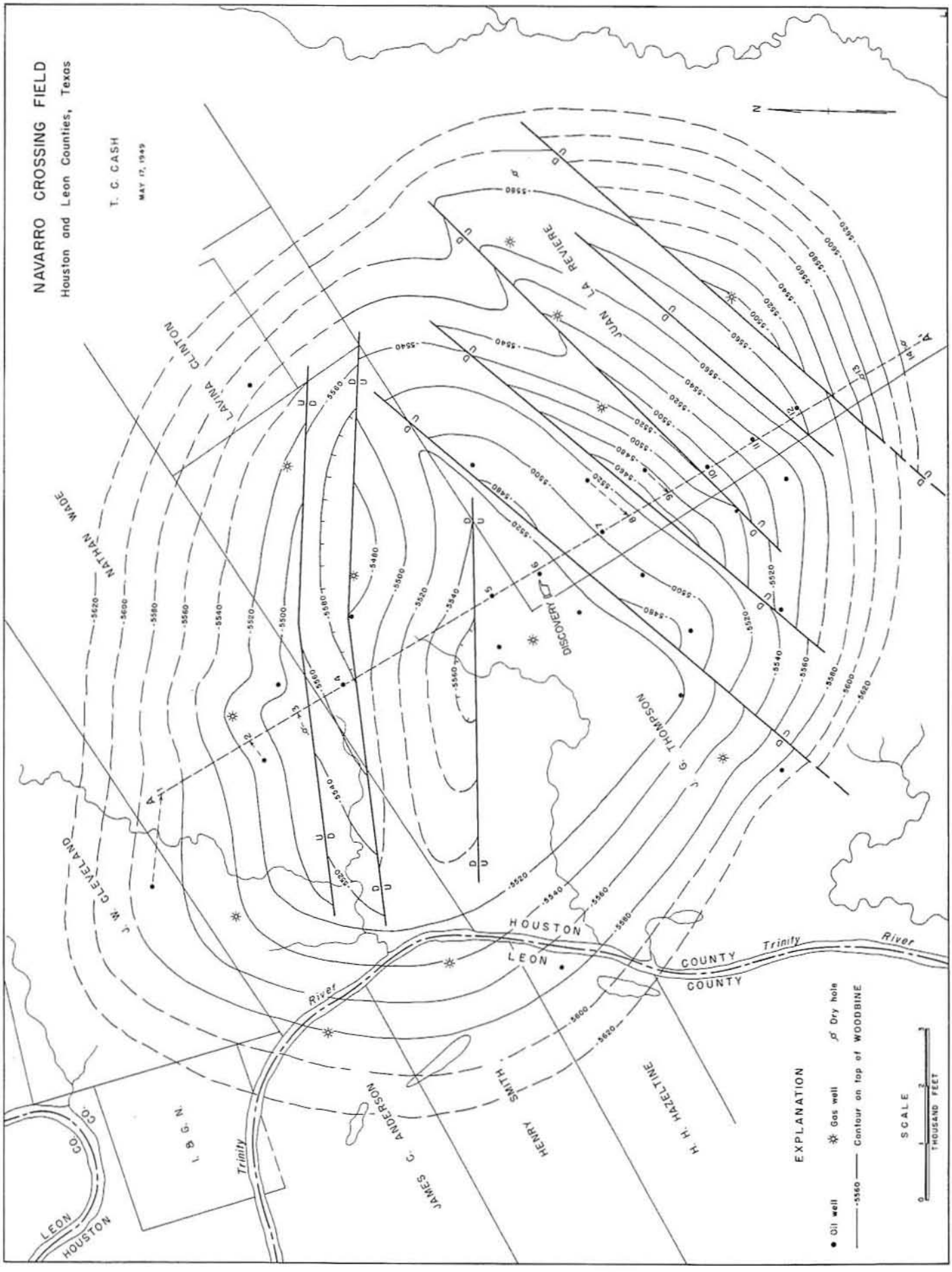


TYPE SECTION OF ROCKS PENETRATED








NAVARRO CROSSING FIELD
Houston and Leon Counties, Texas
T. C. CASH
MAY 17, 1949
N
DISCOVERY
LAVINA CLINTON
NATHAN WADE
J. M. CLEVELAND
J. G. THOMPSON
JUAN LA REVIERE
H. H. HAZELTINE
JAMES C. ANDERSON
HENRY SMITH
G. B. N. L.
HOUSTON
LEON
COUNTY
Trinity River
LEON
HOUSTON
CO.
EXPLANATION
Oil well
Gas well
Dry hole
Contour on top of WOODBINE
SCALE
THOUSAND FEET

THICKNESS OF RESERVOIR ROCK

Woodbine sand: Maximum of 70 feet of gas sand and 13 feet of oil sand.

LITHOLOGY OF RESERVOIR ROCK

Woodbine sand:	Thickness feet
Argillaceous sand and shale.	0 - 20
Medium- to fine-grained argillaceous lignitic sand.	30
Impervious fossiliferous shale and shaly sand	35
Medium-grained sand with shale lenses.	50

CONTINUITY OF RESERVOIR ROCK

Woodbine sand: Most of the oil is produced from the thin oil column of the lower sand which occurs in an oval-shaped area at the top of the structure. Oil production from the upper sand is restricted to a narrow band around the flanks of the structure except on a part of the east flank, where the sand is not developed.

The Woodbine sands are continuous in the field and are thought to be intercommunicative. Continuity of the Woodbine throughout the East Texas basin is generally recognized.

SELECTED REFERENCE

Wilson, E. B (1938) Navarro Crossing field, Houston County, Texas: Amer. Assoc. Petr. Geol., Bull., vol. 22, pp. 1600-1601.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine sand	Feet
Elevation of top of gas	-5,477
Elevation of bottom of gas	-5,615
Relief	138
Elevation of top of oil	-5,615
Elevation of bottom of oil	-5,628
Relief	13

The above figures represent conditions at time of discovery. The amount of structural closure on the top of the Woodbine is in excess of 160 feet.

CHARACTER OF OIL

Woodbine sand:
Gravity, A.P.I., 37.1° to 33.1°
Sulphur, 0.10%
Base, paraffin

CHARACTER OF GAS

Woodbine sand:
Average analysis of gas from 2 wells in field:
Specific gravity of gas, 0.067
Condensate content, 7 bbls. per million cu. ft.
Gravity of condensate, 52.6°

WATER PRODUCTION

Woodbine sand: Currently, there are 16 wells which produce a total of 2,370 bbls. of water daily.

PRODUCTION HISTORY

Woodbine sand and Total field

Year	WELLS PRODUCING at end of year: Oil or Oil & Gas Flowing	Oil Artif. lift	Gas or Gas & Conds.	OIL PRODUCTION (barrels) Yearly	CONDENSATE PRODUCTION (barrels) Yearly	TOTAL LIQUIDS (barrels) Yearly	TOTAL LIQUIDS (barrels) Cumulative	GAS PRODUCTION (Mcf) Yearly	GAS PRODUCTION (Mcf) Cumulative
1938	5	-	-	24,335	693	25,028	25,028	106,355	106,355
1939	17	-	-	180,725	1,468	182,193	207,221	243,025	349,380
1940	20	-	-	184,521	155	184,676	391,897	28,771	378,151
1941	21	-	-	188,965	59	189,024	580,921	5,212	383,363
1942	16	5	-	136,723	-	136,723	717,644	52,396	435,759
1943	18	3	-	86,406	-	86,406	804,050	136,406	572,165
1944	14	6	-	81,660	140	81,800	885,850	231,815	803,980
1945	11	9	7	122,247	2,967	125,214	1,011,064	552,060	1,356,040
1946	12	7	12	87,913	8,577	96,490	1,107,554	1,338,861	2,694,901
1947	12	7	17	91,879	14,252	106,131	1,213,685	2,125,774	4,820,675
1948	13	7	16	80,832	14,112	94,944	1,308,629	1,780,313	6,600,988
1949*	10	7	17	73,136	12,171	85,307	1,393,936	1,776,475	8,377,463

*P.S. - 1949 data added by amendment

NEW ANGUS FIELD
Navarro County, Texas

A. C. WRIGHT
District Geologist, Shell Oil Company, Tyler, Texas
July 1950

LOCATION

The New Angus field is located at Angus 6 miles south of Corsicana, the county seat of Navarro County, Texas. For relationship to other productive areas in the immediate vicinity, see the accompanying paper on the Corsicana-Powell field. This field is within the area covered by that paper.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Random drilling led to the discovery of this field. Numerous shallow wells previously drilled in the vicinity produced some oil and gas and lent encouragement to the drilling of other wells. On March 5, 1946, Tex Harvey Oil Co. commenced the drilling of its #1 J. L. Jackson, the completion of which resulted in the discovery of the field.

DISCOVERIES

Nacatoch sand: December 31, 1946;
Tex Harvey Oil Co. #3 J. L. Jackson.
Wolfe City sand: April 15, 1946;
Tex Harvey Oil Co. #1 J. L. Jackson.

ELEVATION OF SURFACE

At well locations: Highest, 438 ft.; lowest, 403 feet.

SURFACE FORMATION

Midway

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest stratigraphic horizon penetrated is 242 feet below the top of the Woodbine group.

NATURE OF TRAPS

Each of the reservoirs is controlled mainly by faulting, but may be affected by pinch-out of porosity.

PRODUCTIVE AREAS

Nacatoch sand: 20 acres. (2 wells; 1 gas & 1 oil)
Wolfe City sand: About 40 acres.

THICKNESSES OF RESERVOIR ROCKS

Nacatoch sand: 5 feet.
Wolfe City sand: 10 feet.

LITHOLOGY OF RESERVOIR ROCKS

Nacatoch sand: Shaly, silty sand.
Wolfe City sand: Shaly, silty sand.

CONTINUITY OF RESERVOIR ROCKS

Nacatoch sand: Widespread, but erratic.
Wolfe City sand: Widespread, but erratic.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Feet
Nacatoch sand:	
Elevation of top of gas	-111
Elevation of top of oil	-141
Thickness of gas column	30±
Thickness of oil column	4±
Wolfe City sand:	
Elevation of top of gas	-956
Elevation of top of oil	-966
Thickness of gas column	10±
Thickness of oil column	15±

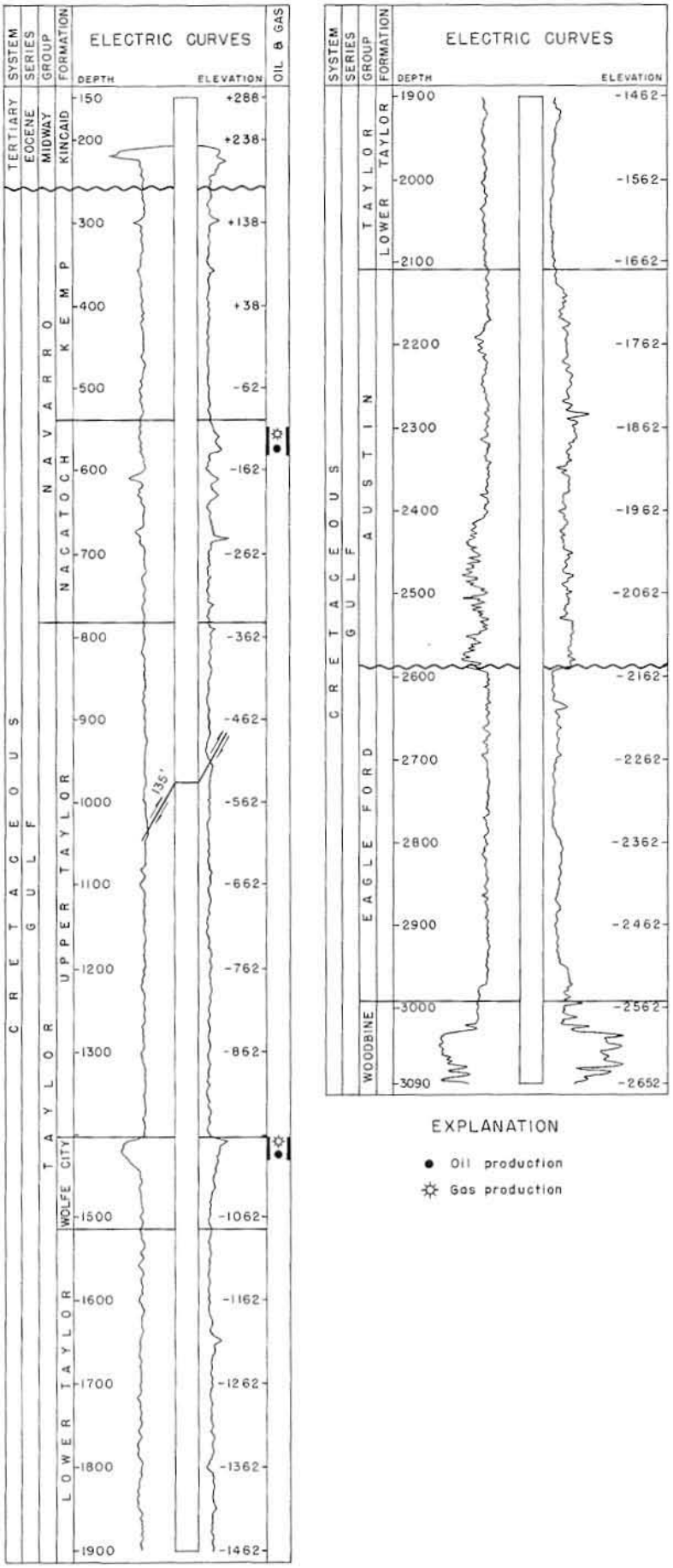
CHARACTER OF OIL

Nacatoch sand: Gravity, 25.6
Wolfe City sand: Gravity, 39.4

WATER PRODUCTION

Nacatoch sand: None.
Wolfe City sand: Salt water has constituted a minimum of 40% of the gross daily production of the discovery well since the date of its completion.

TYPE SECTION OF ROCKS PENETRATED



EXPLANATION

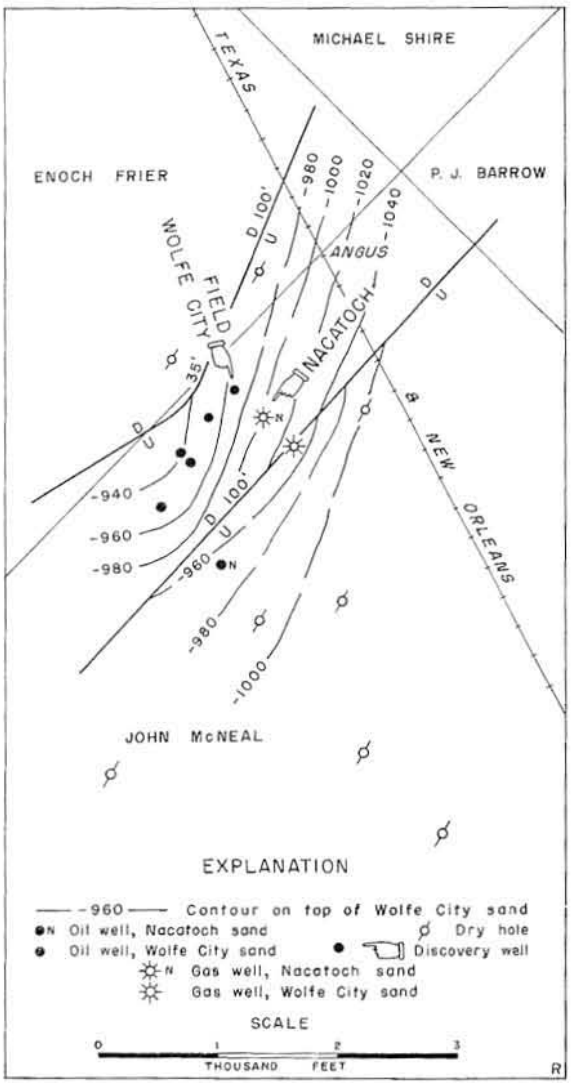
- ● Oil production
- ☼ Gas production

PRODUCTION HISTORY

Nacatoch sand: Only two wells have been completed in this sand. The discovery well has been shut-in since completion on December 31, 1946 as a gas well with a daily capacity of 100,000 cubic feet. The second well had a daily capacity of 7 barrels of 25.6° gravity oil when completed on May 20, 1950.

Wolfe City sand:

Year	WELLS PRODUCING at end of period — Pumping	OIL PRODUCTION (barrels) — Yearly	Cumulative
1946	1	1,813	1,813
1947	1	3,279	5,092
1948	1	2,917	8,009
1949	1	2,543	10,552
1950			
January	1	168	10,720
February	1	195	10,915
March	1	221	11,136
April	3	493	11,629
May	4	493	12,122
June	5	608	12,730



NEW HOPE FIELD
Franklin County, Texas

JOHN M. CLAYTON
Geologist, Seaboard Oil Company, Dallas, Texas
June 29, 1950

LOCATION

The New Hope field is in southeastern Franklin County 10 miles south and slightly east of Mt. Vernon, the county seat. It is in the north central part of the East Texas basin some 20 miles south of the Sulphur Bluff-Talco fault zone.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Early in 1941, the Tide Water Associated Oil Co. and the Seaboard Oil Co. of Delaware, operating jointly, conducted a reconnaissance gravity survey of the northern portion of the East Texas basin. This survey revealed a broad minimum nosing with suggestions of local gravity anomalies. This work was followed by a reflection seismograph survey of the area, which localized a simple anticlinal structure with a minimum closure of 125 feet.

DISCOVERIES

Bacon lime: May 4, 1943; Tide Water Associated Oil Co. and Seaboard Oil Co. of Delaware #1 A. J. Bacon (Dual completion in Bacon lime and Pittsburg sand.)

Hill sand: March 5, 1944; Tide Water Associated Oil Co. and Seaboard Oil Co. of Delaware #1 C. D. Elledge.

Pittsburg sand: April 26, 1943; Tide Water Associated Oil Co. and Seaboard Oil Co. of Delaware #1 A. J. Bacon (Dual completion in Bacon lime and Pittsburg sand.)

Elledge sand: February 19, 1944; Tide Water Associated Oil Co. and Seaboard Oil Co. of Delaware #1 J. P. Campbell.

NATURE OF TRAPS and STRUCTURE

The New Hope structure is of a simple anticlinal type with a probable closure of 150 to 200 feet, as indicated by the dry hole to the northwest of production. The simplicity of the individual reservoirs is altered somewhat by the lenticularity of the porous zones. No faults or other structural irregularities were noted during development of the field.

PRODUCTIVE AREAS

	Acres
Bacon lime	4,600
Hill sand	1,300
Pittsburg sand	3,300
Elledge sand	1,500
New Hope field	4,600

The productive area of each zone is fully defined and drilling is complete except for possible additional water injection wells.

THICKNESSES OF RESERVOIR ROCKS

	Feet		
Net productive	Min.	Max.	Avg.
Bacon lime	2	23	11
Hill sand	0	36	13.5
Pittsburg sand	4	35	17
Elledge sand	1	15	3.5

LITHOLOGY OF RESERVOIR ROCKS

Bacon lime: Gray to brownish-gray, oolitic and fossiliferous porous limestone.

Hill sand: Gray to light gray medium-grained porous sandstone.

Pittsburg sand: Gray medium- to fine-grained slightly porous to porous sandstone, commonly fossiliferous near base.

Elledge sand: Gray fine- to medium-grained slightly porous sandstone.

POROSITY AND PERMEABILITY

	Porosity (percent)	Permeability (millidarcies)	
	Avg.	Max.	Avg.
Bacon lime	18.9	2,760	379
Hill sand	16.6	1,278	390
Pittsburg sand	13.4	592	61.1
Elledge sand	10.8	141	17.3

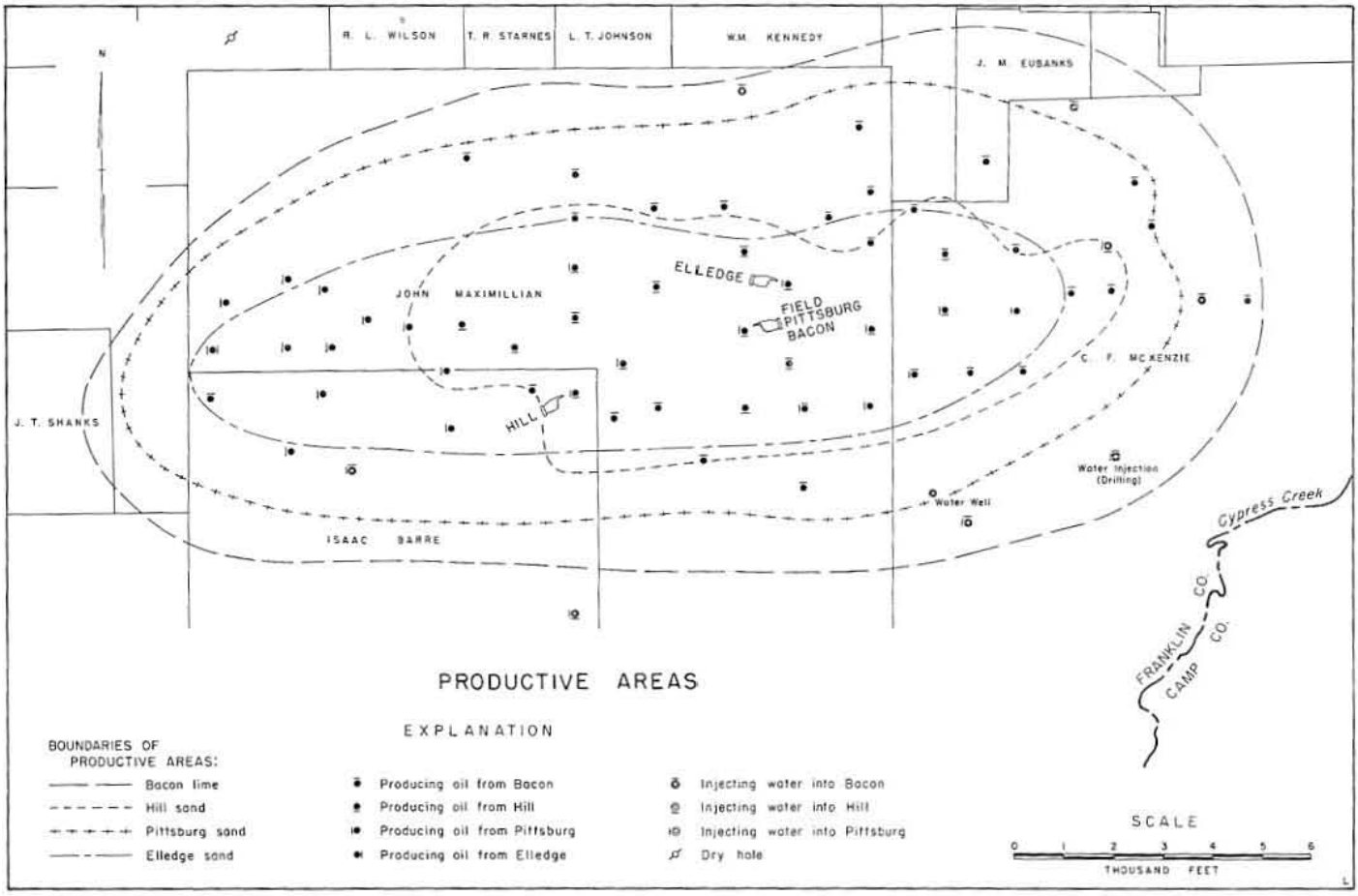
CONTINUITY OF RESERVOIR ROCKS

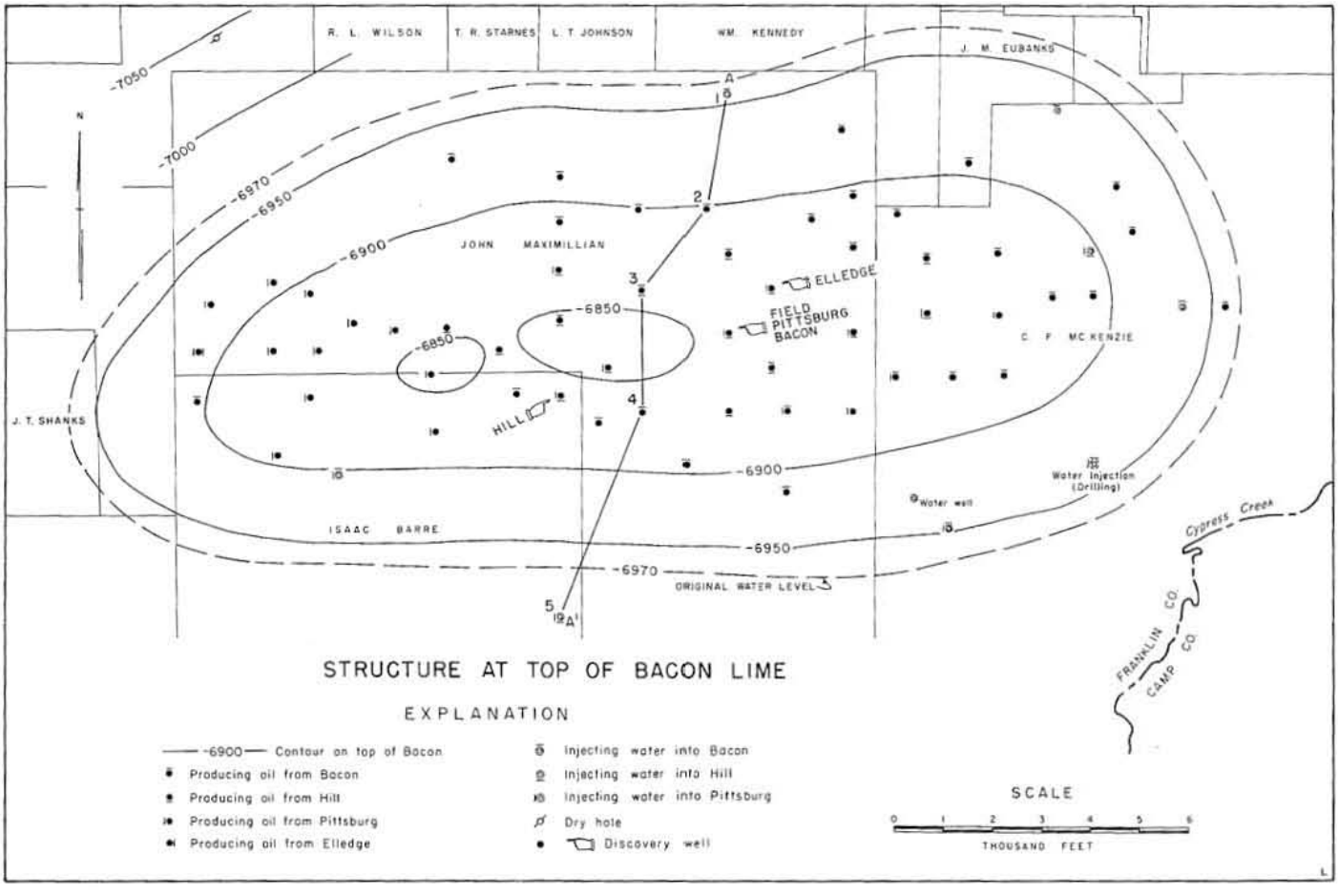
Bacon lime: The Bacon lime is a lenticular and locally developed limestone at the base of the Ferry Lake formation of the upper Glen Rose. It derived its name from the occurrence in the discovery well in this field (see paper by Wayne V. Jones listed under SELECTED REFERENCES.) The porosity in this zone is rather well and uniformly developed over the central and eastern portion of the field, but is poorly developed at the western part of the structure. Its irregular development both locally and regionally is probably responsible for the lack of water drive which is noted in this reservoir.

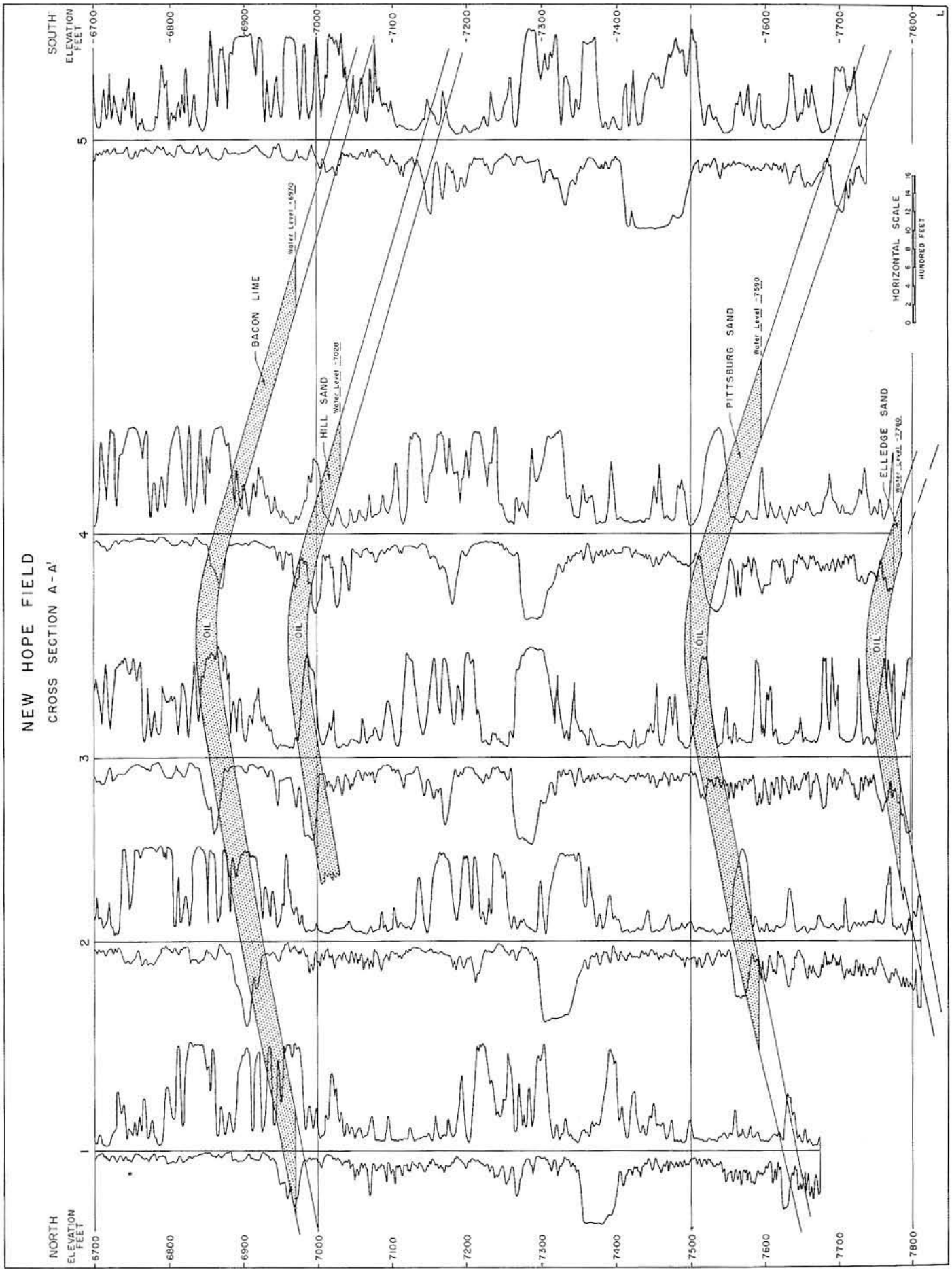
Hill sand: The Hill sand is well developed and continuous over the central and eastern portions of the field but is absent on the western one-third of the structure.

Pittsburg sand: The Pittsburg sand is generally continuous over the entire structure; however, there are several other sands associated with the main Pittsburg sand which, although productive where present, are very erratic in development.

Elledge sand: The Elledge sand is approximately 200 feet below the Pittsburg sand and is a local member within the Travis Peak formation. It is somewhat lenticular in the field, and since it is only one of the many thin sands within the Travis Peak, it cannot be correlated outside the limits of the field.


R. L. WILSON
T. R. STARNES
L. T. JOHNSON
WM. KENNEDY
J. M. EUBANKS
JOHN MAXIMILLIAN
ELLEDGE
FIELD
PITTSBURG
BACON
C. F. MC KENZIE
J. T. SHANKS
HILL
Water Injection (Drilling)
Water Well
ISAAC BARRE
Cypress Creek
FRANKLIN CO.
CAMP CO.
PRODUCTIVE AREAS
EXPLANATION
BOUNDARIES OF PRODUCTIVE AREAS:
Bacon lime
Hill sand
Pittsburg sand
Elledge sand
Producing oil from Bacon
Producing oil from Hill
Producing oil from Pittsburg
Producing oil from Elledge
Injecting water into Bacon
Injecting water into Hill
Injecting water into Pittsburg
Dry hole
SCALE
0 1 2 3 4 5 6
THOUSAND FEET

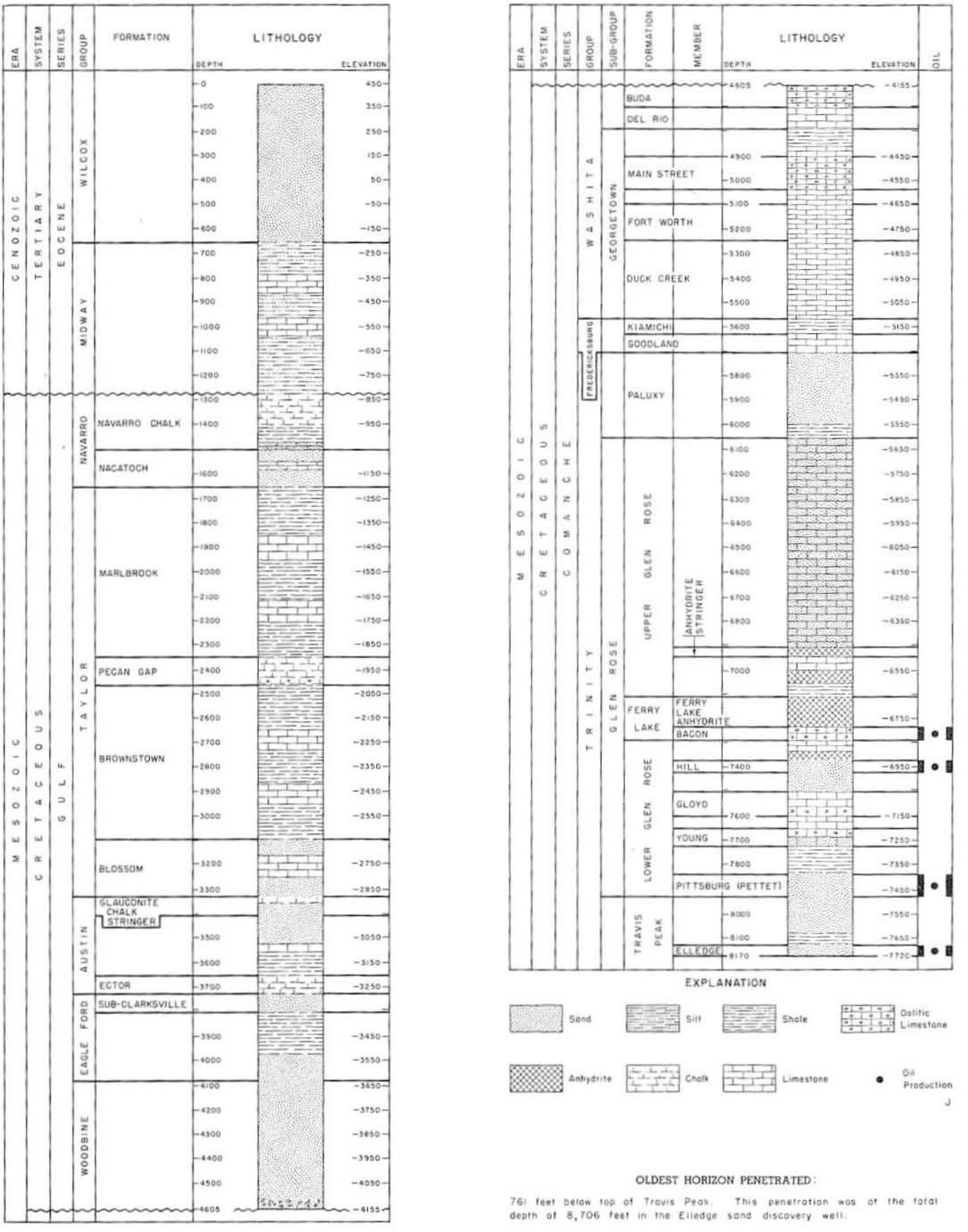

R. L. WILSON
T. R. STARNES
L. T. JOHNSON
WM. KENNEDY
J. M. EUBANKS
-7050
-7000
-6970
-6950
-6900
-6850
JOHN MAXIMILLIAN
ELLEDGE
FIELD
PITTSBURG
BACON
C. F. MC KENZIE
J. T. SHANKS
HILL
A
A'
1
2
3
4
5
Water Injection (Drilling)
Water well
ISAAC BARRE
ORIGINAL WATER LEVEL
Cypress Creek
FRANKLIN CO.
CAMP CO.
STRUCTURE AT TOP OF BACON LIME
EXPLANATION
-6900- Contour on top of Bacon
Producing oil from Bacon
Producing oil from Hill
Producing oil from Pittsburg
Producing oil from Elledge
Injecting water into Bacon
Injecting water into Hill
Injecting water into Pittsburg
Dry hole
Discovery well
SCALE
0 1 2 3 4 5 6
THOUSAND FEET


NEW HOPE FIELD
CROSS SECTION A-A'
SOUTH
ELEVATION
FEET
NORTH
ELEVATION
FEET
-6700
-6800
-6900
-7000
-7100
-7200
-7300
-7400
-7500
-7600
-7700
-7800
BACON LIME
Water Level -6970
HILL SAND
Water Level -7028
PITTSBURG SAND
Water Level -7590
ELLEDGE SAND
Water Level -7760
OIL
HORIZONTAL SCALE
0 2 4 6 8 10 12 14 16
HUNDRED FEET
1
2
3
4
5

TYPE SECTION OF ROCKS PENETRATED

SURFACE FORMATION: Wilcox

ELEVATION OF SURFACE: Highest, 480 ft; lowest, 336 ft.



EXPLANATION

Sand · Silt · Shale · Oolitic Limestone

Anhydrite · Chalk · Limestone · Oil Production

J

OLDEST HORIZON PENETRATED:

761 feet below top of Travis Peak. This penetration was at the total depth of 8,706 feet in the Elledge sand discovery well.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Bacon	Hill	Pittsburg	Elledge
Elevation of top of oil, feet	-6,844	-6,956	-7,476	-7,725
Elevation of base of oil, feet	-6,970	-7,028	-7,590	-7,780
Relief	126	72	114	55

CHARACTER OF OIL

Bacon lime:
Gravity, A.P.I., 44.1° — Sulfur, percent, 0.70 — Color, greenish-black
Gravity, specific, 0.806 — Saybolt Universal viscosity at 100° F., 32 sec.

Hill sand:
Gravity, A.P.I., 47.4° — Sulfur, percent, 0.47 — Color, dark green
Gravity, specific, 0.791 — Saybolt Universal viscosity at 100° F., 35 sec.

Pittsburg sand:
Gravity, A.P.I., 47.8° — Sulfur, percent, 0.43 — Color, dark green
Gravity, specific, 0.789 — Saybolt Universal viscosity at 100° F., 34 sec.

Elledge sand:
Gravity, A.P.I., 54.9° — Sulfur, percent, 0.23 — Color, brownish-green
Gravity, specific, 0.759 — Saybolt Universal viscosity at 100° F., 32 sec.

For analyses see:		Bacon	Hill	Pittsburg		Elledge
U. S. Bureau of Mines	Lab. ref. No.	46015	47019	46018	47020	46016
Analyses of Crude Oils from 283 Important Oil Fields of the United States, R. I. 4289 (1948)	Item			238		
Petroleum-Engineering Study of the New Hope Oil Field, Franklin County, Texas, R. I 4594 (1949)	Page	30	31		32	33

PRESSURE MAINTENANCE

During the years 1944 and 1945, the producing reservoirs in the New Hope field showed an alarming loss in bottom hole pressure. Curtailed production did not retard this loss and it was readily evidenced that these reservoirs did not have an effective water drive. A pressure maintenance program, using water injected on the flanks of the reservoirs, was recommended. In order to accomplish this program, it was necessary to unitize the oil productive area. The pressure maintenance program was approved by the Railroad Commission of Texas as a conservation measure and unitization of the New Hope field was made effective February 1, 1946.

The beneficial effects of the pressure maintenance program were evidenced early in the life of the project. In U. S. Bureau of Mines R.I. 4594 (listed under SELECTED REFERENCES,) it is estimated that the recovery will be increased as much as 100%.

Bacon lime: In this reservoir the bottom hole pressure had dropped from an initial of 3,425 psi. to 2,025 psi. prior to the initial water injection. The 14 producing wells were all on the pump and were making 630 barrels of oil per day. On December 31, 1949, approximately 2,700 barrels of water was being injected daily into 5 wells at surface pressure of 1,650 psi. The reservoir pressure had been restored to 2,913 psi. and there were 30 producing wells, 20 of which were flowing, with a daily oil production of 2,345 barrels. The wells still on the pump were pumping because of water production occasioned by the pressure maintenance program.

Hill sand: In this reservoir the bottom hole pressure had dropped from an initial of 3,425 psi. to 2,762 psi. prior to the initial water injection. The 17 producing wells were flowing, making 710 barrels of oil per day. On December 31, 1949, approximately 2,500 barrels of water was being injected daily into two wells, at a surface pressure of 1,400 psi. The reservoir pressure had been restored to 2,984 psi. and there were 15 producing wells, 14 of which were flowing, with a daily oil production of 1,500 barrels.

Pittsburg sand: In this reservoir the bottom hole pressure had declined from an initial 3,523 psi. to a low of 1,780 psi. in 1947, even though water injection had actually been started two years prior. The 20 wells producing at the time of initial injection were on the pump, making 2,100 barrels of oil per day. On December 31, 1949, approximately 2,100 barrels of water was being injected daily into 6 wells at a surface pressure of 3,700 psi. Reservoir pressure had been restored to 2,131 psi. and there were 19 producing wells, 9 of which were flowing, with a daily oil production of 1,100 barrels. This reservoir has not responded to the pressure maintenance program as readily as the other two since, due to the low permeability, an injection well is capable of taking only some 400 barrels of water per day at an injection pressure of 3,700 psi. In view of this situation, the reservoir withdrawal has been curtailed in order to restore bottom hole pressure.

WATER PRODUCTION

Bacon lime: Water was first produced on the initial completion of a well on the north edge of the Bacon reservoir in March 1946. The water production in this well has continued at a constant rate, even though the oil production from the same well has increased due to the pressure maintenance program. As of June 1, 1950, 8 wells, located on the edges of the producing area, were producing water. Practically all of this water production is a result of the pressure maintenance program since the chloride content of produced water is considerably less than the chloride content of the initial water produced from the reservoir in 1946.

Hill sand: As of June 1, 1950, one well located on the south edge of the Hill reservoir was producing water. A number of other edge wells have ceased to produce oil from this reservoir due to water encroachment. Since this reservoir has a partial water drive in conjunction with the pressure maintenance program, it was anticipated that flank wells would be watered out early in the life of the project.

Pittsburg sand: As of June 1, 1950, one well located on the southwest flank of the Pittsburg reservoir was producing some water. No well in this reservoir produced water prior to the pressure maintenance program, and since this well now producing water is located near an injection well, it is readily apparent that the water produced is due to the pressure maintenance program.

Elledge sand: As of June 1, 1950, there was only one well producing from the Elledge reservoir. Eight wells which had previously produced from this reservoir had been abandoned, due to lack of productivity. No water has ever been produced from this reservoir.

SELECTED REFERENCES

Carpenter, Charles B., Anderson, Kenneth F., and Book, Alton B. (1949) Petroleum engineering study of the New Hope field, Franklin County, Texas: U. S. Bureau of Mines, R. I. 4594.

Jones, Wayne V. (1945) Bacon limestone, East Texas: Amer. Assoc. Petr. Geol., Bull., vol. 29, pp. 839-845.

Stehr, R. A. (1945) New Hope Oil Field, Franklin County, Texas: Amer. Assoc. Petr. Geol., Bull., vol. 29, pp. 836-839.

Trube, Albert S., Jr. and DeWitt, Sam N. (1949) High pressure water injection for maintaining reservoir pressures, New Hope field, Franklin County, Texas. Presented at the San Antonio, Texas, meeting of the Petroleum Branch, A.I.M.E., October 5-7, 1949; publication forthcoming in Transactions of the American Institute of Mining and Metallurgical Engineers.

PRODUCTION HISTORY

	NUMBER OF WELLS at end of year			OIL PRODUCTION (barrels)	
	Producing oil		Injecting		
	Pump.	Flow.	water	Yearly	Cumulative
Field totals					
1943				123,926	123,926
1944				1,009,004	1,132,930
1945				1,639,468	2,772,398
1946				1,278,497	4,050,895
1947				1,471,539	5,522,434
1948				1,611,262	7,133,696
1949				1,876,283	9,009,979
Bacon lime					
1943	0	3	0	66,637	66,637
1944	0	13	0	298,596	365,233
1945	6	14	0	286,532	651,765
1946	22	0	1	262,350	914,115
1947	14	11	2	495,218	1,409,333
1948	8	21	5	711,254	2,120,587
1949	7	24	5	826,984	2,947,571
Hill sand					
1944	0	15	0	299,046	299,046
1945	0	17	0	559,055	858,101
1946	0	19	1	334,380	1,192,481
1947	0	18	2	380,028	1,572,509
1948	1	16	2	446,835	2,019,344
1949	1	14	2	547,736	2,567,080
Pittsburg sand					
1943	0	3	0	57,289	57,289
1944	0	21	0	360,326	417,615
1945	0	29	2	710,661	1,128,276
1946	13	20	2	570,738	1,699,014
1947	23	3	4	522,432	2,221,446
1948	14	11	7	426,953	2,648,399
1949	14	10	7	484,095	3,132,494
Elledge sand					
1944	0	4	0	51,036	51,036
1945	0	7	0	83,220	134,256
1946	0	9	0	111,029	245,285
1947	0	7	0	73,861	319,146
1948	0	1	0	26,220	345,366
1949	0	1	0	17,468	362,834

NEW RICHLAND FIELD
Navarro County, Texas

EDWARD J. MATULICH, Jr.
Geologist, Sun Oil Company, Tyler, Texas
May 15, 1950

LOCATION

The one well constituting the New Richland field is approximately 2 miles south of the town of Richland and a few hundred feet west of the North Currie field, which had a long history of production from Woodbine sand prior to discovery of this field. These fields are in the zone of the Luling-Mexia-Talco fault system.

METHODS OF EXPLORATION LEADING TO DISCOVERY

It is presumed that the discovery of this field is a follow-up of the near-by shallower production. Surface mapping of the Midway limestone originally revealed the down-to-west fault.

DISCOVERY

Rodessa lime: October 5, 1946;
Temple Hargrove #1 Guy E. Wallace

ELEVATION OF SURFACE

400 feet.

SURFACE FORMATION

Midway limestone.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated in the one productive well is 205 feet below the top of Travis Peak. There was a penetration of about 230 feet into Travis Peak in the near-by Temple Hargrove #2 Guy E. Wallace, which was drilled to a total depth of 6,205 feet.

NATURE OF TRAP

Rodessa lime: Closure against a fault.

PRODUCTIVE AREA

Rodessa lime and Field: 10 acres.

THICKNESS OF RESERVOIR ROCK

Rodessa lime: 10 feet net productive.

LITHOLOGY OF RESERVOIR ROCK

Rodessa lime: Gray and brown, crystalline, pseudo-oolitic limestone with cellular porosity containing brown, medium-grained, porous sand near the base.

CONTINUITY OF RESERVOIR ROCK

Rodessa lime: Apparently this stratigraphic unit is continuous throughout the entire East Texas basin. However, porosity and permeability within this zone varies somewhat from area to area.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Rodessa lime:	Feet
Elevation of top of oil	-5,045
Elevation of bottom of oil	-5,065
Relief	20

CHARACTER OF OIL

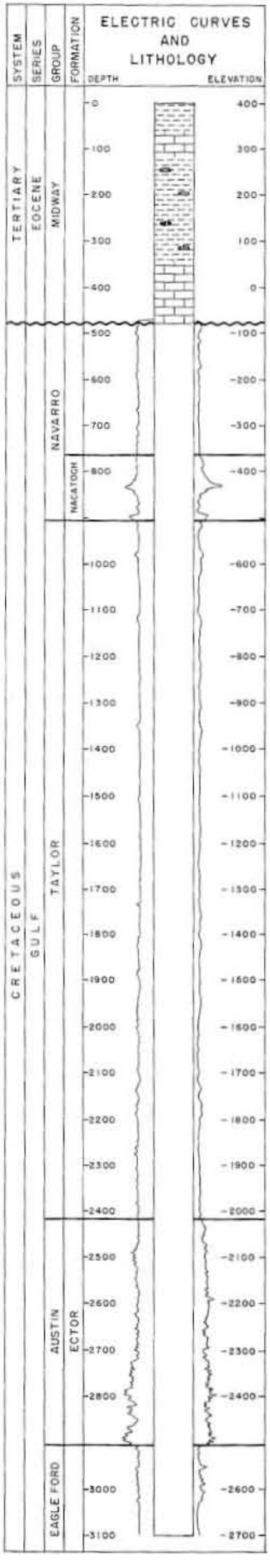
Rodessa lime: Gravity, A.P.I. 23°.

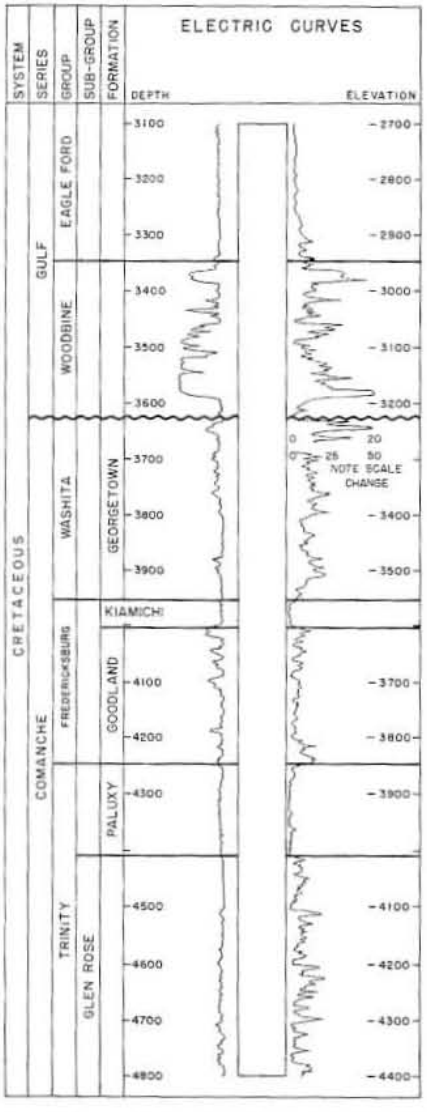
WATER PRODUCTION

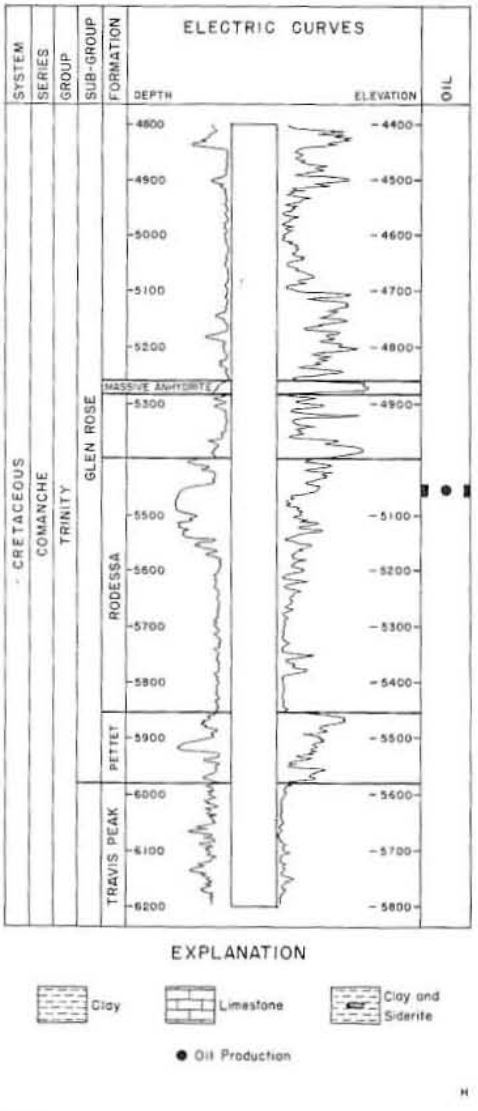
Rodessa lime: Initially, the well produced 157 barrels of salt water along with 39.25 barrels of oil per day. The well was worked over and recompleted on October 1, 1948 and then produced at the rate of 100 barrels of salt water and 4 barrels of oil per day. While the quantity is not known to the writer, it is evident that a large amount of salt water has been produced.

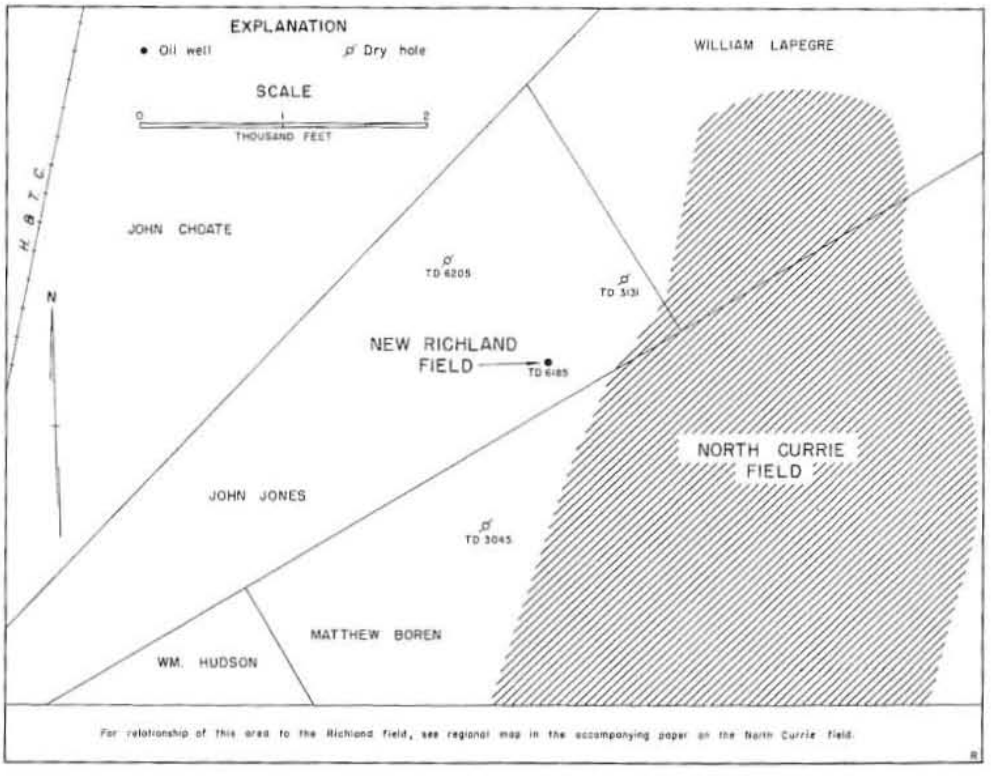
PRODUCTION HISTORY

Rodessa lime and Field total: The discovery well is the only well which has produced. It pumped a total of 3,816 barrels of oil from time of discovery in October 1946 to January 1, 1950. During January 1950, it pumped a total of 65 barrels of oil.


ELECTRIC CURVES AND LITHOLOGY
SYSTEM
SERIES
GROUP
FORMATION
DEPTH
ELEVATION
TERTIARY
EOCENE
MIDWAY
NAVARRO
NACATOCH
CRETACEOUS
GULF
TAYLOR
AUSTIN
ECTOR
EAGLE FORD


ELECTRIC CURVES
SYSTEM
SERIES
GROUP
SUB-GROUP
FORMATION
DEPTH
ELEVATION
CRETACEOUS
COMANCHE
GULF
TRINITY
GLEN ROSE
EAGLE FORD
WOODBINE
WASHITA
FREDERICKSBURG
PALUXY
GEORGETOWN
KIAMICHI
GOODLAND
NOTE SCALE CHANGE


ELECTRIC CURVES
SYSTEM
SERIES
GROUP
SUB-GROUP
FORMATION
DEPTH
ELEVATION
OIL
CRETACEOUS
COMANCHE
TRINITY
GLEN ROSE
MASSIVE ANHYDRITE
RODESSA
PETTET
TRAVIS PEAK
EXPLANATION
Clay
Limestone
Clay and Siderite
Oil Production


EXPLANATION
Oil well
Dry hole
SCALE
THOUSAND FEET
WILLIAM LAPEGRE
JOHN CHOATE
TD 6205
TD 5131
NEW RICHLAND FIELD
TD 6185
NORTH CURRIE FIELD
JOHN JONES
TD 3045
MATTHEW BOREN
WM. HUDSON
H B T C
N
For relationship of this area to the Richland field, see regional map in the accompanying paper on the North Currie field.

NIGGER CREEK FIELD
Limestone County, Texas

FRANK BRYAN*
Consulting Geologist, Groesbeck, Texas
April 10, 1950

LOCATION and OTHER NAME

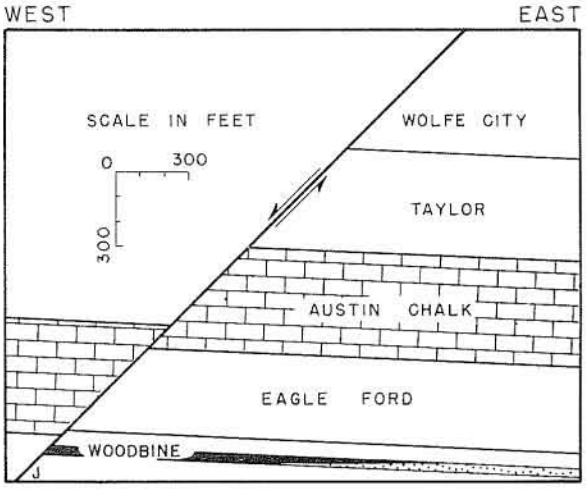
The Nigger Creek field is in the Pedro Varela survey 5 miles west of the town of Mexia. It is in the zone of the Tehuacana-Mexia fault graben system. It is 3 miles west of the south end of the Mexia field and on the upthrown side of a fault parallel to the fault at Mexia. It is near the southernmost extent of production from the Woodbine sand. Commercial oil has been found along strike southward in only the Cedar Creek field.

The field has been designated as the Negro Creek field in certain published reports. This name, however has had only very limited usage.

DISCOVERY

Woodbine sand: July 8, 1926;
Transcontinental Oil Co. #1 A. E. Rosson.

CROSS SECTION



ELEVATION OF SURFACE

At well locations:
Highest, 514 feet; lowest, 483 feet.

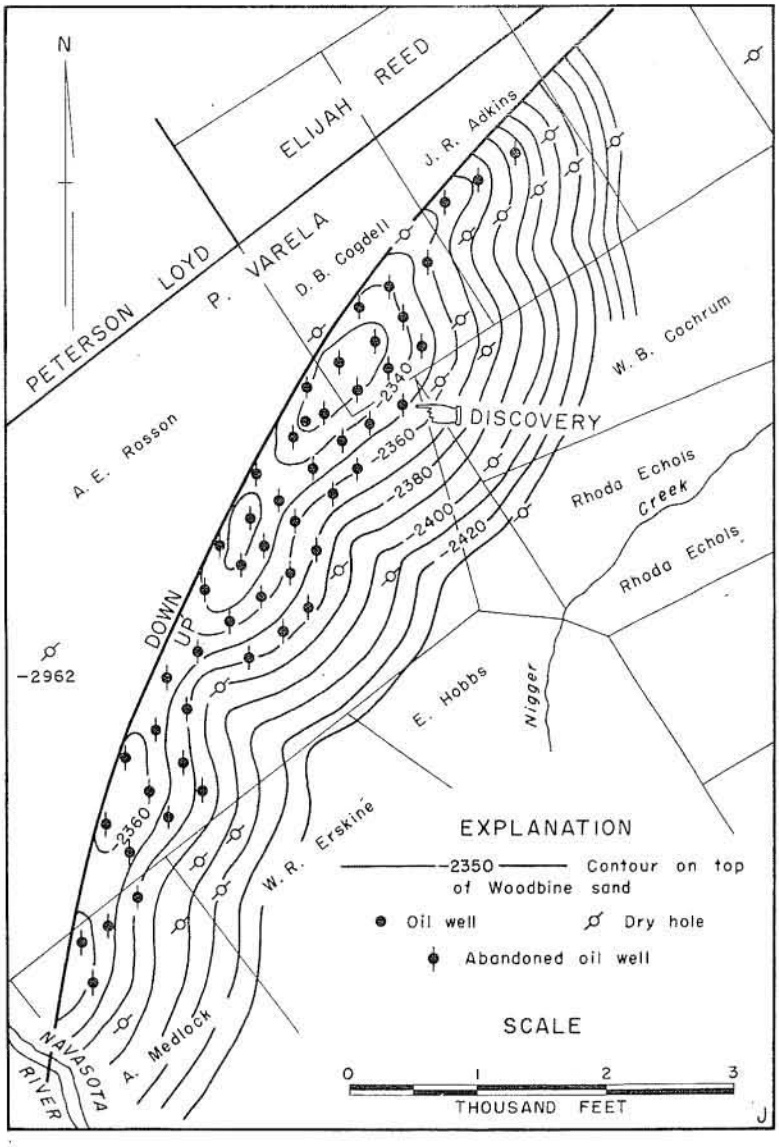
SURFACE FORMATION

Midway limestone, Eocene, is the only formation exposed within the area of the field.

*The author gratefully acknowledges the papers listed below under SELECTED REFERENCES. Many of the entries herein have been extracted from those papers.

METHODS OF EXPLORATION LEADING TO DISCOVERY

In search for a particular set of conditions which they regarded as sufficiently favorable to warrant exploratory drilling, Leon J. Pepperberg and Heath M. Robinson, both then in consulting practice in Dallas, in August, 1924, extended mapping of surface geology to include this area where they found the desired conditions. The predominating structural feature is a down-to-west fault similar to that at Mexia where production had been discovered in 1920. The fact that this prospective area was up-dip from Mexia was a serious handicap in arranging for financing exploratory drilling. Early in 1925, W. E. Wrather, who was also then a consulting geologist of Dallas, became convinced of the possibilities of production on an up-dip fault and presented a drilling proposition to Transcontinental Oil Co., Pittsburgh, Pa., and induced that company to undertake the operations which resulted in discovery.



OLDEST STRATIGRAPHIC HORIZON PENETRATED

About 20 feet below top of Buda limestone.

TYPE SECTION OF ROCKS PENETRATED

For information relative to the stratigraphic section penetrated in this field, the reader is referred to the accompanying paper on the Cedar Creek field. The stratigraphic section is essentially the same in the two fields, which are separated by a distance of only about $1\frac{1}{2}$ miles.

NATURE OF TRAP

Woodbine sand: Closure against fault.

PRODUCTIVE AREA

Woodbine sand and Field: 171 acres.

THICKNESS OF RESERVOIR ROCK

Woodbine sand: From 8 to 24 feet net productive.

LITHOLOGY OF RESERVOIR ROCK

Woodbine sand: Fine-grained, soft, loosely-cemented sand with porosity of 25%.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

	Woodbine sand
Elevation of top of oil, feet	2,325
Elevation of bottom of oil, feet	2,360
Relief, feet	35

CHARACTER OF OIL

Woodbine sand:
Gravity, A.P.I., 40° Sulphur, .27%
Base, intermediate

For oil analyses see:
U. S. Bureau of Mines Lab. ref. no. 26586
Tabulated Analyses of Texas Crude Oils
R. I. 3252 (1934) Item 32, Group 4
Tabulated Analyses of Texas Crude Oils
T. P. 607 (1939) Item 43, Group 4

WATER PRODUCTION

There was a constant water encroachment. More than five barrels of water was lifted with each barrel of oil when the field was abandoned in 1931.

SELECTED REFERENCES

Hull, J. P. D. (1926) Discovery of Nigger Creek oil pool, Limestone County, Texas: Amer. Assoc. Petr. Geol., Bull., vol. 10, pp. 997-998.

Lahee, F. H. (1929) Oil and gas fields of the Mexia and Tehuacana fault zones, Texas: Amer. Assoc. Petr. Geol., Structure of Typical American Oil Fields, vol. 1, pp. 304, 308, 323, 332, 351, 355, 361, 367, 374, 376, 381, 383.

Lahee, F. H. (1934) A study of the evidences for lateral and vertical migration of oil: Amer. Assoc. Petr. Geol., Problems of Petroleum Geology, pp. 420, 421.

Pepperberg, Leon J. (1929) Nigger Creek field, Limestone County, Texas: Amer. Assoc. Petr. Geol., Structure of Typical American Oil Fields, vol. 1, pp. 409-420.

Rich, John L. (1934) Problems of the origin, migration, and accumulation of oil: Amer. Assoc. Petr. Geol., Problems of Petroleum Geology, pp. 340, 341.

PRODUCTION HISTORY

Woodbine sand and Field:

The most definite available data relative to the early production history are in the paper by Leon J. Pepperberg listed above under Selected References. The following data in this paragraph are quoted from that paper. On July 8, 1926, the discovery well was completed, with initial production at the rate of 2,800 barrels per day. On July 26, when the production rate of the discovery well had declined to 2,399 barrels per day, there were 18 rigs and derricks, 20 locations, 5 drilling wells and 2 completions in the field. The field produced 539,995 barrels of pipe-line oil between July 8 and September 10 from 37 wells, and a total of 1,585,470 barrels from 72 producing wells to January 1, 1927. The peak production was 22,085 barrels per day from 33 pumping and flowing wells. This was reached September 7, two months after the discovery well was completed. During 1927, the production amounted to 972,290 barrels, and during the first half of 1928, to 132,240 barrels, making a total of 2,690,000 barrels during the first two years of operations. In June, 1928, 45 wells were producing a total of 650 barrels of oil per day.

The field was abandoned as fully depleted by pumping on July 1, 1931. The total production to that date amounted to 2,985,116 barrels; 17,560 barrels per acre.

The field was again listed as a producer, with one well producing, during the years 1938 to 1941; 1938, 155 barrels; 1939, 358 barrels; 1940, 116 barrels; 1941, 27 barrels.

There was no production then until after January 11, 1950, when J. C. Bertrand et al. #1 C. R. Yelverton was completed at an in-between location. This well was put on pump March 1, 1950, pumping 22 barrels of oil and 86 barrels of water per day. This is the only well now producing.

NOLAN EDWARD FIELD
Wood County, Texas

HASTINGS MOORE
District Geologist, Danciger Oil & Refining Company, Henderson, Texas
July 20, 1950

LOCATION

The Nolan Edward field is located 3 miles northwest of Mineola. It is near the trend of the Merigale-Paul field four miles southwest of the southwest end of that field.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Seismograph.

DISCOVERY

Sub-Clarksville: June 25, 1949; Bobby Manziel #1 Maude Thompson, Swanson Yarbrough survey, A-658. Pumped 108 barrels of 18° gravity crude per day from depth of 4,691 to 4,704 feet.

ELEVATION OF SURFACE

At well locations: Highest, 475 ft.; lowest, 424 feet.

SURFACE FORMATION

Queen City.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

230 feet below top of Woodbine. This penetration was in the discovery well.

NATURE OF TRAP and STRUCTURE

The structure of the Nolan Edward field is a small faulted dome with production thus far lying within a horst.

THICKNESS OF RESERVOIR ROCK

	Feet		
Sub-Clarksville	Min.	Max.	Avg.
From top to bottom	0	50	20
Net productive	0	20	12

PRODUCTIVE AREA

Sub-Clarksville and Field: 120 acres.

CONTINUITY OF RESERVOIR ROCK

The sub-Clarksville formation occurs as a blanket deposit over all of Wood County and parts or all of several adjoining counties. Over most of this area, the sands are quite ashy or are entirely ash. Areas of clean sand are quite local.

LITHOLOGY OF RESERVOIR ROCK

Sub-Clarksville: The reservoir rock varies from fine-grained sand to highly ashy sand.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Sub-Clarksville:	Feet
Elevation of top of oil	-4,221
Elevation of bottom of oil	-4,300
Relief	79

CHARACTER OF OIL

Sub-Clarksville:
Gravity, A.P.I. @ 60° F.: 18°
Odor: Sweet
Color: Black

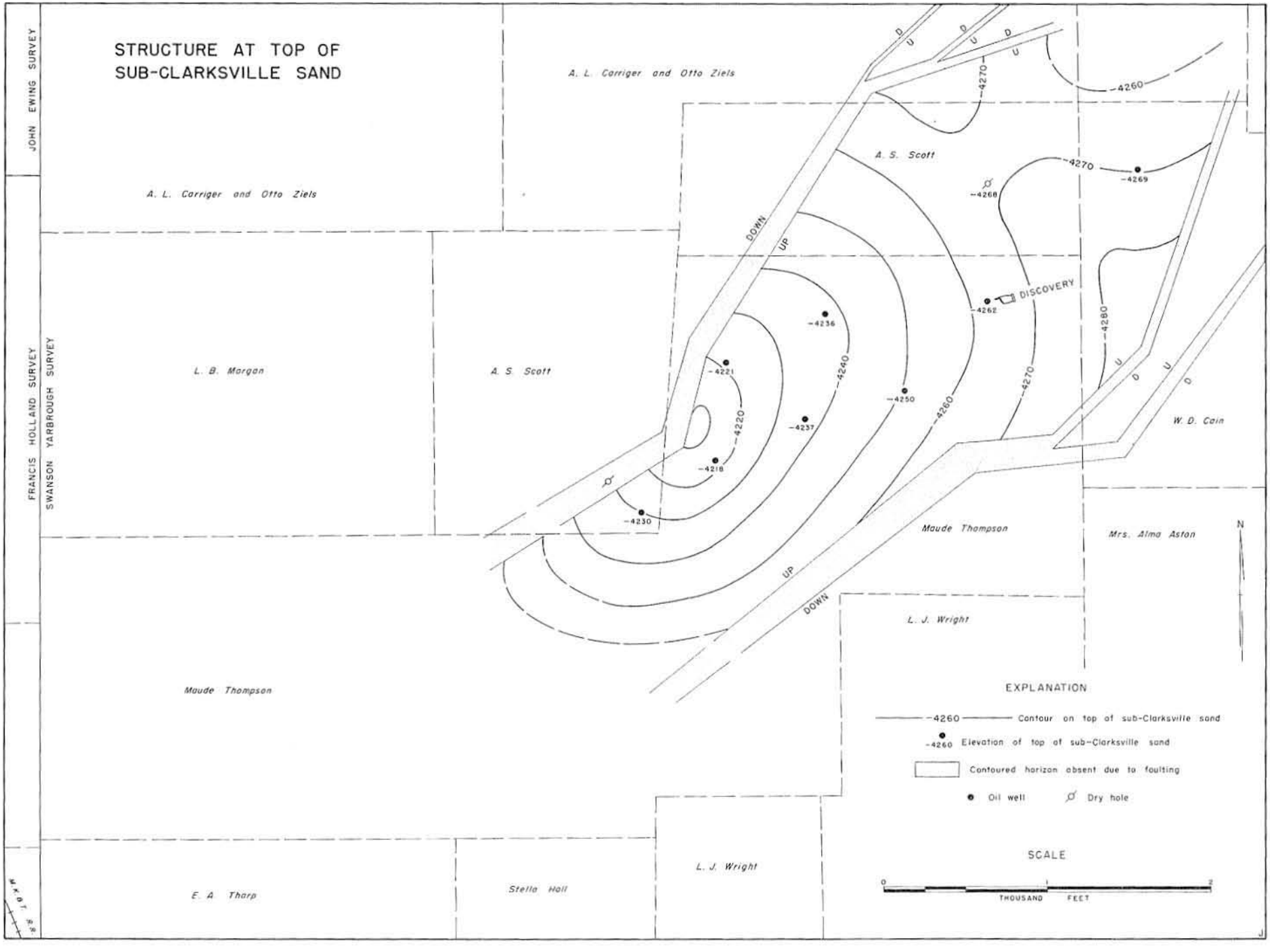
CHARACTER OF GAS

Sub-Clarksville: Due to the negligible quantity of gas produced, no analysis has been made.

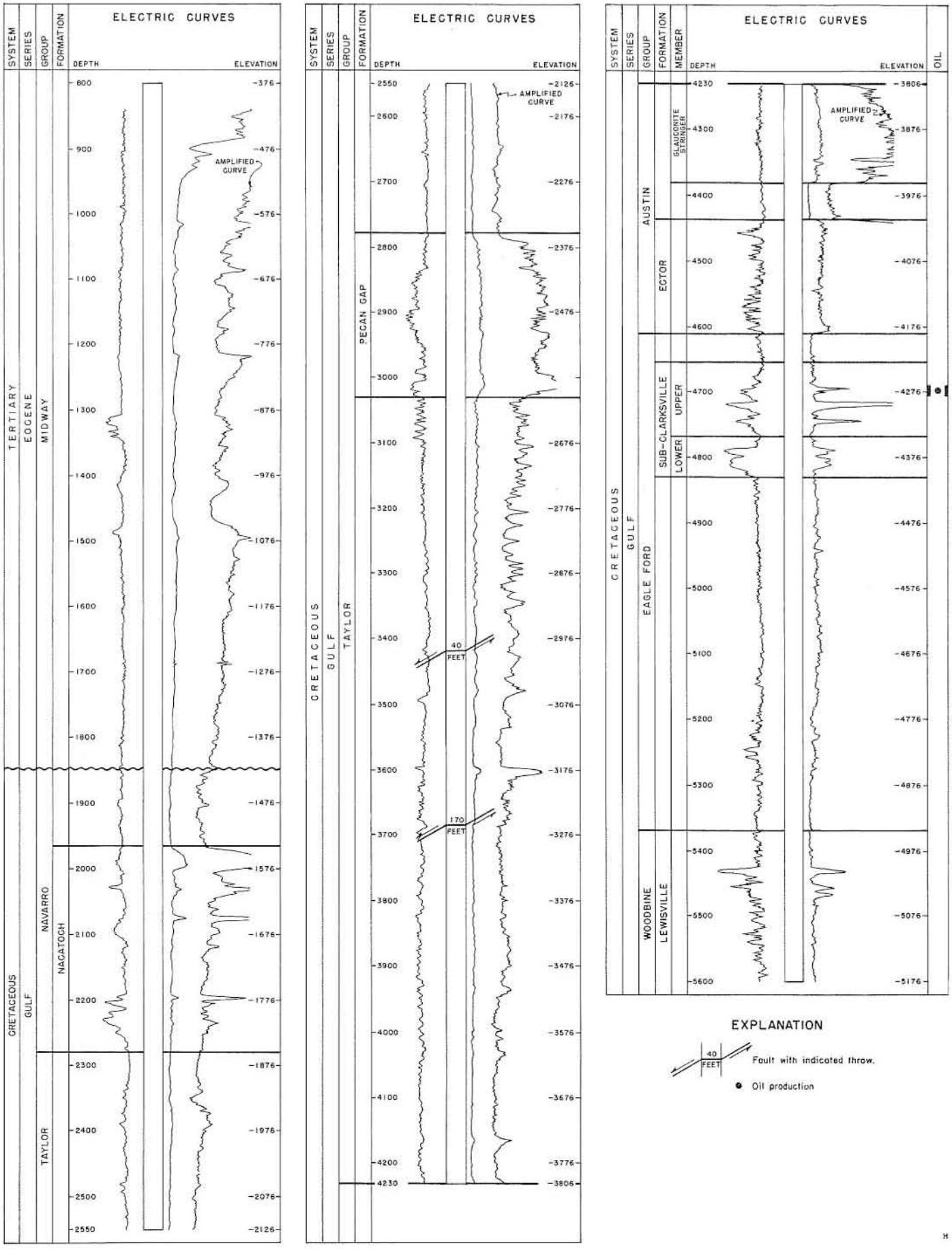
PRODUCTION HISTORY

Sub-Clarksville: From the date of discovery in June to the end of the year 1949, the field produced 38,853 barrels of oil. There were 5 pumping wells at the end of the year.

During April 1950 the production amounted to 7,945 barrels by 6 pumping wells.


STRUCTURE AT TOP OF
SUB-CLARKSVILLE SAND
JOHN EWING SURVEY
FRANCIS HOLLAND SURVEY
SWANSON YARBROUGH SURVEY
A. L. Carriger and Otto Ziels
A. L. Carriger and Otto Ziels
A. S. Scott
L. B. Morgan
A. S. Scott
W. D. Cain
Maude Thompson
Mrs. Alma Aston
L. J. Wright
Maude Thompson
E. A. Tharp
Stella Hall
L. J. Wright
DISCOVERY
-4260
-4270
-4269
-4268
-4262
-4280
-4236
-4221
-4240
-4220
-4250
-4237
-4260
-4270
-4218
-4230
DOWN
UP
UP
DOWN
D U D U D U
D U D U D
EXPLANATION
-4260 Contour on top of sub-Clarksville sand
-4260 Elevation of top of sub-Clarksville sand
Contoured horizon absent due to faulting
Oil well
Dry hole
SCALE
0
1
2
THOUSAND FEET
N

TYPE SECTION OF ROCKS PENETRATED



NORMANGEE-FLYNN FIELD
Leon County, Texas

PHILIP S. SCHOENECK
District Geologist, The Atlantic Refining Company, Tyler, Texas
December 27, 1950

LOCATION

The Normangee-Flynn field is between the towns of Flynn and Normangee. The most westward of the four wells is $2\frac{1}{2}$ miles south of Flynn.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Random drilling.

DISCOVERY

Woodbine: December 7, 1946; Daniels Oil Co. #1 Mrs. F. A. Cox Estate. Flowed by heads 72.45 barrels of 33° gravity oil in 25 hours; tubing pressure, 10 to 100 psi.; six sets of perforations between depths of 6,950 and 7,316 feet. Although the casing was perforated also opposite Buda lime at 7,416 to 7,428 feet, it is generally believed that the production comes entirely from Woodbine.

The presence of oil in the Woodbine in this vicinity had been demonstrated in February 1946 in Claude Bell #1 Brown & Carson but the amount produced (variously reported 2 to 8 barrels per day) did not appear to indicate commercial production. Therefore, this well was not considered as the discovery well. Some production was obtained from it during 1947.

ELEVATION OF SURFACE

At well locations: Highest, 549 ft.; lowest, 415 feet.

SURFACE FORMATION

Sparta sand.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated is 158 feet below the top of the Goodland lime. This penetration was in United North & South Dev. Co. #1 Ray L. Oden.

NATURE OF TRAP

Woodbine: The trap-forming factors have not been determined. The dip of the reservoir rock is uninterrupted southeast at the rate of 125 feet per mile parallel with the base of Austin, the attitude of which is depicted on the accompanying map.

PRODUCTIVE AREA

Woodbine and Field: Any estimate of productive area would be very speculative; apparently there is no actually commercially productive area. There has been some very minor production from four wells scattered as indicated on the accompanying map. The distance between the extreme wells is slightly less than 3 miles.

LITHOLOGY OF RESERVOIR ROCK

Woodbine: The Woodbine section consists almost entirely of shales. The Lewisville and Dexter members cannot be differentiated. In Daniels Oil Co. #1 Mrs. F. A. Cox Estate, the correlated top of the Woodbine is at the depth of 6,906 feet, which is 44 feet above the highest perforation. From microscopic studies of the adequate cores from this well, there seems little doubt that the source of the production is indigenous oil from the Woodbine shales. These shales are rich in hydrocarbons showing occasional free oil on bedding planes and in the paper-thin silty to finely sandy laminations. The continuous core of 192 feet of section below 7,016 feet is described as follows: Slightly mottled gray to brown shale with fish scales, fish bones, lignite spots and inclusions; and oily spots, usually oily around fish scales and bones (rib bones and vertebrae). The shales are firm to hard and calcareous in streaks, with occasional lignitic shale, pyritic shale and streaks of silty shale.

THICKNESS and CONTINUITY OF RESERVOIR ROCK

Indeterminate. See above discussion of lithology.

CHARACTER OF OIL

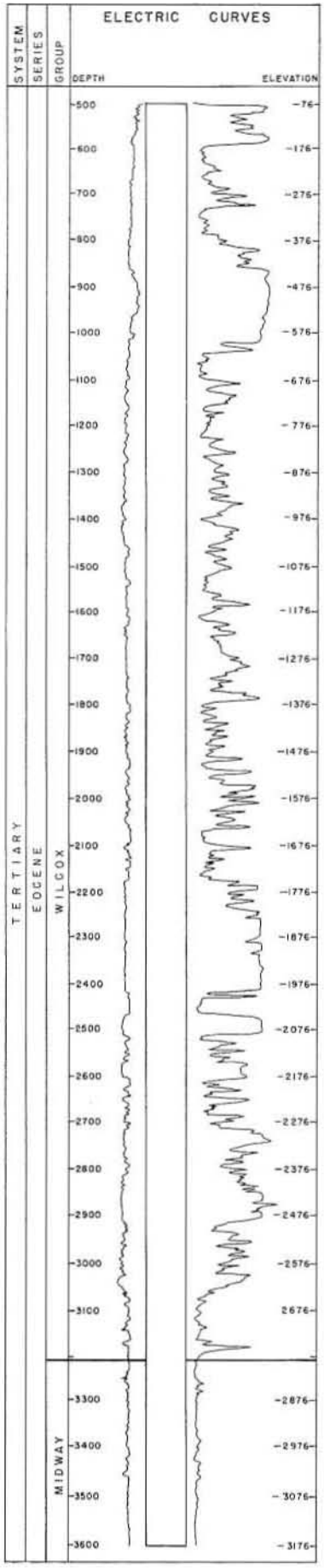
Gravity, 33° to 35°.

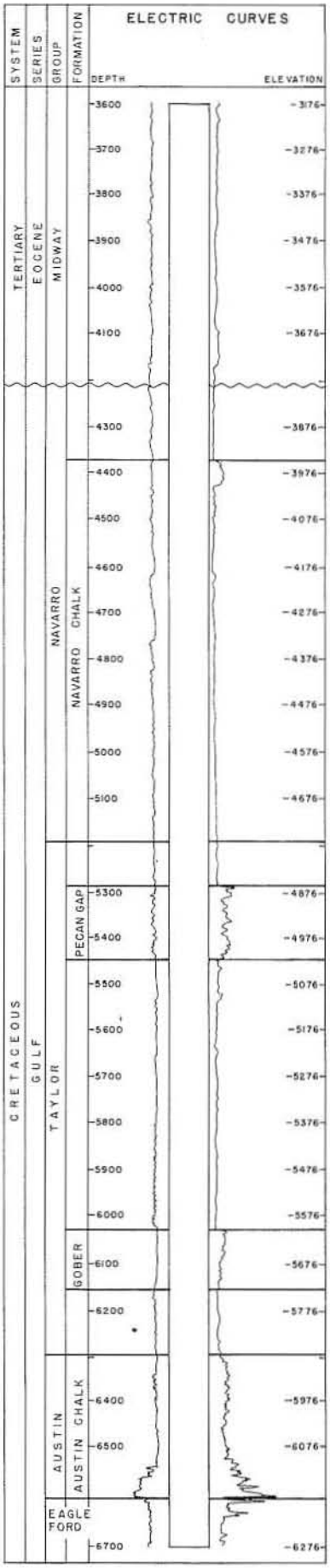
DEVELOPMENT AND PRODUCTION HISTORY

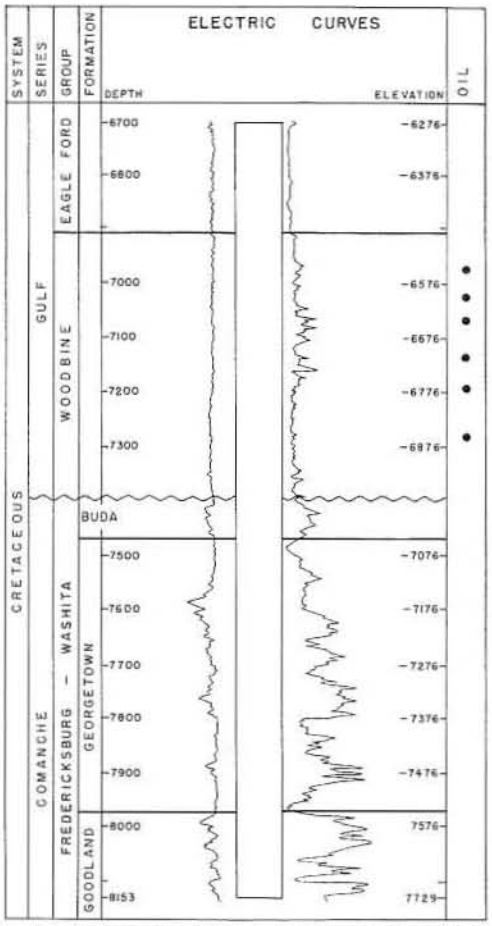
	NUMBER OF WELLS		OIL PRODUCTION (barrels)	
Year	Completed	Producing at end of year	Yearly	Cumulative
1946	1	1	1,128	1,128
1947	3	3	6,825	7,953
1948	0	1	4,474	12,427
1949	0	1	3,205	15,632
1950 to 8/1	0	1	1,314	16,946

The only well now producing is the discovery well, which appears to have operated intermittently since completion. United North & South #1 Ray L. Oden produced 11 months in 1947 and about 8 months in 1948 and was abandoned on 9/2/48. Claude Bell #1 Brown & Carson produced 9 months in 1947 and Tex Harvey #1 B. L. Powell produced 5 months in 1947. The discovery well is the only well which has produced since 9/1/48.

TYPE SECTION OF ROCKS PENETRATED



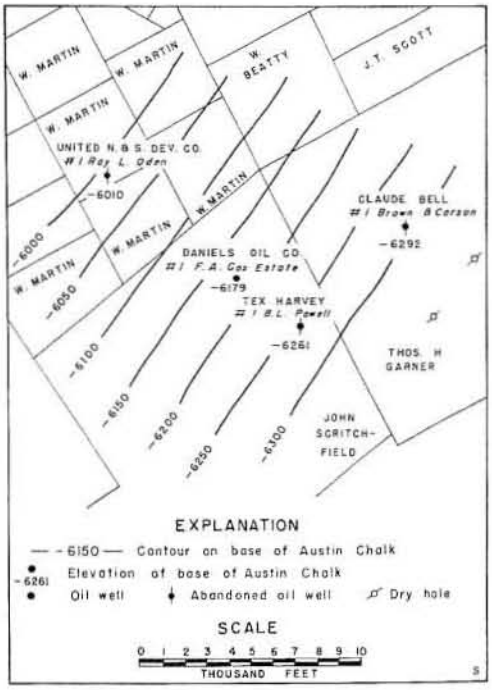




Note: This TYPE SECTION is based on the log of DANIELS OIL CO. #1 Mrs. F. A. Cox Estate from 501 to 7401 feet and, below that, with adjusted depths and elevations, on the log of UNITED NORTH AND SOUTH DEV. CO. #1 Ray L. Oden.

EXPLANATION

● Oil production



NORTH CURRIE FIELD
Navarro County, Texas

FREDERICK R. SCHEERER
Geologist, Atlantic Refining Company, Tyler, Texas
August 1, 1950

LOCATION

North Currie field is in southern Navarro County 12 miles north of the town of Mexia and 2 miles north of the Currie field. It is in the zone of the Luling-Mexia-Talco fault system.

DATA CONCERNING SHALLOWER RESERVOIRS

Oil and gas have been produced from reservoirs above the Woodbine, but the production has been relatively unimportant. Available relevant data are very meager -- too meager to warrant entries under the various headings in this paper. There was production of oil and gas from shallow reservoirs prior to the discovery of Woodbine production. Development of the Woodbine sands resulted in discovery of additional shallow reservoirs. Some of the old shallow productive area is beyond the boundary of the Woodbine productive area. The quantities of oil and gas production were relatively so unimportant that few records were kept. It is believed that each of the shallower reservoirs is in either the Kincaid formation or the Nacatoch formation.

Kincaid formation: The youngest formation to produce at North Currie is the Kincaid formation of the Midway group. A few wells have produced oil and gas from sandy streaks within the Midway lime, which is the uppermost member of the Kincaid formation. The Midway lime is about 350 feet below the surface at North Currie. It ranges from 10 to 15 feet in thickness. Oil has been produced also from a glauconitic sand stringer immediately under the Midway lime. The lower, non-productive part of the Kincaid formation consists mainly of sandy shales and shales. The oil produced from the Kincaid formation had an average gravity of 20.3° Be. and a paraffin content of .13%.

Nacatoch formation: Some gas has been produced from reservoirs in the Nacatoch formation on both the upthrown and downthrown sides of the major fault. The Nacatoch sand zone is capped by about 40 feet of chalk. This sand zone consists of about 160 feet of interbedded sand and sandy shales.

SURFACE FORMATIONS

The Wills Point and Kincaid formations, both in the Midway group, are the only formations exposed within the general area of the field.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Woodbine sand: The location of the well which led to the discovery of Woodbine production was selected on the basis of interpretations of surface and subsurface geological data. The location was recommended by D. J. Edson, of the Humble Oil Co., and by F. H. Lahee, of the Sun Oil Co. No actual surface mapping was done. The recommendations were based on the general trend of the fault zone and on suggestive topography. The position of outcrop of the major fault was kot known.

DISCOVERIES

Woodbine sand: In December 1921 the Sun Oil Co. #1-A G. W. Hardy flowed 20,000 Mcf of gas per day from the Woodbine formation at depth of 2,976 feet. In January 1922, it was deepened 20 feet and completed for 60,000 Mcf of gas per day, making it the discovery well of the North Currie field. In August 1922, the first Woodbine oil well, the Sun Oil Co. #B-1 C. S. West, was completed flowing 850 barrels of oil per day.

ELEVATION OF SURFACE

The average elevation is about 400 feet above sea level.

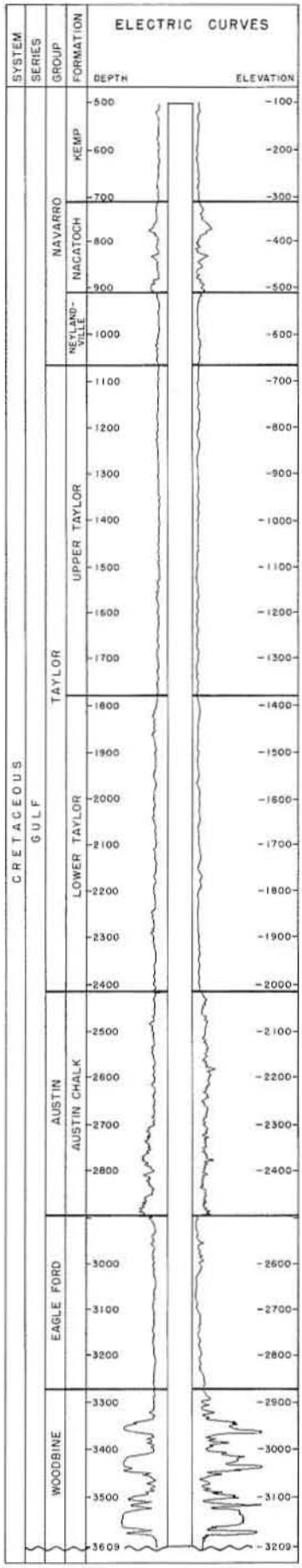
OLDEST STRATIGRAPHIC HORIZON PENETRATED

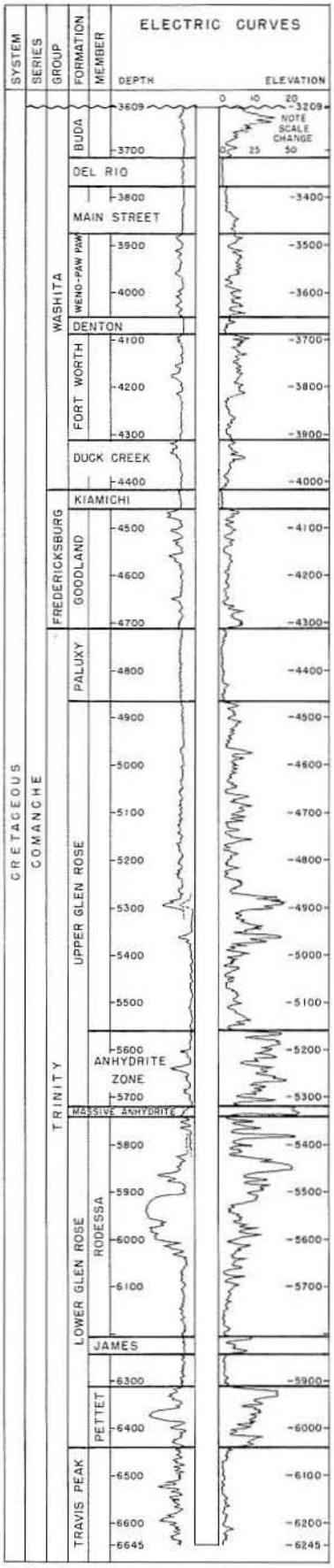
The oldest stratigraphic horizon penetrated within the vicinity of the field is about 230 feet below the top of the Travis Peak. This penetration was in Temple Hargrove #2 Guy E. Wallace, a dry hole drilled to the total depth of 6,205 feet. This dry hole is near the one productive well constituting the New Richland field.

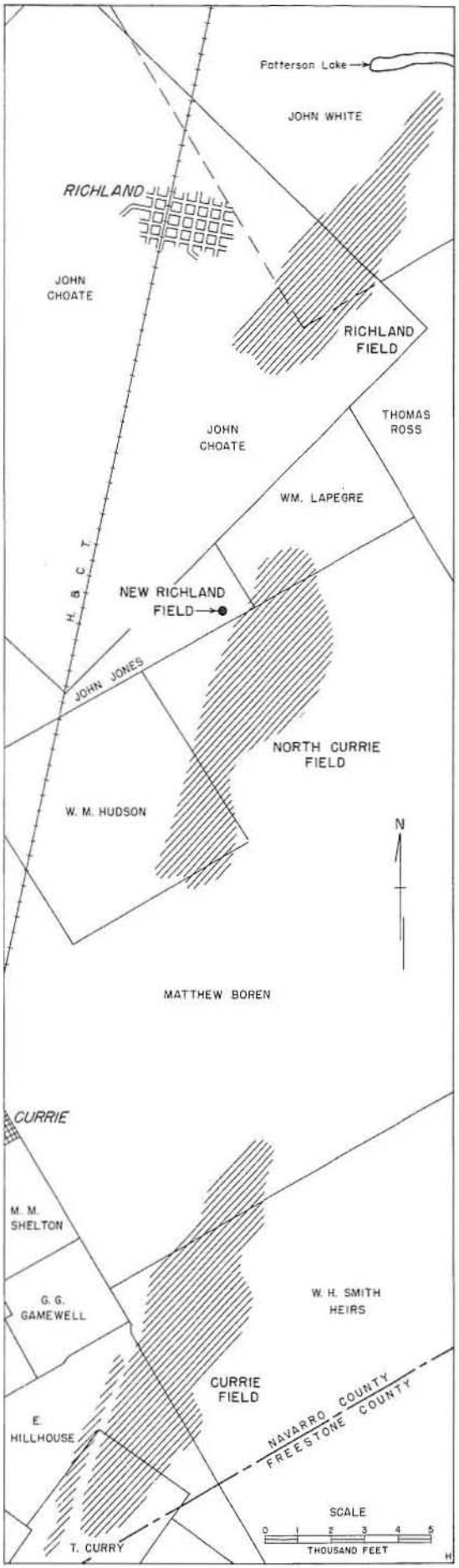
PRODUCTIVE AREA

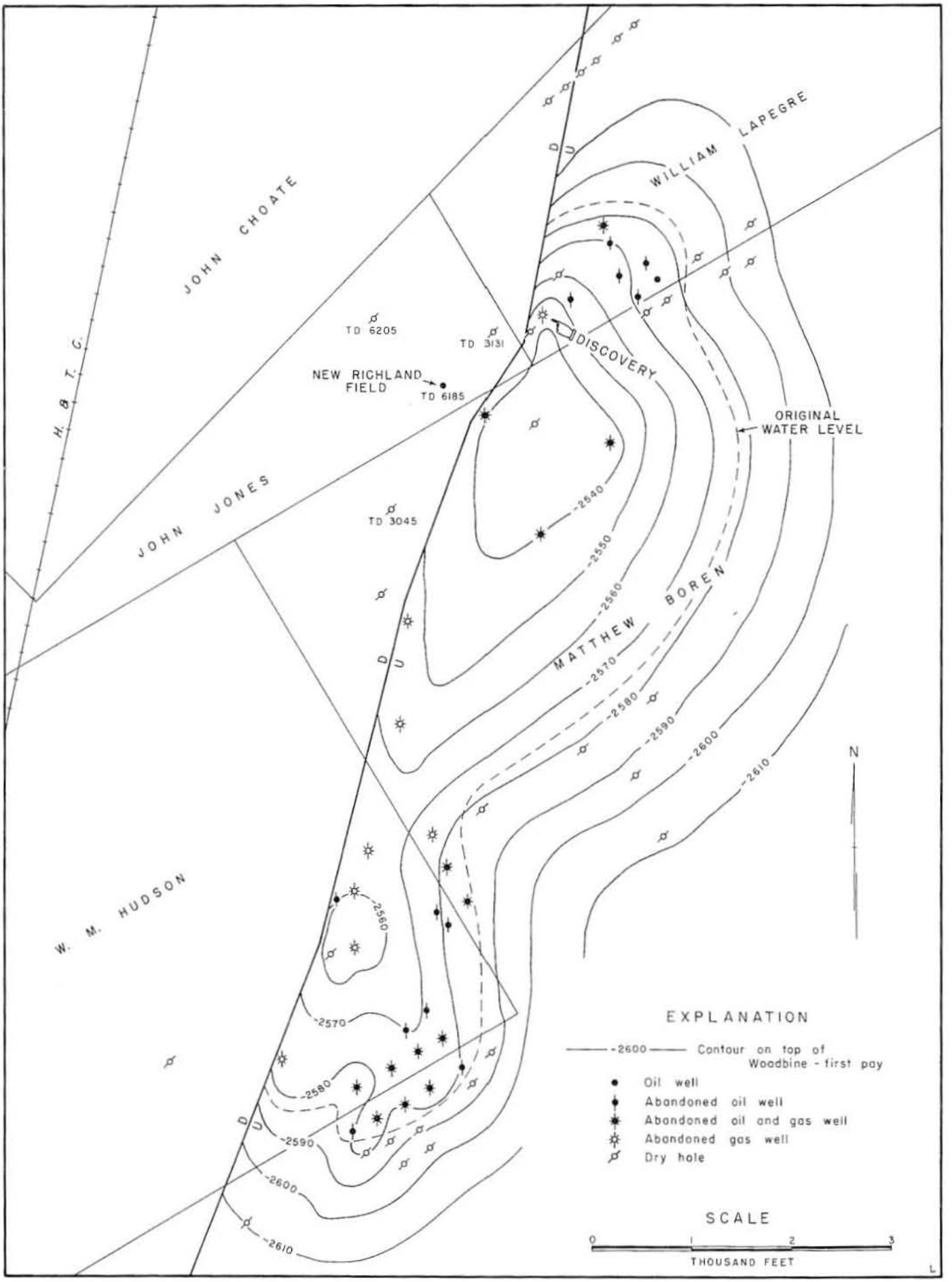
Woodbine sands: About 370 acres. The productive area is about 9,000 feet long and has a maximum width of about 2,000 feet.

TYPE SECTION OF ROCKS PENETRATED








JOHN CHOATE
H. & T. C.
JOHN JONES
W. M. HUDSON
WILLIAM LAPEGRE
MATTHEW BOREN
D U
TD 6205
TD 3131
NEW RICHLAND FIELD
TD 6185
DISCOVERY
ORIGINAL WATER LEVEL
TD 3045
-2540
-2550
-2560
-2570
-2580
-2590
-2600
-2610
N
EXPLANATION
-2600- Contour on top of Woodbine - first pay
Oil well
Abandoned oil well
Abandoned oil and gas well
Abandoned gas well
Dry hole
SCALE
0 1 2 3
THOUSAND FEET

NATURE OF TRAPS

Woodbine sands: Oil and gas were trapped by closures against a northeast-southwest trending fault. This fault has a maximum displacement of approximately 400 feet in the central part of the field.

THICKNESSES AND LITHOLOGY OF RESERVOIR ROCKS

Woodbine sands: There are three productive sands in the Woodbine formation: the First pay, the Main pay and the Swink pay. The uppermost Woodbine consists of 35 to 40 feet of alternating shales, sandy shales, and thin sands and limes. This is separated from the First pay by a limestone layer about 2 feet thick. The First pay is a sand body 3 to 10 feet thick which initially produced dry gas in the central part of the field, and oil at the north and south ends of the field. The accompanying structural map is contoured on top of the First pay. This First pay is separated from the second, or Main pay by about 10 feet of shale and sandy shale. The Main pay consists of 16 to 20 feet of hard and soft sand with a few shale breaks. The Main pay also produced gas in the highest part of the North Currie structure, and oil at the north and south ends. The Main pay is separated from the third or Swink pay by 10 to 12 feet of shale. The Swink pay, which produced oil only, is a thin sand body of 3 to 6 feet in thickness. Oil shows have been found below the Swink pay, but no commercial production has been found. All the Woodbine pay zones at North Currie field apparently had the same original water level at about -2,580 feet.

The above description of the Woodbine pay zones does not fit the type electric log submitted with this paper, for the Woodbine formation shown on the type log is located on the downthrown, non-productive side of the fault.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine sands:	Feet
Highest elev. of First pay	-2,535
Original elev. of water level	-2,580
Relief	45

At time of discovery, gas occupied a zone of unknown thickness in First pay and in Main pay. Apparently there was no free gas in the Swink pay. The oil-water contact was at the same elevation in the three sands.

WATER PRODUCTION

Woodbine sands: Most of the wells began making water upon completion or soon thereafter.

CHARACTER OF OIL

Woodbine First pay:
Gravity, 42.33° to 45° Be.
Paraffin, 1.15% to 2.00%

Woodbine Main pay:
Gravity, 38.5° to 39° Be.
Pafaffin, 1.24% to 1.73%

Woodbine Swink pay:
Gravity, 38.5° to 38.9° Be.
Paraffin, 1.32% to 1.63%

SELECTED REFERENCE

Lahee, Frederic H. (1929) Oil and gas fields of the Mexia and Tehuacana fault zones, Texas: Amer. Assoc. Petr. Geol.,. Structure of Typical American Oil Fields, vol. 1, pp. 312-317, 328, 329, 340-346, 358, 363, 364.

PRODUCTION HISTORY

Woodbine sands: The first Woodbine production was gas. The discovery of oil followed the discovery of gas by about nine months. All three of the Woodbine pays have produced oil. Reliable data as to quantities of gas produced are not available. The only available reliable production figures are those below reporting quantities produced through 1927. Throughout the subsequent years, the reporting services have consolidated North Currie with Currie and have not reported the totals with a sufficient degree of accuracy to afford a basis for determining North Currie production even for the years during which Currie production has been accurately determined separately. North Currie production is such a small percentage of the total that the inaccuracies in the totals for some years are probably of about the order of the North Currie production. North Currie has long been slowly approaching complete depletion. There have been 35 productive wells drilled in the field. All but one of those have been abandoned. The one remaining well is now producing about 5 barrels of oil daily.

Woodbine sands:	OIL PRODUCTION (barrels)	
Year	Yearly	Cumulative
1924		77,184
1925	76,547	153,731
1926	82,307	236,038
1927	41,813	277,851

NORTH GALLATIN FIELD
Cherokee County, Texas

JAMES A. WEBB
Geologist, W. B. Hinton, Mt. Pleasant, Texas
March 10, 1951

LOCATION

This one-well field is in central Cherokee County about 4 miles north of Gallatin and about $2\frac{1}{2}$ miles west of Summerfield.

METHOD OF EXPLORATION LEADING TO DISCOVERY

This short-lived field was discovered as a result of trend drilling westward along the strike of the Ponta fault.

DISCOVERY

Woodbine: March 5, 1946; T. G. Shaw #1 Bolton. Pumped at daily rate of 37.8 barrels of oil and 240 barrels of salt water; perforations at 4,172 to 4,174 feet.

ELEVATION OF SURFACE

At discovery well, derrick floor: 277 feet.

SURFACE FORMATION

Reklaw.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated in the one productive well is about 3 feet below the top of the Woodbine, as indicated on the accompanying TYPE SECTION. About 3/4 mile northwest of the discovery well, Hansbro #1 Bolton was completed early in 1951 as a dry hole at the total depth of 9,100 feet. The top of the Travis Peak in that dry hole is at the depth of 8,741 feet.

NATURE OF TRAP and STRUCTURE

The trap appears to be due to the termination of the reservoir rock at a fault. The fault is on a large, low relief anticline which has approximately 150 feet of relief at the base of the Massive Anhydrite. The productive Woodbine is on the upthrown side of the fault.

PRODUCTIVE AREA

Woodbine and Field: 20 acres.

THICKNESS OF RESERVOIR ROCK

Woodbine: 3 feet.

LITHOLOGY OF RESERVOIR ROCK

Woodbine: Clean, medium-grained sand.

CONTINUITY OF RESERVOIR ROCK

Woodbine: The productive sand is quite local.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine:	Feet
Elevation of top of oil	-3,897
Elevation of bottom of oil	-3,900
Relief	3

The above figures merely represent elevations and relief in the one productive well.

CHARACTER OF OIL

Woodbine: Gravity, A. P. I.: 41°.

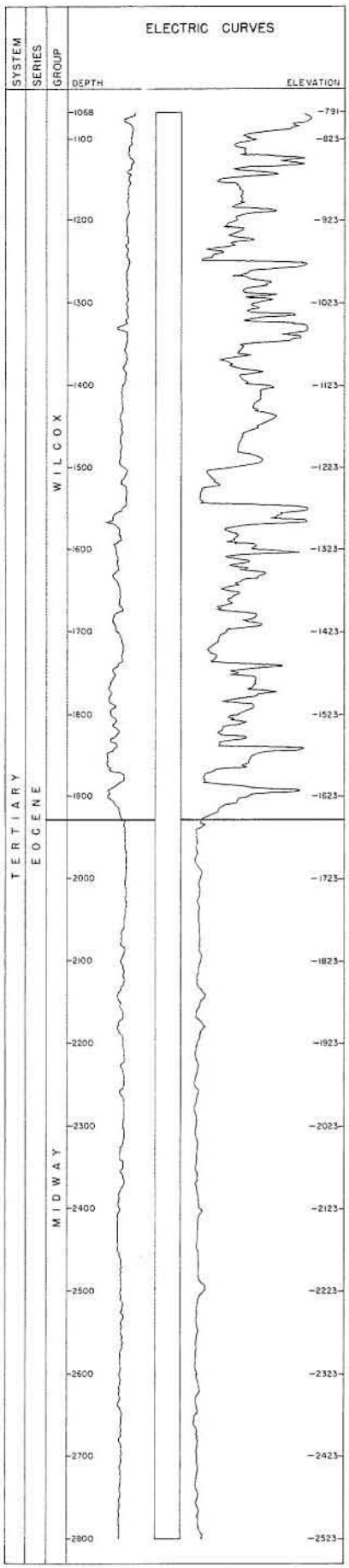
WATER PRODUCTION

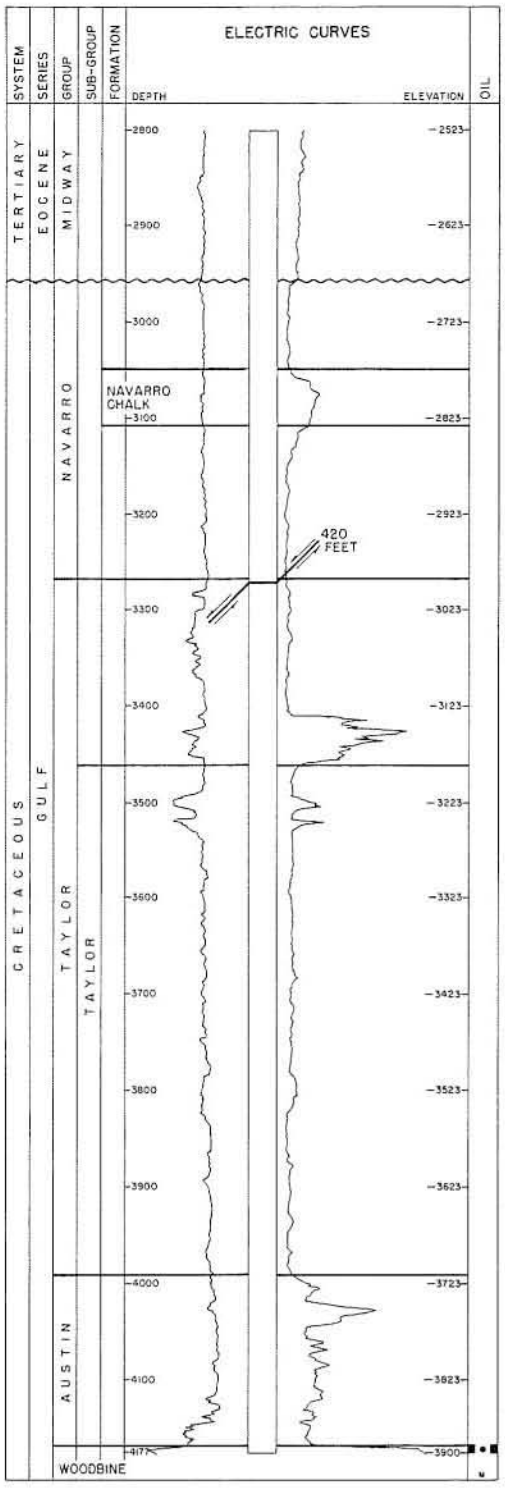
Woodbine: Initially, water production was about 88% of gross fluid. Water ratio increased rapidly and within seven months the well was abandoned.

PRODUCTION HISTORY

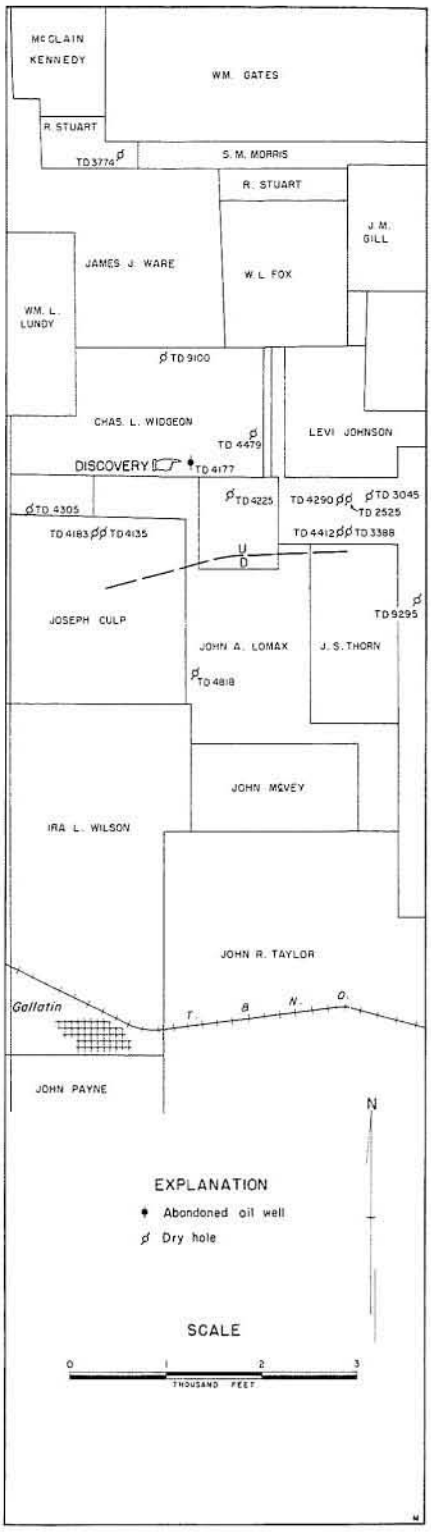
Woodbine and Field: The discovery well produced a total of 285 barrels of oil before abandonment. No other production has been obtained.

TYPE SECTION OF ROCKS PENETRATED





EXPLANATION
• Oil production



NORTH GROESBECK FIELD
Limestone County, Texas

W. A. REITER
Consulting Geologist, Houston, Texas
February 24, 1950

LOCATION and OTHER NAMES

North Groesbeck is a depleted gas field 4½ miles northwest of Groesbeck, county seat of Limestone County. It is about midway between the Mexia field and the South Groesbeck field. It is in the Mexia-Tehuacana fault graben system. It has also been known as the Bains Creek field and as the Stroud field.

METHODS OF EXPLORATION LEADING TO DISCOVERY

After the discovery of gas in the Nacatoch formation in the Mexia field in 1912 and subsequent development southward, J. R. Stroud, a large landowner, drilled the discovery well on his farm.

DISCOVERIES

Nacatoch: 1913
J. R. Stroud #1 J. R. Stroud
Woodbine: 1924
Well designation not available.

ELEVATION OF SURFACE

At well locations: Highest, 520 ft.; lowest, 418 feet.

SURFACE FORMATIONS

Wills Point shales (upper Midway) and Tehuacana limestone (lower Midway).

OLDEST STRATIGRAPHIC HORIZON PENETRATED

230 feet below the top of the Travis Peak formation. This penetration was in C. W. Killough #1 Belle Arnett.

NATURE OF TRAPS and STRUCTURE

The accumulation in each of the two reservoirs is on a faulted anticline trending northeast-southwest in a region where the regional dip is southeast. The accumulations are on the upthrown side of the fault. The fault is down to the northwest with a throw of approximately 350 feet at the top of the Nacatoch sand and of 430 feet at the top of the Woodbine sand. There is little, if any, northwest dip at the position of the Nacatoch sand, but the top of the Woodbine sand encounters the fault about 60 feet lower than its elevation at the apex of the anticline.

THICKNESSES OF RESERVOIR ROCKS

Nacatoch sand: 90 feet of sand.
Woodbine sand: 15 to 20 feet of sand.

PRODUCTIVE AREAS

	Acres (approximate)
Nacatoch sand	700
Woodbine sand	330
North Groesbeck field	1,000

LITHOLOGY OF RESERVOIR ROCKS

Nacatoch sand consists of several sands separated by sandy shale.
Woodbine sand is a good sand.

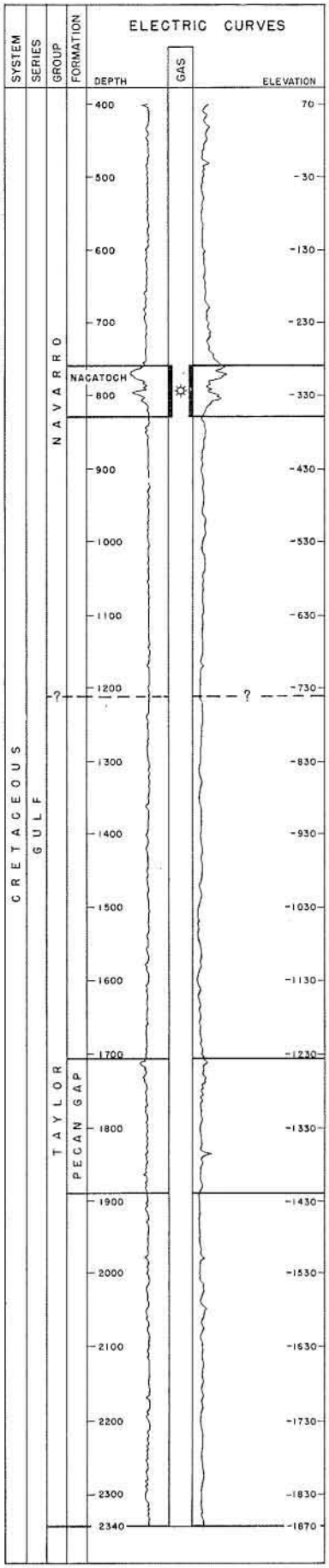
CONTINUITY OF RESERVOIR ROCKS

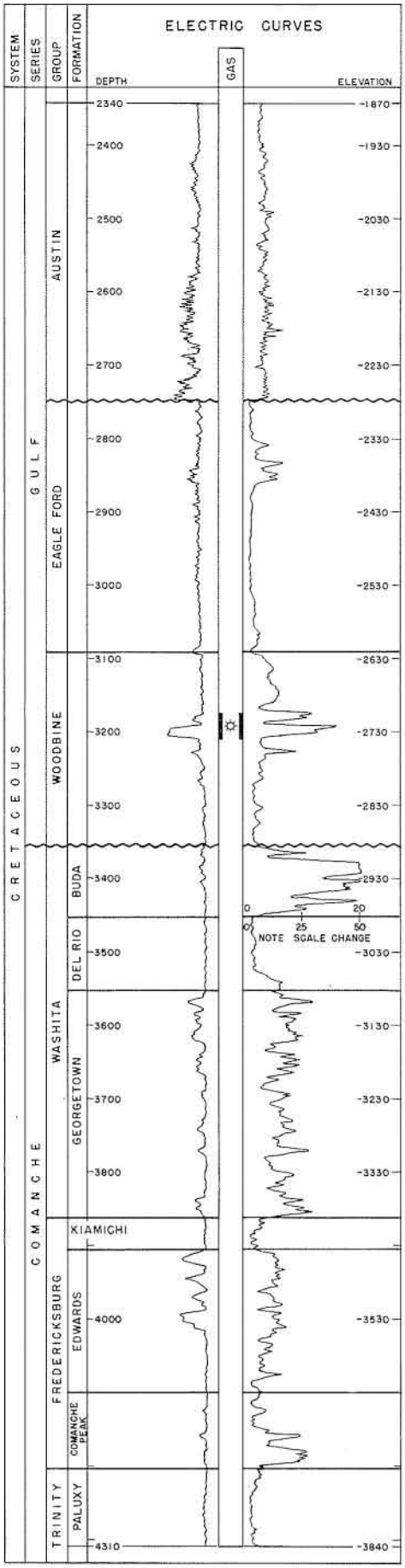
Nacatoch sand consists of several sands, each of which varies considerably in thickness and is totally absent at places. The Nacatoch formation is continuous over a large area in Texas and Louisiana.
Woodbine sand in this field is correlative with the main pay sand of the Mexia field. It lenses out completely 7 to 10 miles south of this field.

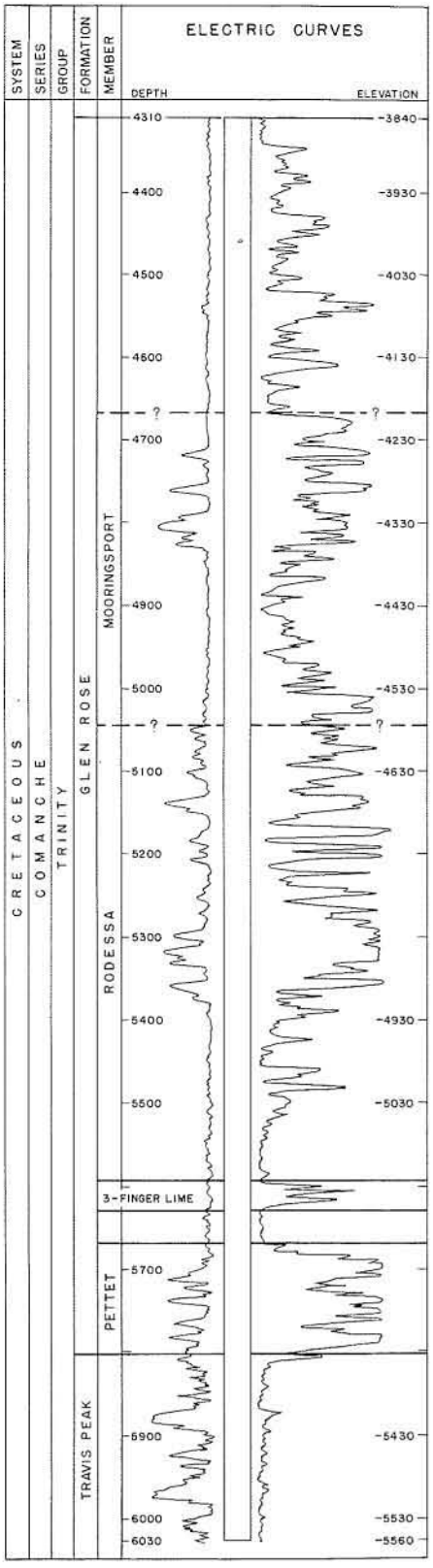
ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Nacatoch sand	Feet
Elevation of top of gas	- 90
Elevation of bottom of gas	-160
Relief	70
No oil was found	
Woodbine sand	
Elevation of top of gas	-2,450
Elevation of bottom of gas	-2,480
Relief	30
No oil was found.	

TYPE SECTION OF ROCKS PENETRATED

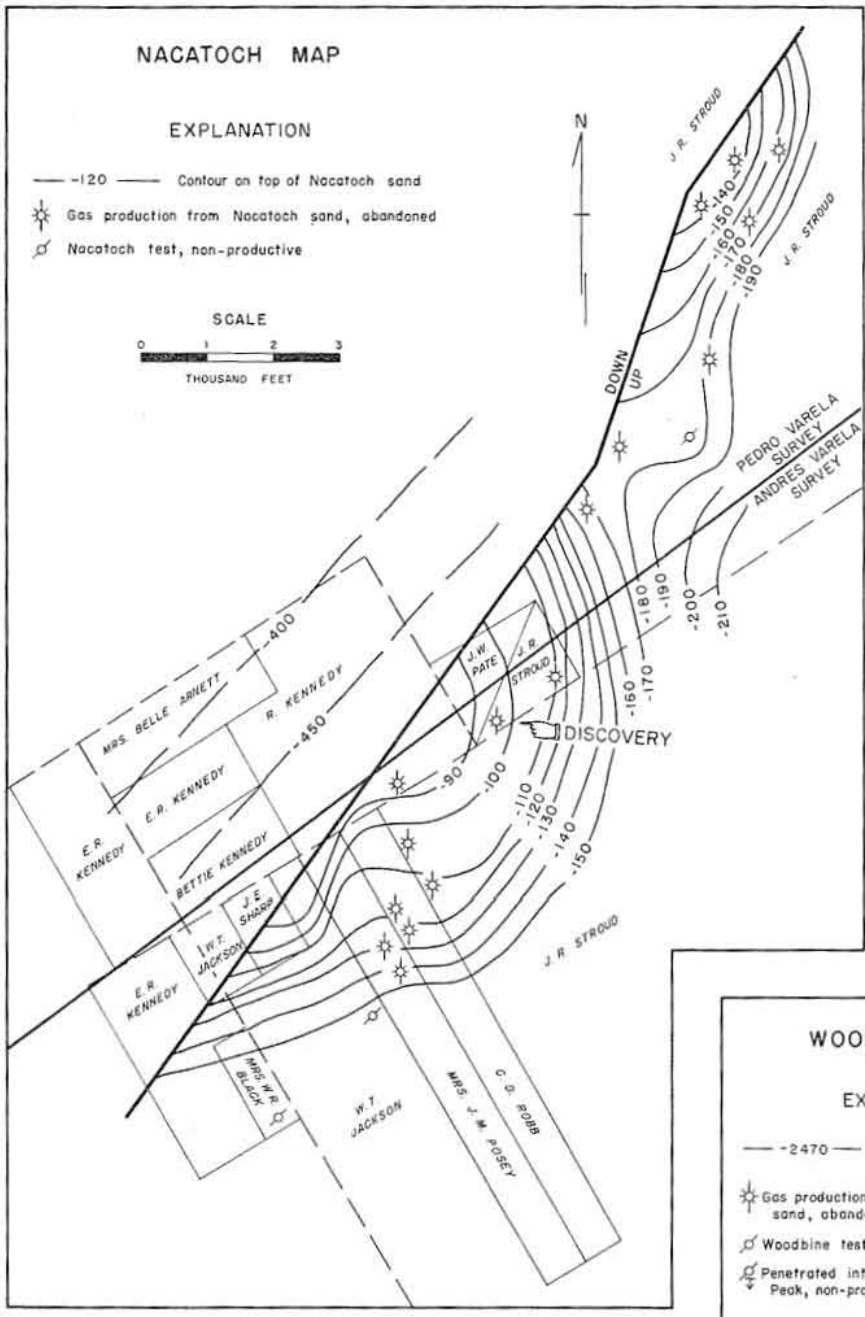






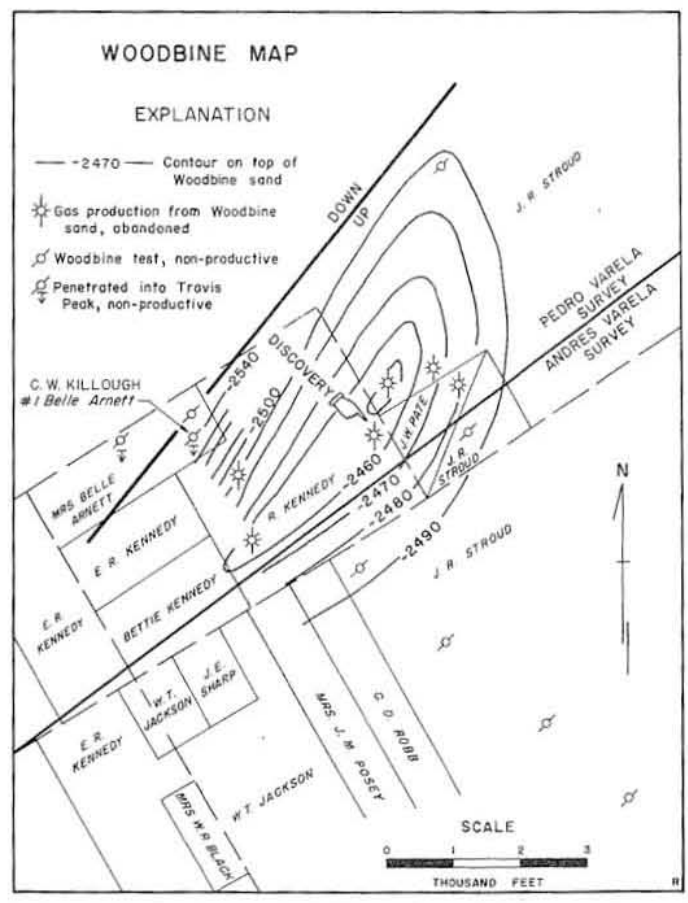
The above is a composite log compiled from the log of two wells outside the productive area of the field.

☼ Gas production



PRODUCTION HISTORY

The records pertaining to this field are so confused with the records of other fields, particularly the Mexia and the South Groesbeck fields, and are so indefinite that it appears impractical to endeavor to present such data as would have normal value in technical studies. At best, with any amount of effort, only gross approximations could be made. It appears that, at least as to most of the production, the quantity of gas was not determined, that royalty was on a well per year basis and that much of the gas from this field was intermingled with gas from other fields before metering. Most of the Nacatoch gas went through a pipe line built in 1914 to supply the market at Groesbeck, but also went in part into a pipeline system which supplied Angus, Corsicana, Groesbeck, Mart, Mexia, Teague, Tehuacana, Waco and Wortham. At least a part of the Woodbine gas was utilized in the production of oil from the Woodbine sand in the Mexia field. Both reservoirs were essentially depleted prior to 1934. It appears that a total of about 16 wells produced gas from the Nacatoch sand and 6 wells produced gas from the Woodbine sand.



SELECTED REFERENCES

Lahee, F. H. (1929) Oil and gas fields of the Mexia and Tehuacana fault zones, Texas: Amer. Assoc. Petr. Geol., Structure of typical American oil fields, vol. 1, pp. 304, 307, 308, 311, 312, 339, 340, 353, 357, 358, 362, 363.

Ley, H. A., and Willson, K. M. (1934) Gas fields in northeast Texas embayment: Amer. Assoc. Petr. Geol., Geology of natural gas, pp. 651, 667, 671, 673, 674, 678, 679.

Matson, G. C. (1916) Gas prospects south and southeast of Dallas: U.S. Geol. Sur., Bull. 629, pp. 77-110, plate VI.

NORTH LANSING FIELD
Harrison County, Texas

PHILIP S. SCHOENECK
District Geologist, The Atlantic Refining Company, Tyler, Texas
October 2, 1950

LOCATION

The North Lansing field centers at a point about 8 miles northeast of Longview and 8 miles northwest of Hallsville. It is 6 miles southwest of the Whelan field; between the Whelan field and the Willow Springs field.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Credit for discovery of the field is due to reflection seismograph. The Atlantic Refining Co. conducted correlation surveys during the first half of 1941 and detailed seismic work during the summer of 1946. Seismic work was conducted by Stanolind Oil & Gas Co. during 1944, by The Pure Oil Co. during 1945 and by Shell Oil Co. during 1946. The earliest geophysical activity appears to have been in 1940, about a year before Atlantic's first survey.

On the basis of data afforded by drilling prior to 1948, regional mapping of the base of the Pecan Gap chalk showed strong evidence of flattening and the possibility of the continuation of a structural ridge, roughly between the Whelan and Willow Springs fields.

DISCOVERIES

Young: December 14, 1949; The Atlantic Refining Co. #1 M. P. Isam Gas Unit, E. A. Merchant survey. Initial production test indicated an absolute open flow daily capacity of 16,000 Mcf of gas with 26 barrels of 53° gravity condensate; perforations, 6,734-6,740 and 6,762-6,768 and 6,778-6,793 feet; gas-condensate ratio, 38.4 Mcf per barrel. This well was drilled to the total depth of 8,000 feet. There were ten sets of perforations between 7,394 and 7,906 feet in sands of the Travis Peak. Salt water entered, perhaps from two of the sands, and prevented this well from being considered as the Travis Peak discovery well.

Travis Peak: June 12, 1950; The Atlantic Refining Co. #1 F. L. Landers Gas Unit, E. A. Merchant survey. From Travis Peak perforations at 7,442-7,458 and 7,582-7,606 feet, this well flowed an estimated 2,100 Mcf of gas with no estimate of condensate. There was no potential test. This well is dually completed. From Young perforations at 6,790-6,818 feet it indicated an absolute open flow daily capacity of 23,000 Mcf of gas with 9.77 barrels of 57.8° gravity condensate.

ELEVATION OF SURFACE

At well locations: Highest, 344 ft.; lowest, 235 feet.

SURFACE FORMATIONS

Sparta, Weches and Queen City.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated is 672 feet below the top of the Travis Peak. This penetration was in Atlantic #1 Isam, the discovery well of the Young reservoir and of the field.

NATURE OF TRAPS and STRUCTURE

Accumulation in each of the reservoirs appears to be due to a convex trap of low relief. The few data presently available indicate that the traps are on an anticline of low relief and that none of the wells has intercepted any faults. The structure here appears to be very similar to that at the Whelan field and at the Willow Springs field.

PRODUCTIVE AREAS

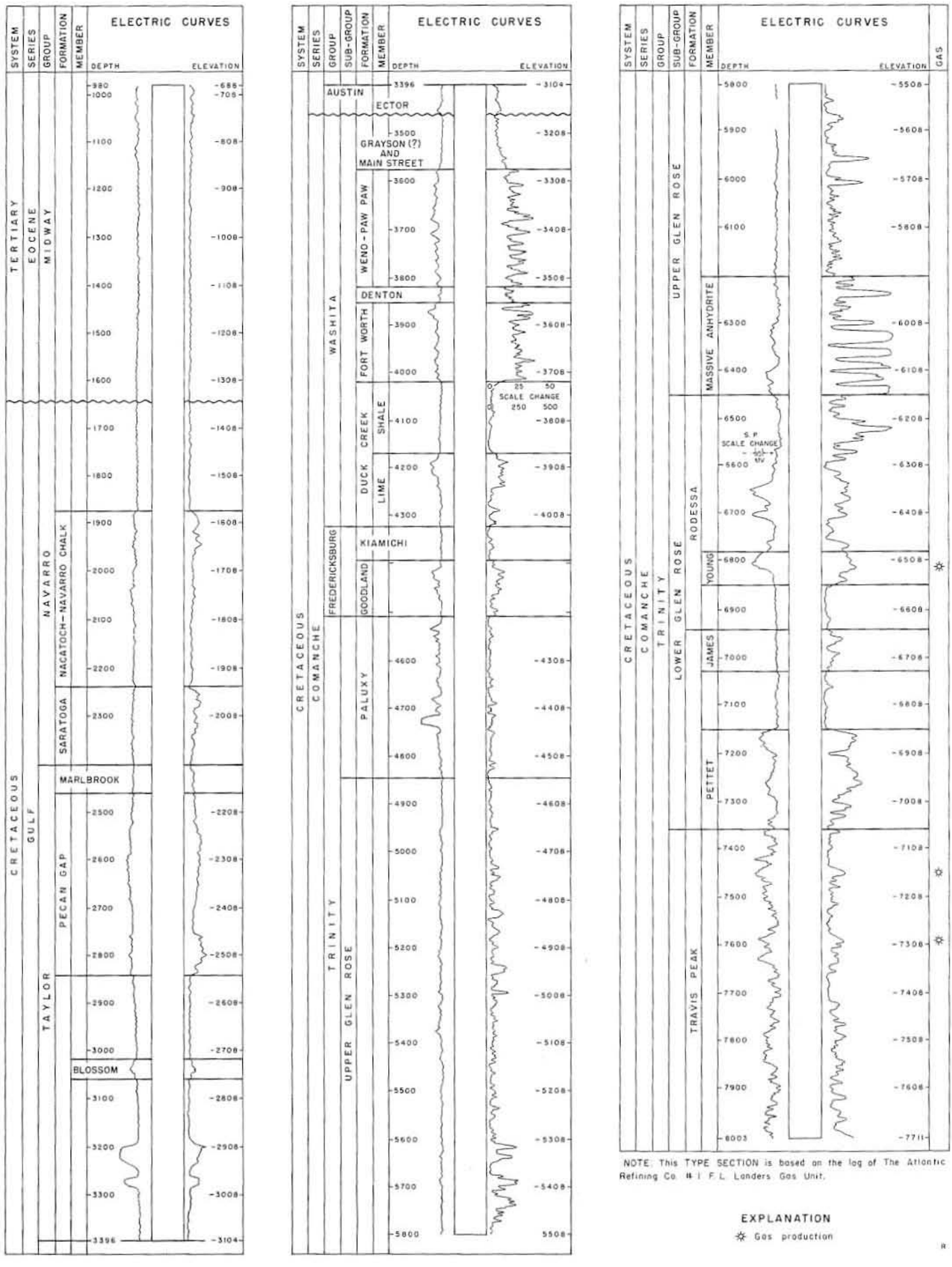
Development has not progressed sufficiently to determine the productive area of either reservoir.

THICKNESSES OF RESERVOIR ROCKS

Young: The Young member of the Rodessa formation has an average thickness of 75 feet. Within this zone, there is a variable thickness of rock sufficiently porous to yield oil or gas. The thickness of the productive zone in the discovery well is 10 feet; in the Atlantic Refining Co. #1 R. H. Still Gas Unit it is 30 feet, the maximum in any well completed to date. In the well where the maximum thickness was observed, the porosity is developed in about the middle one-third of the member, starting 20 feet down from the top and terminating 26 feet above the base. Porosities in other wells vary in vertical position and in continuity; porous zones are commonly separated by dense impervious limestones. The data available to date do not warrant an estimate of average net productive thickness.

Travis Peak: Available data do not afford adequate basis for estimating either gross or net effective thickness of productive sands in the Travis Peak formation. The well credited with discovery, Atlantic #1 Landers, was drilled 645 feet into the Travis Peak formation and two porous zones were perforated for production but no potential test was made. In that well, the upper zone is 16 feet thick and is topped 84 feet below the top of the Travis Peak formation; the lower zone is 24 feet thick and is topped 224 feet below the formation top. Atlantic #1 Isam was drilled 672 feet into the Travis Peak formation. It penetrated several Travis Peak sands, possibly five, which are probably capable of yielding commercial gas, but mechanical difficulties precluded getting satisfactory data.

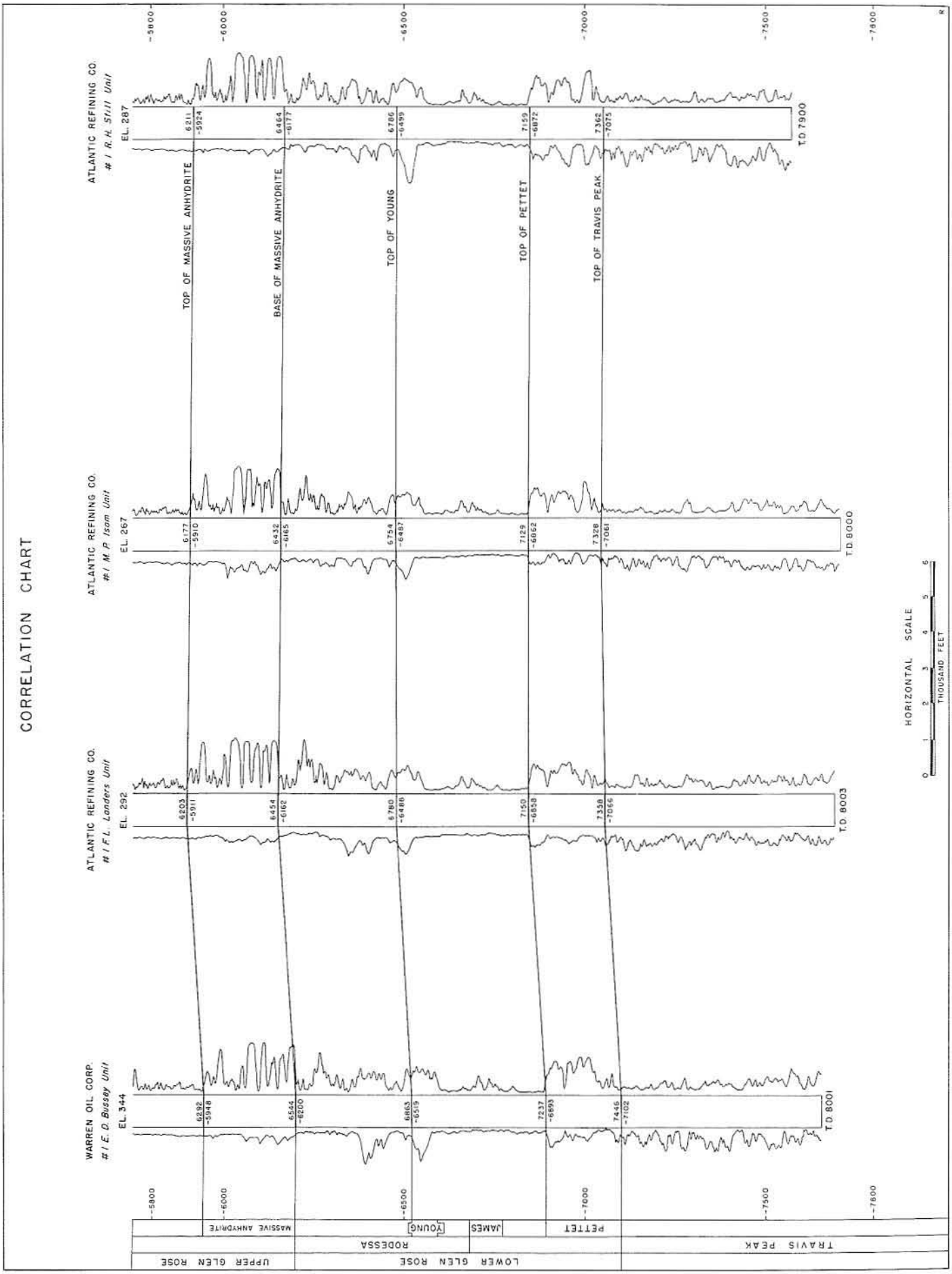
TYPE SECTION OF ROCKS PENETRATED



NOTE: This TYPE SECTION is based on the log of The Atlantic Refining Co. #1 F.L. Landers Gas Unit.

EXPLANATION

☼ Gas production


CORRELATION CHART
-5800
-6000
-6500
-7000
-7500
-7800
ATLANTIC REFINING CO.
1 R. H. Still Unit
EL. 287
6211 -5924
6464 -6177
6786 -6499
7159 -6872
7362 -7075
T.D. 7900
ATLANTIC REFINING CO.
1 M. P. Isom Unit
EL. 267
6177 -5910
6432 -6165
6754 -6487
7129 -6862
7328 -7061
T.D. 8000
ATLANTIC REFINING CO.
1 F.L. Landers Unit
EL. 292
6203 -5911
6454 -6162
6780 -6488
7150 -6858
7338 -7046
T.D. 8003
WARREN OIL CORP.
1 E. D. Bussey Unit
EL. 344
6292 -5948
6544 -6200
6863 -6519
7237 -6893
7446 -7102
T.D. 8001
TOP OF MASSIVE ANHYDRITE
BASE OF MASSIVE ANHYDRITE
TOP OF YOUNG
TOP OF PETTET
TOP OF TRAVIS PEAK
HORIZONTAL SCALE
0 1 2 3 4 5 6
THOUSAND FEET
UPPER GLEN ROSE
LOWER GLEN ROSE
MASSIVE ANHYDRITE
YOUNG
JAMES
PETTET
RODESSA
TRAVIS PEAK

LITHOLOGY OF RESERVOIR ROCKS

Young: Very firm to hard gray highly fossiliferous limestone with coquina type porosity, grading to a fossil conglomerate with large megascopic shells and calcite inclusions, with occasional glauconite and oolites. There are rather wide variations vertically foot by foot in both porosity and permeability. A core from one well showed porosity ranging from 8.1% to 27.1% and averaging 18.6%. The horizontal permeability ranges from 1 millidarcy to 355 millidarcys and averages 111.8 millidarcys. The vertical permeability ranges from 3.2 millidarcys to 340 millidarcys and averages 53.6 millidarcys.

Travis Peak: Silty to fine-grained, gray sandstone; some is greenish-gray to pinkish-gray; occasionally slightly glauconitic; some of the cementing material ranges up to 4% calcium carbonate. Porosities range from 1% to 15%; horizontal permeability, from zero to 77 millidarcys.

CONTINUITY OF RESERVOIR ROCKS

Young: Porosity and permeability are extremely variable. It is uncertain as to whether any one stratigraphic zone is continuously porous throughout the area of the field. At the location of The Atlantic Refining Co. #1 J. O. Williams, a dry hole in the I. R. North survey, there is no effective porosity throughout the full thickness of 70 feet of the Young limestone.

Travis Peak: Development has not progressed sufficiently to determine the continuity of the various sand bodies within the Travis Peak formation. It is evident that both porosity and permeability within the various sands are highly erratic.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Young	Travis Peak
Highest known elev. of gas, feet	-6,498	-7,150
Lowest known elev. of gas, feet	-6,551	-7,314

No oil has been found

Development has not progressed sufficiently to determine the full extent of the gas column in any reservoir. The above figures for Travis Peak represent extreme elevations for two sands in the same well. It is not probable that the two sands are parts of a common reservoir.

CHARACTER OF GAS

Information not available.

WATER PRODUCTION

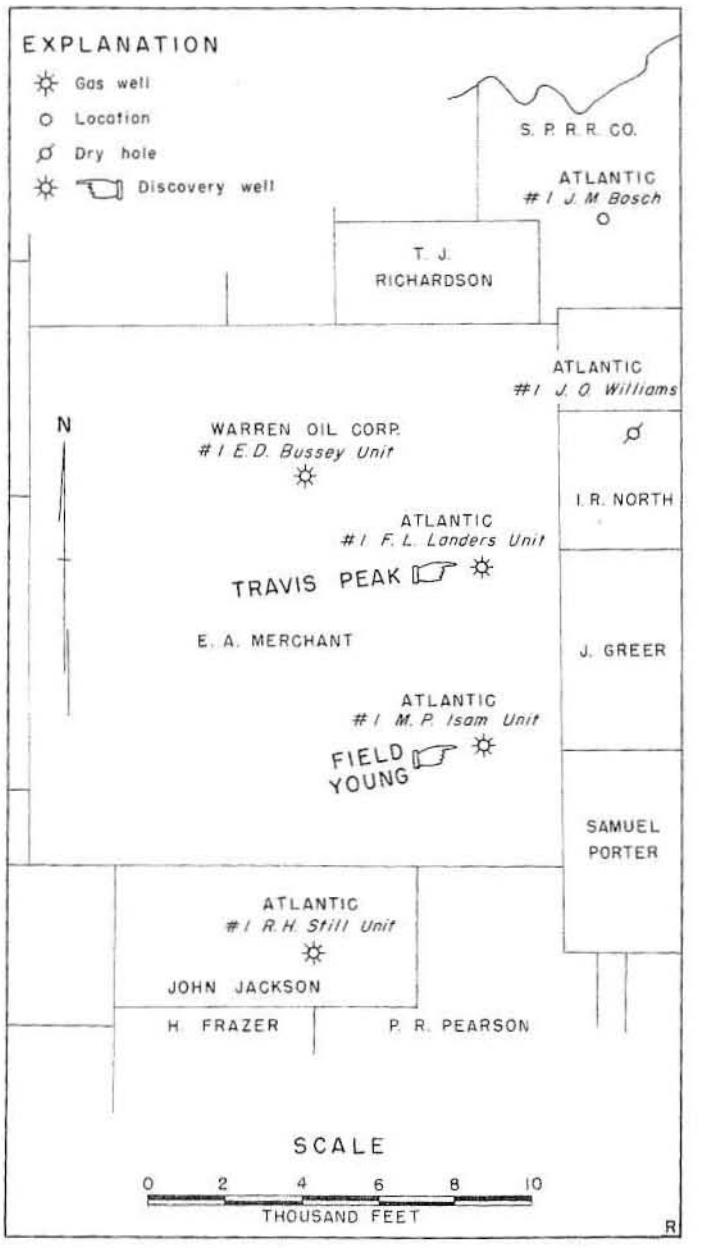
None.

ACID TREATMENT

Some of the wells have been acidized in the Young reservoir. The treatment has ranged from 4,000 to 8,000 gallons with break-down pressures of from 1,700 to 2,100 psi.; final pressures from 800 to 1,350 psi.

PRODUCTION HISTORY

Since there is not yet a pipe line outlet, the only production has been negligible quantities used in field operations.



OAKWOOD FIELD
Leon County, Texas

CHARLES A. DURHAM
Geologist, Tyler, Texas
August 16, 1949

LOCATION and OTHER NAME

The Oakwood field is located in northeast Leon County, 9 miles southeast of the town of Oakwood and 3 miles northwest of the Navarro Crossing field in Houston County. This field is also referred to as the West Navarro Crossing field.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Surface geological work by Humble Oil & Refining Co. in western Houston and eastern Leon counties during the early part of 1930 indicated the presence of structure in the Oakwood area, which was later confirmed by both core drill and seismic work. Humble first acquired leases in the area during 1930 as a result of the surface geologic work.

DISCOVERY

Woodbine: April 3, 1939; Humble Oil & Refining Co. and Sun Oil Co. #1 E. F. Swift Heirs.

NATURE OF TRAP

Woodbine: Faulted oval-shaped dome.

PRODUCTIVE AREA

Woodbine and Field: Approximately 3,200 acres.

THICKNESS OF RESERVOIR ROCK

	Feet	
Woodbine:	Max.	Avg.
From top to bottom	147	--
Net productive	70	26

CONTINUITY OF RESERVOIR ROCK

Woodbine: Sand development is irregular. However, the individual sand bodies intercommunicate and form a common reservoir. Porous sands in the Woodbine are known to be widely distributed in the East Texas basin.

LITHOLOGY OF RESERVOIR ROCK

Woodbine: Clean, porous, permeable sands interbedded with argillaceous and ashy sands, sandy shales and shales.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine:	Feet
Elevation of top of gas	-5,471
Elevation of bottom of gas	-5,614
Relief	143
Elevation of top of oil	-5,614
Elevation of bottom of oil	-5,618
Relief	4

CHARACTER OF OIL

Woodbine: Dark green oil of 35.9° A.P.I. gravity. The oil produced in this field has been incidental to gas production. At the present time, all productive wells are gas producers, the two wells originally completed as oil producers having been reclassified as gas-condensate wells because of high gas-oil ratios.

CHARACTER OF GAS AND CONDENSATE

Woodbine: The condensate yield of the gas is from 7.5 to 8 barrels per million cubic feet. The gravity of the condensate is 55° A.P.I. at 60° F.

WATER PRODUCTION

During the period when the first two wells were operated as oil producers, they produced a total of 359 barrels of salt water along with 14,205 barrels of oil. Bottom water is present beneath the very thin oil column throughout the field.

SELECTED REFERENCE

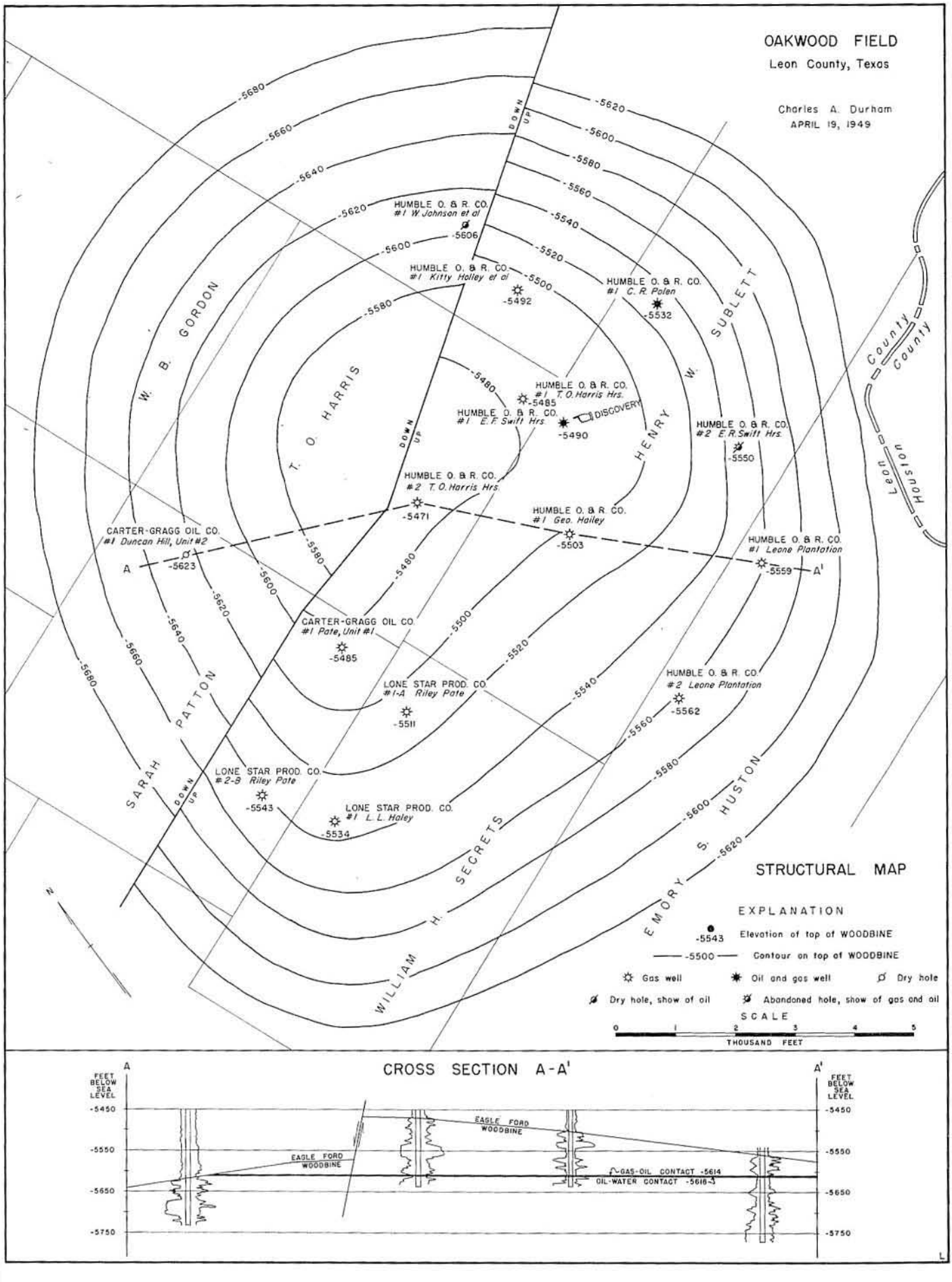
McLellan, H. J., and Wendlandt, E. A. (1940) Developments in East Texas during 1939: Amer. Assoc. Petr. Geol., Bull., vol. 24, p. 1064 (West Navarro Crossing).

PRODUCTION HISTORY

Woodbine and Total field

Year	WELLS PRODUCING at end of year: Oil Flowing	Gas	OIL PRODUCTION (barrels): Yearly	CONDENSATE PRODUCTION (barrels): Yearly	TOTAL LIQUIDS (barrels): Cumulative	GAS PRODUCTION (millions of cubic feet @ 14.65 psi. @ 60° F.): Yearly	Cumulative
1939	2	2	9,547	231	9,778	915	915
1940	2	2	3,001	0	12,779	225	1,140
1941	2	2	1,657	0	14,436	0	1,140
1942	2	2	0	0	14,436	8	1,148
1943	2	2	0	0	14,436	9	1,157
1944	2	2	0	0	14,436	0	1,157
1945	0*	5	0	17,241	31,677	1,471**	2,628
1946	0	6	0	23,932	55,609	2,229	4,857
1947	0	7	0	34,295	89,904	3,418	8,275
1948	0	11	0	46,863	136,767	5,022	13,297
1949***	0	11	0	17,958	154,725	2,445	15,742

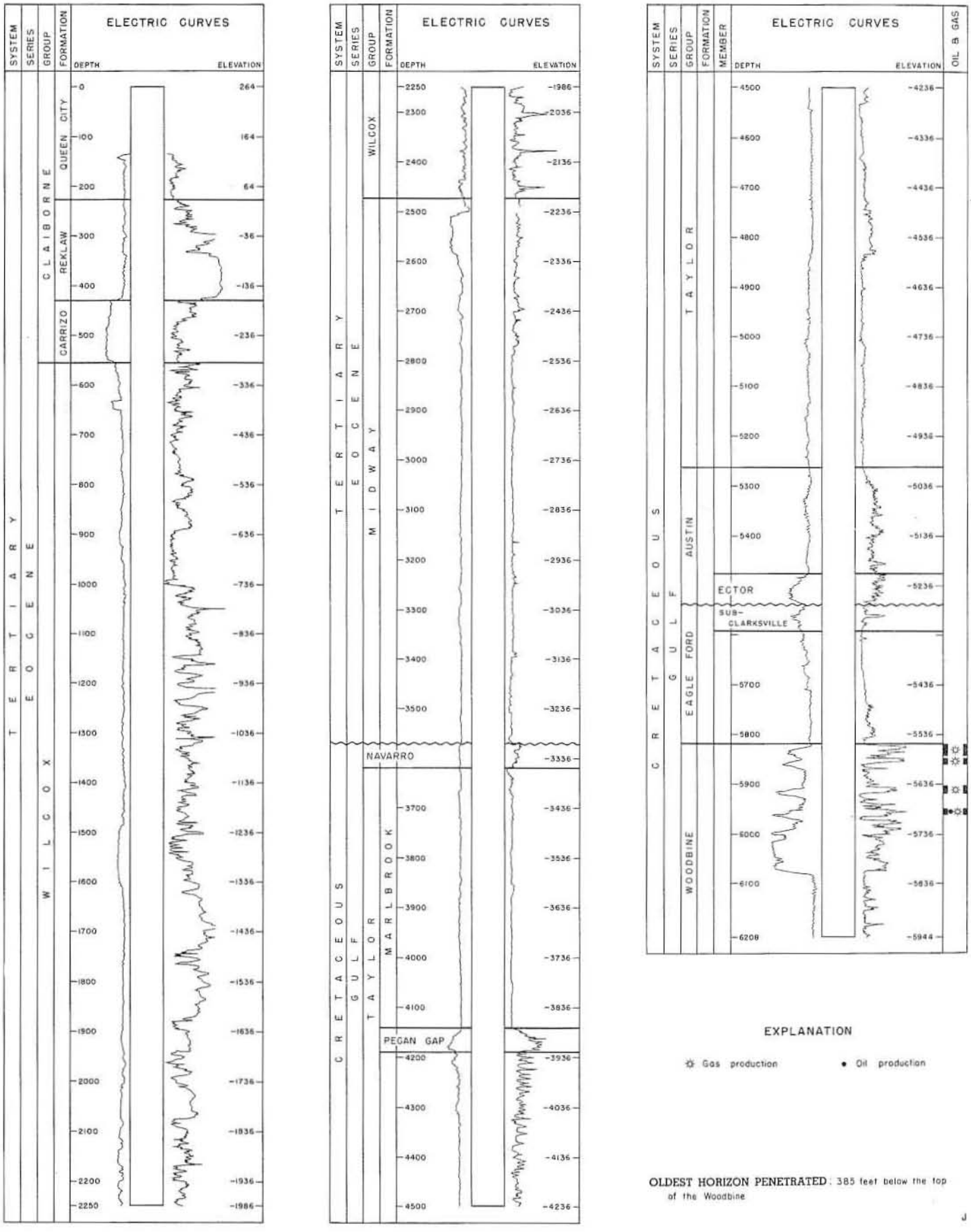
*Two high gas-oil ratio wells were converted to gas wells.
**Connection for gas exportation was made on September 15, 1945. Gas produced previous to this date was incidental to oil production. Some gas was used to drill nearby wells.
***1949 data added by amendment.


OAKWOOD FIELD
Leon County, Texas
Charles A. Durham
APRIL 19, 1949
HUMBLE O. & R. CO. #1 W. Johnson et al -5606
HUMBLE O. & R. CO. #1 Kitty Holley et al -5492
HUMBLE O. & R. CO. #1 C. R. Palen -5532
HUMBLE O. & R. CO. #1 T. O. Harris Hrs. -5485
HUMBLE O. & R. CO. #1 E. F. Swift Hrs. -5490 DISCOVERY
HUMBLE O. & R. CO. #2 E. R. Swift Hrs. -5550
HUMBLE O. & R. CO. #2 T. O. Harris Hrs. -5471
HUMBLE O. & R. CO. #1 Geo. Hailey -5503
HUMBLE O. & R. CO. #1 Leone Plantation -5559
CARTER-GRAGG OIL CO. #1 Duncan Hill, Unit #2 -5623
CARTER-GRAGG OIL CO. #1 Pate, Unit #1 -5485
LONE STAR PROD. CO. #1-A Riley Pate -5511
HUMBLE O. & R. CO. #2 Leone Plantation -5562
LONE STAR PROD. CO. #2-B Riley Pate -5543
LONE STAR PROD. CO. #1 L. L. Haley -5534
W. B. GORDON
T. O. HARRIS
HENRY W. SUBLETT
SARAH PATTON
WILLIAM H. SECRETS
EMORY S. HUSTON
DOWN
UP
A
A'
N
STRUCTURAL MAP
EXPLANATION
-5543 Elevation of top of WOODBINE
-5500 Contour on top of WOODBINE
Gas well
Oil and gas well
Dry hole
Dry hole, show of oil
Abandoned hole, show of gas and oil
SCALE
0 1 2 3 4 5
THOUSAND FEET
CROSS SECTION A-A'
FEET BELOW SEA LEVEL
-5450
-5550
-5650
-5750
EAGLE FORD
WOODBINE
GAS-OIL CONTACT -5614
OIL-WATER CONTACT -5618

TYPE SECTION OF ROCKS PENETRATED

SURFACE FORMATION: Queen City

ELEVATION OF SURFACE: Highest, 366 feet; lowest, 243 feet



EXPLANATION

☼ Gas production • Oil production

OLDEST HORIZON PENETRATED: 385 feet below the top of the Woodbine

OPELIKA FIELD

Henderson and Van Zandt Counties, Texas*

D. E. PROCTER
Geologist, Magnolia Petroleum Company, Tyler, Texas
October 6, 1949

LOCATION

The Opelika field is located mainly in the northeastern part of Henderson County within the triangle formed by the towns of Edom, Brownsboro and Murchison. It is approximately 15 miles south of the Van field, apparently on a distinct structural feature not associated with any established trend.

METHODS OF EXPLORATION LEADING TO DISCOVERY

In 1928, E. A. Wendlandt of the Humble Oil & Refining Co. mapped the Opelika area on the Reklaw greensand. The regional outcrop of this sand is some 10 miles west of this area. Humble Oil & Refining Co. acquired leases as a result of this surface work, and, in 1929, conducted core drill operations and enlarged its lease block.

In 1930, Cranfill & Germany #1 Starr Estate, with support from Humble, was drilled at a location near the crest of the surface structure to test the Woodbine formation. This well proved to be a dry hole.

Meanwhile, some time shortly prior to the middle of 1930, The Pure Oil Co. conducted surface work on the Opelika prospect, and, as a result of its findings, subsequently assembled a lease block.

In 1933-34, The Pure Oil Co., in an effort to evaluate its holdings, transacted with McElreath & Suggett for the drilling of three Woodbine tests. The wells were located on the east and southeast flanks of the surface structure near the Pure block, and all found the Woodbine dry. After these tests were abandoned, both Humble and Pure dropped most of their leases in the area.

In 1935, Tidewater Oil Co. and Seaboard Oil Co., as associates, became interested in the area as a result of reflection seismograph work conducted during the early part of 1934 and acquired a lease block which included some tracts formerly under Pure and Humble leases.

In 1937, Humble, Tidewater and Seaboard jointly drilled the first deep test, their #1 McElreath & Suggett. This well encountered difficulties and was completed through drill pipe as a small oil producer in the upper Glen Rose. The same operators immediately proceeded to drill the #2 well on the same lease. This well discovered gas in the Rodessa in December of 1937. The operators drilled several additional gas wells. In 1940, Lone Star Producing Co. took over operation of the field to develop the gas reserves.

*Published by permission of Magnolia Petroleum Co.

DISCOVERIES

Upper Glen Rose Stray and Field - Oil: May 20,1937; Tidewater, Seaboard and Humble #1 McElreath & Suggett.
Rodessa Series - Gas: December 5, 1937; Tidewater, Seaboard and Humble #2 McElreath & Suggett.
Travis Peak - Gas: June, 1944; Lone Star #2 McElreath & Suggett (formerly Tidewater, Seaboard and Humble #2 McElreath & Suggett.)
Pettet - Gas: October 25, 1945; Lone Star #1 Jane L. Saylors.
Rodessa Series - Oil: March 19, 1946; Lone Star #1 Ira Buckalew.
James limestone - Gas: April 20, 1949; Lone Star #1 H. C. Turner.

ELEVATION OF SURFACE

At well locations: Highest, 538 ft.; lowest, 385 ft.

SURFACE FORMATIONS

Carrizo, Reklaw and Queen City, all in the Claiborne group, have been identified. The uppermost portion of the Wilcox may be present, but has not been positively identified.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

1,430 feet below the top of the Travis Peak formation. This penetration was in Lone Star Producing Co. #1 J. H. Lewis, which was drilled to a total depth of 10,100 feet.

NATURE OF TRAPS

Upper Glen Rose Stray: The quality of production from this reservoir was so poor that very little attempt has been made to determine either the extent or nature of the trap. These factors consequently remain unknown, and are thus far considered unimportant.

Rodessa-F: Reservoir convexly folded and terminated against a fault, with local terminations resulting from decreased porosity and permeability.

Rodessa-G: The trap is exceedingly local and small in size. It unquestionably results from updip decrease in porosity and permeability.

Rodessa-H: Reservoir convexly folded and terminated against a fault.

Rodessa-I: Actually is probably not a distinct reservoir. Toward the crest of the structure, the impermeable break separating the Rodessa-H and Rodessa-I disappears. Toward the north and west flanks, where the Rodessa-I is recognized as a distinct unit from the Rodessa-H, the traps are probably controlled by updip decrease in porosity and permeability. In most areas, however, there is the possibility of intercommunication between the Rodessa-I on the flank and the porosity which occurs at the same stratigraphic position on the crest of the structure.

James limestone: Trap results from updip decrease in porosity and permeability.

Pettet limestone: Trap results from updip decrease in porosity and permeability.

Travis Peak sands: Unknown, but definitely influenced by permeability. The fact that the area of production is restricted to the crest of the field may indicate that convex folding was a significant trap-forming factor. All Travis Peak porosities tested within the area of the field have thus far yielded gas.

PRODUCTIVE AREAS

	Acres		
	Gas	Oil	Total
Upper Glen Rose Stray	0	40	40
Rodessa-F	9,800	1,000	10,800
Rodessa-G	40	80	120
Rodessa-H	8,800	2,600	11,400
Rodessa-I	0	350	350
James limestone	80	0	80
Pettet limestone	200	0	200
Travis Peak sands	1,000	0	1,000
Surface area of field			11,500

LITHOLOGY OF RESERVOIR ROCKS

Upper Glen Rose Stray: Light gray, soft, chalky limestone with capillary porosity.

Rodessa-F: Brownish-gray, soft, granular limestone with some vugs. Porosity and permeability vary from poor to fair. Degree of mineralization in the vugs varies from slight to complete.

Rodessa-G: Light gray fossiliferous, clastic limestone, sandy in places.

Rodessa-H: Clastic, coquina type limestone grading upward and downward into hard, sandy limestones with capillary porosity. Alteration and mineralization variable. Argillaceous and oolitic in places. Porosity and permeability vary from poor to excellent.

Rodessa-I: Typically similar to Rodessa-H, but in some places it is a fine-grained calcareous sandstone.

James limestone: Tannish-gray, oolitic limestone where porous.

Pettet limestone: Typically a gray, oolitic and pseudo-oolitic limestone, corresponding stratigraphically with a normally impermeable zone. Where impermeable, this zone is less oolitic and darker in color.

Travis Peak: The individual producing sands are tight and cannot generally be correlated from well to well because of cross-bedding. The lenses are of very hard, fine- to coarse-grained, pink and white quartzitic sandstone.

CONTINUITY OF RESERVOIR ROCKS

Upper Glen Rose Stray: Unknown. See entry under "Nature of Traps."

Rodessa reservoirs: The stratigraphic zone within which the Rodessa reservoirs occur is probably continuous throughout most of the East Texas basin, with overlapping porous members developing at different stratigraphic positions. Correlation of these individual members between fields is largely speculative.

Rodessa-F: Area of field plus one mile southward; not present as a porous member one mile northeast of field.

Rodessa-G: Identified as a porous member in a very limited area on northwest flank of field only.

Rodessa-H: Area of field plus one mile southward and one mile northeast. Locally absent in one well on northwest flank of field.

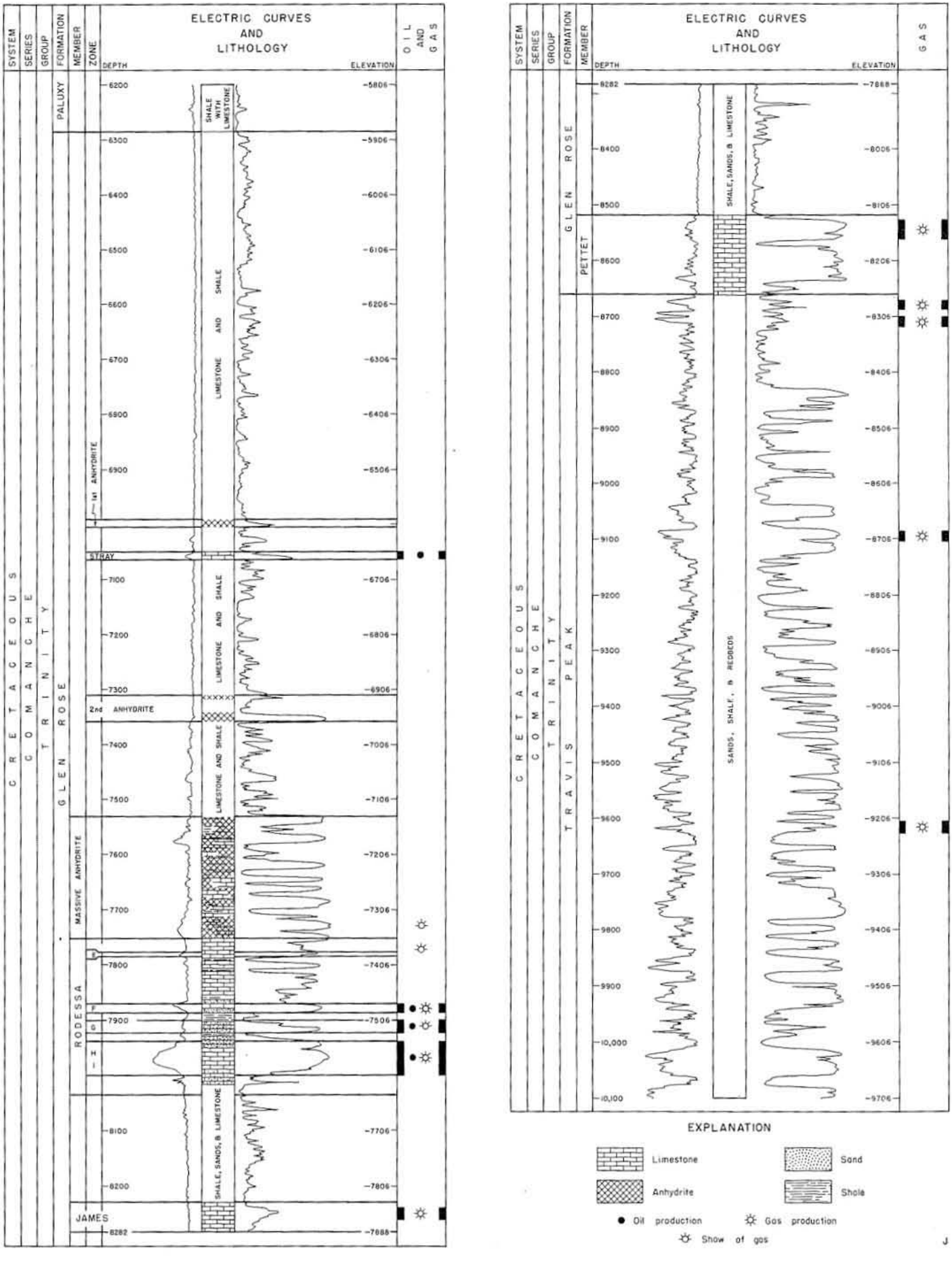
Rodessa-I: Locally present on north and west flanks of field; not present as a separate member over apex of field, but is here developed as a lower addition to the Rodessa-H.

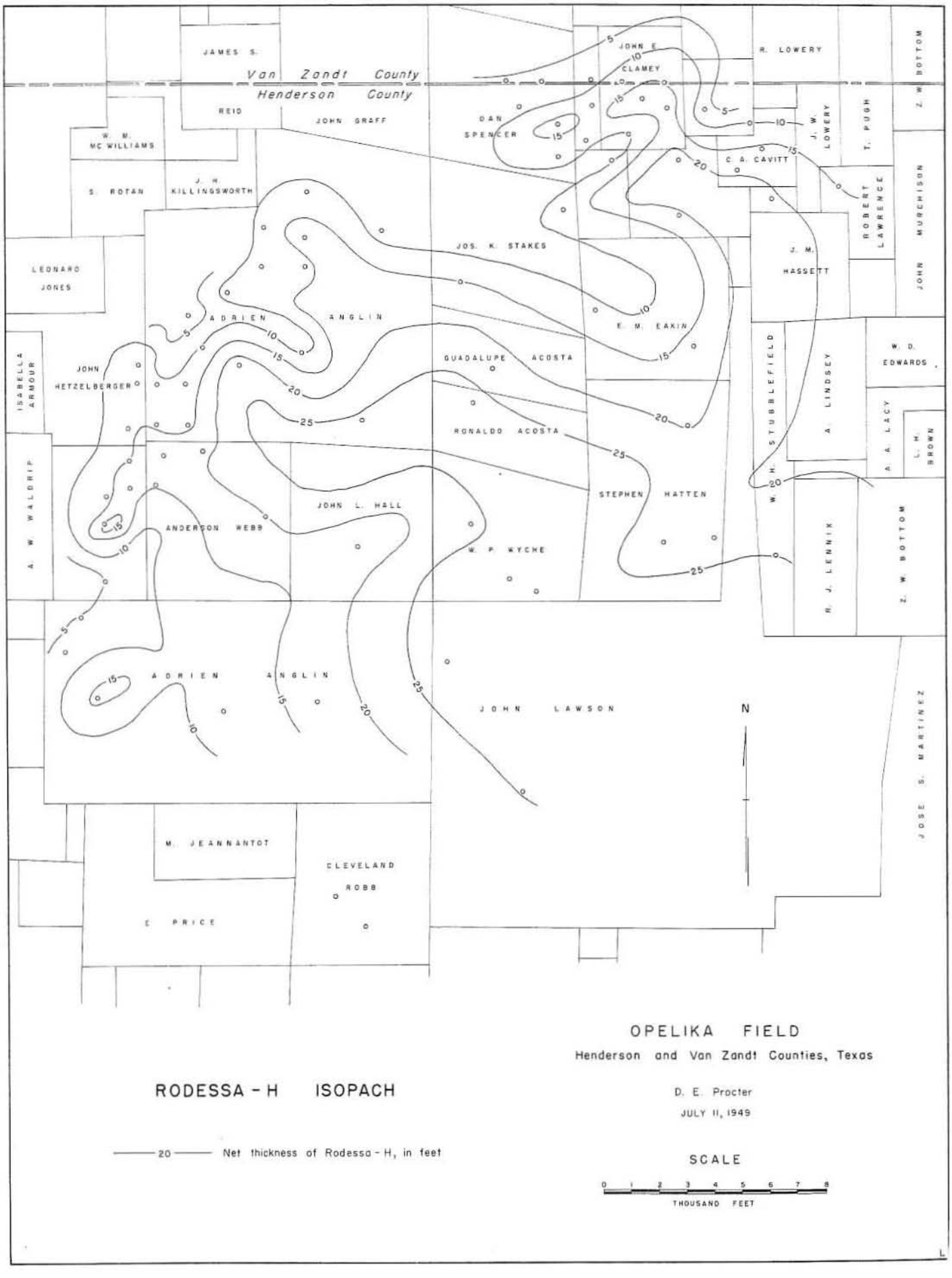
James limestone: Recognized as a reservoir rock over the southwest part of the field, where porosity is developed. Stratigraphically the James limestone is correlatable over most of the southern part of the East Texas basin, but porosity in this section is found only in a few other isolated areas, and consequently continuity outside the field has not been established.

Pettet limestone: Recognized as a reservoir rock in only three wells in the northwest part of the field. The stratigraphic zone in which the reservoir occurs can be correlated over most of the East Texas basin.

Travis Peak sands: Because of the method of completing wells in this reservoir (i.e. simultaneous perforation and testing of multiple sands) and the intensive cross-bedding present, correlation in Opelika field is highly speculative. Continuity of the producing sands consequently cannot be determined.

TYPE SECTION OF ROCKS PENETRATED





OPELIKA FIELD

Henderson and Van Zandt Counties, Texas

D. E. Procter

JULY 11, 1949

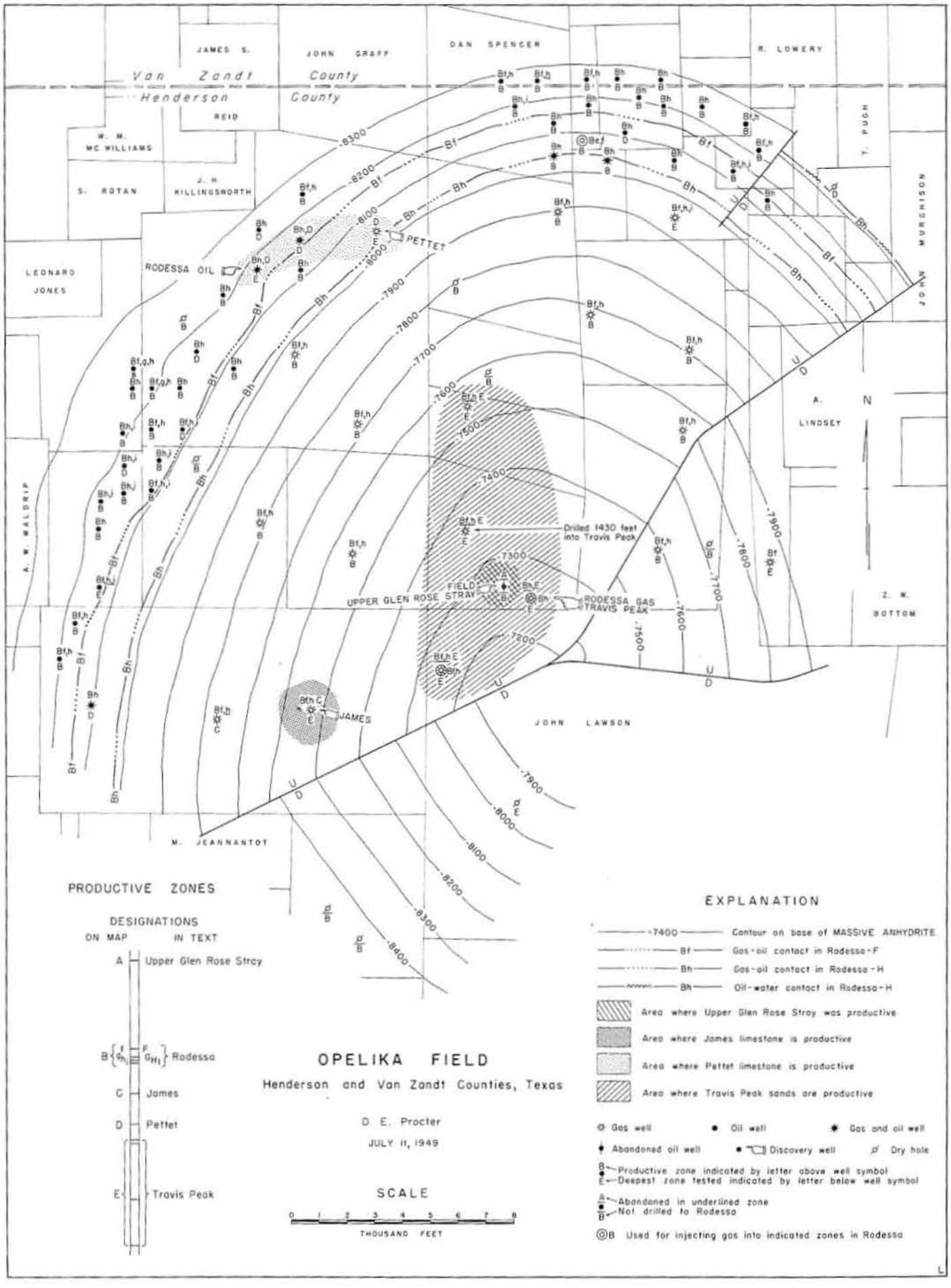
RODESSA - H ISOPACH

——— 20 ——— Net thickness of Rodessa - H, in feet

SCALE

0 1 2 3 4 5 6 7 8

THOUSAND FEET



PRODUCTIVE ZONES

DESIGNATIONS

ON MAP	IN TEXT
A	Upper Glen Rose Stray
B	Rodessa
C	James
D	Pettet
E	Travis Peak

OPELIKA FIELD

Henderson and Van Zandt Counties, Texas

D. E. Procter

JULY 11, 1949

SCALE

0 1 2 3 4 5 6 7 8

THOUSAND FEET

EXPLANATION

-7400- Contour on base of MASSIVE ANHYDRITE

Bf Gas-oil contact in Rodessa-F

Bh Gas-oil contact in Rodessa-H

Bh Oil-water contact in Rodessa-H

Area where Upper Glen Rose Stray was productive

Area where James limestone is productive

Area where Pettet limestone is productive

Area where Travis Peak sands are productive

Gas well • Oil well ✱ Gas and oil well

Abandoned oil well • Discovery well d Dry hole

B Productive zone indicated by letter above well symbol
E Deepest zone tested indicated by letter below well symbol

A/B Abandoned in underlined zone
Not drilled to Rodessa

◎B Used for injecting gas into indicated zones in Rodessa

THICKNESSES OF RESERVOIR ROCKS

	Net productive, in feet		
	Min.	Max.	Avg.
Upper Glen Rose Stray	?	?	?
Rodessa-F	0	10	6
Rodessa-G	0	7	5
Rodessa-H	5	30	20
Rodessa-I	0	12	8
James limestone	0	15	15
Pettet limestone	0	30	25
Travis Peak sands	?	?	?

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Rodessa-F	Rodessa-H
Elevation, top of gas, feet	-7,310	-7,390
Elevation, bottom of gas, feet	-8,255	-8,230
Relief, feet	945	840
Elevation, top of oil, feet	-8,255	-8,230
Elevation, bottom of oil, feet	-8,389+	-8,490
Relief, feet	134+	260

In the other reservoirs, fluid contacts cannot be accurately estimated because of insufficient development. In at least one area, the Rodessa-H and Rodessa-I are known to have different gas-oil contacts.

CHARACTER OF GAS

Rodessa Casinghead*

Component	Mol. %	Gals./Mcf.
Methane and lighter	83.05	--
Ethane	6.77	--
Propane	3.74	1,011
Iso-butane	1.08	0.353
N-butane	1.61	0.508
Iso-pentane	0.63	0.230
N-pentane	0.45	0.162
Hexanes and heavier	0.61	0.281
Carbon dioxide	2.06	0.000
Total	100.00	2.545

26# gasoline, 1.035 gal/Mcf
14# gasoline, 0.774 gal/Mcf
Specific gravity @ 60° F., 0.675

*Sample analyzed by the Wright Petroleum Laboratories for Magnolia Petroleum Co., January 31, 1947.

No other detailed analyses are available. However, gas from the James, Pettet and Travis Peak is sweet, with a recoverable liquid content of about 0.40 to 0.80 gal/Mcf. Sweet gas from the Rodessa gas wells originally yielded about 2.40 gal/Mcf recoverable liquids, which yield has declined steadily to about 1.30 gal/Mcf at present.

CHARACTER OF OIL

Rodessa:	Max.	Min.	Avg.
Gravity @ 60° F.:	51°	39°	43°

Sulphur: None. Color: Dark green.
Base: Paraffin.

WATER PRODUCTION

Although several wells have found water in Rodessa-H and in Rodessa-I, no appreciable water has been produced in the field. Disposal has been effected with evaporating pits.

ACID TREATMENT

With the exception of the Travis Peak sands, the reservoirs react favorably to acidizing. Most of the wells have been acidized prior to completion. The usual amount of acid used is from 6,000 to 10,000 gallons per zone.

CYCLING PLANT

In December of 1940, the Lone Star Producing Co. began operating a cycling plant of the absorption type with a capacity of 50,000 Mcf daily. This has gradually been increased to a present capacity of 90,000 Mcf daily.

RESERVOIR ENERGY

Engineering information indicates that the Rodessa reservoir energy is provided by expansion of the gas cap. A water drive is either absent or very ineffective.

PRODUCTION HISTORY
(Amended to include 1949 data)

Field totals

Year	NUMBER OF WELLS** Producing at end of year: Oil Flowing	Producing at end of year: Gas	Injecting at end of year: Gas	OIL PRODUCTION (barrels): *** Yearly	GROSS GAS PRODUCED (Mcf): Yearly	GROSS GAS PRODUCED (Mcf): Cumulative	GAS INJECTED (Mcf): Yearly	GAS INJECTED (Mcf): Cumulative	LIQUID PRODUCTS OF GAS PROCESSING PLANTS (barrels): Top Crude Distillate	Gasoline	Reduced Crude	Butane	Iso-Butane	Propane	Total	TOTAL LIQUIDS (barrels): Yearly	TOTAL LIQUIDS (barrels): Cumulative
1939*	1	2	0	890	1,207,950	1,207,950	0	0	33,450	0	0	0	0	0	33,450	34,340	34,340
1940	1	4	0	2,245	2,762,900	3,970,850	0	0	124,450	1,570	380	0	0	0	126,400	128,645	162,985
1941	0	8	1	0	23,661,060	27,631,910	15,717,300	15,717,300	1,186,466	36,956	11,994	23,848	0	0	1,259,264	1,259,264	1,422,249
1942	1	12	1	118	27,785,637	55,417,547	18,177,823	33,895,123	1,527,552	0	0	93,013	74,729	0	1,695,294	1,695,412	3,117,661
1943	0	11	2	0	27,288,493	82,706,040	15,540,522	49,435,645	1,435,199	0	0	85,804	63,103	0	1,584,106	1,584,106	4,701,767
1944	0	13	2 (1)	0	28,107,741	110,813,781	16,477,050	65,912,695	1,295,999	0	0	78,227	52,534	0	1,426,760	1,426,760	6,128,527
1945	0	15	2 (1)	0	26,656,475	137,470,256	16,556,731	82,469,426	1,152,352	0	0	85,388	37,016	0	1,274,756	1,274,756	7,403,283
1946	7 (2)	16 (2)	2 (2)	114,644	23,375,416	160,845,672	18,410,176	100,879,602	959,792	0	0	117,105	0	33,350	1,110,247	1,224,891	8,628,174
1947	22 (2)	17 (2)	2 (2)	655,971	29,291,694	190,137,366	24,158,165	125,037,767	877,352	0	0	134,993	0	57,713	1,070,058	1,726,029	10,354,203
1948	30 (1)	17 (2)	2 (2)	872,307	28,392,478	218,529,844	22,148,822	147,186,589	683,534	0	0	130,896	0	57,540	871,970	1,744,277	12,098,480
1949	46 (1)	16 (1)	3 (2)	743,968	34,892,090	253,421,934	23,965,369	171,151,958	647,603	0	0	90,343	0	38,974	776,920	1,520,888	13,619,368

*Production figures for 1939 include all prior production.

**Figures in parentheses indicate number of wells completed in two reservoirs. At the end of 1949, in addition to the wells indicated above, there was one well producing oil by gas lift.

***Oil production prior to 1945 was from Upper Glen Rose Stray and subsequent thereto was from Rodessa reservoirs.

Reservoirs producing gas only

Year	JAMES: NUMBER OF WELLS producing at end of year	JAMES: GAS PRODUCTION (Mcf): Yearly	JAMES: GAS PRODUCTION (Mcf): Cumulative	PETTET: NUMBER OF WELLS producing at end of year	PETTET: GAS PRODUCTION (Mcf): Yearly	PETTET: GAS PRODUCTION (Mcf): Cumulative	TRAVIS PEAK: NUMBER OF WELLS producing at end of year	TRAVIS PEAK: GAS PRODUCTION (Mcf): Yearly	TRAVIS PEAK: GAS PRODUCTION (Mcf): Cumulative	TOTAL OTHER THAN RODESSA: NUMBER OF WELLS producing at end of year	TOTAL OTHER THAN RODESSA: GAS PRODUCTION (Mcf): Yearly	TOTAL OTHER THAN RODESSA: GAS PRODUCTION (Mcf): Cumulative
1944	0	0	0	0	0	0	1	689,390	689,390	1	689,390	689,390
1945	0	0	0	1	58,164	58,164	1	425,174	1,114,564	2	483,338	1,172,728
1946	0	0	0	3	940,438	998,602	3	1,564,721	2,779,285	6	2,505,159	3,777,887
1947	0	0	0	3	1,225,877	2,225,479	4	4,723,358	7,502,653	7	5,950,245	9,728,132
1948	0	0	0	3	958,292	3,183,771	4	4,072,716	11,575,389	7	5,031,028	14,759,160
1949	0	70,372*	70,372	2	591,920	3,877,691	4	5,896,521	15,471,910	6	4,660,813	19,419,973

*This production was prior to July. Tubing packer leaked and subsequent production was evidently from the Rodessa. The well was recompleted in the Rodessa on September 28, 1949.

PATROON FIELD
Shelby County, Texas

JOHN V. TOWNSEND
Geologist, Tyler, Texas
January 29, 1951

LOCATION

The Patroon field is 2 miles east of Patroon and 11½ miles southeast of Shelbyville.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Leases were initially acquired in 1940 as a result of seismic work which suggested the presence of a structural anomaly. Drilling operations on the discovery well were begun on December 23, 1947.

DISCOVERY

Upper Glen Rose: June 13, 1948; Humble Oil & Refining Co. #1-C Pickering Lumber Corp. Initial production; flowed 109.16 barrels of 31.2° gravity oil in 24 hours; choke, 1/4-inch; gas-oil ratio, 11,050 cubic feet per barrel; tubing pressure, 935 psi.; casing pressure, 1,160 psi.; perforations, 5,164-5,192 feet and 5,198-5,212 feet. The well was drilled to total depth of 9,302 feet and plugged back to 5,260 feet.

ELEVATION OF SURFACE

At the one productive well: 287 feet.

SURFACE FORMATION

Wilcox.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

In Travis Peak formation 1,329 feet below its top. This penetration was in the discovery well, the log of which is used in presenting the accompanying TYPE SECTION.

NATURE OF TRAP

Upper Glen Rose: Stratigraphic trap formed by lateral pinchout of porosity.

PRODUCTIVE AREA

Upper Glen Rose and Field: Proven, 40 acres.

THICKNESS OF RESERVOIR ROCK

Upper Glen Rose: Net productive, 0 to 10 feet.

LITHOLOGY OF RESERVOIR ROCK

Upper Glen Rose: Porous, permeable oolitic limestone.

CONTINUITY OF RESERVOIR ROCK

Upper Glen Rose: The reservoir is a locally developed porous limestone lens. Development has proven the absence of effective porosity to the north, west and southwest of the discovery well.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Upper Glen Rose:	In the only productive well
Elevation of top of oil, feet	-4,866
Elevation of bottom of oil, feet	-4,990
Relief, feet	124

CHARACTER OF OIL

Upper Glen Rose:

Gravity, A. P. I. @ 60° F., 31.2
Base: Intermediate
Color: Brownish-green

ACID TREATMENT

Upper Glen Rose: The potential of the discovery well has been increased by treatment with approximately 2,500 gallons of acid.

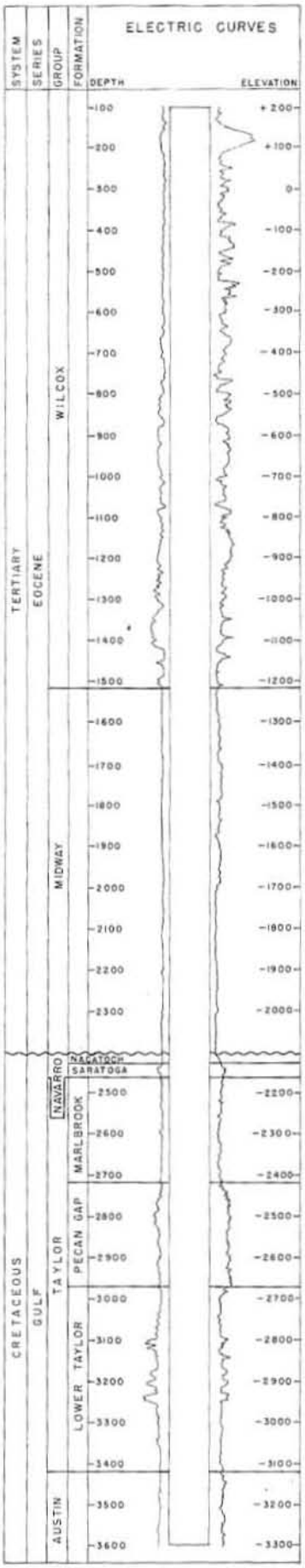
PRODUCTION HISTORY

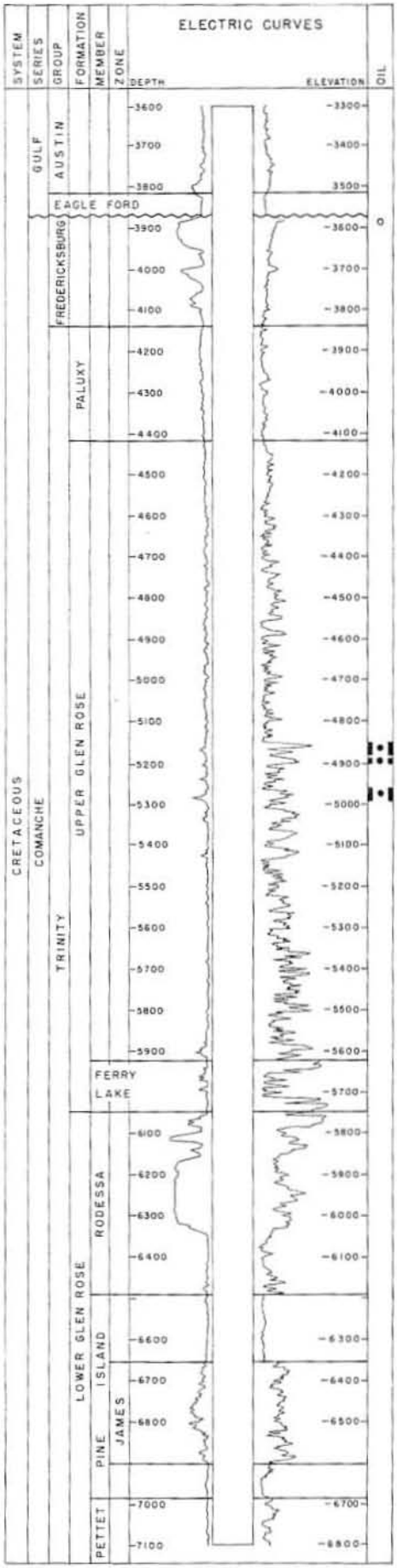
Upper Glen Rose and Field total:

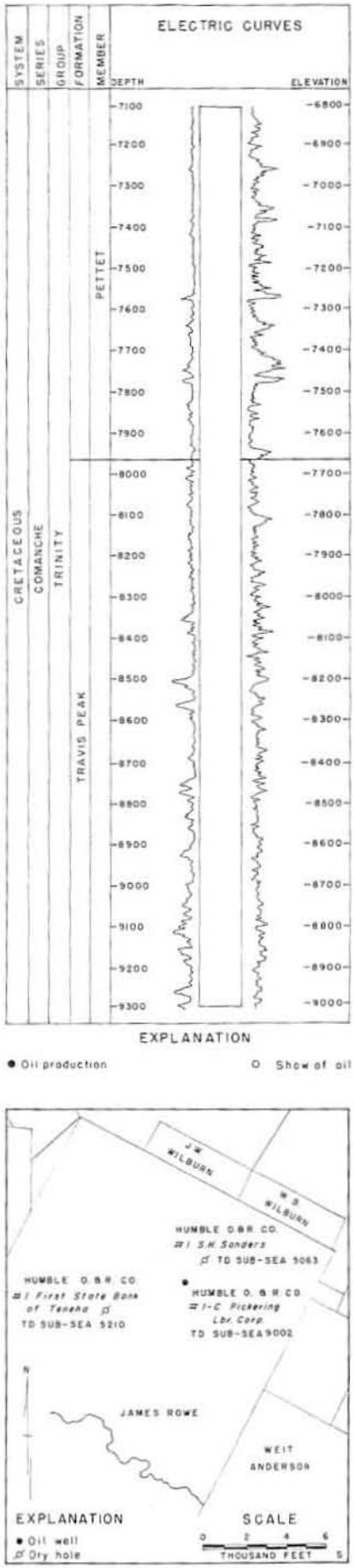
Year	WELLS PRODUCING at end of year	OIL PRODUCTION (barrels) Yearly	Cumulative
1948	1	4,642	4,642
1949	1	5,917	10,559

All production has come from Upper Glen Rose in one well. Two nearby tests have been plugged and abandoned after finding no effective porosity in the Upper Glen Rose section.

TYPE SECTION OF ROCKS PENETRATED







EXPLANATION

● Oil production ○ Show of oil

PEWITT RANCH FIELD
Titus County, Texas

GERALD H. TEFFT
Geologist, Stanolind Oil & Gas Company, Tyler, Texas
July 27, 1950

LOCATION

The Pewitt Ranch field is 13 miles northeast of Mt. Pleasant, county seat of Titus County, and 6 miles east of the Talco field. It is in the zone of the Luling-Mexia-Talco fault system.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Reflection seismograph work along the Luling-Mexia-Talco fault system led to the purchase of leases by Stanolind Oil & Gas Co. in the Pewitt Ranch area in 1942. Subsequently some of the acreage was assigned to W. M. Coats of Longview, Texas, in consideration of the drilling of the exploratory test well which resulted in the discovery of the field.

DISCOVERY

Paluxy sand: October 3, 1949; W. M. Coats & R. E. Moore #1-A Paul H. Pewitt. On initial potential test, pumped 331.15 barrels of oil per day through 24 perforations at depths of 4,507-4,532 and 4,537-4,541 feet. Gas-oil ratio, 200:1. Total depth, 4,543 feet.

ELEVATION OF SURFACE

At well locations: Highest, 310 ft.; lowest, 272 feet.

SURFACE FORMATION

Wilcox group (undifferentiated).

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest stratigraphic horizon penetrated in the vicinity of the field is 547 feet below the top of the upper Glen Rose formation. This penetration was at the dry hole where the total depth is indicated as 5,539 feet on the accompanying map. The accompanying TYPE SECTION is based on the log of that dry hole.

NATURE OF TRAP

Fault trap.

PRODUCTIVE AREA

Paluxy sand and Field: 560 acres estimated proven by development to date. Further development will probably increase this figure.

THICKNESS OF RESERVOIR ROCK

Paluxy sand: 50+ feet.

LITHOLOGY OF RESERVOIR ROCK

Paluxy sand: Grey, medium-grained, porous sandstone.

CONTINUITY OF RESERVOIR ROCK

Paluxy sand: Continuous and uniform within present limits of field. However, within 2 miles to the west, the sand is either replaced by shale or overlain by 60 feet of shale not present in the vicinity of the discovery well.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Paluxy sand:	Feet
No free gas indicated	
Highest proven elevation of oil	-4,211
Lowest proven elevation of oil	-4,289
Proven relief	78+

CHARACTER OF OIL

Gravity, A.P.I.: 18.6° Base: Asphalt

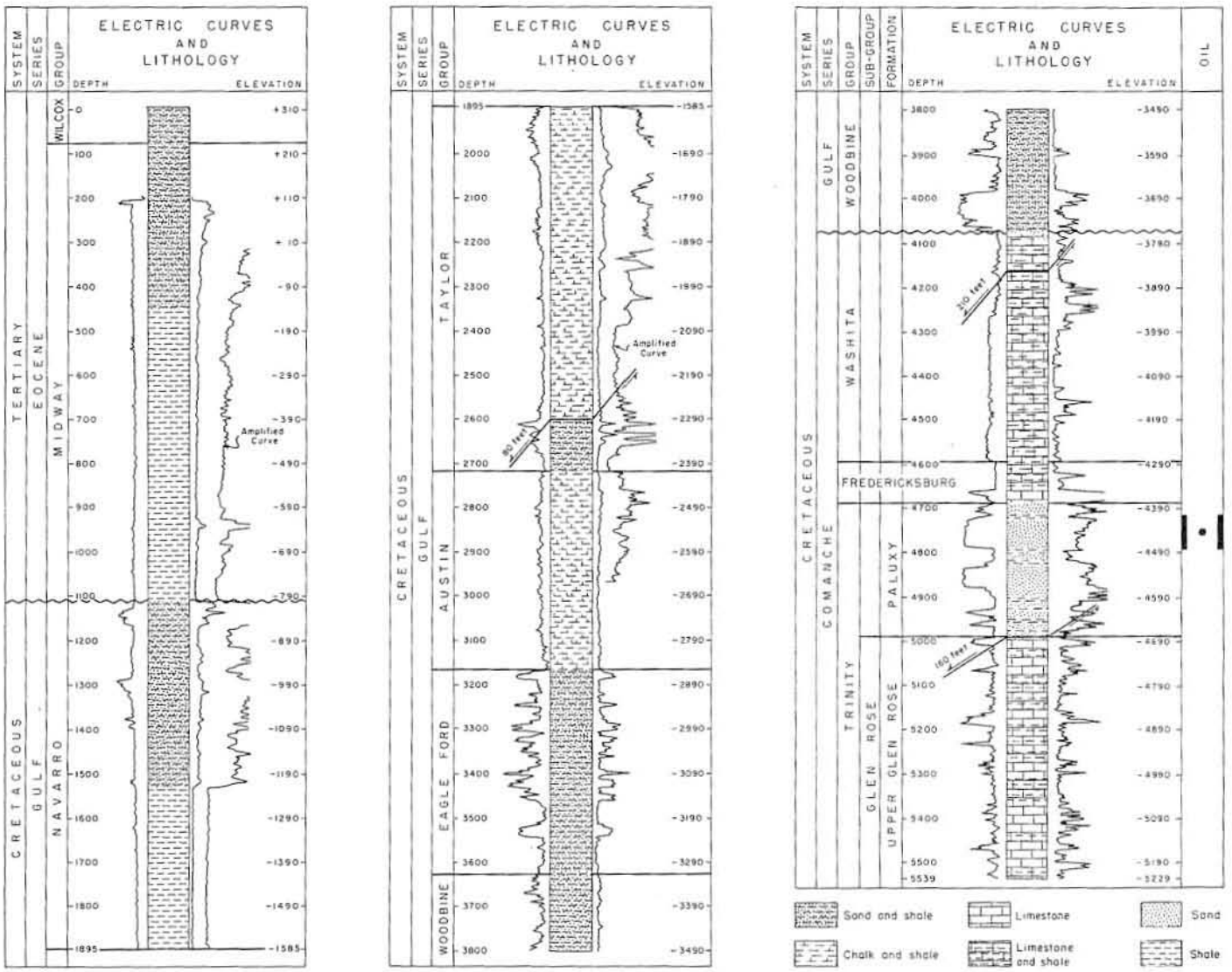
WATER PRODUCTION

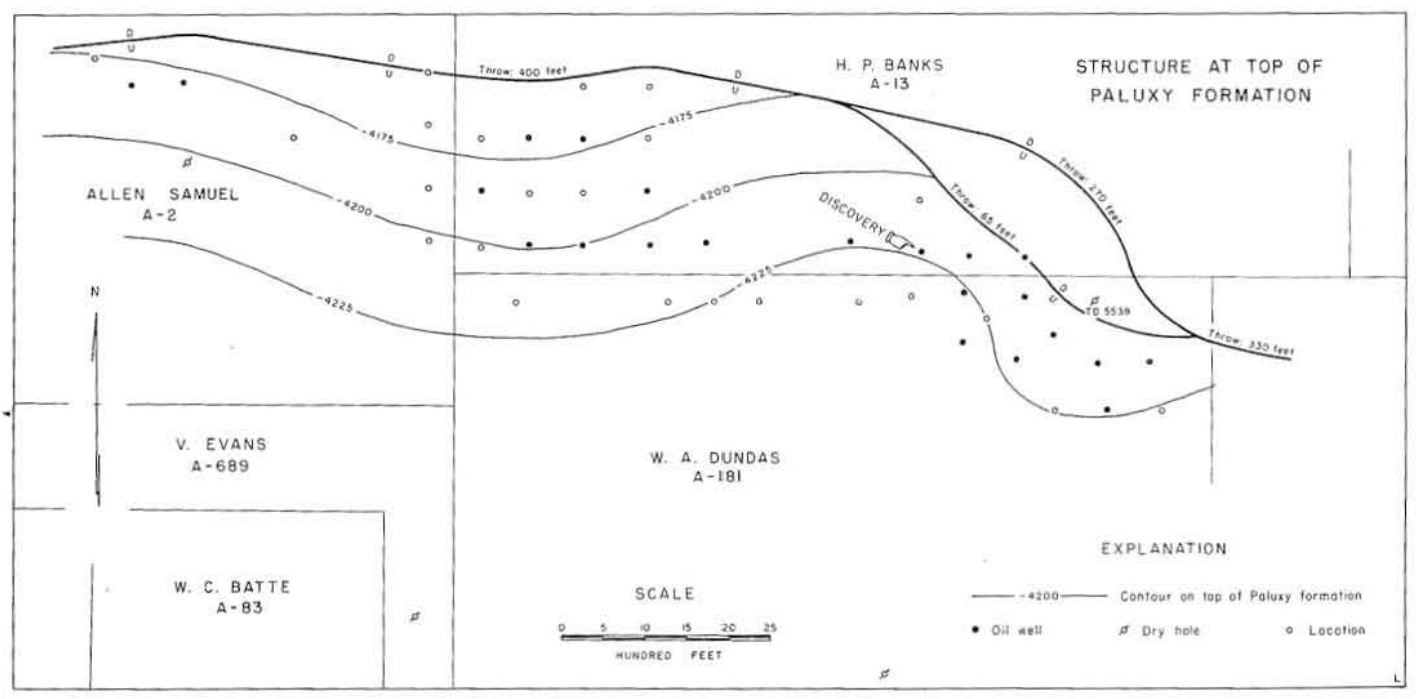
Paluxy sand: A small amount of water has been produced, probably due to poor completion.

PRODUCTION HISTORY

Paluxy sand and Field: From the date of discovery to the end of the year 1949, the production amounted to 19,900 barrels of oil. The second well had been completed before the end of the year. There are now 22 producing wells in the field.

TYPE SECTION OF ROCKS PENETRATED





PICKTON FIELD
Hopkins County, Texas

T. H. SHELBY, Jr.
Geologist, Tyler, Texas
July 26, 1949

LOCATION

The Pickton oil field is located in the northern part of the East Texas basin about one mile south of the town of Pickton and about fifteen miles southeast of Sulphur Springs, county seat of Hopkins County.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Subsurface studies resulted in mapping a structural closure and prompted Humble Oil & Refining Co. to purchase a lease block in early 1942. During the same year, a reflection seismograph survey confirmed the presence of a low-relief anticline. Drilling operations on the discovery well were commenced in June 1944.

DISCOVERY

Bacon lime: November 6, 1944;
Humble Oil & Refining Co. #1 C. D. Nichols.

NATURE OF TRAP

Bacon lime: Simple convex trap on a low-relief anticline slightly modified by permeability barriers.

PRODUCTIVE AREA

Bacon lime and Field: Approximately 2,600 acres. Further development may increase this slightly.

THICKNESSES OF RESERVOIR ROCK

	Feet		
Bacon lime:	Max.	Min.	Avg.
From top to bottom	36	0	--
Net productive	28	0	12

LITHOLOGY OF RESERVOIR ROCK

Bacon lime: Gray porous fossiliferous oolitic limestone. A dense impermeable streak about 2 feet thick generally occurs about the middle of the zone, and a variable thickness of dense gray limestone occurs at the base. On the northeast flank of the structure, a horizontal pinch-out of porosity partly controls the areal extent of production.

CONTINUITY OF RESERVOIR ROCK

Bacon lime: Available evidence indicates that this reservoir has little effective communication with other known occurrences of porosity at the same stratigraphic position in the East Texas basin.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Bacon lime:
No free gas cap. Solution-gas ratio was 2,200 cubic feet per barrel in discovery well.

Elevation of top of oil, feet	-7,388
Elevation of bottom of oil, feet	-7,428
Relief, feet	40

CHARACTER OF OIL

Bacon lime:

Gravity, A.P.I. @ 60° F.	
Maximum	55.1°
Minimum	42.6°
Weighted Average	52°
Sulphur	0.41%

The variation in gravity is controlled largely by surface equipment conditions such as trap pressure, etc.

WATER PRODUCTION

On December 15, 1948, only 9 wells were producing salt water. Five of these were producing less than 4%, and four were producing between 10 and 40%.

ACID TREATMENT

Generally unnecessary.

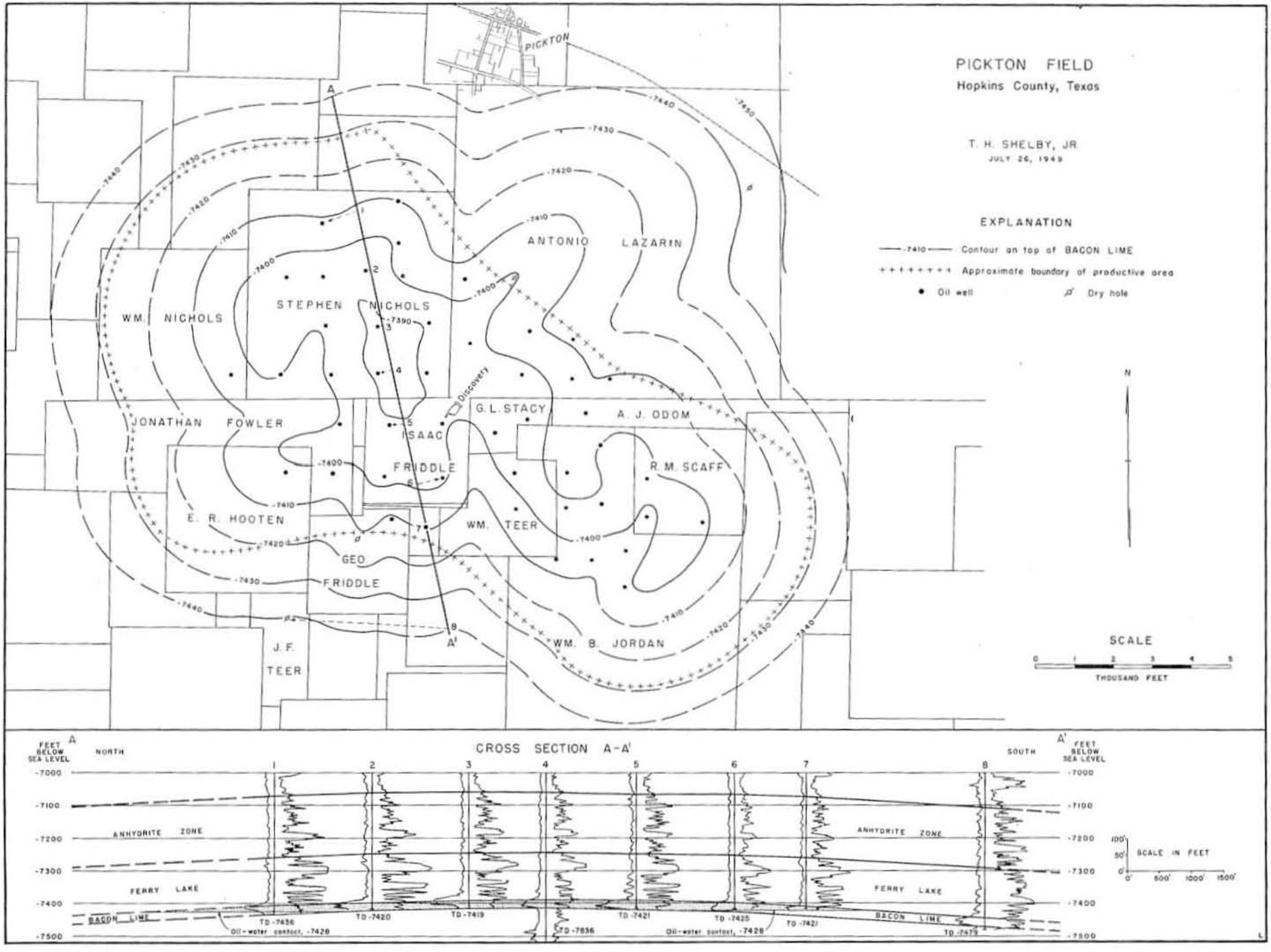
SELECTED REFERENCES

Shelby, T. H., Jr. (1945) Pickton field, Hopkins County, Texas: Amer. Assoc. Petr. Geol., Bull., vol 29, p. 1777. Brief geologic note.

Welsh, J.R., Simpson, R. E., Smith, J. W., and Yust, C.S. (1948) A study of oil and gas conservation in the Pickton field: A.I.M.E., Journal of Petroleum Technology, March 1949, pp. 55-65. Presents comprehensive reservoir data.

PRODUCTION HISTORY

	WELLS PRODUCING at end of year		OIL PRODUCTION (barrels)	
	Oil			
Year	Flowing	Pumping	Yearly	Cumulative
1944	1	-	8,147	8,147
1945	16	-	353,407	361,554
1946	30	-	617,028	978,582
1947	37	1	499,543	1,478,125
1948	44	1	435,769	1,913,894
1949(P.S.)	54	1	658,898	2,572,792

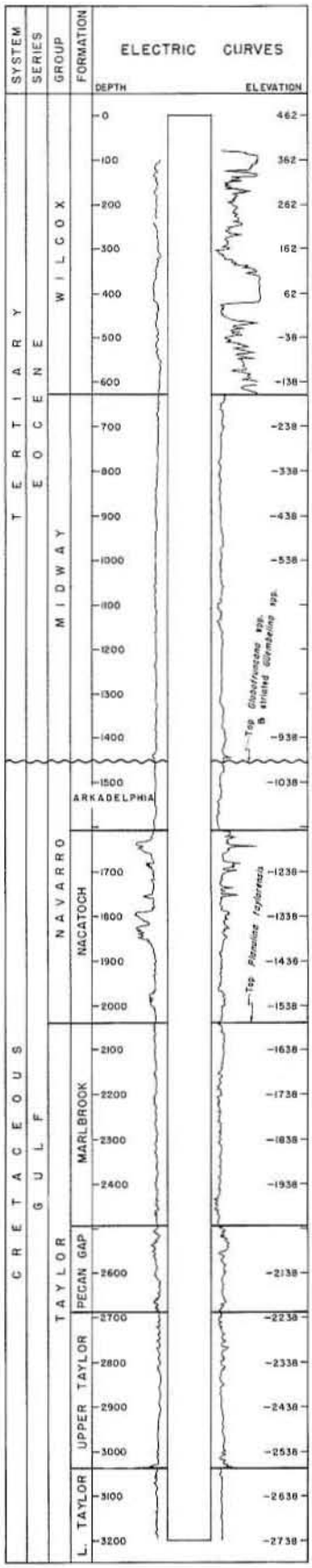

PICKTON FIELD
Hopkins County, Texas
T. H. SHELBY, JR.
JULY 26, 1949
EXPLANATION
-7410- Contour on top of BACON LIME
Approximate boundary of productive area
Oil well
Dry hole
N
SCALE
THOUSAND FEET
PICKTON
ANTONIO LAZARIN
WM. NICHOLS
STEPHEN NICHOLS
JONATHAN FOWLER
ISAAC
Discovery
G.L. STACY
A. J. ODOM
FRIDDLE
R.M. SCAFF
E. R. HOOTEN
WM. TEER
GEO
FRIDDLE
J. F. TEER
WM. B. JORDAN
CROSS SECTION A-A'
NORTH
SOUTH
FEET BELOW SEA LEVEL
ANHYDRITE ZONE
FERRY LAKE
BACON LIME
TD -7436
TD -7420
TD -7419
TD -7421
TD -7425
TD -7421
TD -7479
TD -7836
Oil-water contact, -7428
SCALE IN FEET

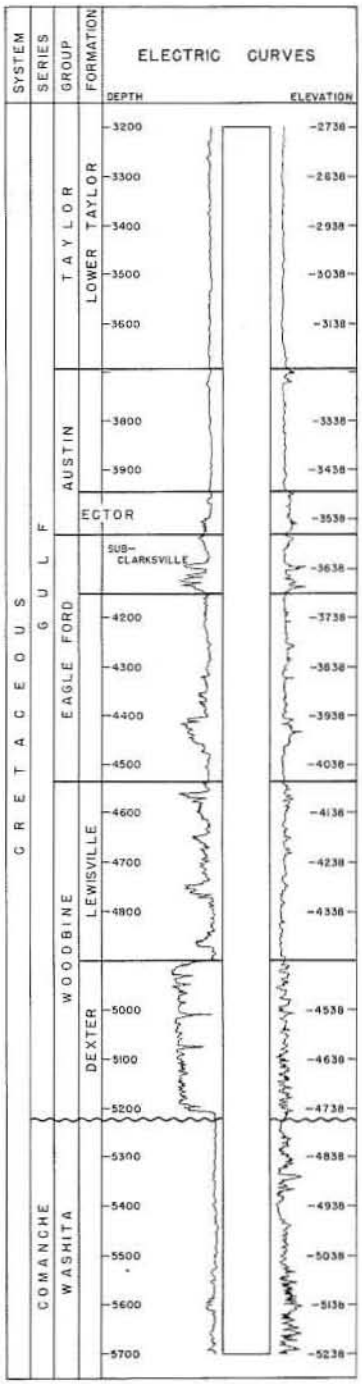
PICKTON FIELD, Hopkins County, Texas

TYPE SECTION OF ROCKS PENETRATED

SURFACE FORMATION : Wilcox

ELEVATION OF SURFACE : Derrick floor : Highest, lowest, 460 feet

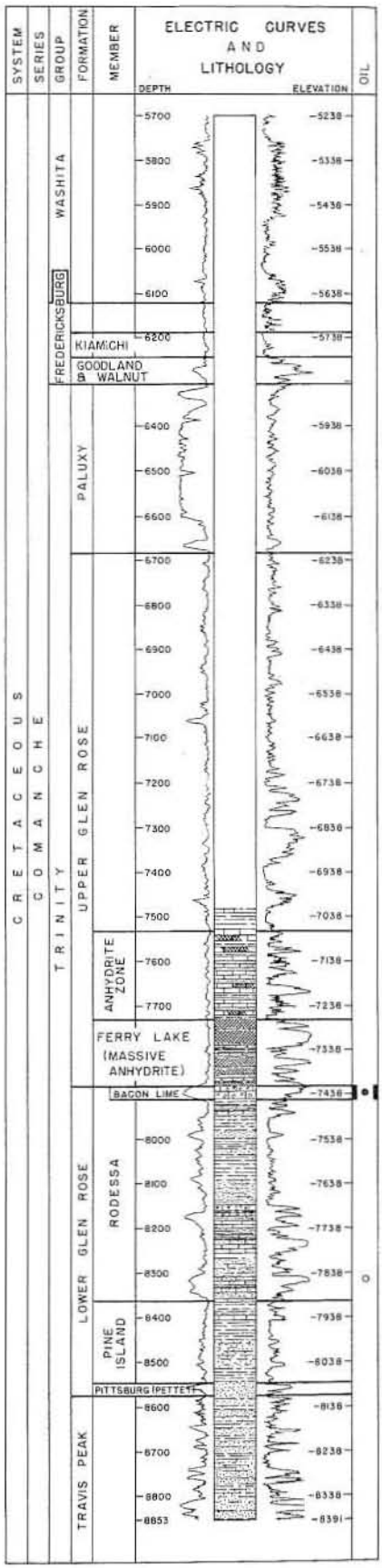




EXPLANATION

- Sand
- Limestone
- Shale
- Anhydrite
- ○ Non-commercial show of heavy black oil
- ● Oil production

OLDEST HORIZON PENETRATED : 278 feet below top of Travis Peak formation



PINE MILLS FIELD
Wood County, Texas

HASTINGS MOORE
District Geologist, Danciger Oil & Refining Company, Henderson, Texas
July 20, 1950

LOCATION

The Pine Mills field is 3 miles southeast of the Pine Mills community in southeastern Wood County. It is $4\frac{1}{2}$ miles north of the northwestern edge of the Hawkins field.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Wildcatting tenacity was paramount in the exploration which led to the discovery of this field. Following discovery of the Hawkins field in December of 1940, the Pine Mills area was rapidly leased by several independents, Sohio Petroleum Co. and The Superior Oil Co. Sohio Petroleum Co. gradually added to its holdings until it became the largest leaseholder in the area. It kept its block intact until in 1949 when it began surrendering leases as rentals fell due. J. M. DuePree of Mineola and F. R. Jackson of Longview secured a farm-out from Sohio of a part of its leases and, with help from several other leaseholders, drilled DuePree & Jackson #1 G. T. Turner in the David Gilleland survey. This test was dry and abandoned in August of 1949. It had showings in both the sub-Clarksville and Woodbine sands which led the operators to drill their #1 J E. Durrett, the discovery well, 2,600 feet to the southeast.

DISCOVERIES

Sub-Clarksville: October 8, 1949; F. R. Jackson & J. M. DuePree #1 J. E. Durrett. Flowed 242 barrels of 26.5° gravity crude per day from depth of 4,782 to 4,800 feet.

Woodbine: April 5, 1950; F. R. Jackson #1 Kennedy. Flowed 170 barrels of 18° gravity crude per day from depth of 5,472 to 5,478.

NATURE OF TRAPS and STRUCTURE

Each of the reservoirs is on a faulted west-dipping monocline. The throw of the trapping fault is 230 feet. The sub-Clarksville dips westward at the rate of 250 feet per mile and the Woodbine at 300 feet per mile.

PRODUCTIVE AREAS

Development to date does not define the productive area in either of the reservoirs.

THICKNESSES OF RESERVOIR ROCKS

Sub-Clarksville	Min.	Max.	Avg.
Second sand, feet	5	28	22
Third sand, feet (Orr sand)	10	15	12
Woodbine sand:			
Clean sand, feet	0	20	5
Saturated ash and sandy ash, feet	0	60	25

LITHOLOGY OF RESERVOIR ROCKS

Sub-Clarksville:

The first sub-Clarksville sand is barren of hydrocarbons so far as now known. It is a medium-grained, re-cemented, white sand, locally ashy.

The second sub-Clarksville sand is, in the southern portion of the field, a clean, medium-grained sand; it becomes more ashy towards the north. In the discovery well, the permeabilities varied from 400 millidarcys to 1,200 millidarcys.

The third sub-Clarksville sand is a medium- to coarse-grained sand relatively free from ash.

Woodbine:

The oil-bearing portion of the Woodbine is the upper 250 feet of the Lewisville formation, which is composed of alternating shale and ash beds with thin lenses of clean sand. The productivity of the saturated ash is quite questionable. The critical ratio of sand to ash for commercial production has not been determined. It appears that the commercial oil is in multiple, small, stratigraphic traps. Each productive lens is quite local.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Sub-Clarksville		Woodbine
	Second	Third	
Elev. of top of oil, feet	-4,340	-4,402	-4,892*
Elev. of bottom of oil, ft.	-4,450	-4,440	-5,064*
Relief, feet	110	38	(172)*

*Separate sand lenses.

CHARACTER OF OIL

Sub-Clarksville:
Gravity, A.P.I.: 25-28° Base: Mixed
Odor: Sweet Color: Dark brown

Woodbine:
Gravity, A.P.I.: 17-23° Base: Asphaltic
Odor: Sweet Color: Dark brown to black

CHARACTER OF GAS

The quantities of gas produced are negligible. The writer knows of no analyses having been made.

PRODUCTION HISTORY

From the date of discovery in October to the end of 1949 the field produced 18,900 barrels of oil, all from sub-Clarksville. There were 5 sub-Clarksville wells at the end of the year.

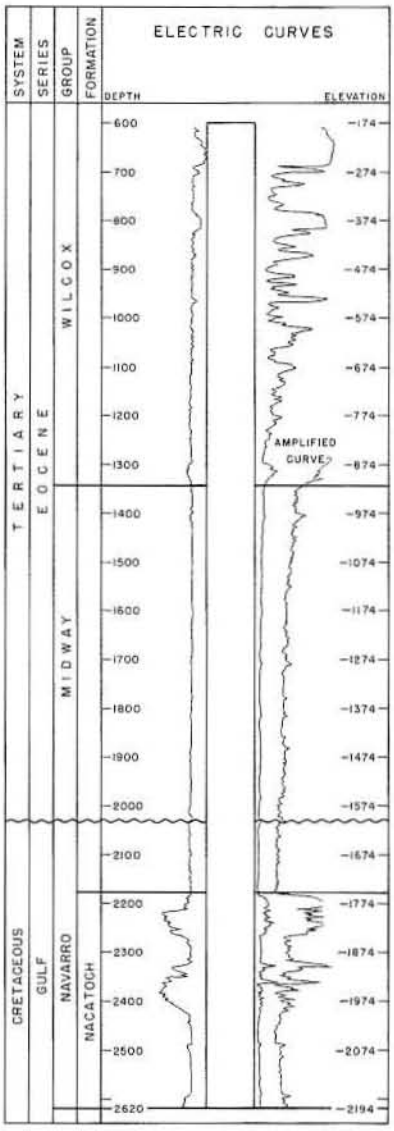
By June 1, 1950, there were 11 sub-Clarksville and 2 Woodbine wells. Production during May amounted to 14,378 barrels from sub-Clarksville and 7,069 barrels from Woodbine.

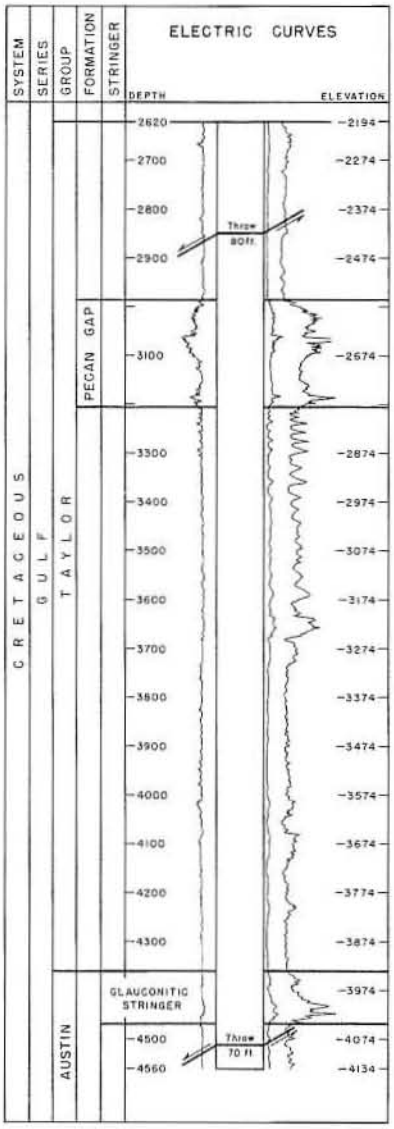
There are 4 wells currently in process of being drilled.

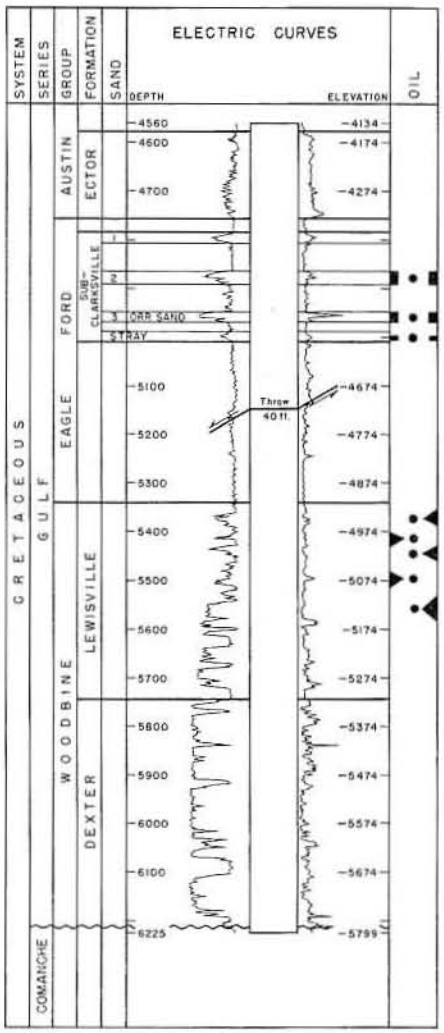
TYPE SECTION OF ROCKS PENETRATED

SURFACE FORMATION : Queen City

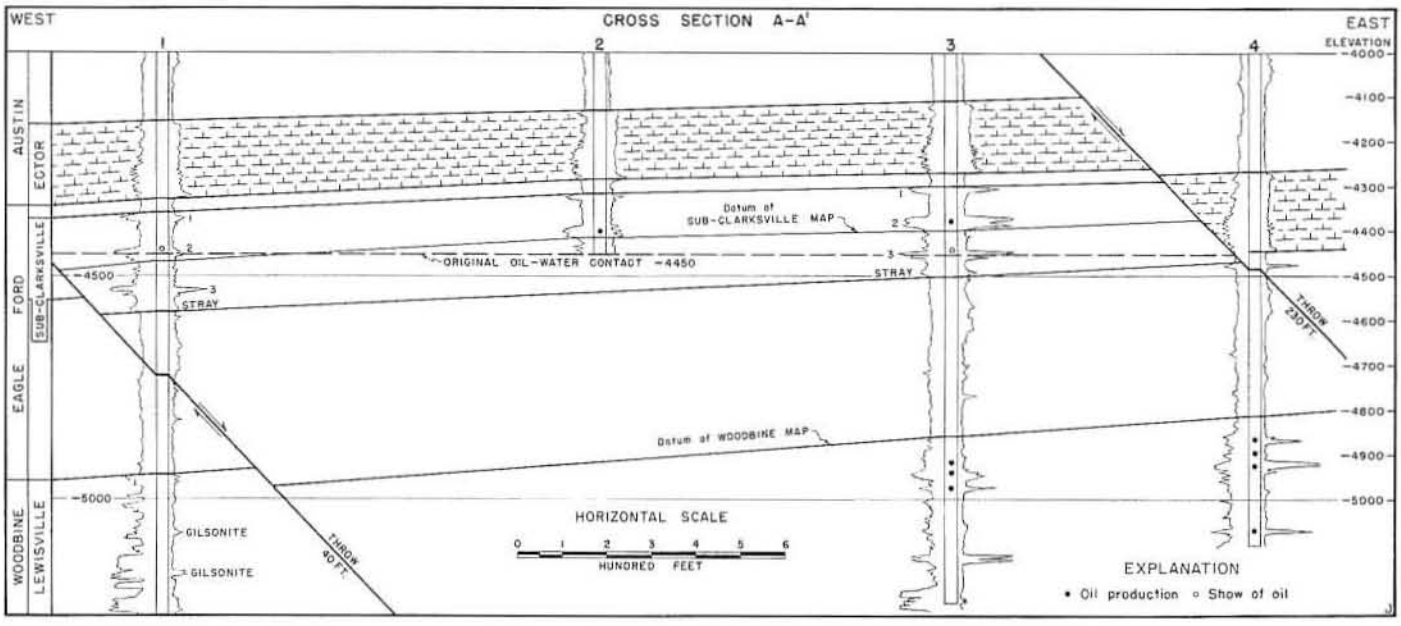
ELEVATION OF SURFACE : Highest, 465 feet, lowest, 385 feet

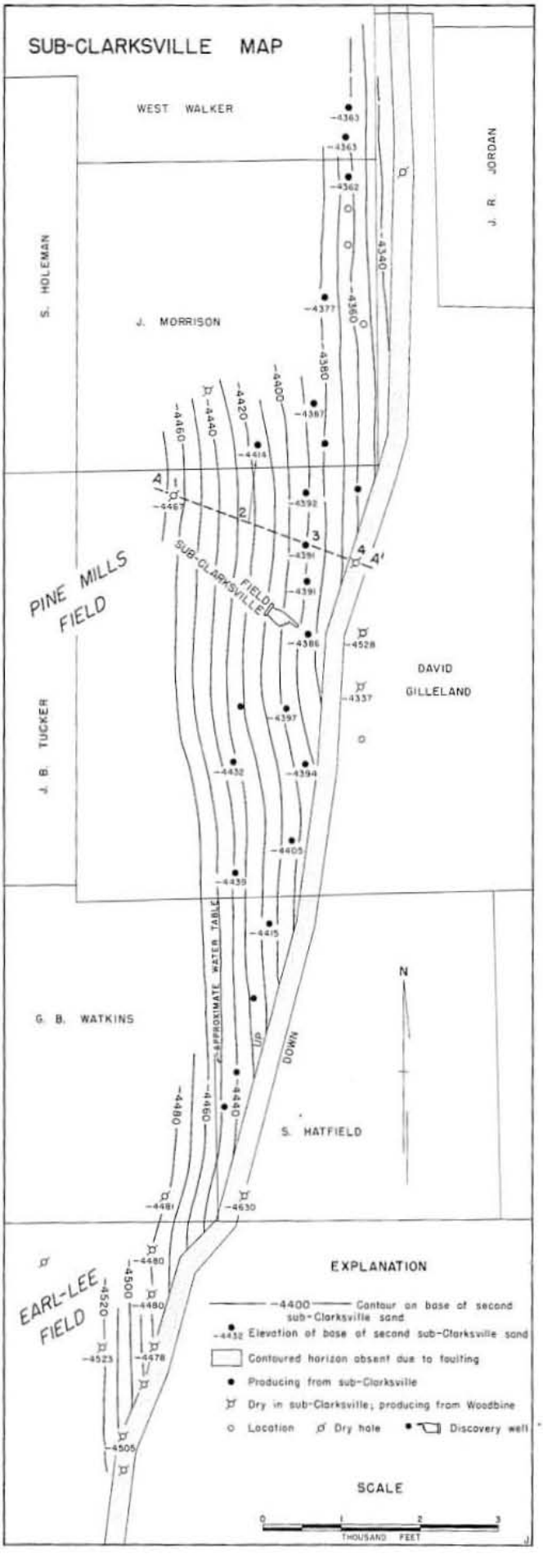


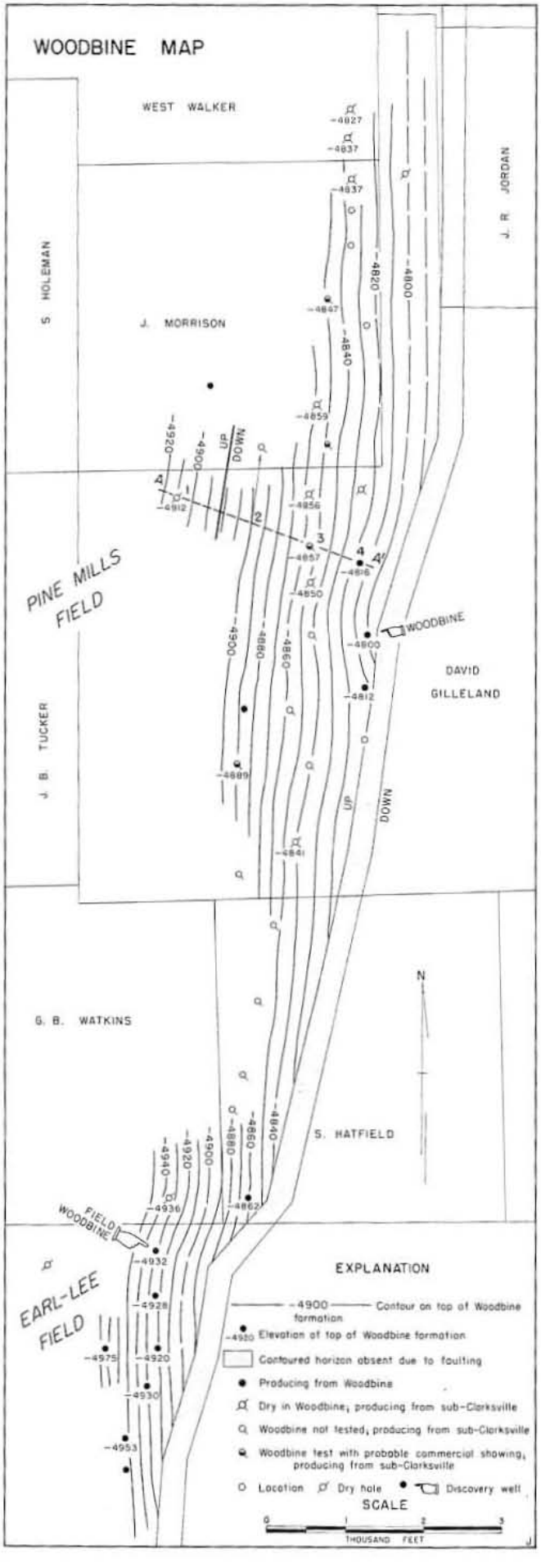




OLDEST HORIZON PENETRATED : About 13 feet below the top of the Comanche series.




SUB-CLARKSVILLE MAP
WEST WALKER
S. HOLEMAN
J. MORRISON
J. R. JORDAN
J. B. TUCKER
G. B. WATKINS
S. HATFIELD
DAVID GILLELAND
PINE MILLS FIELD
SUB-CLARKSVILLE FIELD
EARL-LEE FIELD
APPROXIMATE WATER TABLE
UP
DOWN
EXPLANATION
-4400- Contour on base of second sub-Clarksville sand
-4432 Elevation of base of second sub-Clarksville sand
Contoured horizon absent due to faulting
Producing from sub-Clarksville
Dry in sub-Clarksville; producing from Woodbine
Location
Dry hole
Discovery well
SCALE
THOUSAND FEET


WOODBINE MAP
WEST WALKER
S. HOLEMAN
J. MORRISON
J. R. JORDAN
J. B. TUCKER
G. B. WATKINS
S. HATFIELD
DAVID GILLELAND
PINE MILLS FIELD
WOODBINE FIELD
EARL-LEE FIELD
UP
DOWN
EXPLANATION
-4900- Contour on top of Woodbine formation
-4930 Elevation of top of Woodbine formation
Contoured horizon absent due to faulting
Producing from Woodbine
Dry in Woodbine; producing from sub-Clarksville
Woodbine not tested; producing from sub-Clarksville
Woodbine test with probable commercial showing; producing from sub-Clarksville
Location
Dry hole
Discovery well
SCALE
THOUSAND FEET

PITTSBURG FIELD
Camp County, Texas

W. H. McKENZIE and F. M. ADAIR
Zone Geologist and Geologist, respectively, Gulf Oil Corp., Tyler, Texas
July 7, 1950

LOCATION

The Pittsburg field is in the southwestern part of Camp County approximately 6 miles southwest of the town of Pittsburg and slightly less than 2 miles southeast of the town of Leesburg.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Mapping based on surface exposures and shallow core drill data led to the first oil and gas leasing in the area. Seismograph work, conducted later, confirmed other indications of structure and encouraged the drilling of the discovery well.

DISCOVERY

Pittsburg sands: August 27, 1940; H. S. Moss et al. (W. C. McGlothlin et al.) #1 Eliza Venters.

STRATIGRAPHIC POSITIONS OF RESERVOIRS

Pittsburg sands: The Pittsburg oil sand zones are apparently sandy facies of the Pettet limestone. They occur stratigraphically in the basal part of the Glen Rose sub-group immediately above the Travis Peak formation. The two oil sand zones represent two reservoirs separated by a 25-foot shale break which blankets the field. The two zones are treated as a single reservoir in the production of oil.

NATURE OF TRAPS

Pittsburg sands: The trap in each of the two reservoirs is due to convex folding. The hydrocarbon accumulations are at the crest of a domal type anticlinal fold.

PRODUCTIVE AREA

About 1,500 acres have been proven productive. Erratic sand deposition and the low capacity of the reservoirs discouraged further development.

CONTINUITY OF RESERVOIR ROCKS

Pittsburg sands: The Pittsburg sand zones grade laterally to the south and east into the Pettet limestone, which extends throughout a good portion of the East Texas basin. To the north and northwest of the Pittsburg field, these sandstones cannot be correlated for any appreciable distance, primarily because the lower Glen Rose section immediately overlying them grades laterally updip into a sandy facies. As to each of the two reservoirs, it is believed that the degree of porosity which permits commercial occurrence of oil is a local condition which probably does not extend continuously far beyond the present known extent of the field.

THICKNESSES OF RESERVOIR ROCKS

	Feet	
Net productive	Max.	Min.
Upper Pittsburg sand	18	5
Lower Pittsburg sand	12	2
Total, average for field	19	

LITHOLOGY OF RESERVOIR ROCKS

Pittsburg sands: The reservoirs consist primarily of hard, very fine-grained, well-cemented sandstone with very low porosity and permeability. The sands are quartzitic in part, with lensing porosity. On parts of the structure the porous sands grade laterally into hard, non-porous, silty, shaly, light greenish-grey sandstones with no permeability and no oil saturation. Some sandstone streaks are so very fine-grained that they might be correctly classified as siltstone. Thin, sandy, silty shale beds are scattered through the sand zones.

The two sand zones are separated by approximately 25 feet of hard, dark grey, brittle shale, slightly calcareous in part.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Feet
Upper Pittsburg sand:	
Elevation of top of oil	-7,521
Elevation of bottom of oil	-7,649+
Proven relief (*)	128
Lower Pittsburg sand:	
Elevation of top of oil	-7,585
Elevation of bottom of oil	-7,710+
Proven relief (*)	125

*Development to date has not provided data for determining elevation of oil-water contact.

CHARACTER OF OIL

Gravity, A. P. I., average: 42.4°
Odor: Sweet Base: Paraffin

For analysis see:
U. S. Bureau of Mines Lab. ref. No. 40146
Analyses of Crude Oils from Some Fields of Texas.
R. I. 3699 (1943) Item 89

WATER PRODUCTION

Negligible.

ACID TREATMENT

Mud acid was used in a few wells.

ELEVATION OF SURFACE

At well locations: Highest, 429 feet; lowest, 359 feet.

SURFACE FORMATION

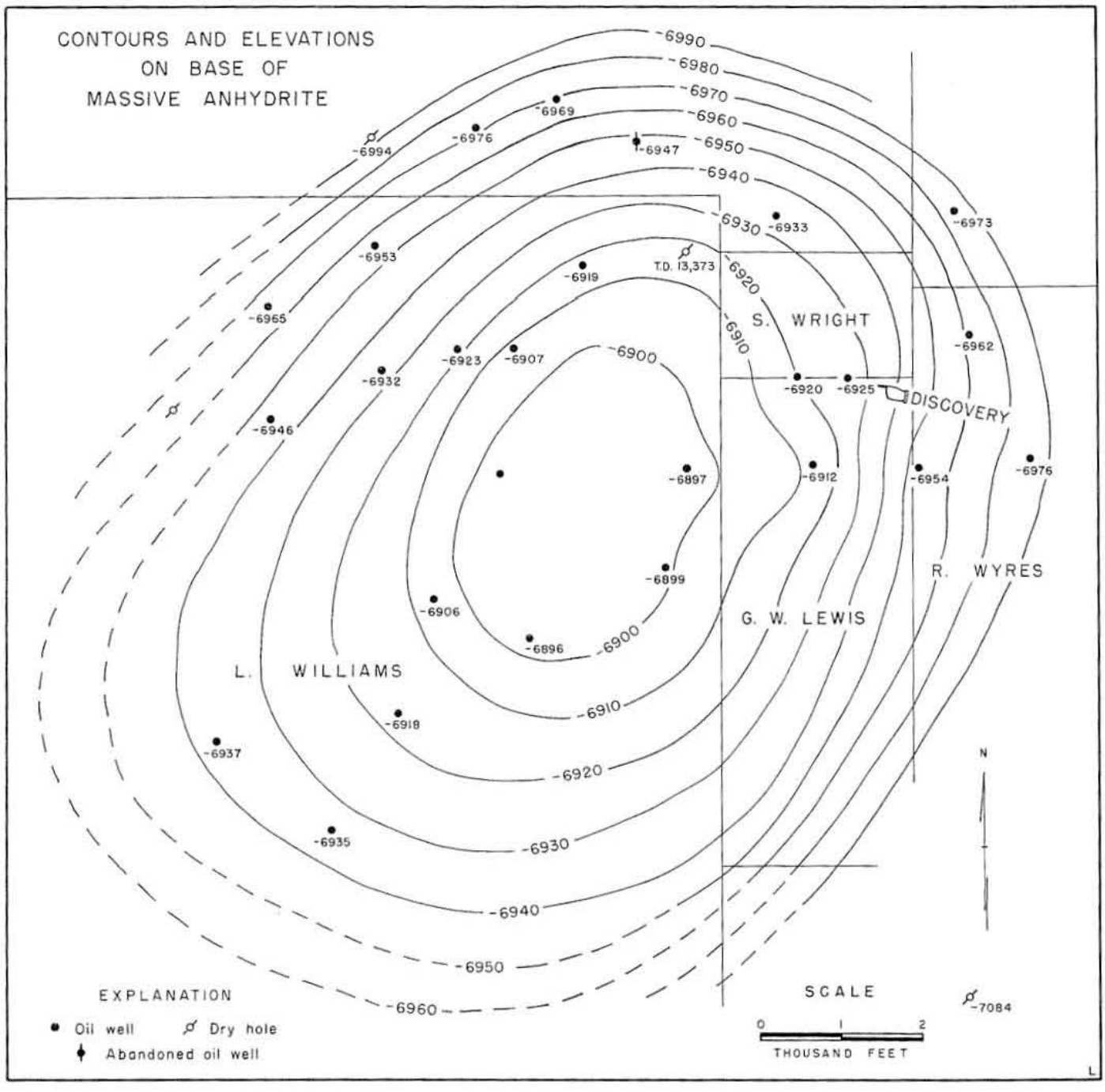
Queen City.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

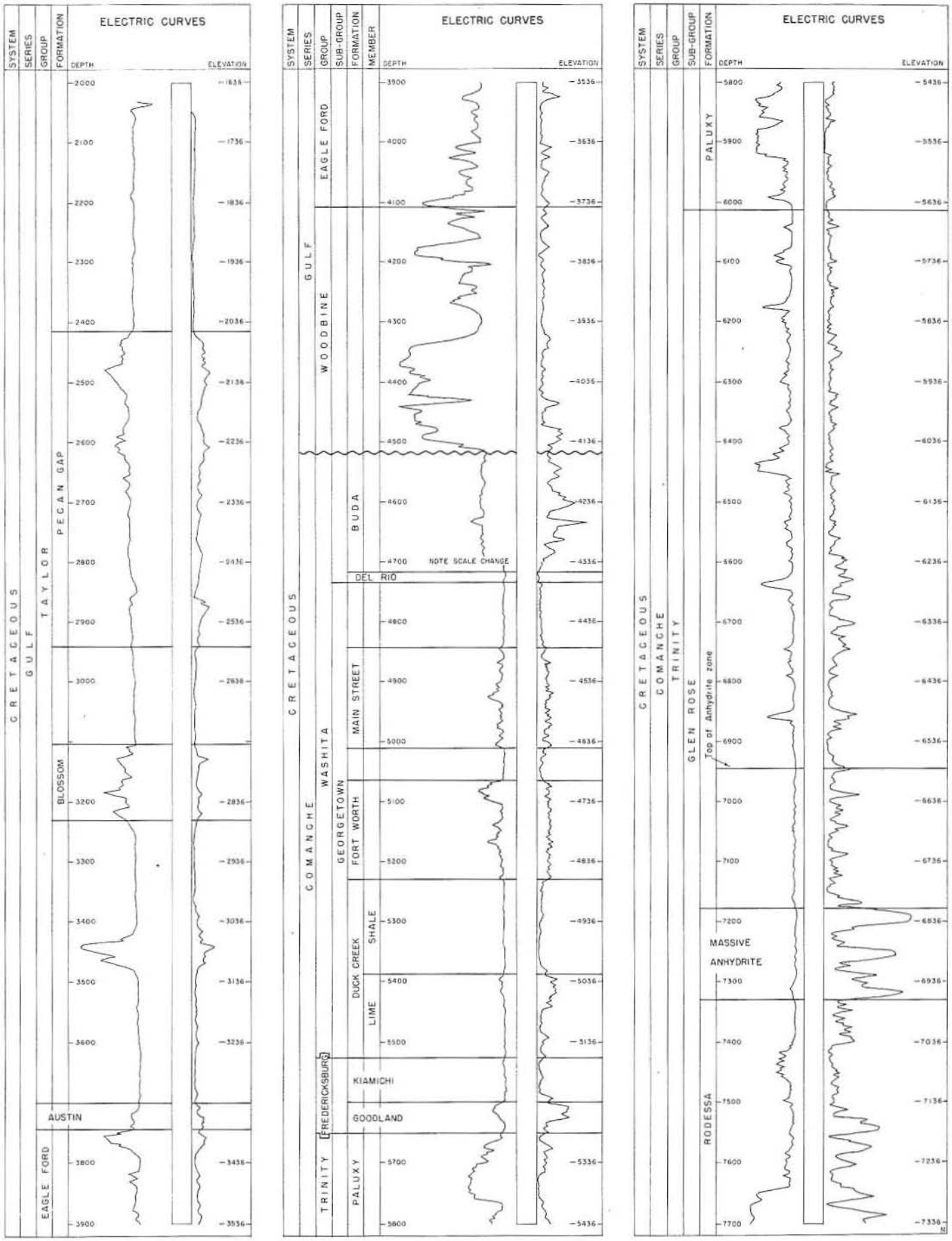
The oldest horizon penetrated is 460 feet below the top of the Buckner formation. This penetration was in R. J. Caraway et al. #1 Mrs. E. A. Chance, which was drilled to a total depth of 13,373.

PRODUCTION HISTORY

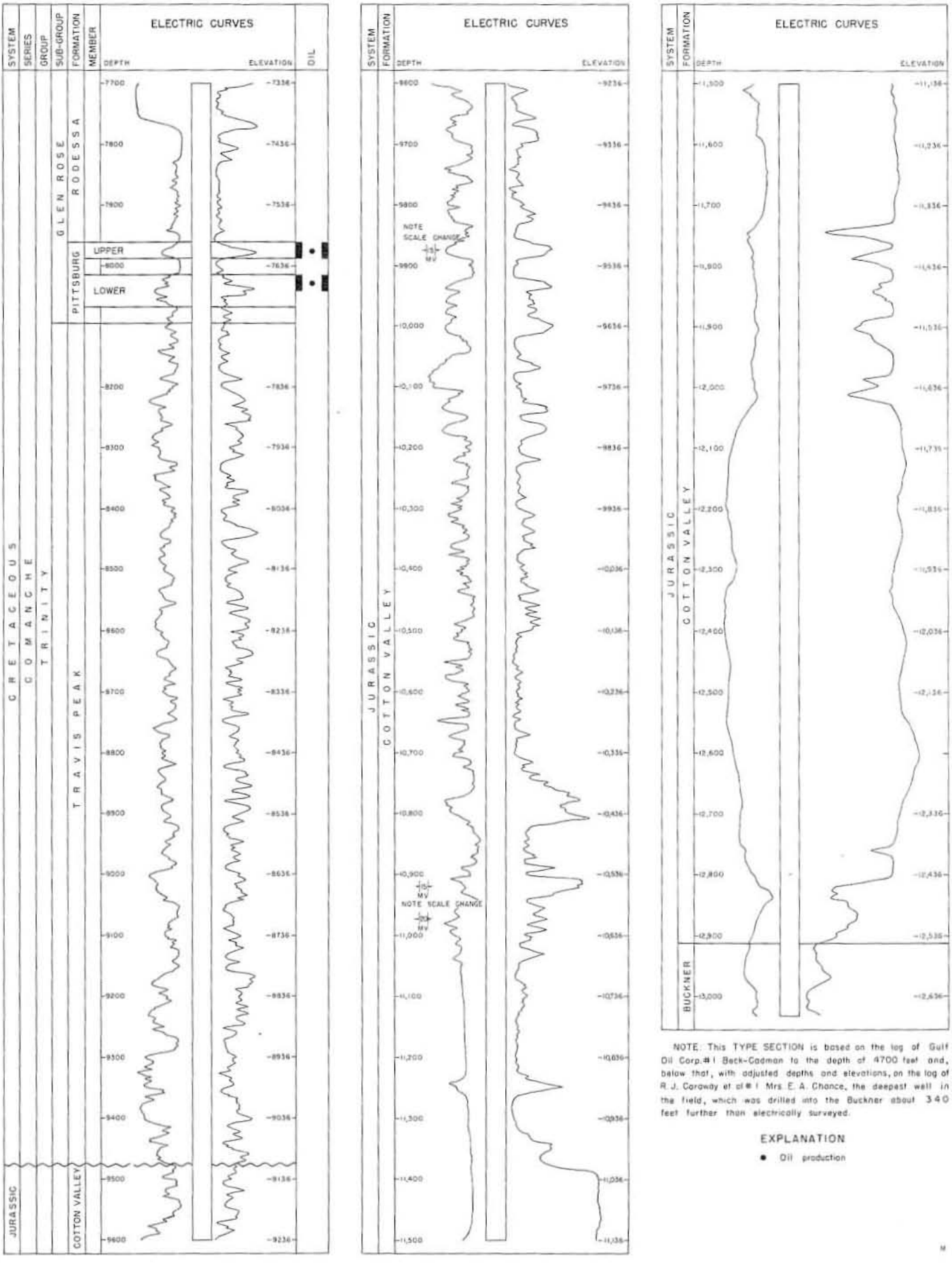
Year	WELLS PRODUCING at end of year	OIL PRODUCTION (barrels) Yearly	Cumulative
1940	1	11,046	11,046
1941	3	34,292	45,338
1942	4	96,868	142,206
1943	7	137,602	279,808
1944	21	362,801	642,609
1945	23	428,618	1,071,227
1946	25	324,708	1,395,935
1947	25	255,178	1,651,113
1948	24	198,166	1,849,279
1949	23	142,212	1,991,491



TYPE SECTION OF ROCKS PENETRATED



TYPE SECTION OF ROCKS PENETRATED



NOTE. This TYPE SECTION is based on the log of Gulf Oil Corp.#1 Beck-Cadman to the depth of 4700 feet and, below that, with adjusted depths and elevations, on the log of R. J. Caraway et al #1 Mrs. E. A. Chance, the deepest well in the field, which was drilled into the Buckner about 340 feet further than electrically surveyed.

EXPLANATION

- Oil production

PLEASANT GROVE DEEP FIELD
Rusk County, Texas

JOHN R. BUNN
Consulting Geologist, Tyler, Texas
January 25, 1950

LOCATION

The Pleasant Grove Deep field is 1½ miles southeast of Pleasant Grove school house and 12 miles southwest of the town of Henderson. It is located approximately 4 miles south of the southeast extremity of the East Texas field. The productive area is entirely within the George May survey.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Subsurface geological mapping.

DISCOVERY

Woodbine sand: May 6, 1941;
Ross Sears #1 J. F. Pool.

ELEVATION OF SURFACE

At well locations: Highest 427 ft.; lowest, 387 feet.

SURFACE FORMATIONS

Queen City and Reklaw formations of Claiborne group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated is 38 feet into calcareous shale and limestone which is probably at the top of the Washita group. This penetration was in L. O. McMillan #2 J. F. Pool at depth of 4,239 to 4,277 feet.

NATURE OF TRAP

Woodbine sand: Structural nose with flat domal closure and slight overlap of Austin chalk over eroded lower Woodbine sand section. Local thinning in certain wells suggests irregular minor faulting.

PRODUCTIVE AREA

Woodbine sand and Field: 195± acres.

THICKNESS OF RESERVOIR ROCK

Woodbine sand: Net productive, 5 to 12 feet.

LITHOLOGY OF RESERVOIR ROCK

Woodbine sand: Soft, permeable sand, typical of Dexter member of Woodbine section.

CONTINUITY OF RESERVOIR ROCK

Woodbine sand: Sheet sand truncated in easterly direction and overlapped by deposition of Austin chalk.

CHARACTER OF OIL

Woodbine sand: Gravity, A.P.I., 39°.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine sand:	Feet
Elevation of top of oil	-3,634
Elevation of bottom of oil	-3,652
Relief	18

The above figures represent conditions at time of discovery.

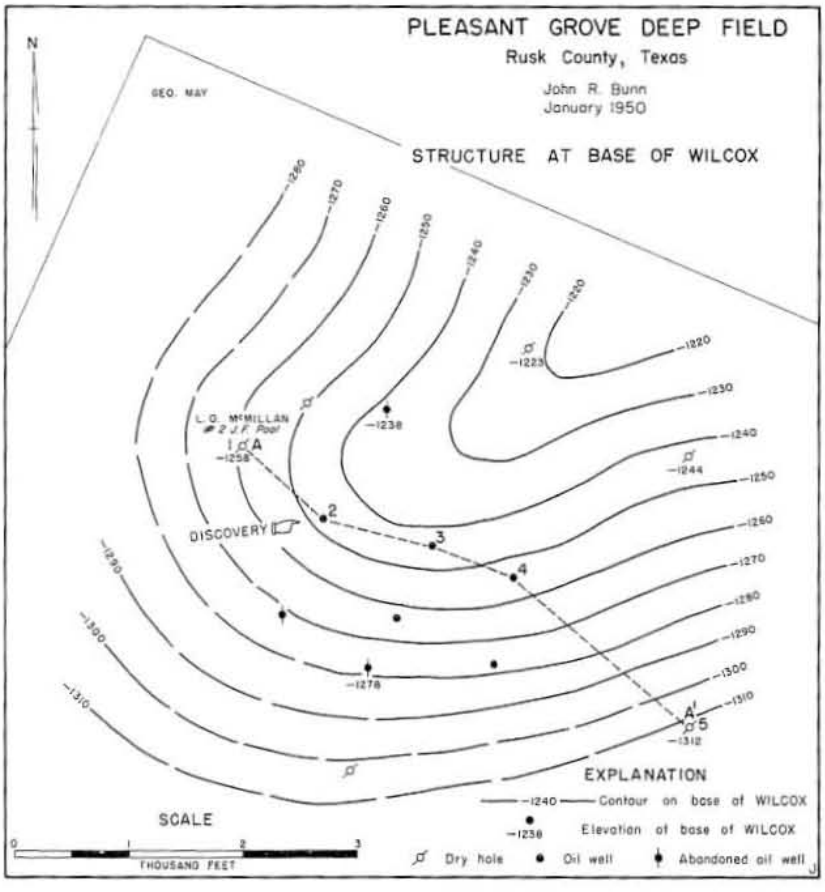
WATER PRODUCTION

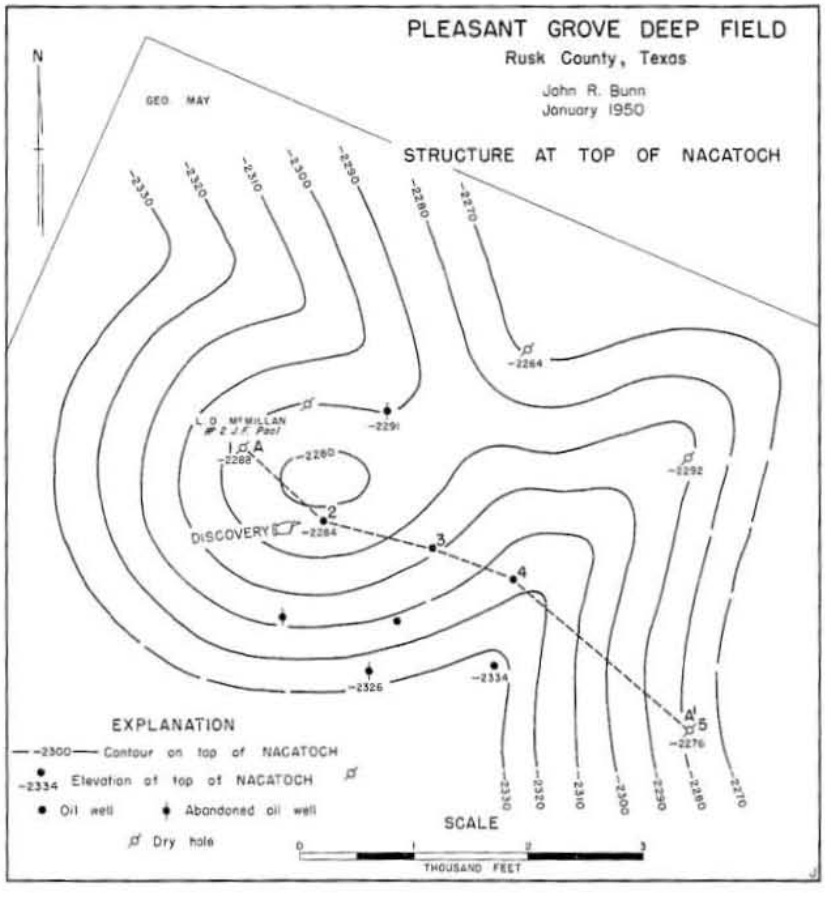
All wells produced some water on initial completion. Wells in field now produce from 7 to 80 % water.

PRODUCTION HISTORY

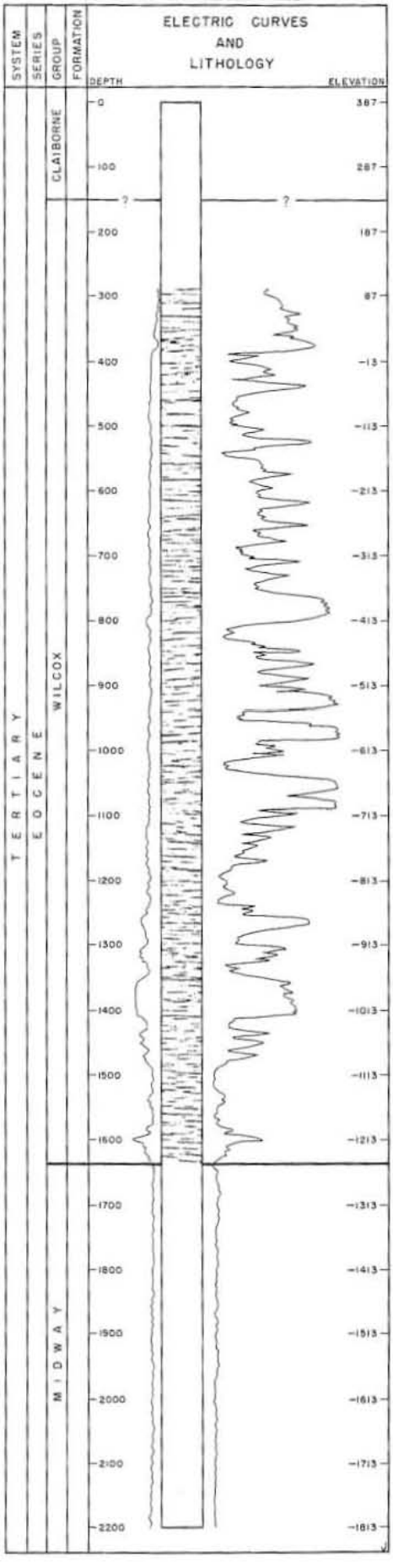
Woodbine sand and Field:

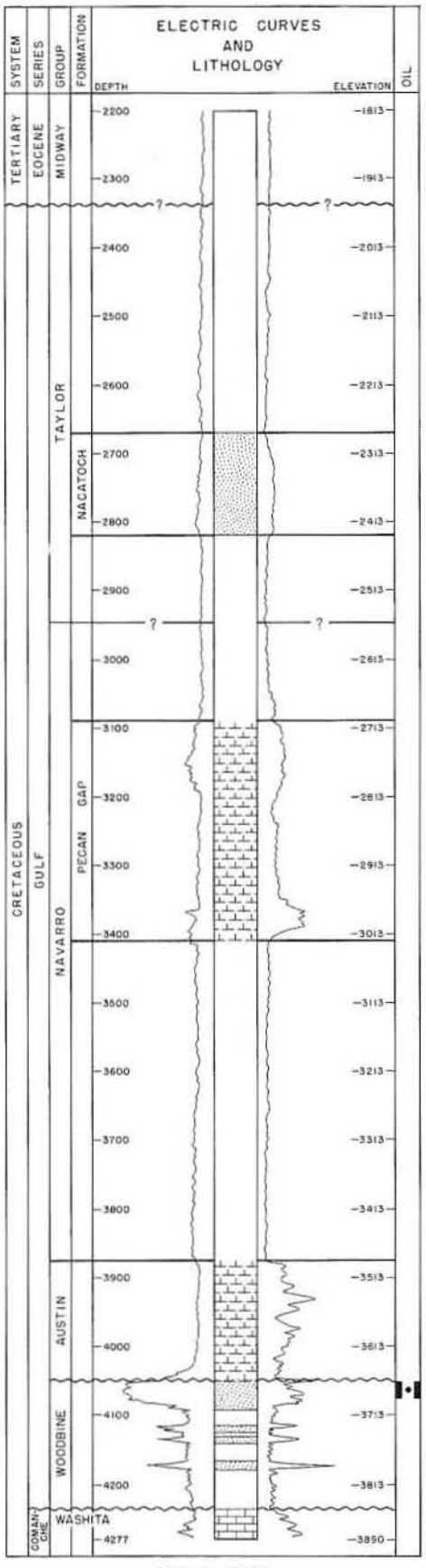
	WELLS PRODUCING at end of year		OIL PRODUCTION (barrels	
	Oil			
Year	Flowing	Pumping	Yearly	Cumulative
1941	4	1	19,673	19,673
1942	4	3	57,357	77,030
1943	3	4	61,186	138,216
1944	2	5	73,872	212,088
1945	0	6	73,335	285,423
1946	0	6	79,920	365,343
1947	0	6	84,338	449,681
1948	0	6	79,510	529,191
1949	0	6	52,894	582,085

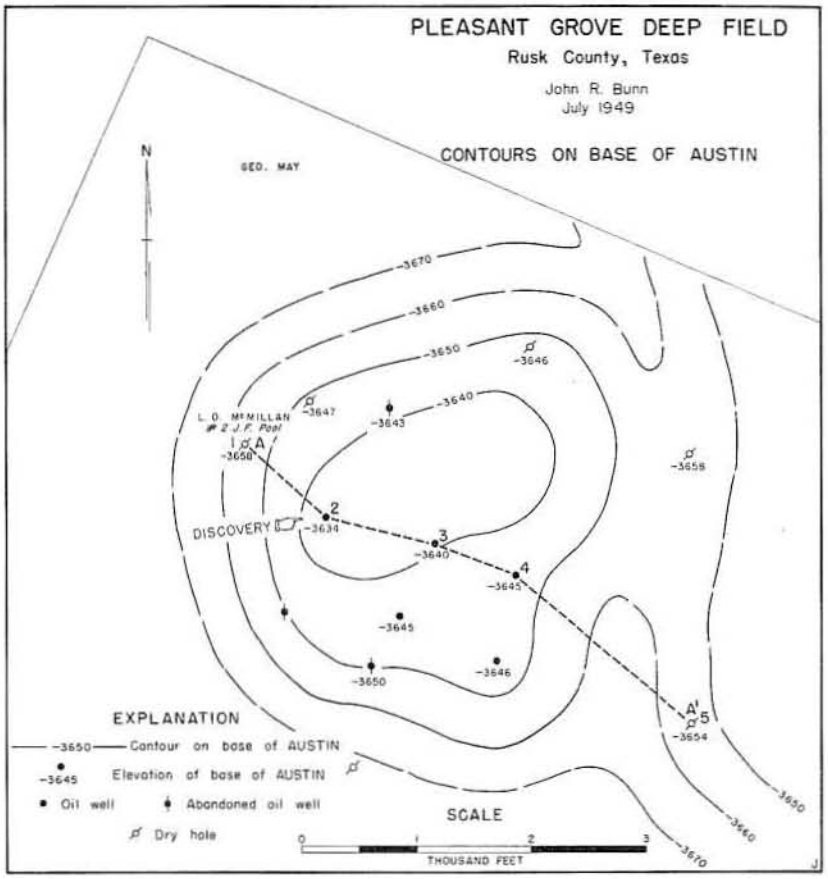


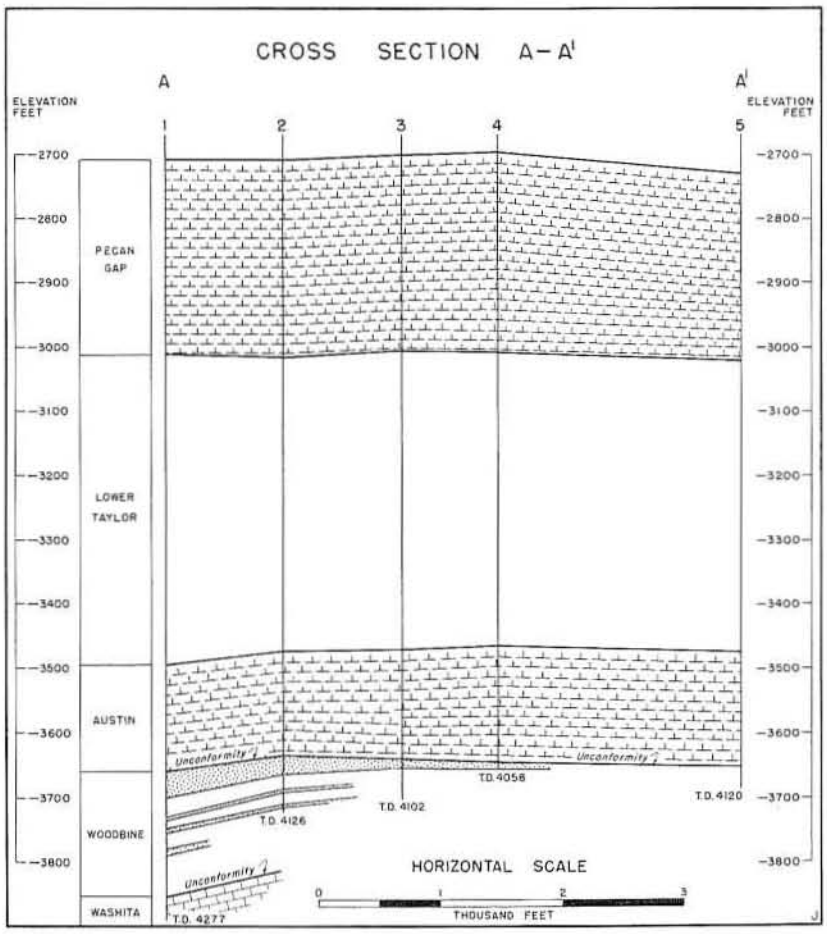


TYPE SECTION OF ROCKS PENETRATED




ELECTRIC CURVES AND LITHOLOGY
SYSTEM
SERIES
GROUP
FORMATION
DEPTH
ELEVATION
OIL
TERTIARY
EOCENE
MIDWAY
TAYLOR
NACATOCH
PECAN GAP
NAVARRO
GULF
AUSTIN
WOODBINE
WASHITA
COMANCHE
CRETACEOUS
2200
2300
2400
2500
2600
2700
2800
2900
3000
3100
3200
3300
3400
3500
3600
3700
3800
3900
4000
4100
4200
4277
-1813
-1913
-2013
-2113
-2213
-2313
-2413
-2513
-2613
-2713
-2813
-2913
-3013
-3113
-3213
-3313
-3413
-3513
-3613
-3713
-3813
-3890
EXPLANATION
Sand, shale, streaks of lignite
Sand
Limestone
Chalk
Oil production


PLEASANT GROVE DEEP FIELD
Rusk County, Texas
John R. Bunn
July 1949
CONTOURS ON BASE OF AUSTIN
N
GEO. MAY
-3670
-3660
-3650
-3640
-3646
-3647
-3643
L. O. McMILLAN
2 J. F. Pool
A
-3650
-3658
DISCOVERY
2
-3634
3
-3640
4
-3645
-3645
-3650
-3646
A'
5
-3654
-3650
-3640
-3670
EXPLANATION
-3650 Contour on base of AUSTIN
-3645 Elevation of base of AUSTIN
Oil well
Abandoned oil well
Dry hole
SCALE
0 1 2 3
THOUSAND FEET


CROSS SECTION A-A'
A
A'
ELEVATION FEET
1
2
3
4
5
-2700
-2800
-2900
-3000
-3100
-3200
-3300
-3400
-3500
-3600
-3700
-3800
PECAN GAP
LOWER TAYLOR
AUSTIN
WOODBINE
WASHITA
Unconformity
Unconformity
Unconformity
T.D. 4058
T.D. 4120
T.D. 4102
T.D. 4126
T.D. 4277
HORIZONTAL SCALE
0 1 2 3
THOUSAND FEET

PLEASANT GROVE SHALLOW FIELD
Rusk County, Texas

JOHN R. BUNN
Consulting Geologist, Tyler, Texas
March 15, 1950

LOCATION

The Pleasant Grove Shallow field is in southwest Rusk County about 14 miles southwest of Henderson, the county seat. It is about $2\frac{1}{2}$ miles southwest of the Pleasant Grove Deep field and about 3 miles northeast of the Lone Star field. The present productive area is entirely within the Jose Ignacio Sanches survey.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Subsurface geology.

DISCOVERY

Nacatoch sand: February 24, 1942; O. W. Killam #1 Ethel Bass. Initial production, 212 barrels of oil and 55 barrels of salt water during 20 hour test; gas-oil ratio, 200:1. Perforation, 2,910-2,965 feet.

ELEVATION OF SURFACE

At well locations: Highest, 434 ft.; lowest, 362 feet.

SURFACE FORMATIONS

Weches and Queen City formations of Claiborne group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated by any well in the field is 27 feet below the top of the Woodbine group. This penetration was in the discovery well.

NATURE OF TRAP

Nacatoch sand: Erratic permeability and local structural irregularities along the southwest slope of a large structural nose, in the graben area between the Lone Star-Ponta fault on the south and the east extension of the Summerfield fault zone on the north.

PRODUCTIVE AREA

Nacatoch sand and Field: 30± acres.

THICKNESS OF RESERVOIR ROCK

Nacatoch sand: From 10 to 60 feet. Uncertain.

LITHOLOGY OF RESERVOIR ROCK

Nacatoch sand: Sandy shale and fine shaly sand with some thin lenticular streaks of fine sand. Permeability is erratic.

CONTINUITY OF RESERVOIR ROCK

Nacatoch sand: The Nacatoch sand zone is continuous as a recognizable porous medium throughout most of Northeast Texas. Its permeability is low and erratic from well to well in this field.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Nacatoch sand:	Feet
No free gas cap generally	
Highest known elevation of oil	-2,446
Lowest known elevation of oil	-2,771
Relief	325

Dry holes indicate that the reservoir is not sufficiently porous to yield oil throughout the above indicated vertical extent.

CHARACTER OF OIL

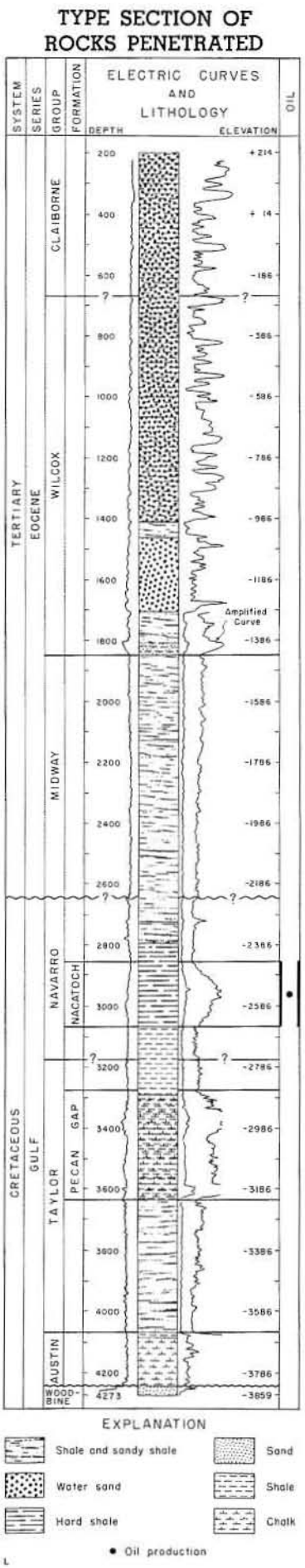
Nacatoch sand: Gravity, A.P.I., 36° to 38°.

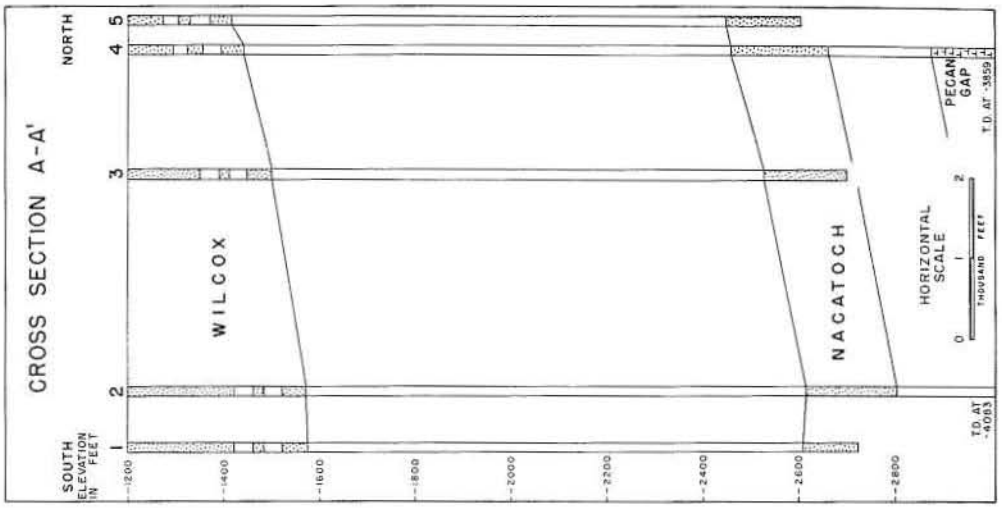
WATER PRODUCTION

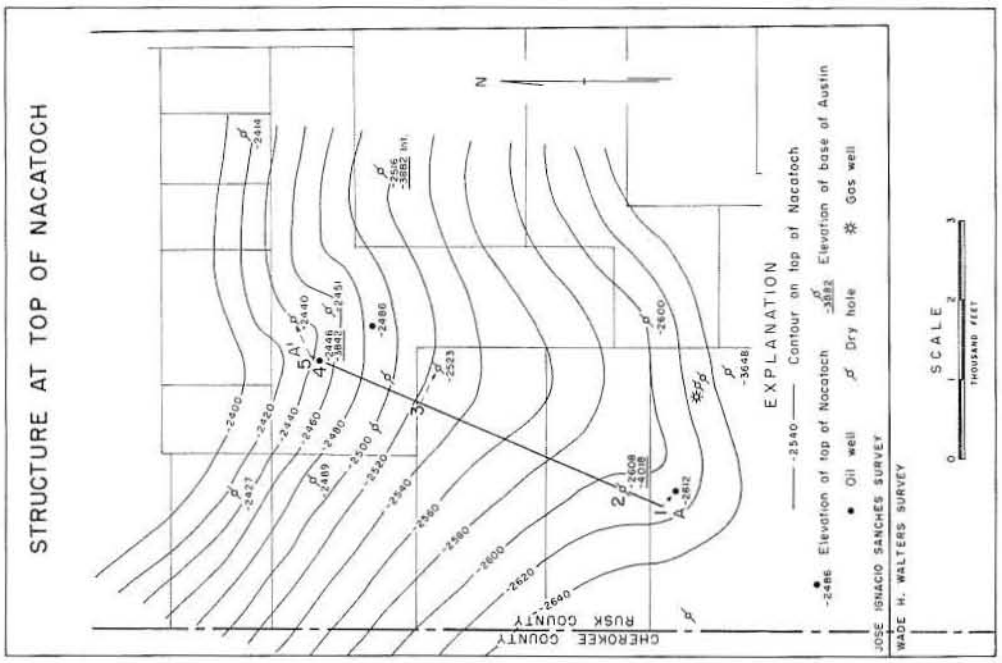
Nacatoch sand: Some water occurs in all wells.

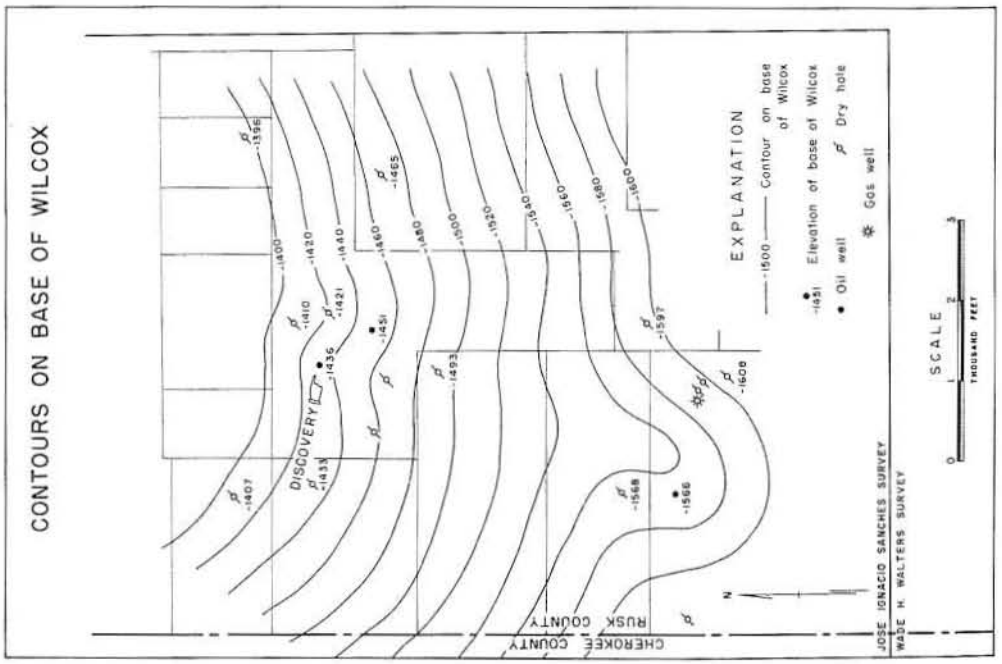
PRODUCTION HISTORY

	WELLS PRODUCING at end of year		OIL PRODUCTION (barrels)	
	Oil			
Year	Flowing	Pumping	Yearly	Cumulative
1942	0	1	10,384	10,384
1943	0	1	6,624	17,008
1944	0	1	5,446	22,454
1945	0	1	3,435	25,889
1946	0	1	2,449	28,338
1947	0	1	2,725	31,063
1948	1	1	13,115	44,178
1949	0	3	6,782	50,910


TYPE SECTION OF ROCKS PENETRATED
SYSTEM
SERIES
GROUP
FORMATION
ELECTRIC CURVES AND LITHOLOGY
DEPTH
ELEVATION
OIL
CRETACEOUS
TERTIARY
GULF
EOCENE
CLAIBORNE
WILCOX
MIDWAY
NAVARRO
TAYLOR
AUSTIN
NACATOCH
PECAN GAP
WOOD-BINE
Amplified Curve
EXPLANATION
Shale and sandy shale
Sand
Water sand
Shale
Hard shale
Chalk
Oil production


CROSS SECTION A-A'
NORTH
SOUTH
ELEVATION IN FEET
WILCOX
NACATOCH
PECAN GAP
T.D. AT -3859
T.D. AT -4083
HORIZONTAL SCALE
THOUSAND FEET


STRUCTURE AT TOP OF NACATOCH
EXPLANATION
Contour on top of Nacatoch
Elevation of top of Nacatoch
Elevation of base of Austin
Oil well
Dry hole
Gas well
SCALE
THOUSAND FEET
JOSE IGNACIO SANCHES SURVEY
WADE H. WALTERS SURVEY
CHEROKEE COUNTY
RUSK COUNTY


CONTOURS ON BASE OF WILCOX
EXPLANATION
Contour on base of Wilcox
Elevation of base of Wilcox
Oil well
Dry hole
Gas well
DISCOVERY
SCALE
THOUSAND FEET
JOSE IGNACIO SANCHES SURVEY
WADE H. WALTERS SURVEY
CHEROKEE COUNTY
RUSK COUNTY

POST OAK FIELD
Falls County, Texas

GREGORY L. TURNER
District Geologist, The Pure Oil Company, Tyler, Texas
June 1, 1950

LOCATION and OTHER NAME

The Post Oak field is located 6 miles southwest of Marlin, the county seat of Falls County, and 2 miles southeast of the town of Chilton. It is situated on a broad structural terrace that interrupts the regional east dip between the Balcones and Mexia fault zones, and is one of several shallow fields aligned in a north-south direction on this terrace.

This field has occasionally been referred to as being a part of the Chilton field, which is located about 2 miles to the north.

METHOD OF EXPLORATION LEADING TO DISCOVERY

The reasoning that led to the discovery location is not known to the writer. However, one old report on the discovery well mentions a probable surface anticline in the immediate area.

DISCOVERY

Buda lime: November 6, 1922; Grey Bros. & Hennesy #1 Mrs. H. H. Llewellyn. Flowed (?) 15 to 20 barrels of 32° gravity oil per day.

ELEVATION OF SURFACE

At well locations: 369 feet.

SURFACE FORMATION

Lower Taylor shale.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest stratigraphic horizon penetrated by either of the two productive wells is in the Edwards limestone. A horizon about 200 feet below the top of the Glen Rose was penetrated in a dry hole about 150 feet southward where the datum elevation is indicated as -673 on the accompanying map. The accompanying TYPE SECTION is based on the log of that dry hole.

NATURE OF TRAP

Buda lime: The trap appears to result from a local porosity or crevice developed on a sharp fold in the regional southeast dip.

PRODUCTIVE AREA

Buda lime and Field: About 5 acres.

THICKNESS OF RESERVOIR ROCK

In this area the Buda lime has a total thickness of 20 feet. The productive thickness is not known.

LITHOLOGY OF RESERVOIR ROCK

Buda lime: White, impure, fossiliferous limestone.

CONTINUITY OF RESERVOIR ROCK

The Buda formation is found throughout most of the East Texas basin. Discontinuous porosity is developed at several places. From local porosity developments, it has produced oil in Falls County at the Satin, Chilton, Post Oak and Lott fields.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Buda lime:	Feet
No free gas	
Highest proven elevation of oil	-673
Lowest proven elevation of oil	-676
Proven relief of oil column	3

CHARACTER OF OIL

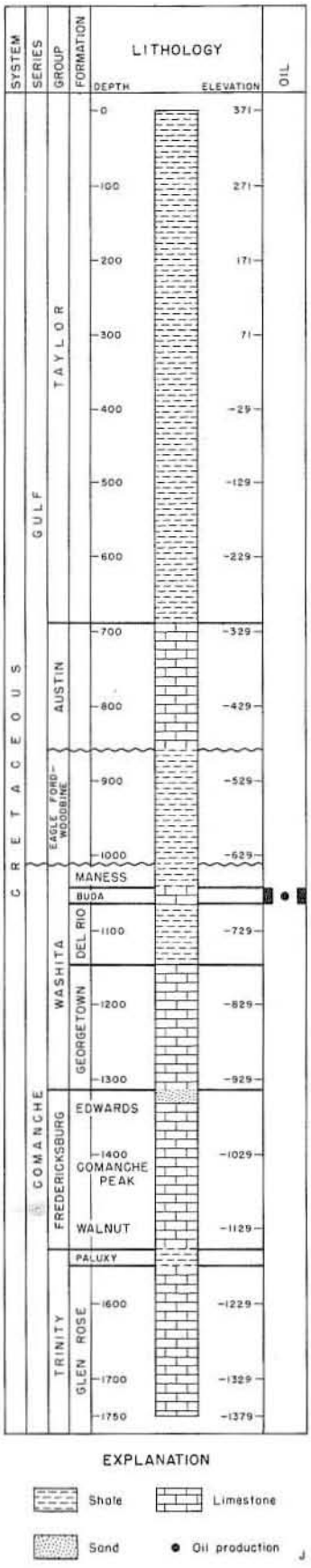
Gravity, A.P.I., average: 32°

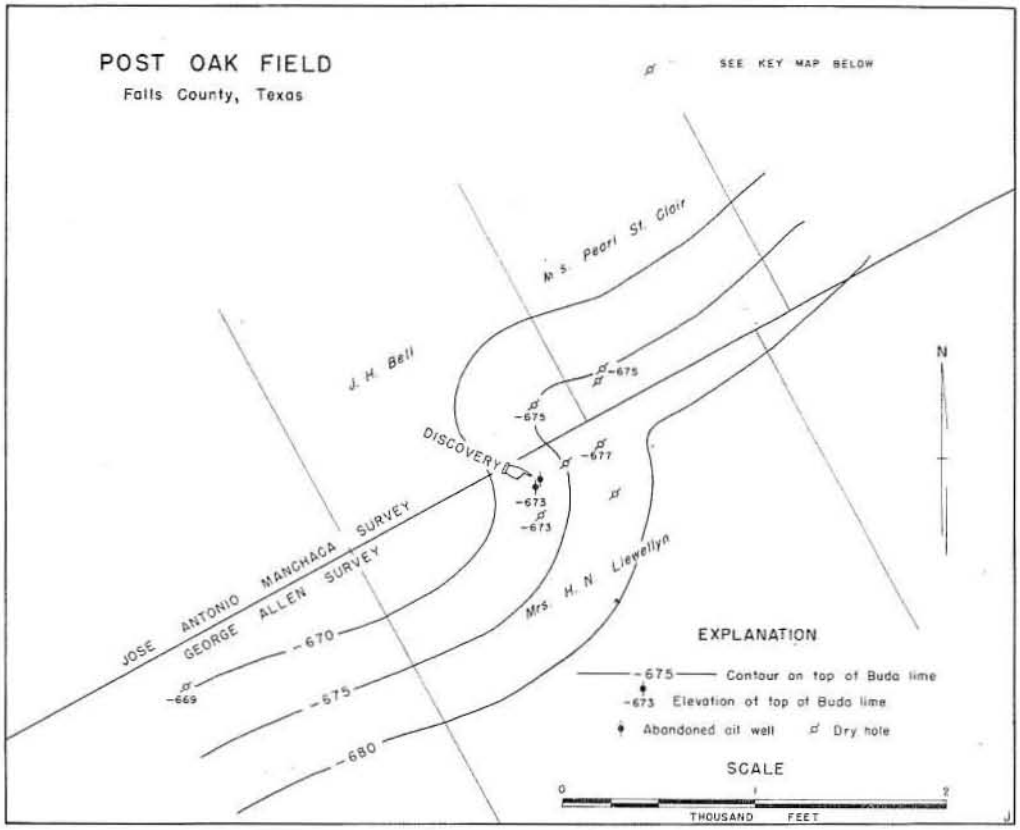
PRODUCTION HISTORY

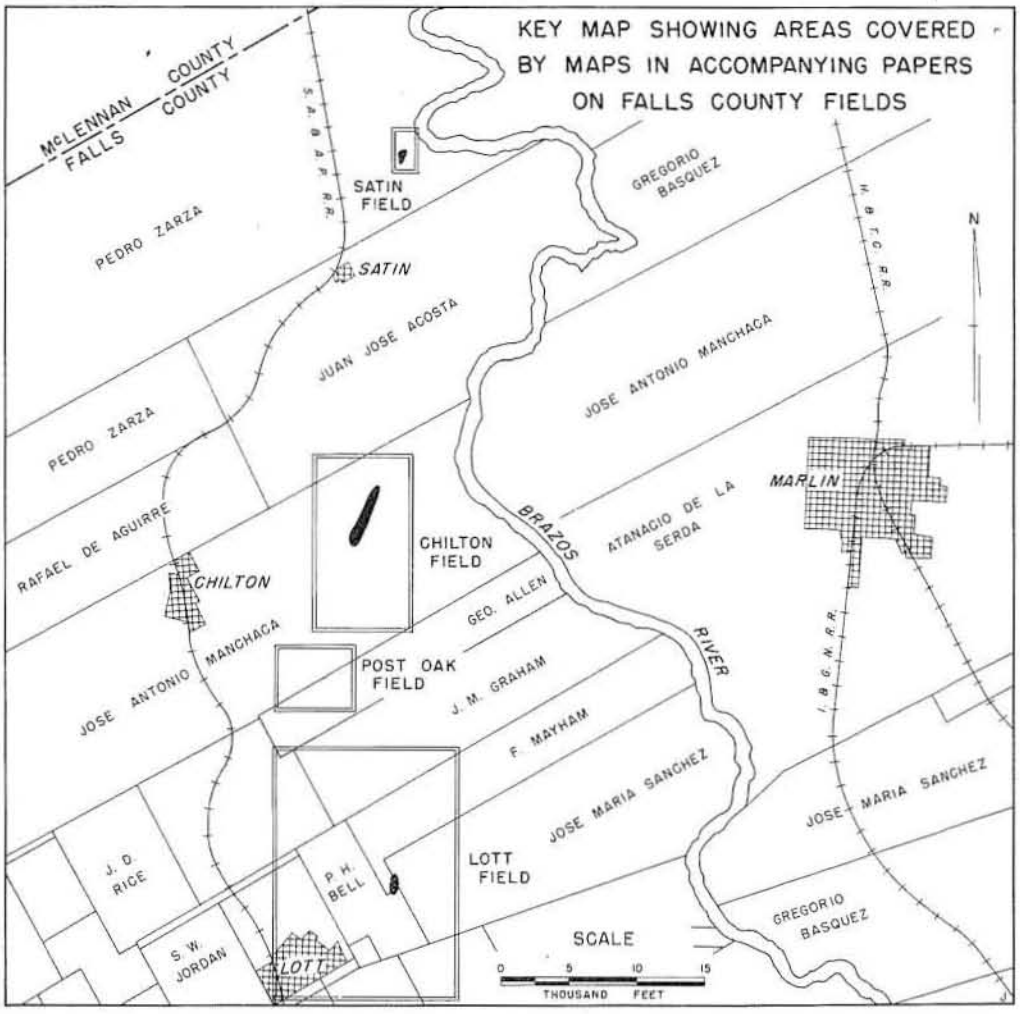
No figures have been found for the two wells that produced in the field. In all references consulted this production has apparently been combined with that reported for the Chilton field. The discovery well was drilled in 1922 and abandoned in 1923. The second well was drilled in 1930 and abandoned by 1932.

Data relative to water production and acid treatment are also not available.

TYPE SECTION OF ROCKS PENETRATED
IN VICINITY OF
POST OAK FIELD







QUITMAN FIELD
Wood County, Texas

W. K. SMITH
Exploitation Engineer, Shell Oil Company, Kilgore, Texas
June 30, 1950

LOCATION

The Quitman field is 3½ miles northwest of the town of Quitman, the county seat of Wood County.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Apparently the structural high was first discovered by refraction seismograph survey conducted by Shell Petroleum Corp. in 1930. Detailed reflection seismograph work confirmed the previous findings by refraction survey and provided sufficiently detailed information that a leasing and drilling program followed. A test well was drilled to a total depth of 5,040 feet in June 1935. Since this well had penetrated 600 feet of Woodbine formation without finding in it any indications of accumulation of oil or gas and having found only slight showing of oil in the Eagle Ford group, interest in the prospect waned. However, interest was renewed as deeper beds were found productive in the Rodessa, Talco and Pittsburg fields. In 1942, Shell Oil Co. Inc., initiated steps toward the promotion of a deep test by offering a cash and acreage contribution. Negotiations were speeded to conclusion when Paluxy production was discovered in the Coke field, only about 12 miles northeast. The negotiations led to the drilling of the well which discovered production in the Paluxy sand and which discovered the field.

DISCOVERIES

Sub-Clarksville: April 16, 1947;
B. F. Phillips "B" #3 J. B. Goldsmith.
Eagle Ford: November 1, 1945;
Shell Oil Co. #1 Atlatl Royalty Corp. and Harris.
Woodbine: July 19, 1948;
Rogers Lacy "A" #2 M. H. Cox.
Paluxy: December 1, 1942;
Delta Drilling Co. #1 J. B. Goldsmith.

ELEVATION OF SURFACE

At well locations: Highest, 487 ft.; lowest, 362 feet.

SURFACE FORMATIONS

Reklaw, Carrizo and Wilcox.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The deepest test drilled in the field encountered salt after penetrating 1,500 feet of the Cotton Valley formation. The age of the salt is questionable. The most generally accepted interpretation is that the salt is Eagle Mills which pierced the overlying Jurassic sediments. This penetration was in the well where "DEEPEST TEST" is indicated on the accompanying map.

AREAL DISTRIBUTION OF OIL AND GAS

Sub-Clarksville: The majority of the wells producing from this formation are located in the northeastern portion of the field.

Eagle Ford: This zone is productive in the structurally high portion of each fault block.

Woodbine: Production is confined to one small fault block in the southwest flank of the structure.

Paluxy: With the exception of one area in the southwestern portion of the field where the upper sands are shaled out, this zone is productive in the structurally high portion of each fault block.

STRUCTURE

The Quitman field is on an elongated faulted anticline trending northeasterly. There are two culminating highs separated by a shallow saddle. In general, the faults strike parallel with the axis of the anticline and predominantly dip toward the axial plane at 45° to 55°. The structure is similar on all productive zones with the exception that the faulting is more complex at shallow depths. This is due to the termination of several of the faults against other faults.

NATURE OF TRAPS

Sub-Clarksville: Composite convex trap.

Eagle Ford: Composite convex trap.

Woodbine: Controlled by faulting.

Paluxy: A common oil-water interface is present throughout the reservoir with the exception that in one fault block in the southern portion of the field a separate water level occurs 104 feet higher than in other fault blocks. Therefore, the reservoir may be classified as a complex convex trap.

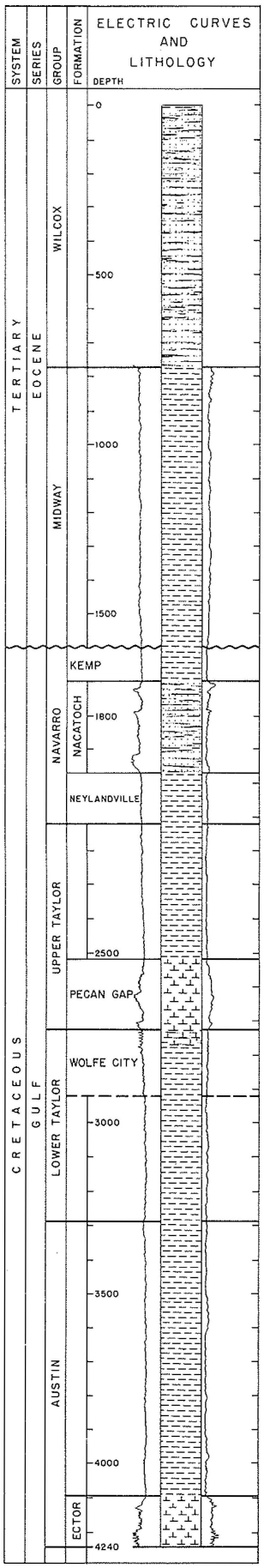
PRODUCTIVE AREAS

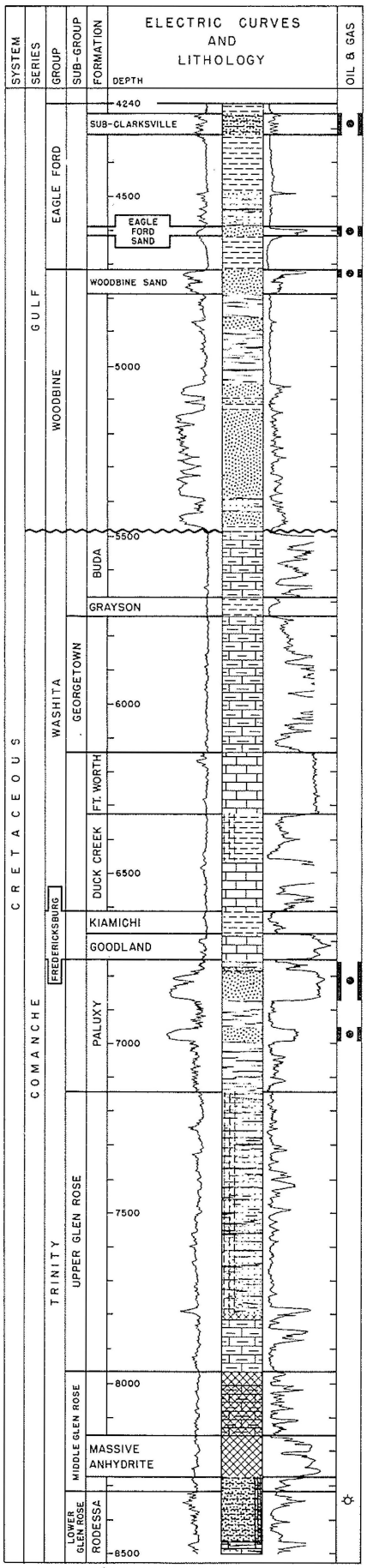
	Acres
Sub-Clarksville	500+
Eagle Ford	1,600
Woodbine (one well)	30
Paluxy	2,500
Quitman field	2,500

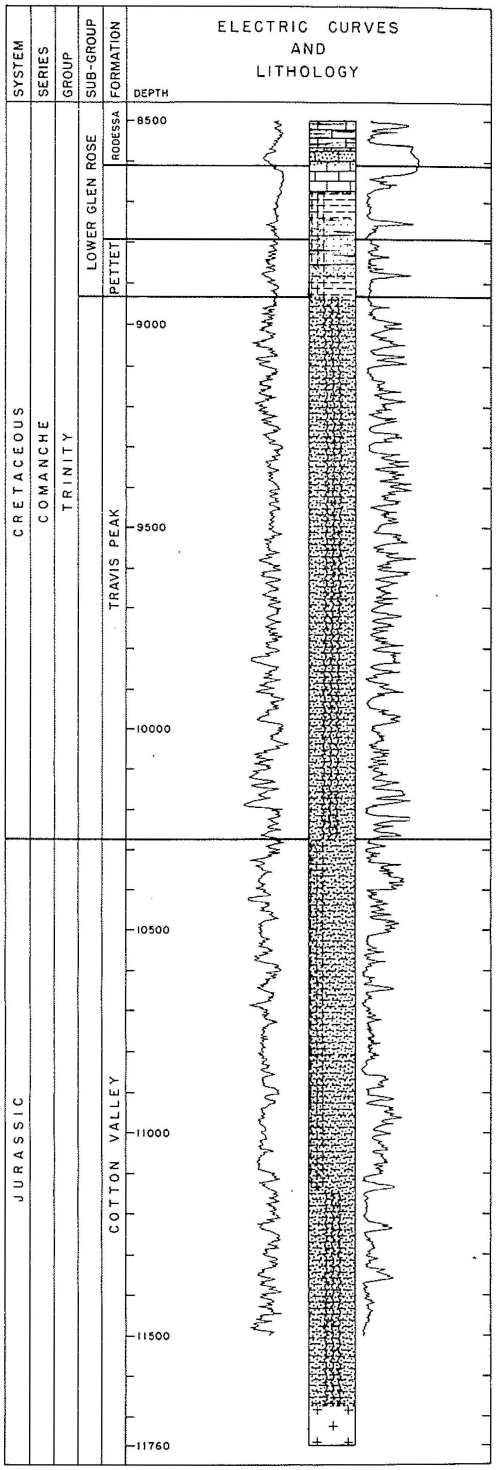
THICKNESSES OF RESERVOIR ROCKS

	Net productive, feet		
	Min.	Max.	Avg.
Sub-Clarksville	2	18	10
Eagle Ford	10	10	10
Woodbine (one well)			9
Paluxy	2	96	35

TYPE SECTION OF ROCKS PENETRATED





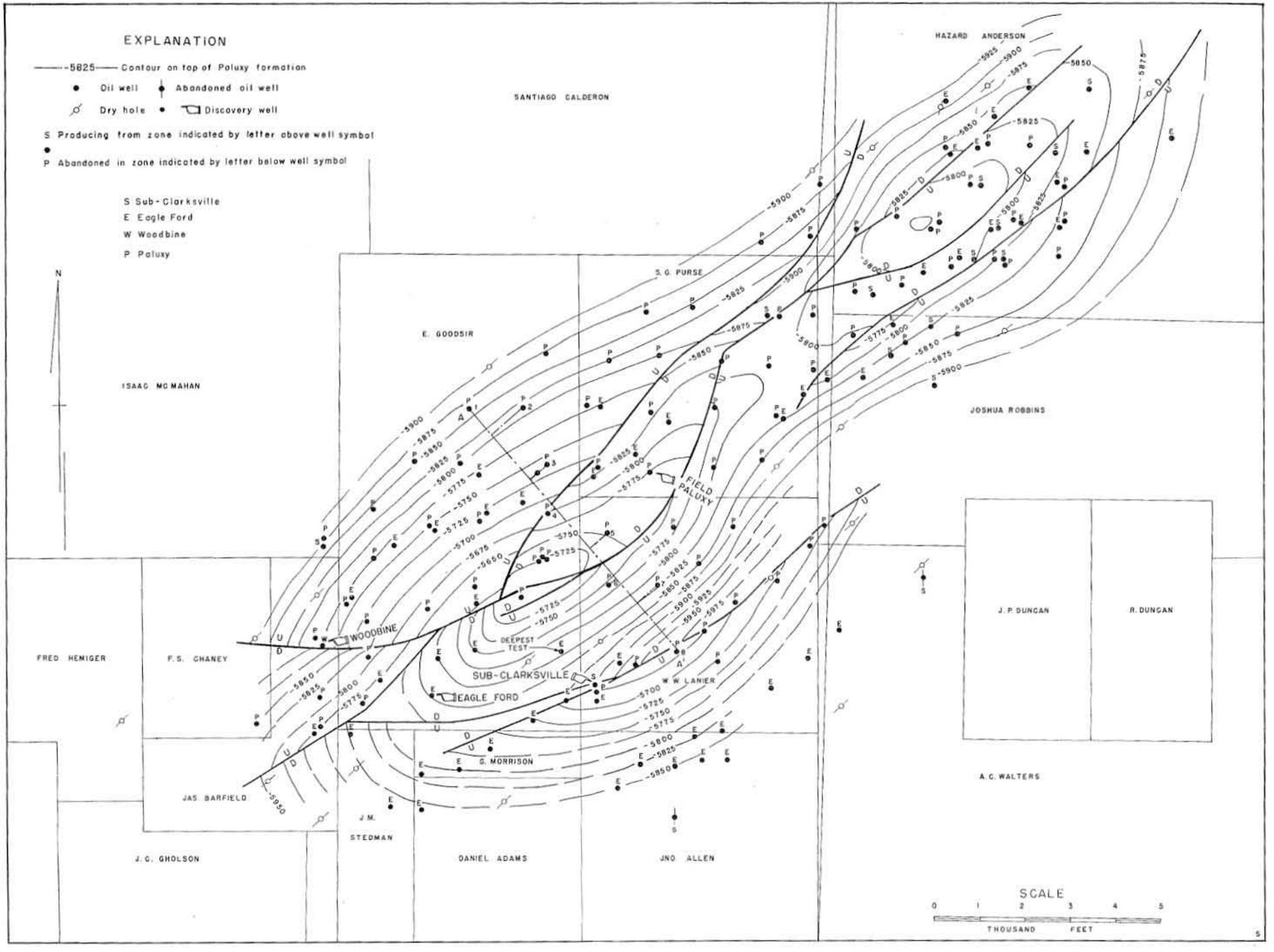


NOTE: The above is based on a composite log. It was compiled to show the complete section. Due to faulting, some strata are absent in the log of almost every well. Therefore, the depth figures in the lower part of the section are in excess of typical depths.

EXPLANATION

- Sand
- Shaly sand
- Sandy shale
- Shale
- Rock salt
- Hard limestone
- Chalk
- Red beds
- Anhydrite
- Hard limestone and sand
- Hard limestone and shale
- Slightly sandy shale
- Indicated sediments with limestone and shale
- Indicated sediments, hard
- Oil production
- Show of gas

H


EXPLANATION
-5825- Contour on top of Paluxy formation
Oil well
Abandoned oil well
Dry hole
Discovery well
S Producing from zone indicated by letter above well symbol
P Abandoned in zone indicated by letter below well symbol
S Sub-Clarksville
E Eagle Ford
W Woodbine
P Paluxy
N
SANTIAGO CALDERON
HAZARD ANDERSON
S. G. PURSE
E. GOODSIR
ISAAC MC MAHAN
JOSHUA ROBBINS
FIELD PALUXY
WOODBINE
DEEPEST TEST
SUB-CLARKSVILLE
EAGLE FORD
W. W. LANIER
J. P. DUNCAN
R. DUNCAN
FRED HEMIGER
F. S. CHANEY
G. MORRISON
A. C. WALTERS
JAS. BARFIELD
J. M. STEDMAN
DANIEL ADAMS
JNO. ALLEN
J. C. GHOLSON
SCALE
0 1 2 3 4 5
THOUSAND FEET

CONTINUITY OF RESERVOIR ROCKS

Faulting disrupts the continuity of all the productive beds.

Sub-Clarksville: This reservoir rock consists of upper and lower sand members separated by a major shale break of field-wide extent. Each sand member is further divided by lesser shale stringers so that the reservoir as a whole is irregular and very lenticular.

Eagle Ford: This sand is remarkably uniform throughout the entire field.

Woodbine: This reservoir rock is the uppermost sand body in the Woodbine formation. With minor variations in sand development, it is continuous in each fault block.

Paluxy: The Paluxy formation consists of a series of alternating shales and sands and is characterized by extremely rapid variation in distribution of the sands with no apparent linear pattern of sand development. Locally asphaltic sands varying in thickness from a few inches up to 40 feet further disrupt the continuity of the reservoir.

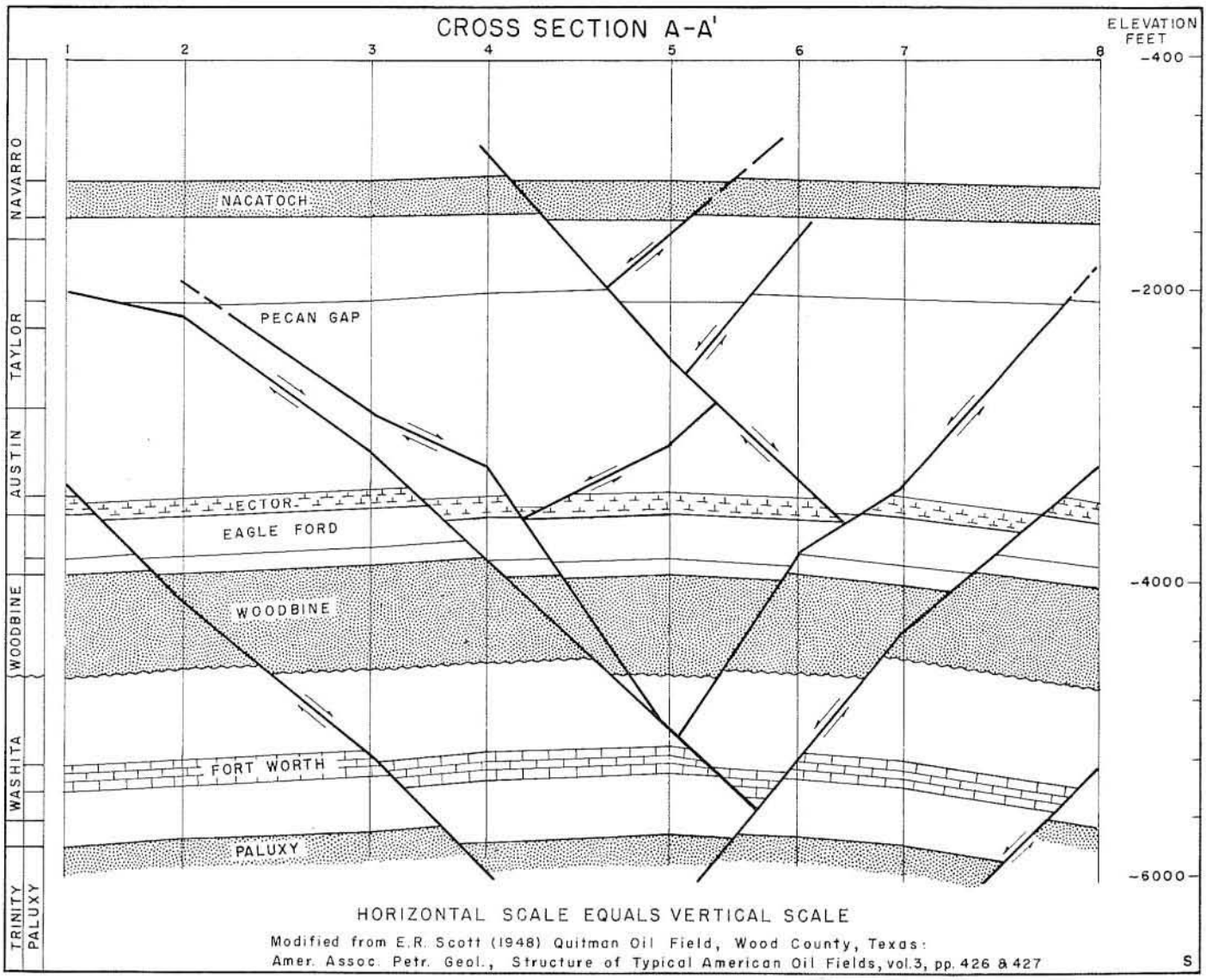
WATER PRODUCTION

Water encroachment has been fairly uniform in the individual fault blocks for the Paluxy and Eagle Ford reservoirs; however, the present water levels differ in the various blocks. The one Woodbine well produced water on completion and a gradual increase in water production has been noted in this well. Most of the sub-Clarksville wells produce small amounts of water.

All of the salt water produced in the field is injected in the massive Woodbine sand through three salt water disposal wells.

Average chloride contents of the water from each reservoir are as follows:

	Chloride, ppm.
Sub-Clarksville	40,000
Eagle Ford	50,000
Woodbine	50,000
Paluxy	80,000



LITHOLOGY OF RESERVOIR ROCKS

Sub-Clarksville: Sand; fine- to medium-grained, hard, poorly sorted sand grains with varying amounts of silty material and shale inclusions.

Eagle Ford: Sand; fine- to medium-grained, well consolidated. Sand grains are poorly sorted with the amounts of silty material increasing progressively from the top to the base.

Woodbine: Sand; medium-grained, friable, slightly silty but porous and permeable.

Paluxy: Sand, fine- to medium-grained, well consolidated. Sand grains vary from well sorted to poorly sorted with large amounts of fine silty material in the pore space.

ELEV. AND RELIEF OF PRODUCTIVE ZONES

	Elev. of oil, feet		Relief
	Top	Bottom	feet
Sub-Clarksville	-3,472	-3,608±	136±
Eagle Ford	-3,725	-3,865	140
Woodbine	-3,943	-3,952	9
Paluxy	-5,652	-5,909	257

SELECTED REFERENCE

Scott, E. R. (1948) Quitman oil field, Wood County, Texas: Amer. Assoc. Petrol. Geol. Structure of Typical American Oil Fields, vol. 3, pp. 419-431.

D DEVELOPMENT AND PRODUCTION HISTORY

Year	NUMBER OF WELLS Completed	Producing oil at end of year Flow.	Artif.	OIL PRODUCTION (barrels) Yearly	Cumulative
Field totals					
1942	1	1	0	3,080	3,080
1943	48	45	4	647,484	650,564
1944	10	52	7	2,072,785	2,723,349
1945	6	58	7	2,160,402	4,883,751
1946	8	59	13	2,334,648	7,218,399
1947	31	63	36	2,945,548	10,163,947
1948	27	58	68	3,726,838	13,890,785
1949	19	55	89	2,889,844	16,780,629
Sub-Clarksville					
1947	8	0	5	21,399	21,399
1948	5	0	10	91,195	112,594
1949	3	0	13	139,861	252,455
Eagle Ford					
1945	1	0	1	3,020	3,020
1946	4	0	5	61,257	64,277
1947	17	0	22	326,879	391,156
1948	20	0	42	719,074	1,110,230
1949	12	0	53	762,360	1,872,590
Woodbine					
1948	1	0	1	9,200	9,200
1949	0	0	1	34,880	44,080
Paulxy					
1942	1	1	0	3,080	3,080
1943	48	45	4	647,484	650,564
1944	10	52	7	2,072,785	2,723,349
1945	5	58	6	2,157,382	4,880,731
1946	4	59	8	2,273,391	7,154,122
1947	6	63	9	2,597,270	9,751,392
1948	1	58	15	2,907,369	12,558,761
1949	4	55	22	1,952,743	14,611,504

CHARACTER OF OIL

	Sub-Clarksville	Eagle Ford	Paluxy
Gravity, A.P.I.	16.7	25°	40.7°
Color	Black	Black	Very dark green
Sulphur, % by wt.	3.4	2.31	1.00
Pour Point, °F.	-5	0	+5
Viscosity, S.U. @ 40°F., sec.	Too viscous	Too viscous	57.7
Viscosity, S.U. @ 60°F., sec.	Too viscous	Too viscous	48.7
Viscosity, S.U. @ 80°F., sec.	6,780	1,428	42.1
Yield:			
225° E.P. Gasoline, %V.	3.9	6.9	16.4
400° E.P. Naphtha, %V.	5.2	5.1	6.9
Light Gas Oil, %V.	6.9	7.7	15.9
Heavy Gas Oil, %V.	1.4	8.4	13.3
Residue, %V.	82.1	71.4	47.1
Loss, %V.	0.5	0.5	0.4

RED LAKE FIELD
Freestone County, Texas

ELVIN M. HURLBUT, Jr.
Geologist, Shell Oil Company, Tyler, Texas
September 25, 1950

LOCATION

The Red Lake field is in central Freestone County about 9 miles southeast of Fairfield, the county seat.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Surface work revealed the presence of a southeast-trending nose near Turlington. Seismic work in 1933 suggested closure, and a well was drilled the following year.

DISCOVERIES

Woodbine: May 22, 1934;
Daniel Oil & Royalty Co. #1 P.D.C. Ball Estate.
Rodessa: July 1, 1950;
Humble Oil & Refining Co. and Shell Oil Co. #1 P.D.C. Ball Estate.

ELEVATION OF SURFACE

At well locations: Highest, 436 ft.; lowest, 405 feet.

SURFACE FORMATIONS

Wilcox group, lower Eocene, and Carrizo and Reklaw formations, Claiborne group, middle Eocene.

OLDEST STRATIGRAPHIC ZONE PENETRATED

Travis Peak.

NATURE OF TRAPS

Woodbine: Structural closure: Two separate closures occur as evidenced by the fact that the top of the productive sand in the northernmost well is below the gas-salt water contact of the two southern wells. No faults have been proved in any of the wells. The thickness of the producing sand and the quality of the correlation data leave uncertain the cause for the dry hole west of the discovery well.

Rodessa: Structural closure.

PRODUCTIVE AREAS

Woodbine: 400 acres.
Rodessa: Unknown.

THICKNESSES OF RESERVOIR ROCKS

Woodbine: 16 to 17 feet net productive on southern closure; 12 feet net productive on northern closure.

Rodessa: Upper zone, 6 ft.; lower zone, 10 feet.

LITHOLOGY OF RESERVOIR ROCKS

Woodbine: Medium-grained, friable sand with some lignite in lower part.

Rodessa: Upper zone: Light gray to brown, very microfossiliferous limestone with gilsonite stringers.
Lower zone: Gray, fossiliferous, micro-oolitic (?) limestone.

CONTINUITY OF RESERVOIR ROCKS

Woodbine: The reservoir rock appears to be continuous throughout the field. It thickens slightly to the southeast and thins slightly to the northeast.

Rodessa: Unknown.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Woodbine:	Feet
On southern closure	
Elev. of top of gas in highest well	-4,412
Elev. of gas-water contact	-4,429
Relief	17
On northern closure	
Elev. of top of gas in the one well	-4,456
Elev. of gas-water contact	-4,468
Relief	12

Rodessa: Data not available.

CHARACTER OF GAS AND CONDENSATE

Woodbine: No information available.
Rodessa: Gravity: Gas, 0.608; Condensate 53.7°.

PRODUCTION HISTORY

Woodbine:

Year	NO. OF WELLS at end of year	CONDENSATE PRODUCTION (barrels) Yearly	Cum.	GAS PRODUCTION Mcf Yearly	Cumulative
1934	1*	0	0	0	0
1935	2**	0	0	315,000	315,000
1936	3	0	0	487,000	802,000
1937	3	685	685	504,000 Est.	1,306,000
1938	3***	408	1,093	300,000	1,606,000
1939	3***	313	1,406	174,000	1,780,000
1940	3***	208	1,614	137,313	1,917,313
1941	3***	165	1,779	108,414	2,025,727
1942	3***	84	1,863	60,348	2,086,075
1943	3***	100	1,963	95,740	2,181,815
1944	2	493	2,456	352,186	2,534,001
1945	2	302	2,758	331,637	2,865,638
1946	2	274	3,032	187,556	3,053,194
1947	2	451	3,483	244,715	3,297,909
1948	1	315	3,798	434,676	3,732,585
1949	1	173	3,971	247,365	3,979,950

*Temporarily shut-in.

**One well temporarily shut-in; one well actually producing.

***One well temporarily shut-in; two wells actually producing.

The above data for 1934, 1935 and 1936 are from respective annual issues of Petroleum Development and Technology, A. I. M. E. The data for 1937 through November 1949 are from files of Railroad Commission of Texas.

Rodessa:

The one Rodessa well was completed July 1, 1950.

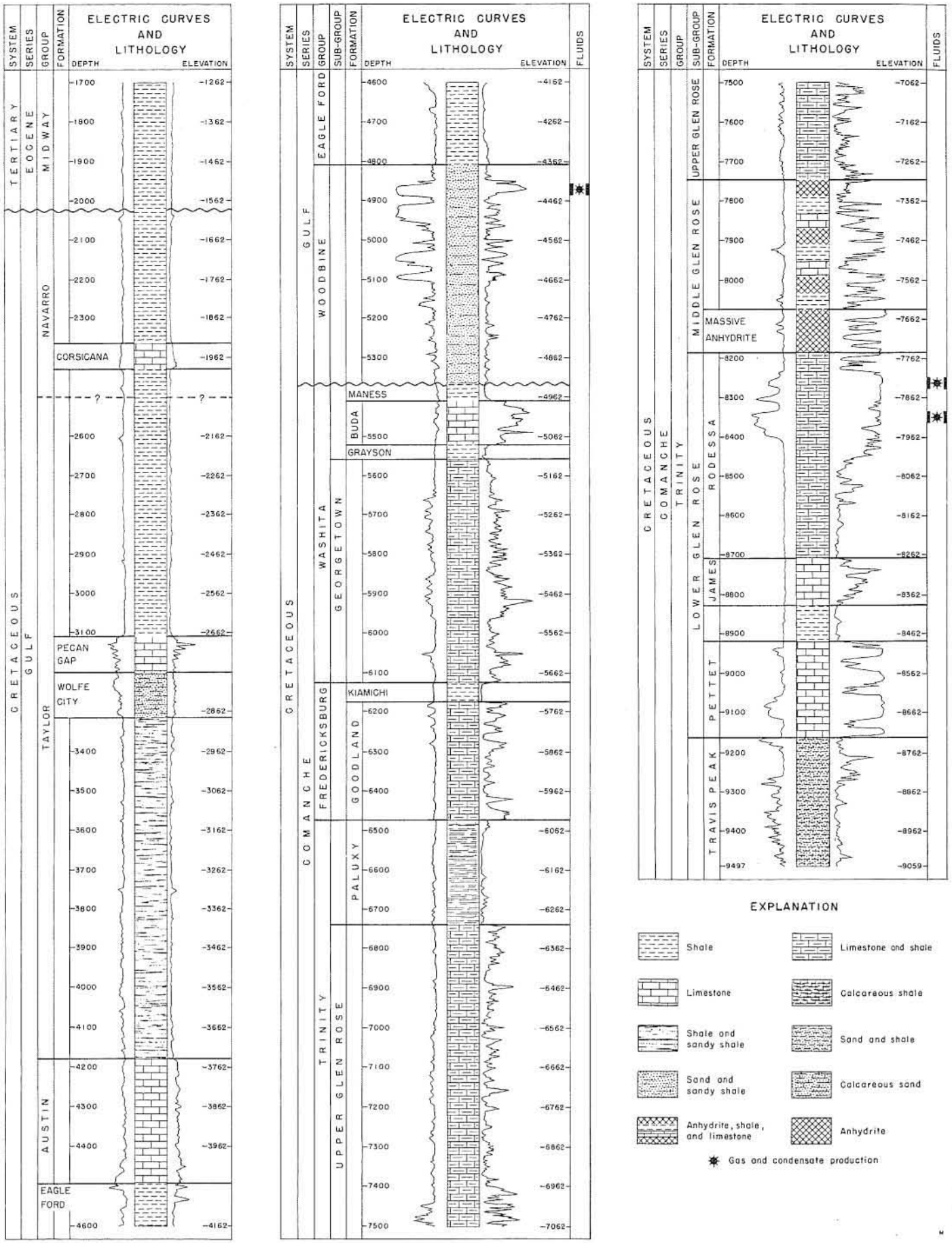
WATER PRODUCTION

Woodbine: Definite data as to quantities of water produced are not available. The Woodbine discovery well produced water from the beginning, and in 1938 was completely flooded out. The well was then temporarily shut-in, and in 1944 it was plugged and abandoned. The Daniel Oil & Royalty Co. #2 P.D.C. Ball Estate, completed in 1935, first began to make water in 1938. The water production in 1942 from this well was 3 to 4½ barrels per million cubic feet of gas.

Rodessa: Data not yet available.



TYPE SECTION OF ROCKS PENETRATED



REDLAND FIELD
Angelina County, Texas

K. L. McHENRY
Consulting Geologist, Lufkin, Texas
July 1, 1950

LOCATION and OTHER NAME

The Redland field is located adjacent to the Redland schoolhouse in the townsite of Redland, which is 4 miles north of the city of Lufkin, county seat of Angelina County. It is one of several shallow fields which have produced small quantities of oil from the Kittrell formation. It is one of the northernmost or farthest updip fields to produce oil from the Kittrell formation.

This field has also been known as the Davisville field.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Shows of oil in test wells in the immediate vicinity led to the drilling of the discovery well.

DISCOVERY

Kittrell sand: March 25, 1939; K. L. McHenry #1 Russell Estate. The initial daily production amounted to about 100 barrels, $2\frac{1}{2}\%$ of which was oil and $97\frac{1}{2}\%$ was water.

ELEVATION OF SURFACE

At well locations, the elevation of the surface is about 350 feet above sea-level. In the immediate vicinity, the range in elevation is from about 250 feet in the creek bottoms to about 375 feet on the hill crests.

SURFACE FORMATION

In the immediate vicinity of Redland, the surface rocks are composed of shales, greensands and limey marls of the upper Crockett formation, which represents the top part of the Cook Mountain portion of the Claiborne group. The base of Yegua (Cockfield) sands is exposed along the south bank of Mill Creek about $1\frac{1}{2}$ miles south of Redland and Yegua sands are exposed from there southward.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest stratigraphic horizon penetrated within the field is about 1,000 feet below the top of the Wilcox group. The oldest horizon penetrated in the general area is 673 feet below the top of the Washita group. This penetration was in Union Producing Co. #2 E. R. Bolton located about 5 miles northeast of the Redland field on the Michelli prospect. The following stratigraphic tabulation is based on the log of a nearby well, K. L. McHenry #1 E. R. Bolton.

PRODUCTIVE AREA

Kittrell sand and Field: 40 acres.

NATURE OF TRAP

Kittrell sand: The Kittrell sand is faulted against the basal Reklaw formation by a normal down-to-the-north fault having a demonstrable throw of 20 feet at the producing level (displacement is based on correlation of electric logs of wells located about 800 feet apart and in which one log has 20 feet of the Weches section cut out by the fault.)

THICKNESS and LITHOLOGY OF RESERVOIR ROCK

Kittrell sand: The productive section consists of about 10 feet of fine-grained, ashy, uncemented sand containing considerable amounts of micaceous material and glauconite, topped in the discovery well at a depth of 1,010 feet. The Kittrell sands in the immediate area of the field consist of 50 to 75 feet of fine-grained, ashy, uncemented, micaceous and glauconitic sands irregularly bedded in brown and green shales and marls. The individual sand streaks range in thickness from thin partings up to 20 feet. These sands are completely free of cementing material and pose a bad problem in producing fluid from the reservoir.

CONTINUITY OF RESERVOIR ROCK

Kittrell sand: There appears to be a zone of continuous porosity about 10 feet below the top of the Kittrell formation varying in thickness from 5 to 20 feet with the sand streaks lower in the section being irregularly bedded but nevertheless interconnected to form a reasonably permeable reservoir. The interconnection of the irregularly bedded sands in this zone is postulated from the behavior of numerous test wells in the immediate area.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Kittrell sand:	Feet
Elevation of top of oil	-656
Elevation of bottom of oil	-666
Relief	10

CHARACTER OF OIL

Kittrell sand: Dark green oil which turns black after settling. Gravity, A.P.I., 25°.

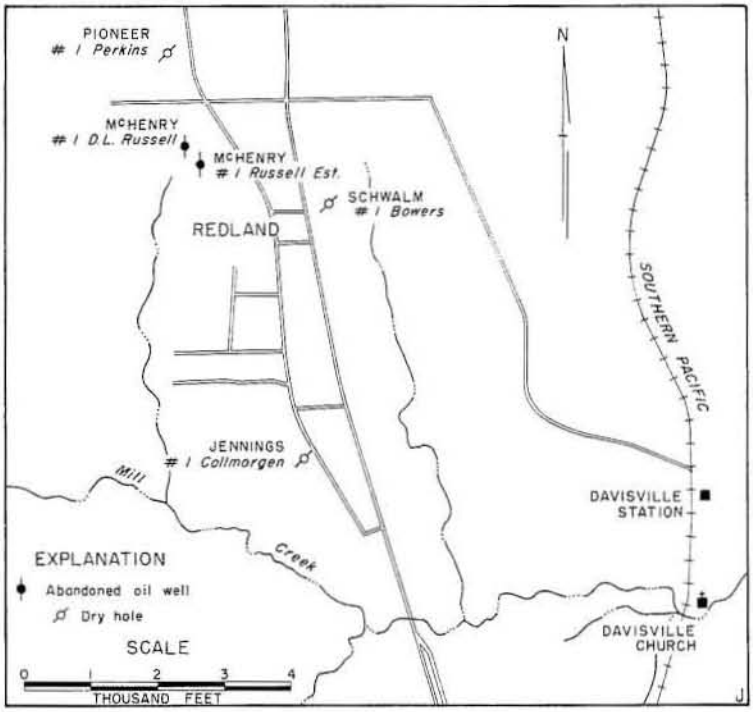
WATER PRODUCTION

Kittrell sand: The water production of the two wells after pumping 48 hours remained constant at 98% and 97%, respectively. The water contained 1,500 parts per million total solids (principally bicarbonates).

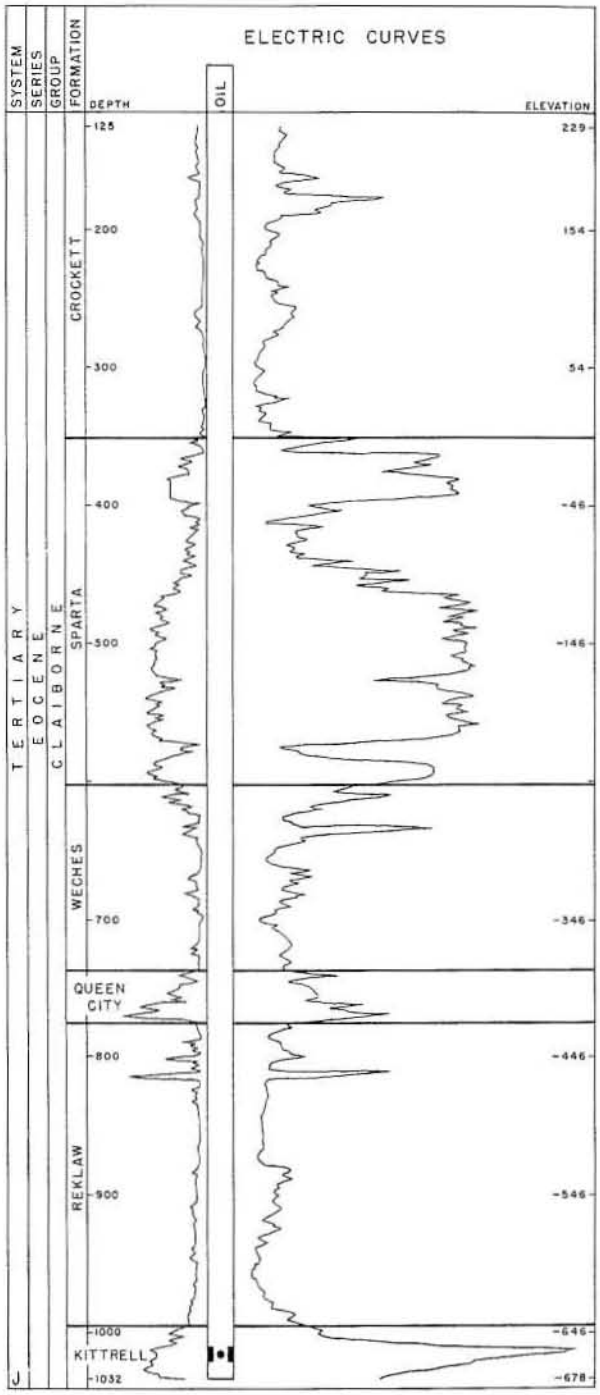
STRATIGRAPHIC SECTION PENETRATED

In K.L. McHenry #1 E. R. Bolton

SYSTEM	SERIES	GROUP	FORMATION	ELEVATION OF TOP (FEET)	THICKNESS (FEET)
TERTIARY	EOCENE	CLAIBORNE	CROCKETT	TOP ABSENT (SURFACE 222)	64
			SPARTA	+ 158	246
			WECHES	- 88	135
			QUEEN CITY	- 223	41
			REKLAW	- 264	193
			KITTRELL	- 457	76
			CARRIZO	- 533	128
		WILCOX		- 661	2800
		MIDWAY		-3461	945
CRETACEOUS		NAVARRO		-4406	365
	GULF	TAYLOR	UPPER	-4771	372
			LOWER	-5143	452
		AUSTIN	ECTOR TONGUE	-5595	297
	COMANCHE	WASHITA	MAIN STREET	-5892	310
TOTAL DEPTH				-6202	6434



TYPE SECTION OF ROCKS PENETRATED



PRODUCTION HISTORY

Kittrell sand and Total field:

Well	Date of production	OIL PRODUCTION (barrels)
K. L. McHenry #1 Russell Estate	April 1939 - August 1939	150
K. L. McHenry #1 D. L. Russell	60 days about September 1939	175
Total production - Life of field		325

Both wells have been abandoned.

RED SPRINGS FIELD
Smith County, Texas

HARRY S. PHILLIPS
Geologist, Tyler, Texas
January 29, 1951

LOCATION

The Red Springs field is in the immediate vicinity of the community of Red Springs, about 13 miles north of Tyler, the county seat of Smith County.

METHODS OF EXPLORATION LEADING TO DISCOVERY

As a result of interpretations of surface and subsurface geology, leases in the Red Springs area have been held intermittently since 1927 by various major companies, including Humble Oil & Refining Co. In 1947, Humble mapped the prospect with a reflection seismograph. Results of the seismic survey confirmed early surface and subsurface geologic work which indicated structural closure in the area. On May 7, 1948, operations were begun on Humble Oil & Refining Co. #1 Everett Wintters et al., which proved to be the field discovery well.

DISCOVERIES

Upper Rodessa: March 16, 1949; Humble Oil & Refining Co. #1 Everett Wintters et al. Initial production, 320.54 barrels of 44.2° A.P.I. gravity oil per day; choke, 1/4-inch perforations, 9,368-9,374 feet and 9,378-9,404 feet; tubing pressure, 510 psi.; gas-oil ratio, 885 to 1.

Lower Rodessa: January 7, 1949; Humble Oil & Refining Co. #1 Everett Wintters et al. On company test, the calculated open flow daily potential was 3,200 Mcf of gas with 85 barrels of 62.5° A.P.I. gravity condensate per million cubic feet; open hole 9,514-9,570 feet; shut-in pressure, 3,300 psi. Since this well was not completed in this reservoir, there is doubt as to whether it should be considered as the discovery well in this reservoir.

Lower Rodessa: December 10, 1949; Delta Drilling Co. #1 J. M. Haddad. On initial production test, the calculated open flow daily potential was 4,100 Mcf gas with 60 barrels of condensate per million cubic feet; perforations, 9,456-9,485 feet; shut-in pressure, 3,339 psi.

ELEVATION OF SURFACE

At well locations: Highest, 536 feet; lowest, 495 feet.

SURFACE FORMATIONS

Sparta, Weches and Queen City of Claiborne group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated is 198 feet below the top of the Travis Peak formation, which to this depth consists of hard sandstones and red beds. This penetration was in Humble #1 Wintters at its total depth of 10,414 feet.

NATURE OF TRAPS

Upper Rodessa: Locally and erratically developed porosity lenses on faulted anticlinal structure.

Lower Rodessa: Closure on faulted anticlinal structure.

PRODUCTIVE AREAS

Upper Rodessa	140 acres
Lower Rodessa	2,300 acres

A somewhat larger area may be proven by future drilling, especially with respect to Lower Rodessa.

THICKNESSES OF RESERVOIR ROCKS

	Feet
Upper Rodessa	
From top to bottom	253
Net productive	20
Lower Rodessa	
From top to bottom	39
Net productive	15

LITHOLOGY OF RESERVOIR ROCKS

Upper Rodessa: Finely crystalline, oolitic and sandy limestone.

Lower Rodessa: Sandy coquina limestone with streaks of sand and finely crystalline limestone.

CONTINUITY OF RESERVOIR ROCKS

The Rodessa member is continuous over most of the East Texas basin. It is composed of non-porous and porous limestones and sandy limestones interbedded with shale. The porous zones are lenticular and grade from porous to non-porous within short distances.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Upper Rodessa	
Elevation of top of oil, feet	-8,646
Elevation of bottom of oil, feet	-8,968
Relief, feet	322

The total oil column is unknown since the water level has not been established.

Lower Rodessa	
Elevation of top of gas, feet	-8,913
Elevation of bottom of gas, feet	-9,282
Relief, feet	369

The total gas-condensate column is unknown since the water level has not been established.

CHARACTER OF OIL AND CONDENSATE

	Upper Rodessa	Lower Rodessa
	Oil	Condensate
Gravity, A.P.I. @ 60° F.	44.2	62.5
Color	Brown	White
Base	Paraffin	

ACID TREATMENT

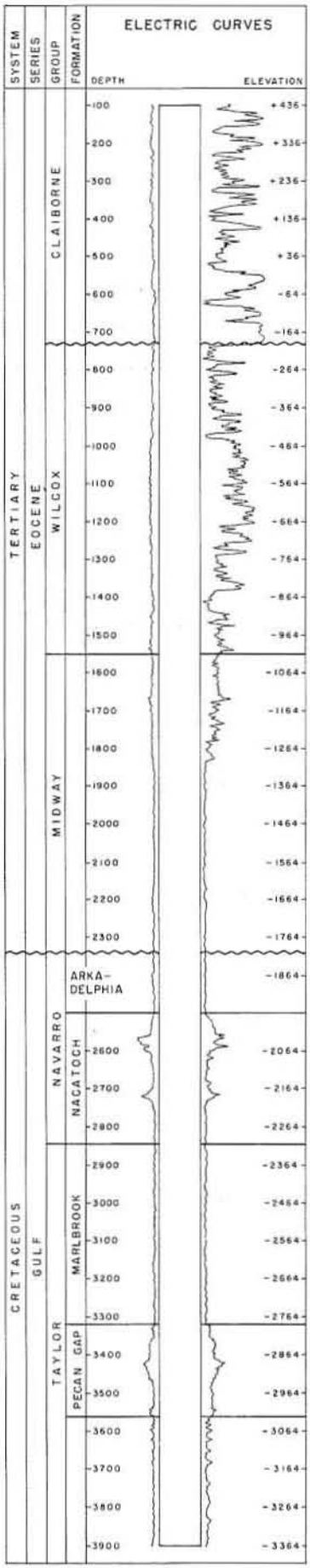
Acidization before final completion is customary.

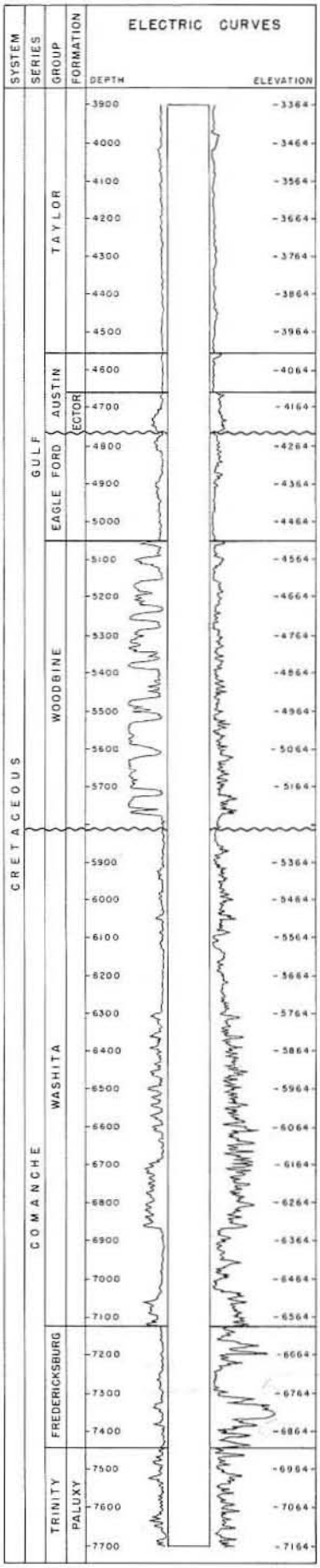
PRODUCTION HISTORY

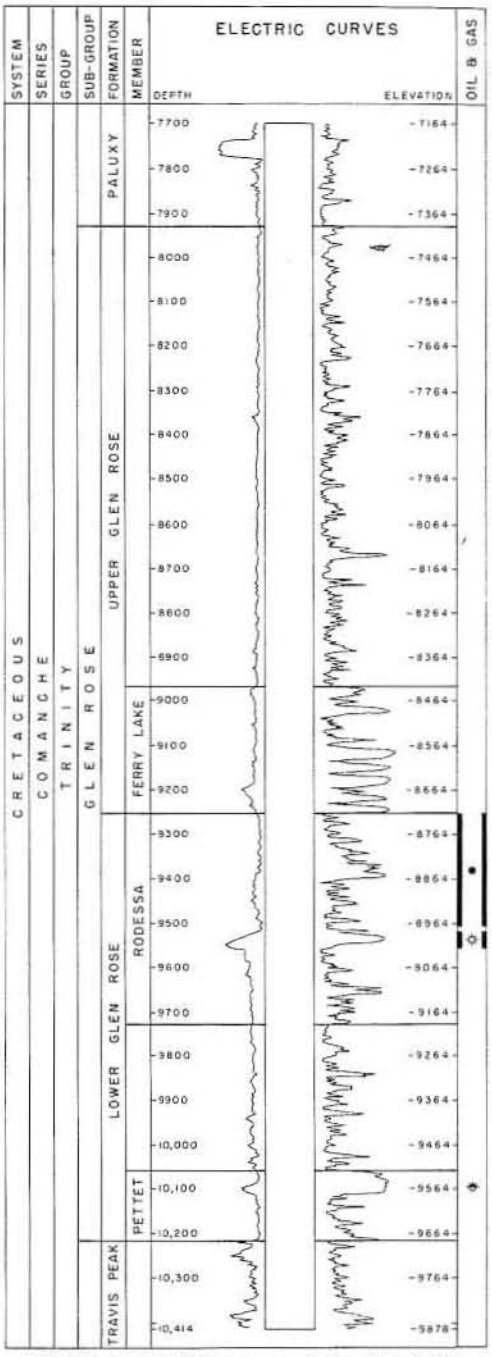
	OIL (barrels)	CONDENSATE (barrels)	GAS (Mcf)
1949			
Upper Rodessa	70,382	0	52,275
Lower Rodessa	0	3,542	36,823
Field	70,382	3,542	89,098

There has been no market for the gas other than as fuel used in the development of the field.

TYPE SECTION OF ROCKS PENETRATED

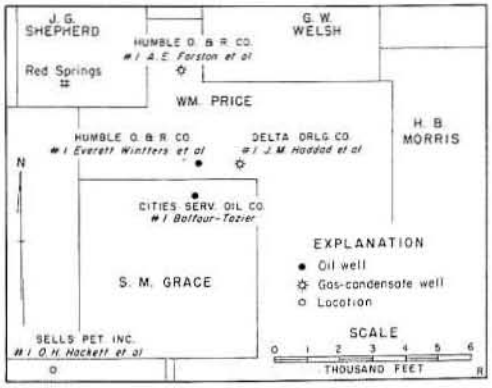






NOTE: This TYPE SECTION is based on the log of Humble Oil and Refining Co. #1 Everett Winters et al.

● Oil production ✲ Gas-condensate production ✲ Show of oil and gas



REED FIELD
Freestone County, Texas

ERNEST B. HILL
District Geologist, The Texas Company, Tyler, Texas
December 15, 1950

LOCATION and OTHER NAMES

The Reed field is 2 miles west of Fairfield, the county seat of Freestone County. It is one of a series of fields trending approximately north-south across the central portion of the county, which series is about 17 miles east of, and more or less parallel to, the Luling-Mexia-Talco fault zone on the western limb of the East Texas basin.

The Railroad Commission and the operators now designate this field as the Reed field. During the last few years, it has been more commonly known as the Fairfield field. Early in its history it was also known as the Moody field.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Surface mapping of the Denny sand of the Wilcox group indicated the presence of an anomaly which was later substantiated by regional subsurface mapping. A subsequent reflection seismograph survey led to the location of the discovery well, The Texas Company #1 McKnight. Drilling commenced on August 27, 1944 and gas was discovered in the Woodbine formation but the well was drilled to and completed in the Travis Peak on February 26, 1945.

DISCOVERIES

Woodbine: July 3, 1945;
The Texas Co. #1 Sneed.
Travis Peak: February 26, 1945;
The Texas Co. #1 McKnight.

ELEVATION OF SURFACE

At well locations: Highest, 460 ft.; lowest, 400 feet.

SURFACE FORMATION

Wilcox.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated is of Jurassic age, possibly older than Cotton Valley. It is 4,600 feet below the top of the Cotton Valley. This penetration was in the well in the Wm. King, Sr. survey indicated on the accompanying maps.

PRODUCTIVE AREAS

Woodbine	3,050 acres
Travis Peak	1,400 acres
Reed field	3,500 acres

NATURE OF TRAPS

Woodbine: A low relief, simple, convex trap on a trend of mild folding.

Travis Peak: The trap is due to curved updip lensing and to decrease in porosity. The productive sands lens-out and grade updip into shaly sands and shales. It is believed that the sands are interconnected sufficiently to constitute a single reservoir.

THICKNESSES OF RESERVOIR ROCKS

Net productive	Feet		
	Min.	Max.	Avg.
Woodbine	3	18	8
Travis Peak	6	25	18

LITHOLOGY OF RESERVOIR ROCKS

Woodbine: Firm, light tan, fine-grained, massive, clean, porous sands with streaks of shale and shaly sands.

Travis Peak: Hard, light to medium gray, fine- to coarse-grained, cross-bedded, slightly porous to porous, somewhat lignitic and pyritic sandstone with streaks of hard sands and dark gray shales.

CONTINUITY OF RESERVOIR ROCKS

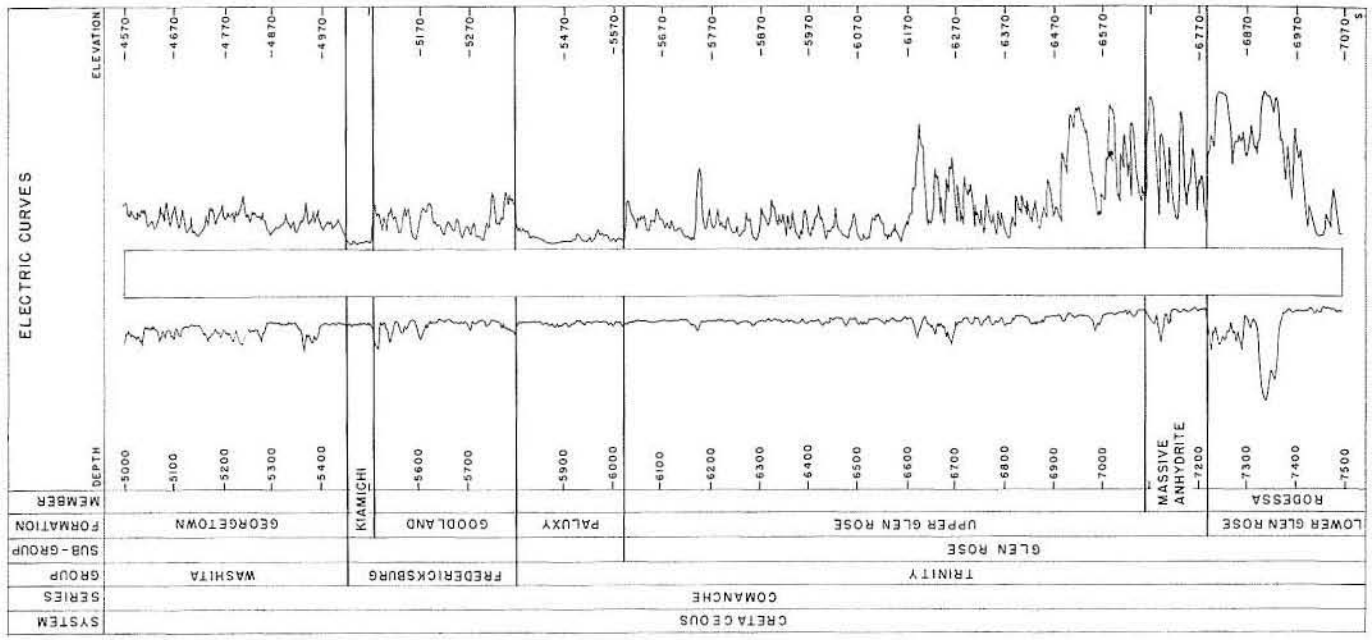
Woodbine: The upper, or first, Woodbine sand, which produces in the north half of the field (see map), is not present in the southern portion of the field. The second Woodbine sand is present over most of the field and produces in all of the wells where it is above the water level.

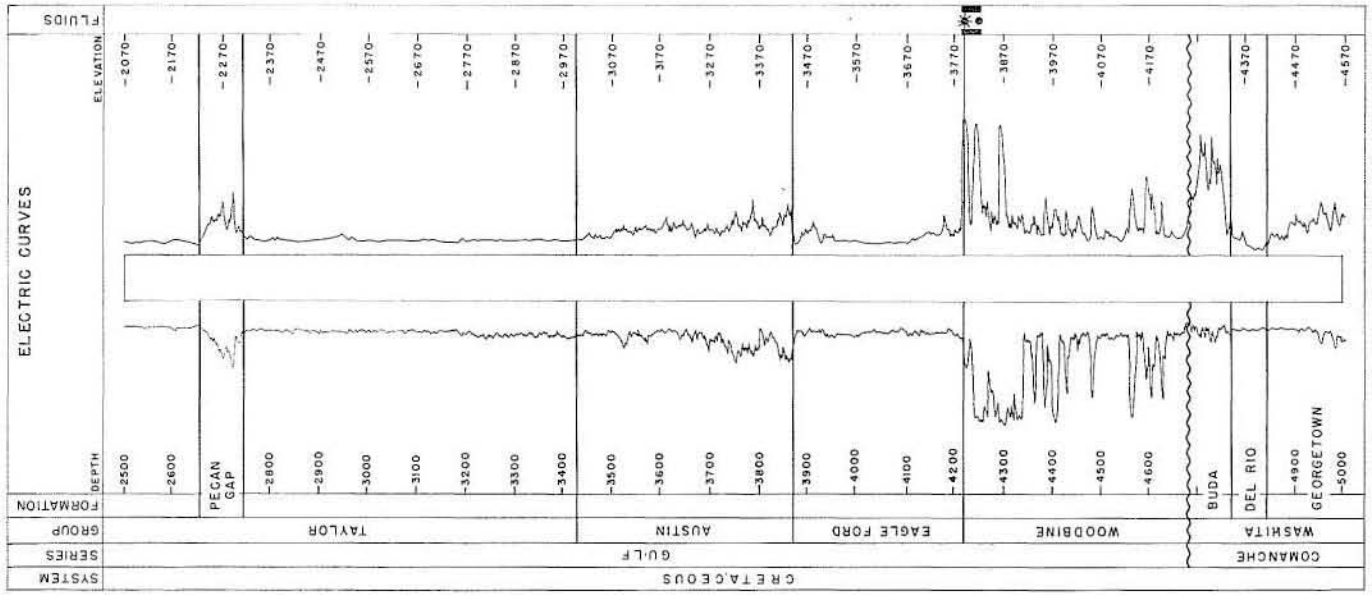
Travis Peak: The Travis Peak sands which are porous enough to produce are present only in the eastern portion of the structurally high area, (see map). These sands are too hard, non-porous and shaly or they are absent over the rest of the area.

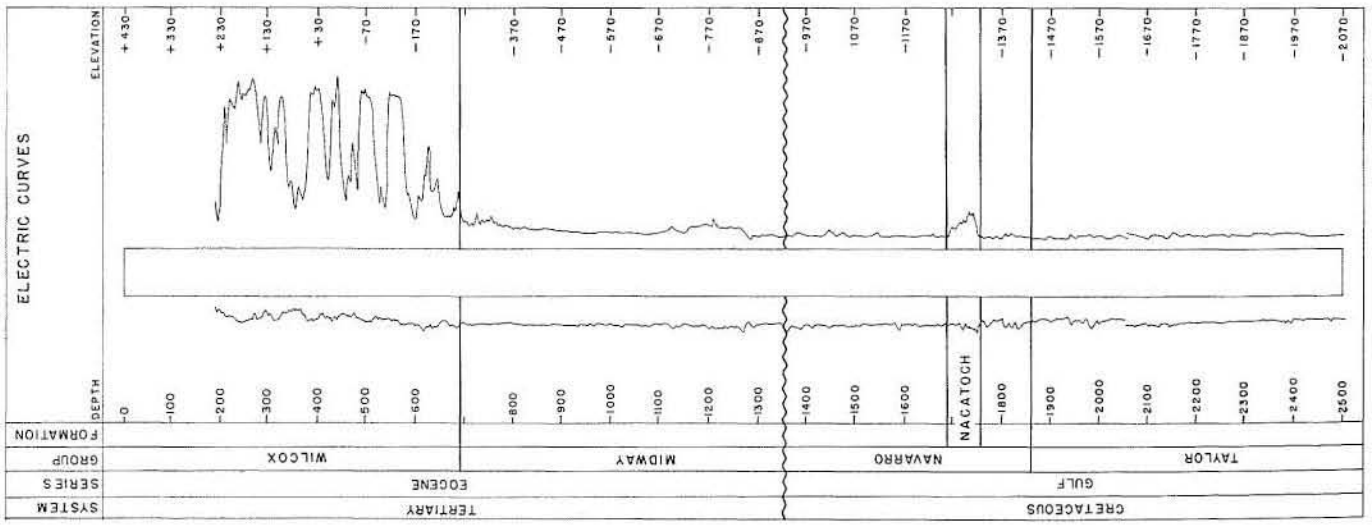
ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Woodbine:	Feet
Elevation of top of gas	-3,762
Elevation of bottom of gas (or oil)	-3,798
Relief	36
Travis Peak:	
Elevation of top of gas	-7,775
Elevation of bottom of gas	-7,860
Relief	85

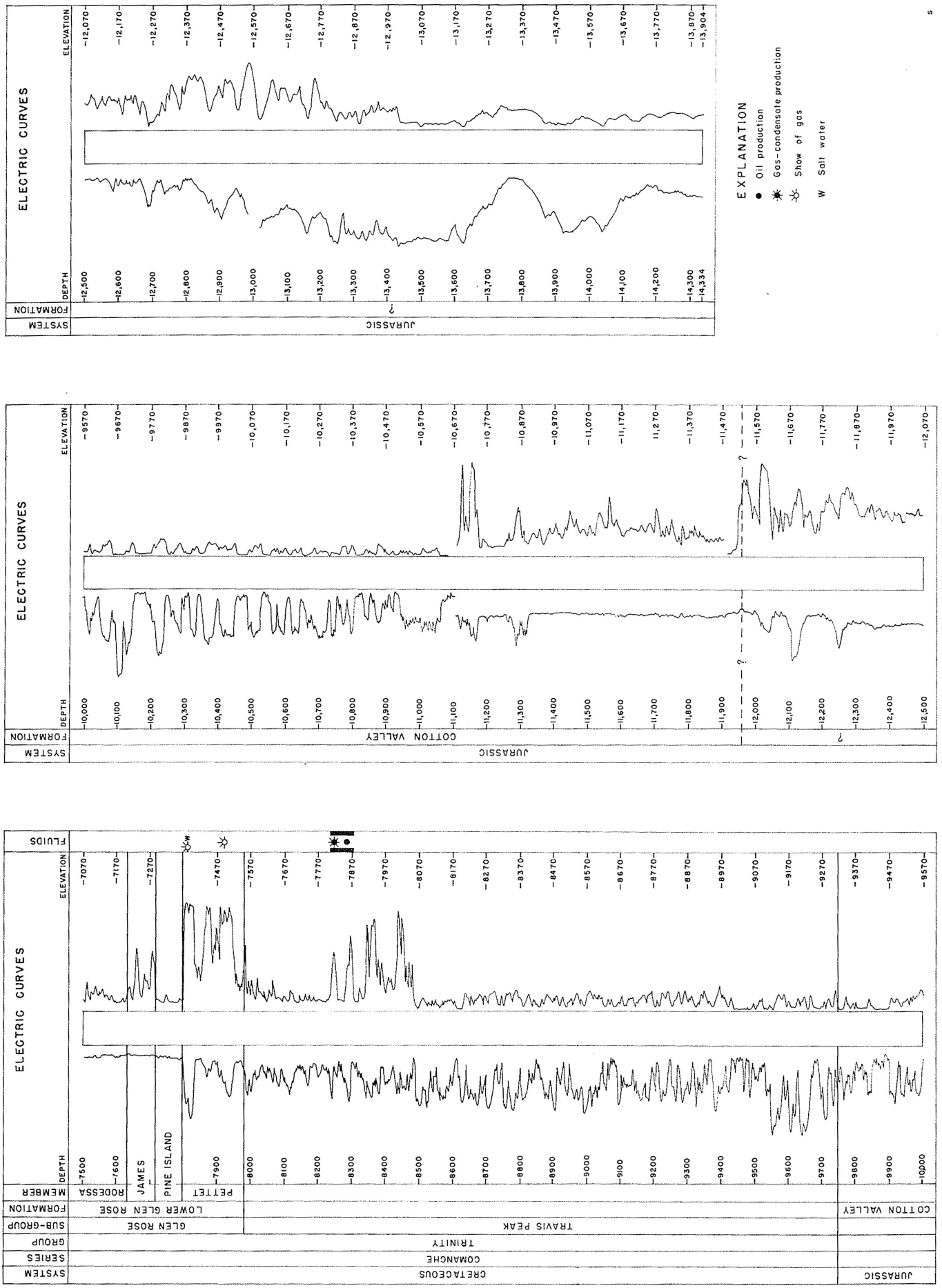
TYPE SECTION OF ROCKS PENETRATED







TYPE SECTION OF ROCKS PENETRATED



CHARACTER OF GAS AND CONDENSATE

	Woodbine	Travis Peak
Gas: Specific gravity	0.608°	0.63°
Condensate: Gravity, A.P.I.	51 to 60°	59° to 66°

WATER PRODUCTION

Most of the Woodbine wells produce no water, but several of them did produce some water until they were worked over. The wells completed in the Travis Peak produce up to one barrel of water per million cubic feet of gas.

RESERVOIR PRESSURES

Original bottom hole pressure	Psi.
Woodbine	1,560
Travis Peak	3,700

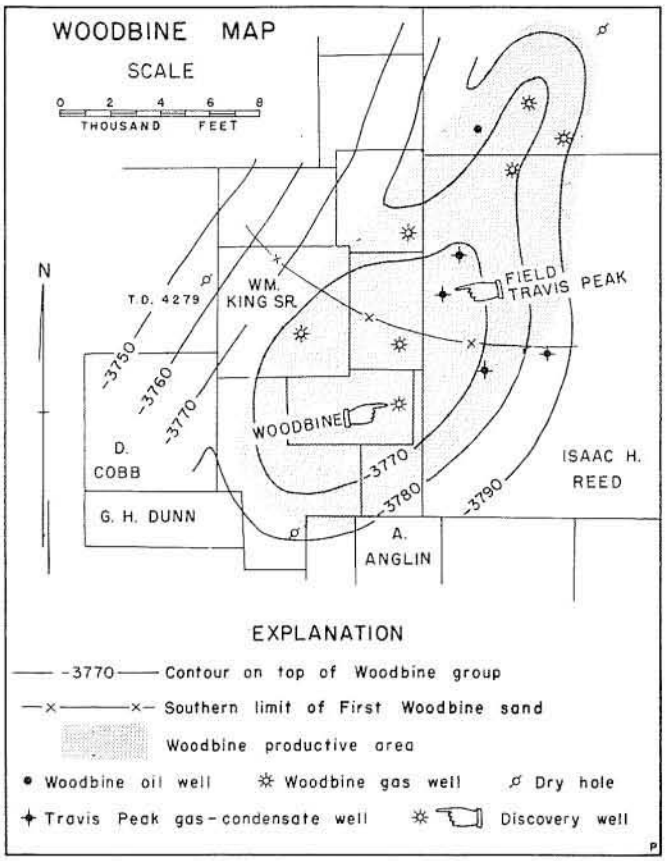
ACID TREATMENT

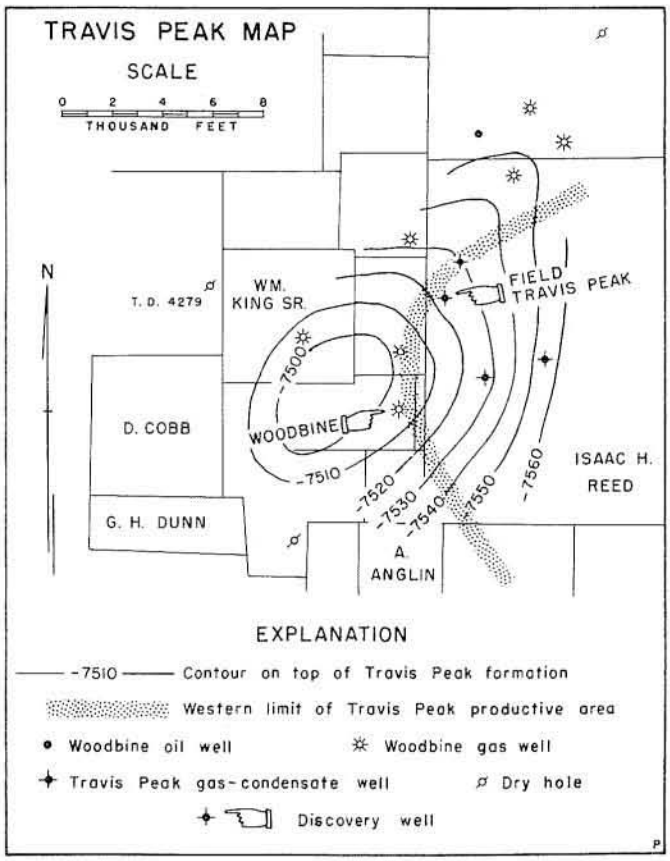
None used.

PRODUCTION HISTORY

Woodbine:

Year	WELLS PRODUCING at end of year	OIL PRODUCTION (barrels) Yearly	OIL PRODUCTION (barrels) Cumulative	CONDENSATE PRODUCTION (barrels) Yearly	CONDENSATE PRODUCTION (barrels) Cumulative	GAS PRODUCTION (Mcf) Yearly	GAS PRODUCTION (Mcf) Cumulative
1947	2	6,750	6,750			17,xxx	17,xxx
1948	1	3,218	9,968			0	17,xxx
1949	4	357	10,325	880	880	464,xxx	481,xxx
1950 to 5/1	8	0	10,325	1,184	2,064	262,xxx	743,xxx
Travis Peak:							
1945	1			5,504	5,504	169,xxx	169,xxx
1946	1			6,287	11,791	181,xxx	350,xxx
1947	1			2,836	14,627	86,xxx	436,xxx
1948	0			0	14,627	0	436,xxx
1949	1			6,132	20,759	230,xxx	666,xxx
1950 to 5/1	2			2,608	23,367	116,xxx	782,xxx





RICHLAND FIELD
Navarro County, Texas

JASPER L. STARNES
Geologist, The Atlantic Refining Company, Tyler, Texas
June 1, 1950

LOCATION

The Richland field is ½ mile east of the city of Richland and 12 miles south of the city of Corsicana. It is in the zone of the Luling-Mexia-Talco fault system.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Trend play between the Powell and North Currie fields and subsequent surface fault mapping led to the discovery of the Richland field.

DISCOVERY

Woodbine sand: February 16, 1924;
McDonald Bros. #1 A. N. Brown

ELEVATION OF SURFACE

At well locations: Highest, 380 ft.; lowest, 345 feet.

SURFACE FORMATION

Midway shale of the Eocene is the only formation exposed within the area of the field.

TYPE SECTION OF ROCKS PENETRATED

The section here is essentially the same as that at the North Currie field. The reader is referred to the accompanying paper on that field.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

Approximately 100 feet below the top of the lower Glen Rose lime.

NATURE OF TRAP

Woodbine sand: Closure against fault with displacement of 450 feet and with hade of 45°.

PRODUCTIVE AREA

Woodbine sand and Field: 234 acres. The productive area is 7,500 feet long and has a maximum width of 1,800 feet.

THICKNESS OF RESERVOIR ROCK

Woodbine sand: From 4 to 28 feet; avg., 20.1 feet.

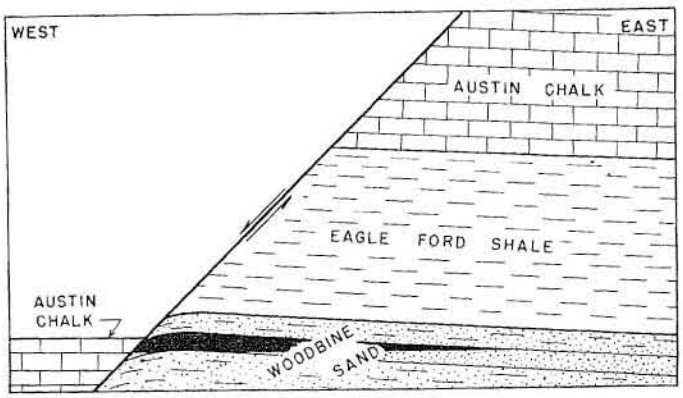
LITHOLOGY OF RESERVOIR ROCK

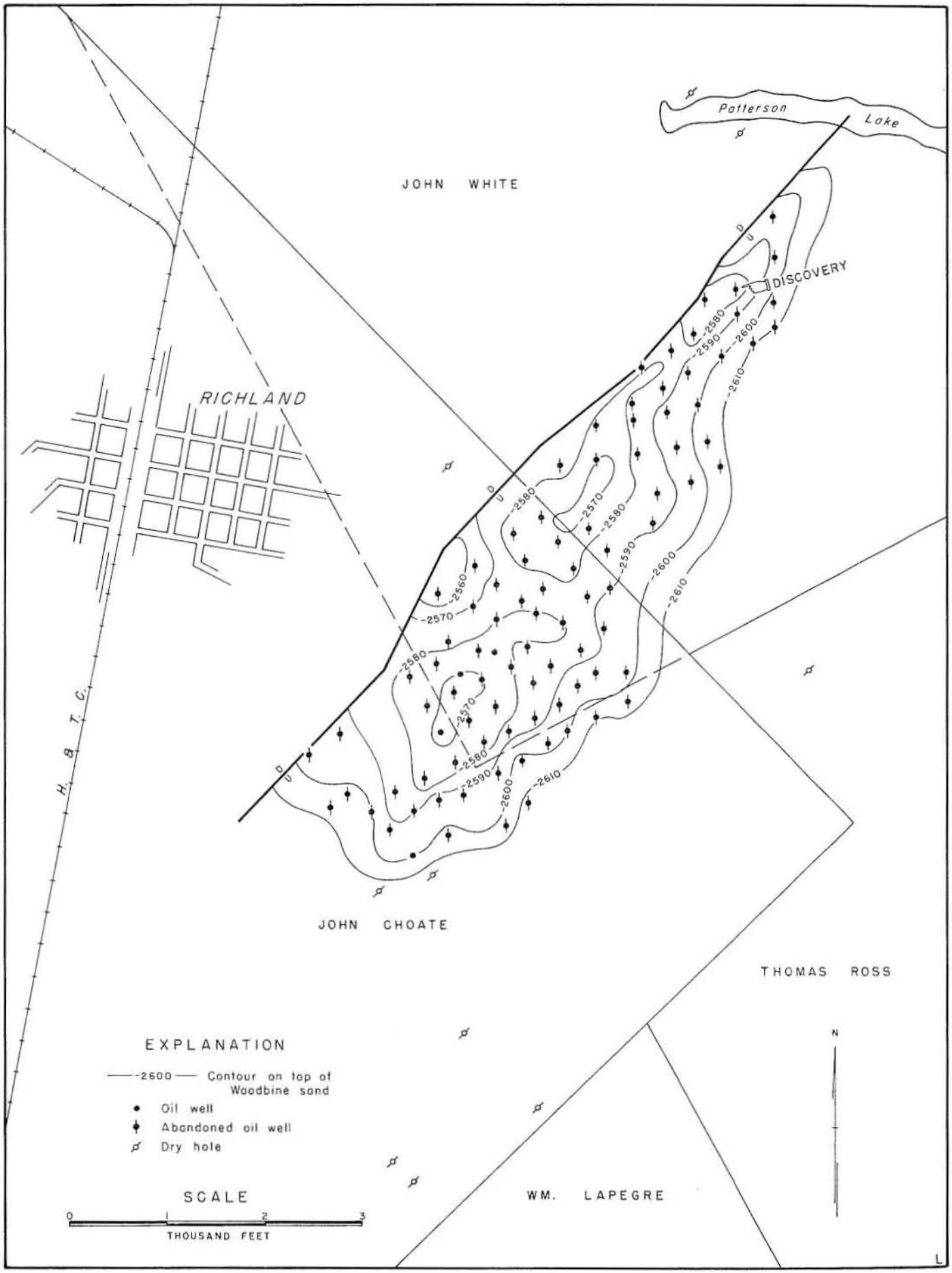
Woodbine sand: Soft sand with shale partings and sandy shale.

CONTINUITY OF RESERVOIR ROCK

Woodbine sand: The Woodbine sand is a blanket sand in this area, the sandy phase disappearing southward in southern Limestone County, but persisting northward into the deep East Texas geosyncline and covering a large part of northeast Texas.

CROSS SECTION




Patterson Lake
JOHN WHITE
DISCOVERY
RICHLAND
H. & T. C.
JOHN CHOATE
THOMAS ROSS
WM. LAPEGRE
-2560
-2570
-2580
-2590
-2600
-2610
D
U
EXPLANATION
-2600- Contour on top of Woodbine sand
Oil well
Abandoned oil well
Dry hole
SCALE
0 1 2 3
THOUSAND FEET
N

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine sand:	Feet
Elevation of top of oil	-2,570
Elevation of bottom of oil	-2,610
Relief	40

CHARACTER OF OIL

Woodbine sand: Gravity, A.P.I., 36.8° to 39.2°.

For analyses see:

U. S. Bureau of Mines	Reference designation
Tabulated Analyses of Representative Crude Petroleums of the U.S., Bull. 291 (1928)	A
Tabulated Analyses of Texas Crude Oils. R.I. 3252 (1934)	B
Tabulated Analyses of Texas Crude Oils. T.P. 607 (1939)	C

Lab. ref. No.	259 & 1061	260 & 24451	24914	24915	38086
Reference designation					
A	259	260			
B, Group 4, Item	41	44	42	43	
C, Group 4, Item	52	53	54		55

WATER PRODUCTION

Woodbine sand: Both edge water and bottom water was produced in the early life of the Richland field due to the extremely rapid rate of production. Solids in the Woodbine water from this field range from 12,048 ppm. to 15,190 ppm. by weight.

SELECTED REFERENCES

Lahee, Frederic H. (1929) Oil and gas fields of the Mexia and Tehuacana fault zones, Texas: Amer. Assoc. Petr. Geol., Structure of Typical American Oil Fields, vol. 1, pp. 304 - 388.

Hill, H. B., and Guthrie, R. K. (1943) Analysis of Oil production in the near-depleted Mexia-Powell fault-line fields of Texas. U. S. Bureau of Mines R. I. 3712, 83 pages, 30 figures.

PRODUCTION HISTORY

Like all the early fault-line fields, the Richland field produced most of its oil during the first few years of life. The peak production was during the discovery year, after which there was rapid decline.

Year	NUMBER OF WELLS PRODUCING *	OIL PRODUCTION (barrels) Yearly	Cumulative
1924	53	3,401,000	3,401,000
1925	87	1,725,000	5,126,000
1926	79	504,935	5,630,935
1927	72	270,537	5,901,472
1928	48	175,506	6,076,978
1929	43	121,218	6,198,196
1930	27	69,459	6,267,655
1931	10	27,164	6,294,819
1932	4	15,063	6,309,882
1933	3	13,727	6,323,609
1934	3	13,052	6,336,661
1935	3	11,234	6,347,895
1936	3	7,695	6,355,590
1937	2	6,384	6,361,974
1938	2	6,934	6,368,908
1939	2	5,792	6,374,700
1940	3	7,255	6,381,955
1941	4	16,065	6,398,020
1942	4	12,824	6,410,844
1943	4	10,980	6,421,824
1944	4	9,233	6,431,057
1945	4	9,161	6,440,218
1946	4	8,871	6,449,089
1947	4	9,893	6,458,982
1948	4	9,842	6,468,824
1949	4	8,872	6,477,696

*Figures for the years 1924 - 1941 represent the average number of wells producing during the year. Figures for the years 1942 - 1949 represent the actual number of wells producing at the end of the year.

RODESSA FIELD

Cass and Marion Counties, Texas, Caddo Parish, Louisiana and Miller County, Arkansas

E. L. HOWARD
Consulting Geologist, Tyler, Texas
March 29, 1951

LOCATION

The Rodessa field occupies portions of three States. It is a long, narrow field extending southwest from southwest Arkansas, across the northwest corner of Louisiana and into Cass and Marion Counties, Texas.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Mapping of surface and subsurface data.

DISCOVERIES

Hill: August 3, 1930;
R. W. Norton #1 Serepty Hill.

Neugent: May 21, 1936;
Blackwell Oil & Gas Co. #1 G. W. Neugent.

Henderson: October 1937;
M. L. Overlees et al #1 L. Henderson.

Gloyd: September 27, 1932;
Arkansas Louisiana Gas Co. #1 S. M. & F. Gloyd.

Dees: April 10, 1934;
United Gas Public Service Co. #1 Sallie Dees.

Young: July 7, 1935;
United Gas Public Service Co. #1 I. L. Young.

Pettet: January 30, 1946;
Jefferson Oil & Gas Co. #1 J. O. Jackson.

Travis Peak: May 1937;
United Gas Public Service Co. #1 A. B. Land. This well was completed in a limestone member in the transitional zone of Travis Peak and produced for a short time only.

ELEVATION OF SURFACE

At well locations: Highest, 340 ft.; lowest, 185 feet.

SURFACE FORMATIONS

Sparta, Weches and Queen City.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated is indicated on the accompanying TYPE SECTION, which is based on the log of R. W. Norton #1 J. E. Payne which is located in C SE SE Sec. 27, T 23 N., R. 16 W., Louisiana. The deepest penetration is in salt which is believed to be of Eagle Mills age.

NATURE OF TRAPS

The dominating feature in controlling the several accumulations of oil and gas is a northwestward regional dip with a major fault parallel to the general strike. The larger accumulations are due primarily to traps formed by faulting. Convex folding, lensing and decrease of porosity and permeability also contribute to forming traps.

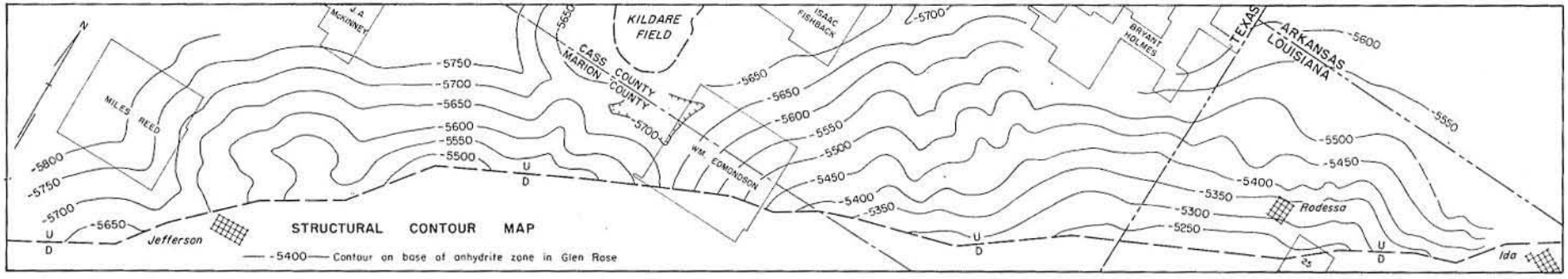
PRODUCTIVE AREAS

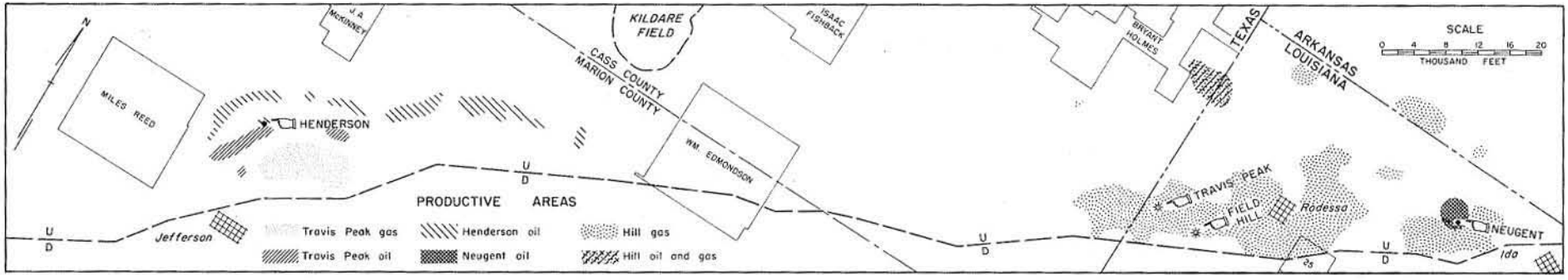
	Acres		Acres
Hill	22,500	Dees-Young	21,500
Neugent	100	Pettet	2,300
Henderson	1,300	Travis Peak	1,380
Gloyd	10,107		

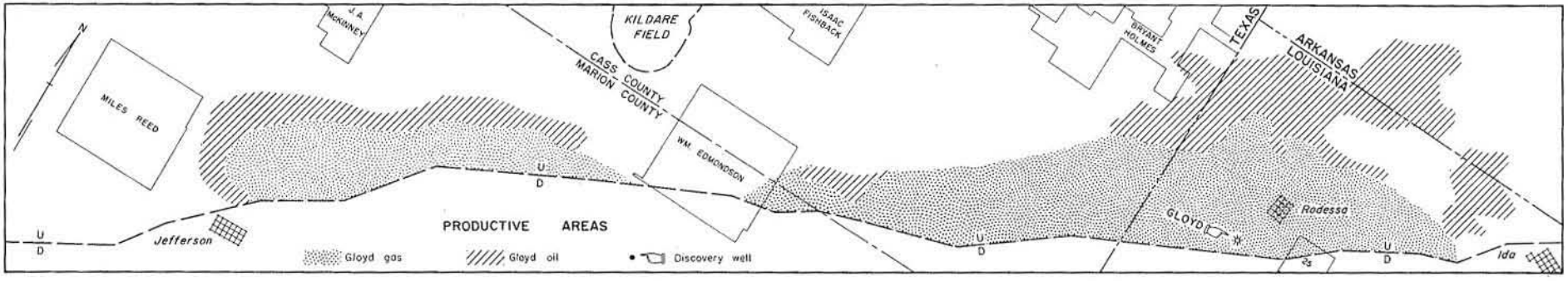
Rodessa field..... 46,800 acres.

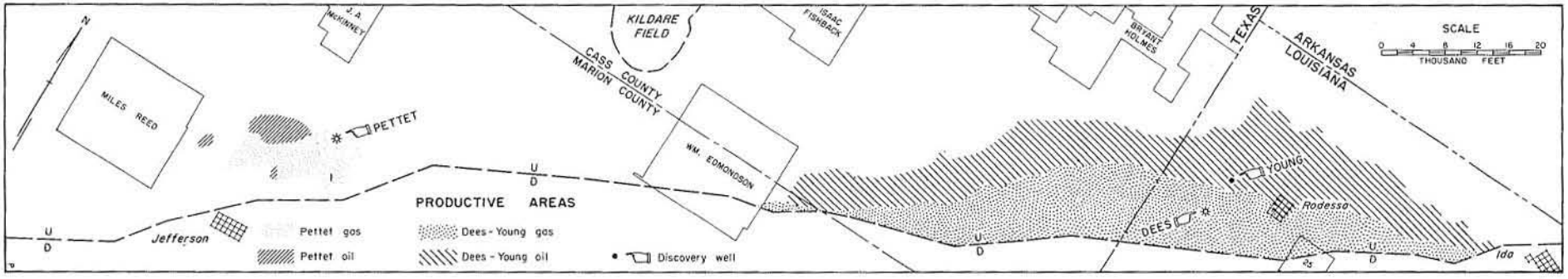
THICKNESSES OF RESERVOIR ROCKS

	Feet, approximate	
	From top to bottom	Net productive
Hill	Max., 50	Avg., 13.5
Neugent		Avg., 10
Henderson	0 - 20	8 to 16; avg., 12
Gloyd	135	Avg. 20 to 25
Dees-Young		
Dees sand	0 - 50	0 to 50; avg., 20
Coquina limestone	20	Avg. 15
Oolitic limestone	30	Avg. 15
Pettet		Avg. 15
Travis Peak		Avg. 12


N
J. A. McKINNEY
KILDARE FIELD
ISAAC FISHBACK
BRYANT HOLMES
TEXAS
ARKANSAS
LOUISIANA
MILES REED
CASS COUNTY
MARION COUNTY
WM. EDMONDSON
-5800
-5750
-5700
-5650
-5600
-5550
-5500
-5450
-5400
-5350
-5300
-5250
U
D
Jefferson
Rodessa
Ida
STRUCTURAL CONTOUR MAP
-5400- Contour on base of anhydrite zone in Glen Rose


N
J. A. McKINNEY
KILDARE FIELD
ISAAC FISHBACK
BRYANT HOLMES
TEXAS
ARKANSAS
LOUISIANA
SCALE
0 4 8 12 16 20
THOUSAND FEET
MILES REED
HENDERSON
CASS COUNTY
MARION COUNTY
WM. EDMONDSON
TRAVIS PEAK
FIELD
HILL
NEUGENT
Rodessa
Jefferson
Ida
PRODUCTIVE AREAS
Travis Peak gas
Travis Peak oil
Henderson oil
Neugent oil
Hill gas
Hill oil and gas


N
J. A. McKINNEY
KILDARE FIELD
ISAAC FISHBACK
BRYANT HOLMES
TEXAS
ARKANSAS
LOUISIANA
MILES REED
CASS COUNTY
MARION COUNTY
WM. EDMONDSON
GLOYD
Rodessa
Jefferson
Ida
PRODUCTIVE AREAS
Gloyd gas
Gloyd oil
Discovery well


N
J. A. McKINNEY
KILDARE FIELD
ISAAC FISHBACK
BRYANT HOLMES
TEXAS
ARKANSAS
LOUISIANA
SCALE
0 4 8 12 16 20
THOUSAND FEET
MILES REED
PETTET
CASS COUNTY
MARION COUNTY
WM. EDMONDSON
YOUNG
DEES
Rodessa
Jefferson
Ida
PRODUCTIVE AREAS
Pettet gas
Pettet oil
Dees - Young gas
Dees - Young oil
Discovery well

LITHOLOGY OF RESERVOIR ROCKS

Hill: Fine-grained sandstones and interbedded shales and sandy shales.

Neugent: Fairly fine-grained sandstone.

Henderson: Sandy coquina limestone which grades locally into tan or gray quartzitic sand.

Gloyd: The Gloyd zone consists of three units of about equal thickness. The upper third and the lower third are limestones and the intermediate third consists mainly of shale which contains local lenses of sandstone and oolitic limestone. Porosity and permeability are quite variable in the two main limestone members and commonly determine the extent of productive areas. The local lenses of sandstone in the shale member are collectively known as the Mitchell sand and are productive in most of the Gloyd productive area northeast from the Cass-Marion County boundary.

Dees-Young: This zone consists of three members; at the top, the Dees sand, which is a medium-grained quartz sand, the coquina limestone member and the oolitic limestone member at the base.

Pettet: The Pettet zone varies from a dense crystalline lime to an oolitic lime with sufficient porosity to yield oil and gas. Only at the southwest end of the field is there sufficient porosity for oil and gas production. In the productive area, the porous condition is at various stratigraphic positions in different parts of the area.

Travis Peak: The productive zones in the Travis Peak are erratic lenses of medium- to fine-grained sand. There are several distinct productive lenses at various stratigraphic positions scattered throughout the total thickness of the Travis Peak formation. In some wells, the production is from several lenses. No effort is made to produce from the several lenses separately where more than one is productive in the same well.

CONTINUITY OF RESERVOIR ROCKS

Hill: The Hill zone is recognizable throughout the area of the field. However, it is productive in only local areas, as indicated on an accompanying map. Only locally is it sufficiently porous and permeable to yield oil and gas.

Neugent: This sand is present in an area of only about 100 acres located near the northeast end of the field.

Henderson: This is a locally porous zone just above the Gloyd in the Glen Rose. It is sufficiently porous and permeable to yield oil and gas in only local areas near the southwest end of the field.

Gloyd: The Gloyd zone as described above under LITHOLOGY is continuous throughout the area of the field. Each of its three members is productive, but no one is productive throughout the Gloyd areas indicated on an accompanying map. In the southwest part of the field, the Gloyd production is from the upper limestone member, which also produces extensively in the large Gloyd area in the northeastern part of the field. In the northeastern Gloyd area, the production is generally from two members of the Gloyd; all of the Gloyd is operated as one reservoir and therefore little attention is given to differentiation of the members. The exact extent of each of the members is not readily determinable.

Dees-Young: The Dees-Young zone, as a stratigraphic unit, is continuous throughout the area of the field. However, the uppermost of the three members, the Dees sand, is distributed over only a part of the area. It thins and becomes tight on the northeast flank of the field. The middle member occurs as a porous coquina limestone throughout most of the area of the field. The lowest member occurs as a porous oolitic limestone in the eastern part of Cass County and in Caddo Parish.

Pettet: The Pettet is sufficiently porous and permeable to yield oil and gas in only the southwestern part of the field.

Travis Peak: Each of the productive lenses in the Travis Peak formation is an extremely local deposit. In the southwest part of the field, there are many productive lenses but no one of them extends over any large area.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

The immediately available data do not afford adequate bases for appropriate entries under this heading.

CHARACTER OF OIL

	Henderson	Gloyd	Dees
Gravity, A.P.I.	39.6°	41.9°	42.6°
Sulphur	0.3%	0.32%	0.28%
Color	Dark green	Greenish-black	Dark green

For analyses see:

Railroad Commission of Texas
Analyses of Texas Crude Oils (1940), pp. 30, 31 and 59.

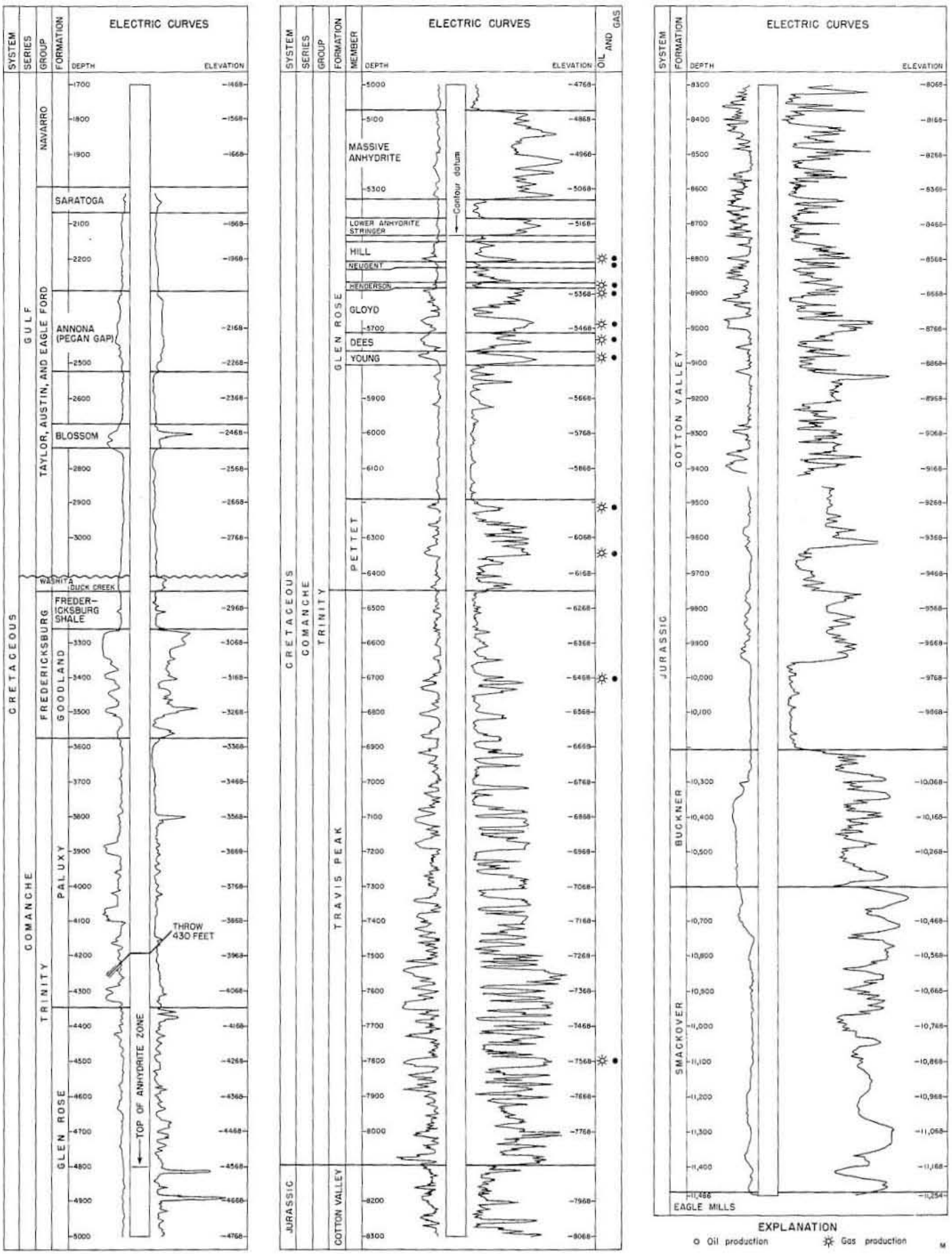
U. S. Bureau of Mines Tabulated Analyses of Texas Crude Oils. T. P. 607 (1939)	Lab. ref. No.	38129	38130
Group 4,	Item	56	57
	Lab. ref. No.	38138	39139
Analyses of Crude Oils from Some Fields of Texas. R.I. 3699 (1943)	Item	67	68

Engineering study of Rodessa Oil Field in Louisiana, Texas and Arkansas. R. I. 3715 (1943), p. 89 (11 samples)

WATER PRODUCTION

Approximately one-half of the salt water produced with oil is delivered to the Nacatoch sandstone through wells drilled especially for the purpose. Other salt water is disposed of in evaporating pits.

TYPE SECTION OF ROCKS PENETRATED



CHARACTER OF GAS

Component	Hill %	Gloyd %	Dees-Young %
Carbon dioxide	.40		.60
Methane	87.09	93.40	87.85
Ethane	4.42	3.85	3.71
Propane	1.60	1.33	1.43
Iso-butane	.40	.46	.52
Normal butane	.52	.38	.59
Pentane	.46	.58	.39
Hexanes	.29		.20
Heptanes plus	.06		.07
Nitrogen	4.76		4.64

ACID TREATMENT

Most of the wells in the Rodessa field were completed without acidization. Wells treated with about 2,000 gallons of acid show less decline in bottom hole pressure per barrel of oil produced then do untreated wells.

SELECTED REFERENCE

Hill, H. B. and Guthrie, R. K. (1943) Engineering study of the Rodessa oil field in Louisiana, Texas and Arkansas: U. S. Bureau of Mines. R.I. 3715.

PRODUCTION HISTORY

Field totals

Year	WELLS PRODUCING at end of year		OIL PRODUCTION (barrels)		GAS PRODUCTION (Mcf)	
	Oil	Gas	Yearly	Cumulative	Yearly	Cumulative
1931		1			227,670	227,670
1932		3			1,383,120	1,610,790
1933		7			7,784,211	9,395,001
1934		21			13,934,264	23,329,265
1935	36	40	1,266,319	1,266,319	33,132,300	56,461,565
1936	488	55	22,365,939	23,632,258	250,759,111	307,220,676
1937	859	93	31,427,176	55,059,434	85,558,885	392,779,561
1938	1,022	117	27,159,793	82,219,227	82,916,592	475,696,153
1939	1,045	138	20,228,519	102,447,746	81,144,590	556,840,743
1940	990	152	14,236,091	116,683,837	102,973,125	659,813,868
1941	883	156	10,471,391	127,155,228	78,559,660	738,373,528
1942	792	135	7,674,285	134,829,513	57,393,098	795,766,626
1943	826	138	5,863,000	140,692,513	53,480,020	849,246,646
1944	806	140	3,018,857	143,711,370	47,380,245	896,626,891
1945	650	140	4,142,151	147,853,521	42,350,640	938,977,531
1946	601	144	3,334,936	151,188,457	30,016,318	968,993,849
1947	588	150	2,886,034	154,074,491	28,350,135	997,343,984
1948	619	154	2,766,501	156,840,992	24,023,493	1,021,367,477
1949	540	109	2,740,500	159,581,492	23,082,045	1,044,449,522

ROWE & BAKER FIELD
Henderson County, Texas

R. W. EATON
Geologist, Tyler, Texas
September 1, 1949

LOCATION and OTHER NAME

This field is in northwestern Henderson County, 6½ miles west and slightly south of the town of Mabank, Kaufman County, Texas. It is in the zone of the Luling-Mexia-Talco fault system. While the official designation by the Railroad Commission is Rowe & Baker, the field is also known by the name of Mabank.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Indications of favorable faulting in the area were discovered in 1921 through the surface work of Richard A. Jones. In 1923, Robert L. Cannon, surface geologist working under the direction of Wallace E. Pratt of Humble Oil & Refining Co., located several surface faults in the Mabank area which were thought to be favorable for the accumulation of petroleum.

On the strength of this investigation, Humble Oil & Refining Co. purchased a block of leases in southeast Kaufman and northwest Henderson counties in 1924. Core-drilling operations were initiated later in the fall of the same year and were completed the following year.

The first well drilled in the area, R. R. Penn #1 Murphy, was abandoned in April 1925, after encountering non-commercial shows of oil and gas in the Woodbine formation. Interest lagged in the area until 1939 when Tyler, Smith, Richards & Holloway #1 Rowe & Baker was completed as a small pumper from the Woodbine formation.

DISCOVERY

Woodbine sand: March 15, 1939;
Tyler, Smith, Richards & Holloway #1 Rowe & Baker.

NATURE OF TRAP

Woodbine sand: Fault segment reservoir on northeast-southwest trending fault, upthrown to the southeast. The main fault has an approximate throw of 350 feet and is a component of the Mexia-Powell-Talco fault system.

PRODUCTIVE AREA

Woodbine sand and Field: 40 acres.

THICKNESS OF RESERVOIR ROCK

Woodbine sand: Average thickness of productive zone, 2 feet. Deepest penetration in productive zone, 10 feet.

LITHOLOGY OF RESERVOIR ROCK

Woodbine sand: Coarse- to fine-grained, somewhat glauconitic sands, and light gray fossiliferous calcareous sandstone.

CONTINUITY OF RESERVOIR ROCK

Woodbine sand: The reservoir at Mabank occurs in sands in the upper Woodbine formation, which is continuous throughout the East Texas basin.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine sand	Feet
No free gas	
Elevation of top of oil	-2,812
Elevation of bottom of oil	-2,826
Relief	14

The above figures represent conditions at time of discovery.

CHARACTER OF OIL

Woodbine sand
Gravity, A.P.I. @ 60° F.: Maximum, 30.7°; Minimum, 32°; Average, 31.4°
Sulphur: 0.94 - 1.02%
Color: Brownish-green

For analysis see:
U. S. Bureau of Mines Lab. ref. No. 39137
Analyses of Crude Oils from Some Fields of Texas.
R. I. 3699 (1943) Item 71

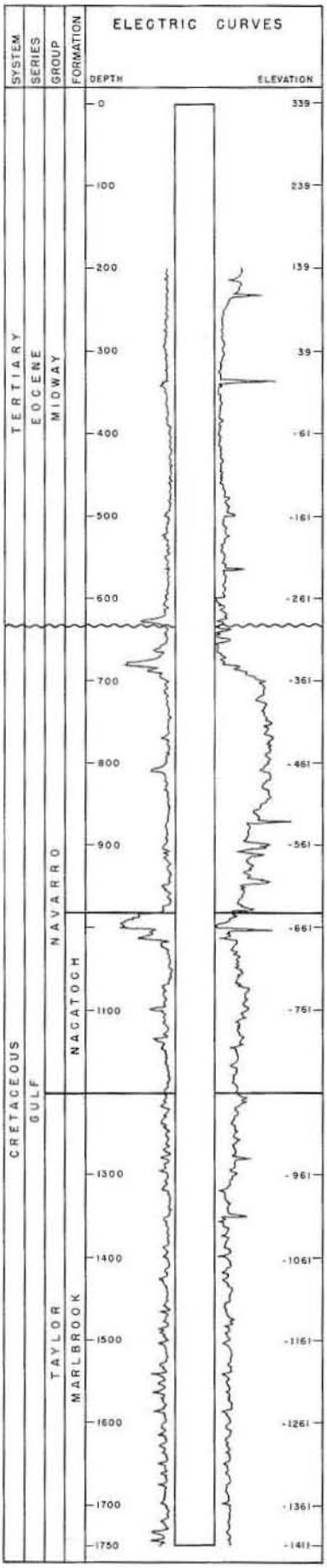
CHARACTER OF GAS

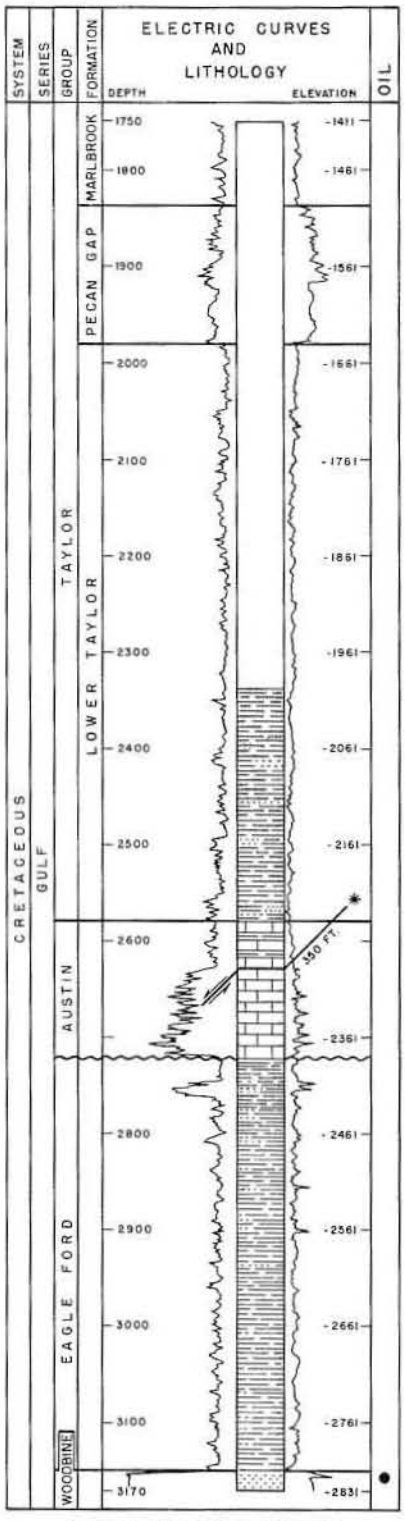
This field did not produce gas in commercial quantities and insofar as known, no analysis was ever made. The highest ratio well had a gas/oil ratio of 250:1 on initial production.

WATER PRODUCTION

The field was abandoned in 1942 as a result of complete flooding of the reservoir by salt water. During the life of the field, 40% to 55% of total production was salt water.

TYPE SECTION OF ROCKS PENETRATED





✱ All producing wells in field cross fault in Austin chalk section.

EXPLANATION

Shale — Sand — Limestone — ● Oil Production

ELEVATION OF SURFACE

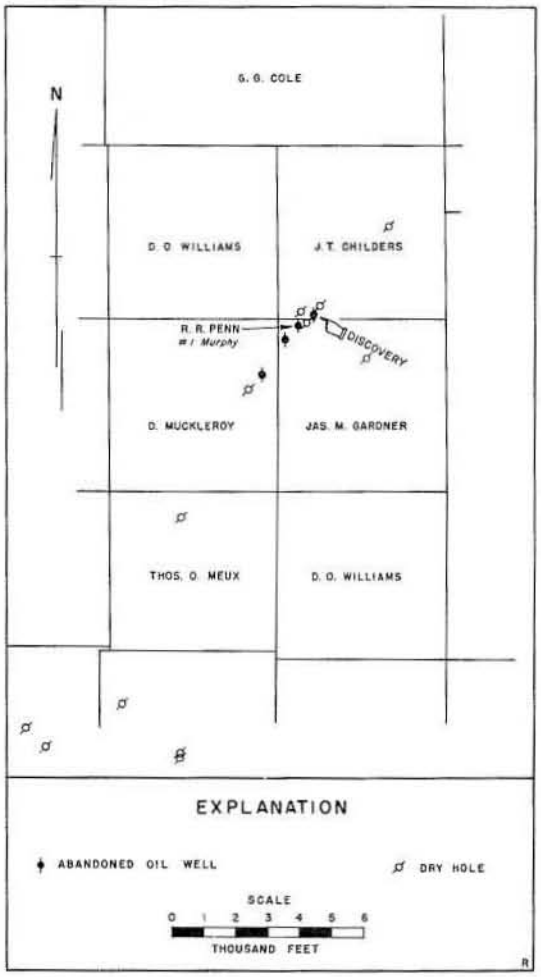
At well locations: Highest, 396 feet; lowest, 320 feet.

SURFACE FORMATION

Lower Midway.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

32 feet below top of Woodbine.



PRODUCTION HISTORY

Woodbine sand and Total field:

Year	WELLS PRODUCING at end of year — Oil Pumping	OIL PRODUCTION (barrels — Yearly	Cumulative
1939	2	1,050	1,050
1940	3	47,422	48,472
1941	3	25,460	73,932
1942	0	9,740	83,672

The last well completion was on June 7, 1940. The field was abandoned as fully depleted by pumping in November 1942.

RUSK FIELD
Cherokee County, Texas

ELVIN M. HURLBUT, Jr.
Geologist, Shell Oil Company, Tyler, Texas
September 25, 1950

LOCATION

The Rusk field is in west-central Cherokee County about 6 miles southwest of Rusk, the county seat, and two miles north of the William Wise field.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Core drill information on the top of the basal Reklaw greensand indicated a high, the center of which lies southwest of the field. The discovery well was located on the basis of this information.

DISCOVERY

Woodbine sand: June 29, 1934; T. J. Wood et al. #1 New Birmingham Development Co.

ELEVATION OF SURFACE

At well locations: Highest, 478 ft.; lowest, 432 feet.

SURFACE FORMATION

Queen City formation, Claiborne group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

215 feet below top of Travis Peak formation.

NATURE OF TRAP

Woodbine sand: Control is insufficient to afford a basis for determining the trap-forming factors.

PRODUCTIVE AREA

Woodbine sand and Field: 20 acres.

THICKNESS OF RESERVOIR ROCK

Woodbine sand: 7 net feet.

CONTINUITY OF RESERVOIR ROCK

Woodbine sand: The sand is present in the three wells which were productive but is absent to the southeast.

CHARACTER OF OIL

Woodbine sand: Gravity, A.P.I.: 42.5°

For analysis see:
U. S. Bureau of Mines Lab. ref. No. 38344
Tabulated Analyses of Texas Crude Oils. T.P. 607 (1939) Group 4, Item 58

LITHOLOGY OF RESERVOIR ROCK

Woodbine sand: Med.-grained, porous brown sand.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine sand:	Feet
Elevation of top of oil in highest well	-4,698
Elevation of oil-water contact	-4,708
Relief	10

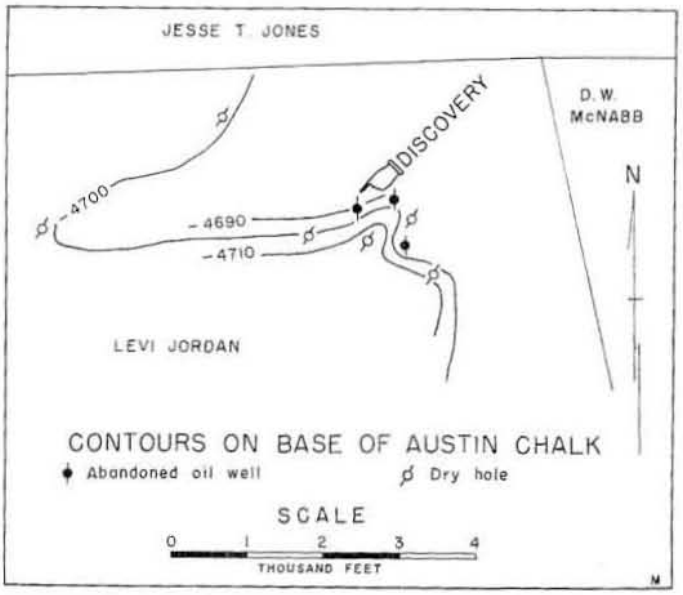
WATER PRODUCTION

Woodbine sand: Definite data as to quantities of water produced are not available. The discovery well was placed on the pump February 23, 1935, and produced daily 500 barrels of liquid of which 70% was salt water.

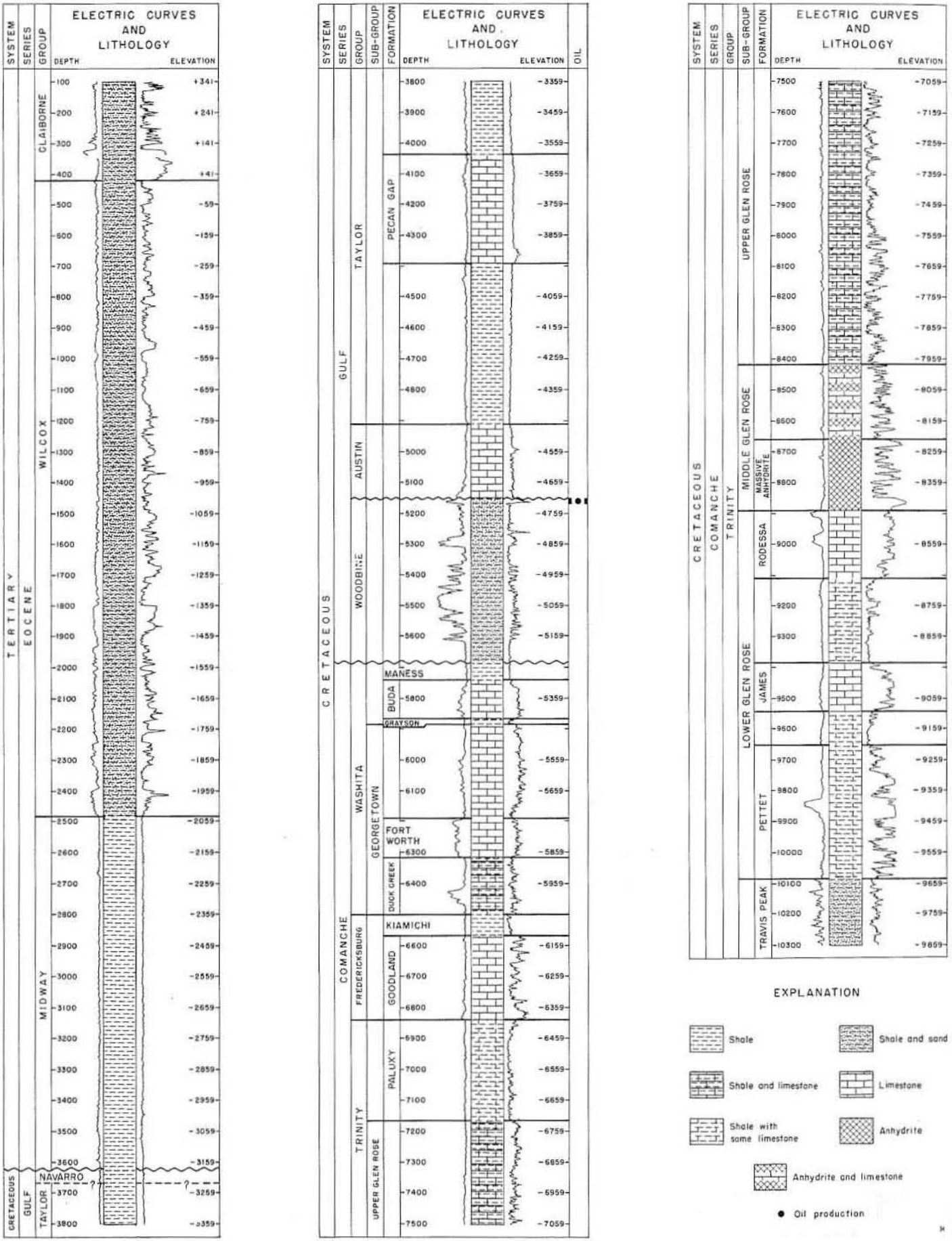
PRODUCTION HISTORY

Year	WELLS PRODUCING at end of year	OIL PRODUCTION (barrels) Yearly	Cumulative
1934	1	35,908	35,908
1935	3	79,215	115,123
1936	2	65,156	180,279
1937	2	35,095	215,374
1938	2	18,524	233,898
1939	0	4,439	238,337

The above data for 1934 and 1935 are from respective annual issues of Petroleum Development and Technology, A.I.M.E. The data for other years are from files of Railroad Commission of Texas.



TYPE SECTION OF ROCKS PENETRATED



SAN AUGUSTINE FIELD

San Augustine County, Texas

JOHN V. TOWNSEND
Geologist, Tyler, Texas
January 29, 1951

LOCATION

The San Augustine field, now abandoned, is in the Edmund Quirk survey 4 miles north of San Augustine, county seat of San Augustine County.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Seismic work indicated the presence of a structural anomaly. Drilling operations on the discovery well were begun on January 28, 1947.

DISCOVERY

Pettet: June 17, 1947; M. E. Davis Oil Co. #1 W. A. Johnson (later, Hiawatha Oil & Gas Co. #1 W. A. Johnson). Initial production, 92.01 barrels of 42.6° A.P.I. gravity oil per day; choke, 9/64-inch; perforations, 8,130-8,160 feet; tubing pressure, 1,450 psi.; casing pressure, 2,040 psi.; gas-oil ratio, 2,000 to 1. The well was drilled to total depth of 8,978 feet and plugged back to 8,936 feet.

ELEVATION OF SURFACE

At well locations: Highest, 428 ft.; lowest, 405 feet.

SURFACE FORMATIONS

Reklaw and Carrizo of Claiborne group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

258 feet below the top of the Travis Peak formation. This penetration was in the discovery well, the log of which is used in presenting the accompanying TYPE SECTION.

NATURE OF TRAP

Pettet: Stratigraphic trap formed by lateral pinchout of porosity.

PRODUCTIVE AREA

Pettet and Field: Proven, 40 acres.

THICKNESS OF RESERVOIR ROCK

Pettet: Net productive, 0 to 10 feet.

LITHOLOGY OF RESERVOIR ROCK

Pettet: Porous, oolitic limestone.

CONTINUITY OF RESERVOIR ROCK

Pettet: The porosity is lenticular and is of small areal extent as proven by two offset wells which encountered no porosity in the Pettet.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Pettet:	In the one well
Elevation of top of oil, feet	-7,726
Elevation of bottom of oil, feet	-7,756
Relief, feet	30

CHARACTER OF OIL

Gravity, A. P. I. @ 60° F., 42.6°

ACID TREATMENT

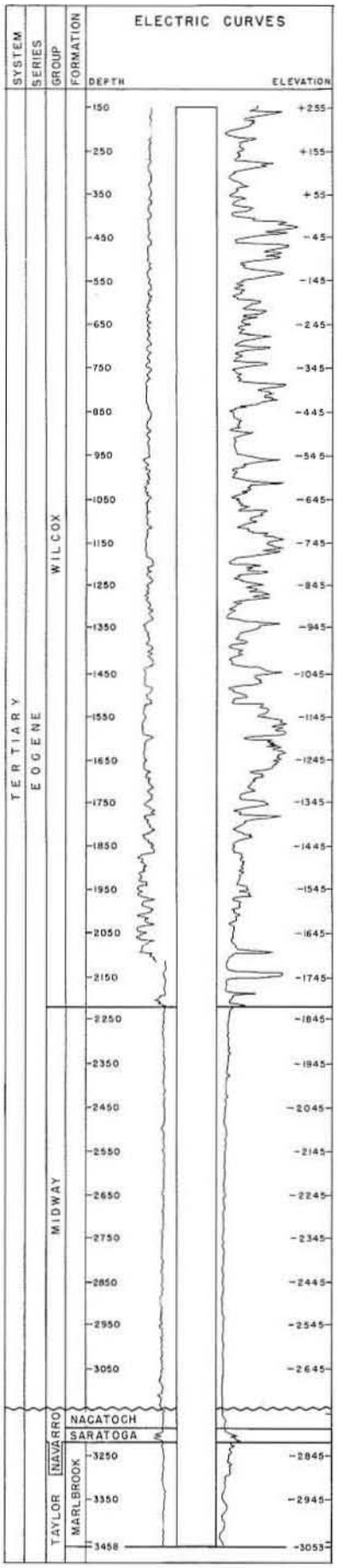
An attempt was made to acidize the discovery well with 1,000 gallons of acid, but the formation failed to break down under a maximum pressure of 2,600 psi.

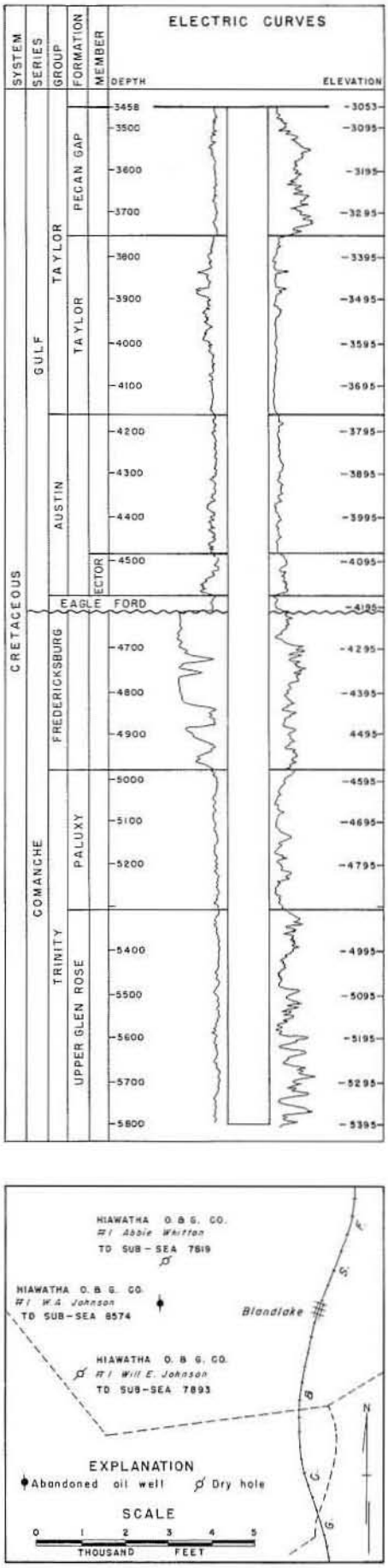
PRODUCTION HISTORY

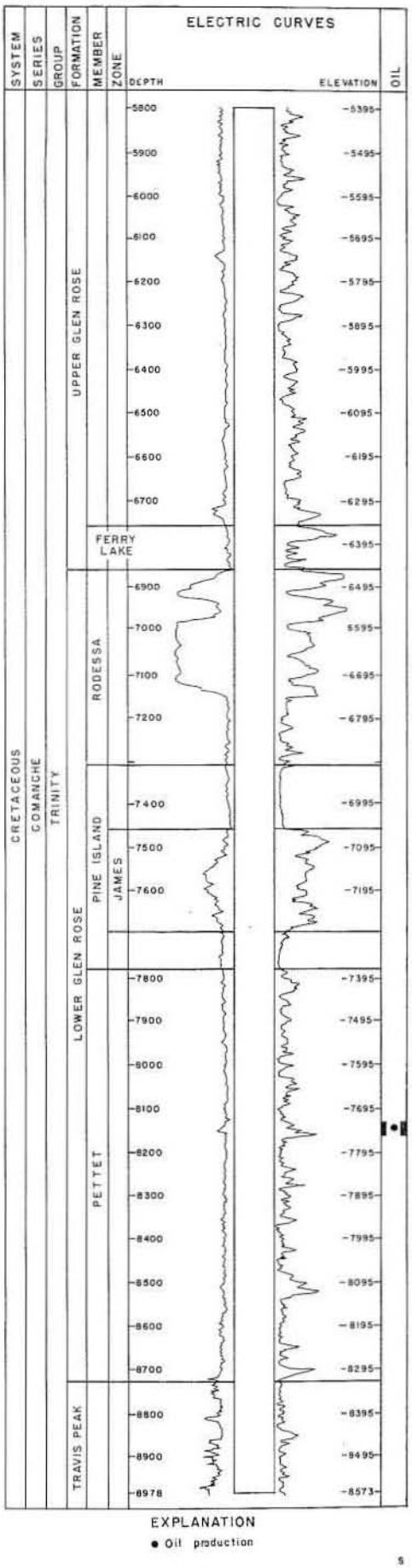
Year	WELLS PRODUCING at end of year	OIL PRODUCTION (barrels) Yearly	Cumulative
1947	1	7,840	7,840
1948	1	3,323	11,163
1949	1	600	11,763

The total production was from the discovery well producing from the Pettet only. After production from the Pettet had decreased to 3 barrels of oil per day, the well was killed on September 24, 1949, in order to test the Travis Peak. After testing and finding the Travis Peak dry, the well was plugged and abandoned on October 1, 1949.

TYPE SECTION OF ROCKS PENETRATED







SAND FLAT FIELD
Smith County, Texas

E. A. WENDLANDT
Geologist, Tyler, Texas
October 11, 1949

LOCATION

The Sand Flat oil field is located slightly south and south-east of the Sand Flat community in north central Smith County, Texas, approximately 7 miles north of Tyler, the county seat of Smith County.

METHODS OF EXPLORATION LEADING TO DISCOVERY

A surface anticlinal structure was mapped in the Sand Flat area by Albert E. Oldham during 1927 for Amerada Petroleum Corp., which acquired a lease block on the prospect during the latter part of the same year. In January 1928, Amerada Petroleum Corp. completed its #1 I. B. Christian as a dry hole, which was located near the crest of the surface structure. This well was drilled to a depth of 5,400 feet in the Woodbine formation. As a result of this failure, most of the leases in the area were dropped.

Interest in this area was revived following the discovery of Trinity production in the East Texas basin, and leases were acquired on the prospect by various companies. In 1943, Skelly Oil Co. made a reflection seismic survey of the area and subsequently acquired a lease covering the W. C. Chisum Estate land. During the following year, Skelly Oil Co. completed its #1 W. C. Chisum Estate as the Paluxy sand discovery well after drilling to a depth of 10,011 feet in the Travis Peak formation and plugging back to a depth of 7,080 feet.

In 1944, Sun Oil Co. deepened its #1 Alice Patterson to the Rodessa section after failing to encounter sand development in the Paluxy section and completed it as the Rodessa discovery well.

DISCOVERIES

Paluxy: March 16, 1944;
Skelly Oil Co. #1 W. C. Chisum et al.

Rodessa: May 31, 1944;
Sun Oil Co. #1 Alice Patterson

ELEVATION OF SURFACE

At well locations (derrick floor):
Highest, 627 feet; lowest, 423 feet.

SURFACE FORMATIONS

Queen City, Weches, and Sparta formations of the Claiborne group are exposed in the producing area.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

Approximately 85 feet below the top of the Travis Peak formation.

NATURE OF TRAP

Paluxy: Faulted anticline.

PRODUCTIVE AREA

Paluxy: Approximately 1,900 acres.

THICKNESSES OF RESERVOIR ROCK

Paluxy:	Feet		
	Max.	Min.	Avg.
From top to bottom	290	280	--
Net productive (approx.)	100	0	22

LITHOLOGY OF RESERVOIR ROCK

Paluxy: The Paluxy producing formation is composed of interbedded fine- to medium-grained sands, shales, and a small amount of limestone. The sands grade laterally into shale in short distances, resulting in erratic occurrence. Upper sands near the top of the Paluxy have a water level of about -6,675 feet on the southeast upthrown side of the large fault and about -6,816 feet on the downthrown side. The lower Paluxy sands are more erratic and generally encounter water between -6,800 and -6,835 feet on the upthrown side. One well produced a small amount of oil from a slightly porous lower sand on the downthrown side before abandonment.

CONTINUITY OF RESERVOIR ROCK

Paluxy: The Paluxy formation is continuous throughout the East Texas basin, but the sands grade laterally into shale, producing erratic and discontinuous porosity occurrences in the vicinity of the Sand Flat field.

CHARACTER OF OIL

Paluxy:
Average gravity, A.P.I.: 27.7°. Base: Mixed.
Sulphur: 1.85 to 2.35%. Color: Black.

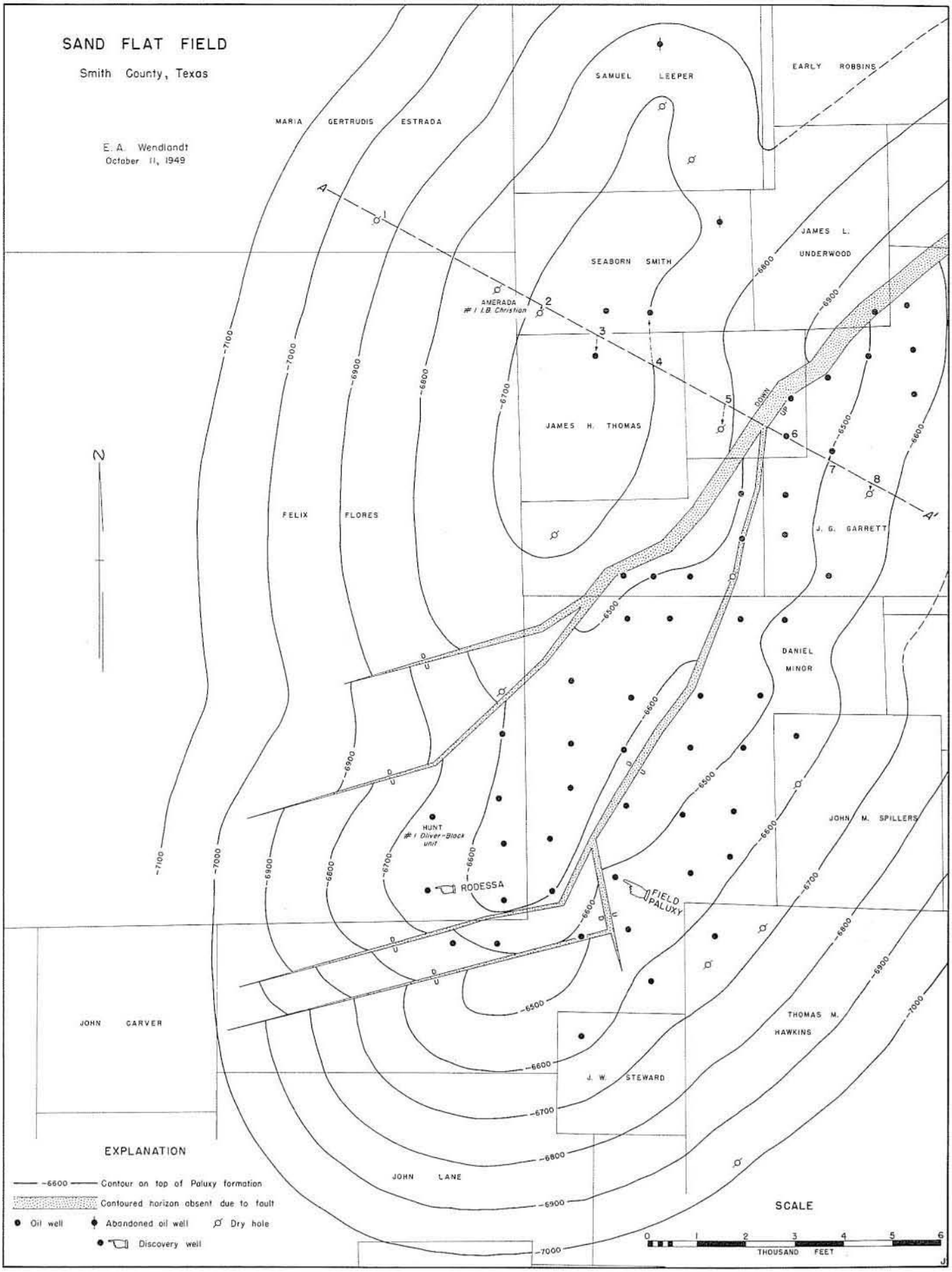
WATER PRODUCTION

Paluxy: During the latter part of 1948, 3 wells were producing an average of 93 barrels of salt water daily.

LOWER GLEN ROSE DEVELOPMENT

A total of 6 wells have been drilled to the Rodessa section of the lower Glen Rose formation on the Sand Flat structure. Two of these were drilled through the lower Glen Rose into the upper Travis Peak, encountering oil showings in impermeable Pettet limestones.

Three of the tests located in the southwest part of the field were completed as small producers, two being completed in slightly porous Rodessa sandy limestone and one in a slightly porous oolitic limestone near the base of the Ferry Lake anhydrite. Present information from the wells drilled to date indicates that the Rodessa production is coming from small local porosity lenses. Two of the Rodessa wells are known to be producing some water.


SAND FLAT FIELD
Smith County, Texas
E. A. Wendlandt
October 11, 1949
MARIA GERTRUDIS ESTRADA
SAMUEL LEEPER
EARLY ROBBINS
JAMES L. UNDERWOOD
SEABORN SMITH
AMERADA #1 I.B. Christian
JAMES H. THOMAS
FELIX FLORES
J. G. GARRETT
DANIEL MINOR
JOHN M. SPILLERS
HUNT #1 Oliver-Block unit
RODESSA
FIELD PALUXY
JOHN CARVER
THOMAS M. HAWKINS
J. W. STEWARD
JOHN LANE
A
A'
DOWN
EXPLANATION
-6600 Contour on top of Paluxy formation
Contoured horizon absent due to fault
Oil well
Abandoned oil well
Dry hole
Discovery well
SCALE
0 1 2 3 4 5 6
THOUSAND FEET

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Paluxy:

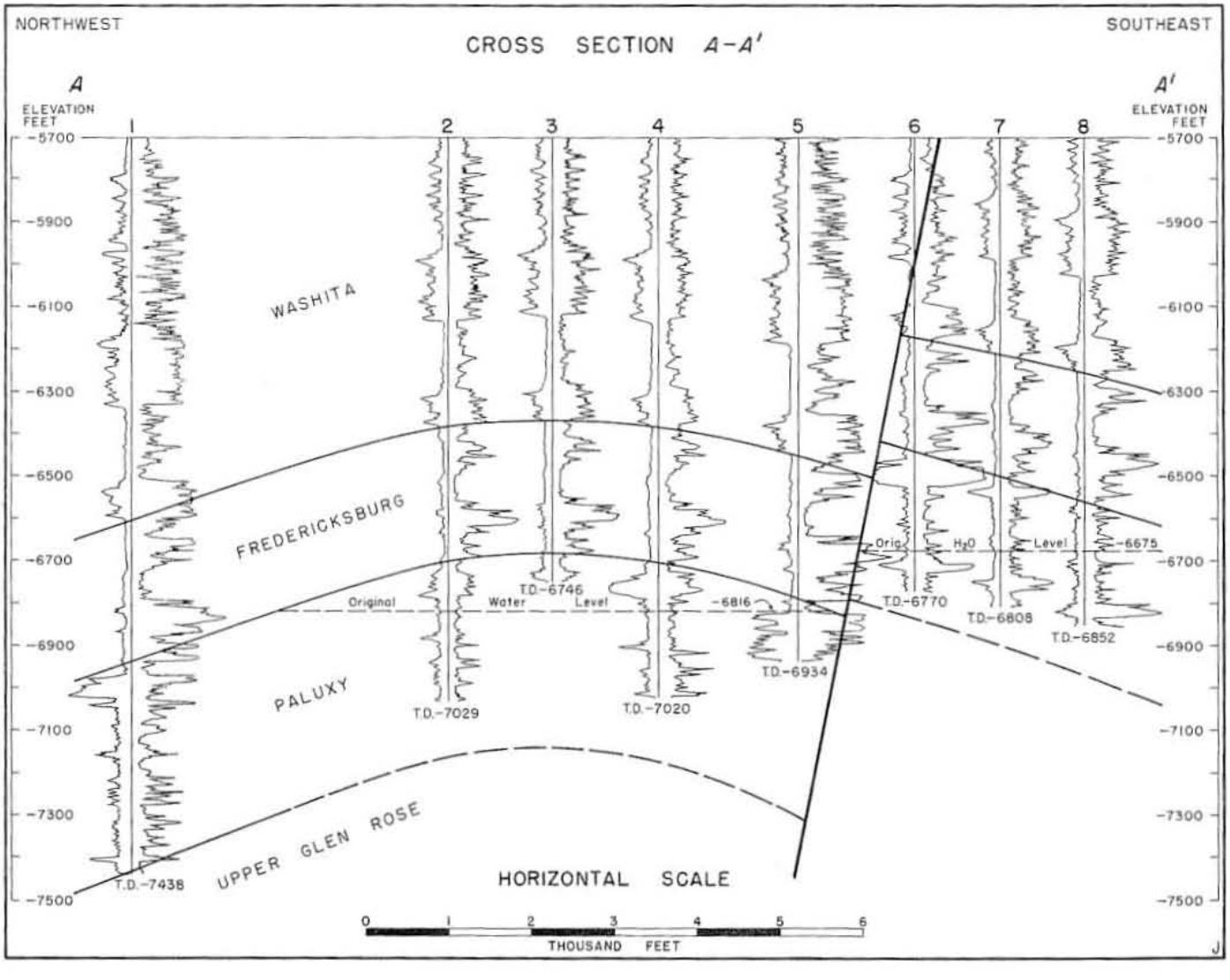
No free gas cap is present.

	Upper sands	Lower sands
Upthrown side of fault		
Elevation of top of oil, feet	-6,440	-6,678 (?)
Elevation of bottom of oil, ft.	-6,675	-6,835
Relief, feet	235	157
Downthrown side of fault		
Elevation of top of oil, feet	-6,682	
Elevation of bottom of oil, ft.	-6,816	
Relief, feet	134	

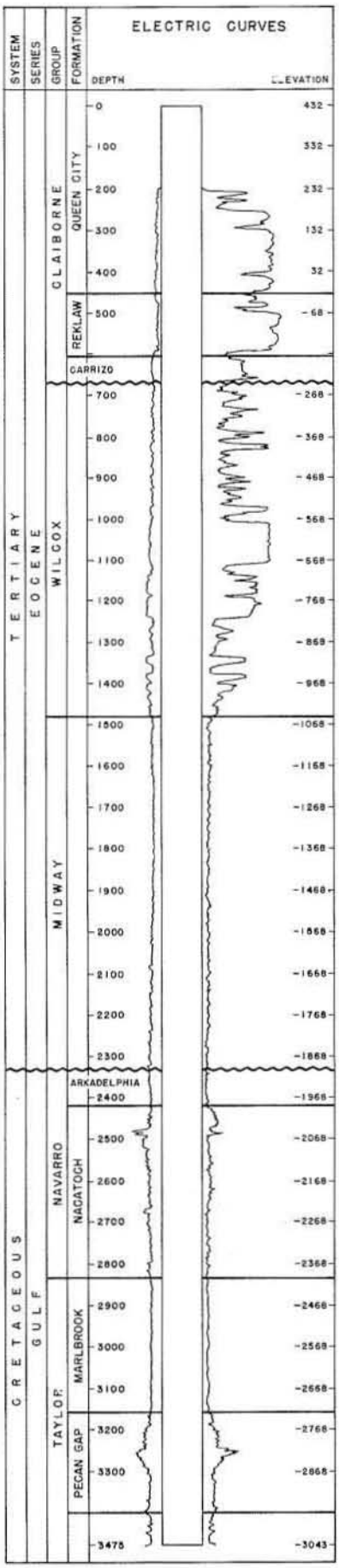
PRODUCTION HISTORY

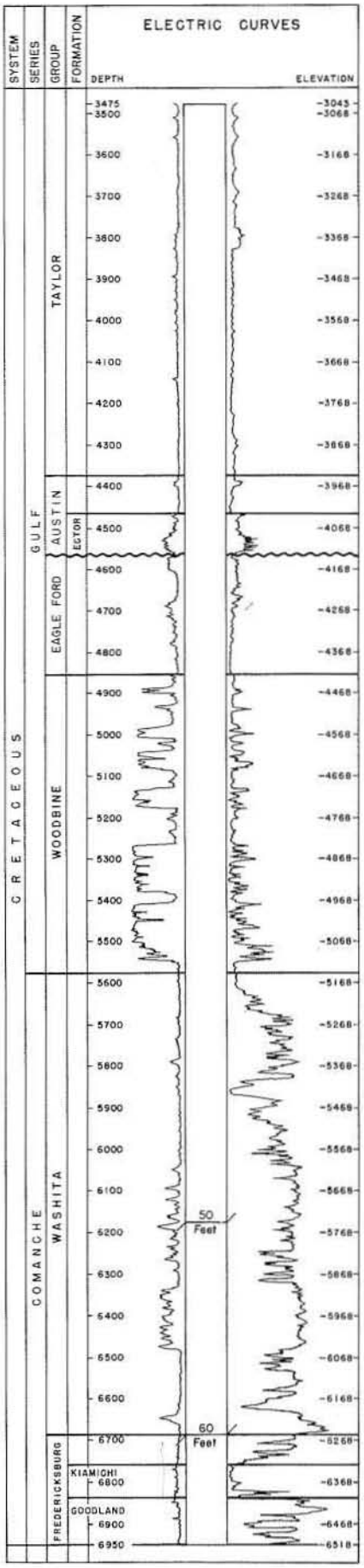
	WELLS PRODUCING at end of year		OIL PRODUCTION (barrels)	
	Flowing	Pumping	Yearly	Cumulative
Paluxy:				
1944	4	1	57,491	57,491
1945	12	2	139,456	196,947
1946	3	24	341,694	538,641
1947	2	40	693,085	1,231,726
1948	2	47	816,512	2,048,238
1949*	2	49	564,901	2,613,139
Rodessa:				
1944	-	1	1,939	1,939
1945	-	1	2,401	4,340
1946	-	1	2,051	6,391
1947	1	1	5,206	11,597
1948	2	1	9,641	21,238
1949*	2	1	4,018	25,256

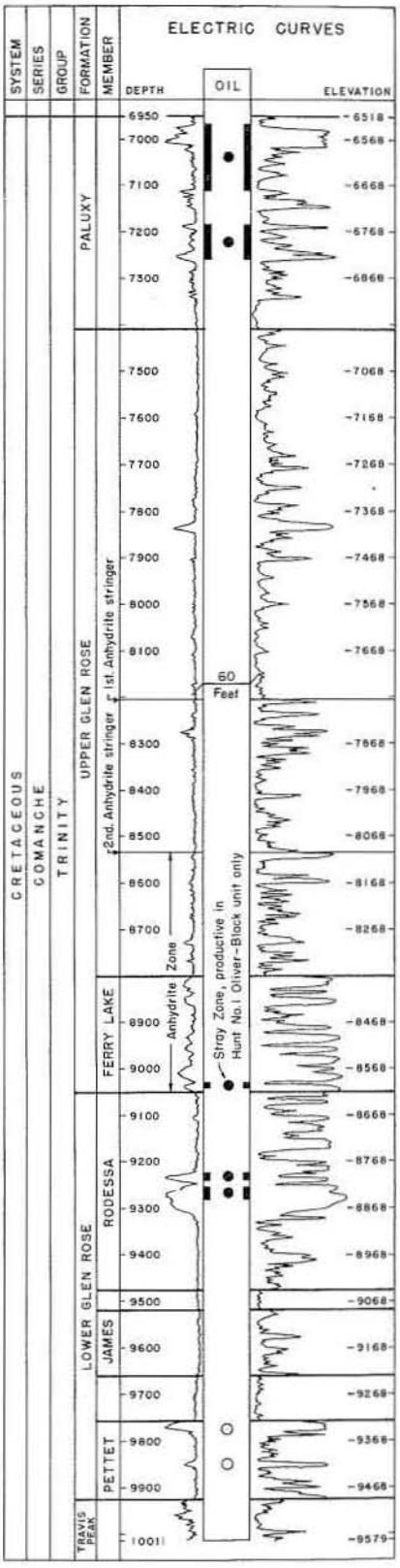
*P.S. - 1949 data added by amendment.



TYPE SECTION OF ROCKS PENETRATED







EXPLANATION

● Oil Production ○ Show of Oil

60 Feet Fault, with approximate displacement

SARDIS FIELD
Cherokee County, Texas

ELVIN M. HURLBUT, Jr.
Geologist, Shell Oil Company, Tyler, Texas
September 25, 1950

LOCATION

The Sardis field is in west-central Cherokee County about 9 miles southwest of Rusk, the county seat, and 3 miles west of the William Wise field.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Subsurface mapping.

DISCOVERY

Woodbine sand: December 18, 1947;
General Crude Oil Co. #1 J. W. Summers.

ELEVATION OF SURFACE

At well locations: Highest, 371 ft.; lowest, 344 feet.

TYPE SECTION OF ROCKS PENETRATED

The section here is essentially the same as that at the Rusk field. The reader is referred to the accompanying paper on that field.

SURFACE FORMATION

Queen City formation, Claiborne group.

OLDEST STRATIGRAPHIC ZONE PENETRATED

Woodbine sand.

NATURE OF TRAP

The accumulation appears to result either from truncation of sand across a nose or from updip decrease in permeability across a nose.

PRODUCTIVE AREA

Woodbine sand and Field: 10 acres.

THICKNESS OF RESERVOIR ROCK

Woodbine sand: 4 net feet.

LITHOLOGY OF RESERVOIR ROCK

Woodbine sand: Gray to brown, medium-grained, porous to slightly porous, ashy sandstone with irregular gray shale streaks.

CONTINUITY OF RESERVOIR ROCK

Woodbine sand: The sand which is productive in the one well in the field is present, at slightly lower elevations, at the locations of each of the two nearby dry holes.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine sand:	Feet
Elevation of top of oil in the one well	-4,800
Elevation of oil-water contact	-4,804
Relief	4

CHARACTER OF OIL

Woodbine sand: Gravity, A.P.I.: 39.9°.

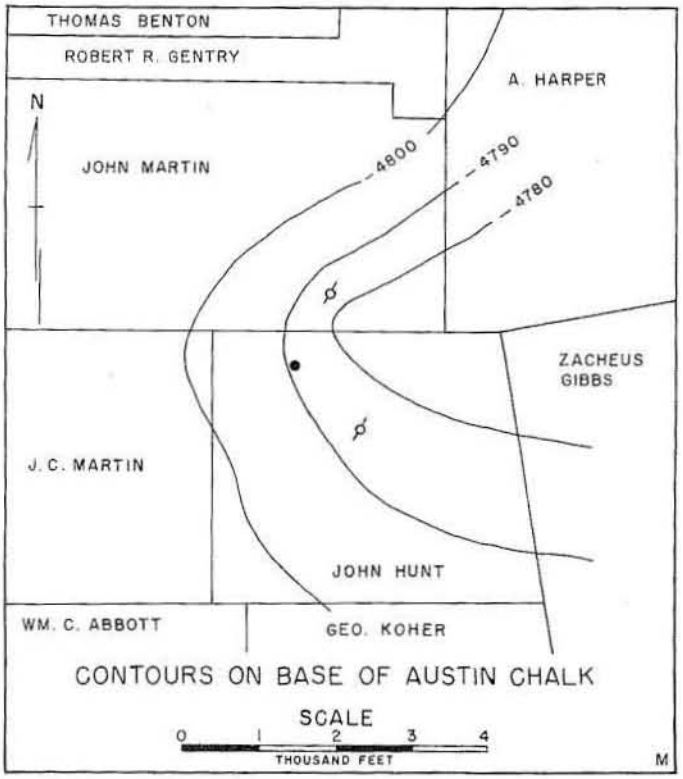
WATER PRODUCTION

Woodbine sand: On initial potential test the one well produced 173 barrels of liquid of which 33% was water. The well later ceased flowing and after recompletion pumped 207 barrels of liquid of which 47% was water.

PRODUCTION HISTORY*

Year	WELLS PRODUCING at end of year	OIL PRODUCTION (barrels) Yearly	Cumulative
1947	1	776	776
1948	0	1,088	1,864
1949	1	8,964	10,828

*Data from files of Railroad Commission of Texas.



SATIN FIELD
Falls County, Texas

GREGORY L. TURNER
District Geologist, The Pure Oil Company, Tyler, Texas
December 15, 1949

LOCATION

The Satin field is located 9 miles northwest of Marlin, the county seat of Falls County, and 2 miles northeast of the town of Satin. It is on the J. Lee Davis farm in the Pedro Zarza survey. It is situated on the northern end of a northeast-southwest trending structural terrace located in the western part of the county.

OTHER NAMES

This field has also been known as the Marlin field and as the Marlin-Satin field.

METHOD OF EXPLORATION LEADING TO DISCOVERY

The reasoning that led to the drilling of the discovery well is not known to the writer, but it is possible that the location, which is on strike with the trend of the old Chilton pool to the south, was made in an effort to extend the production of that field.

DISCOVERY

Buda lime: February 1, 1932; Dixie Oil Syndicate #1 J. Lee Davis. Pumped 180 b/d of 34° gravity oil.

ELEVATION OF SURFACE

At well locations: Highest, 369 ft.; lowest 359 feet.

SURFACE FORMATION

Lower Taylor shale.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest stratigraphic horizon penetrated within the area of the field is in the Edwards limestone. As indicated on the accompanying TYPE SECTION, a well about 700 feet to the northeast was drilled about 500 feet into the Glen Rose.

NATURE OF TRAP

Buda lime: The trap appears to result from local occurrence of relatively high porosity on the flanks of a small low-relief anticline.

PRODUCTIVE AREA

Buda lime and field: Only about 3 acres.

THICKNESS OF RESERVOIR ROCK

The total thickness of the Buda limestone is about 20 feet, of which an estimated 5 feet is productive.

LITHOLOGY OF RESERVOIR ROCK

Buda lime: Impure, fossiliferous limestone.

CONTINUITY OF RESERVOIR ROCK

The Buda formation is widely distributed throughout eastern and south-central Texas. On well logs it can be traced from its outcrop eastward to the flanks of the Sabine uplift and southward into the Gulf Coast area. It has been found to be locally porous at several places, but there is no extensive continuity of the porous condition. This formation is productive in the Chilton field and in the Lott field, both in Falls County southward from the Satin field.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

	Feet
No free gas	
Highest proven elevation of oil	-549
Lowest proven elevation of oil	-552
Proven relief of oil column	3

CHARACTER OF OIL

	Max.	Min.	Wt.Avg.
Gravity, A.P.I.	34.5°	33.9°	34.2°

Sulphur: 0.4% Base: Paraffin

PRODUCTION HISTORY

Buda lime and Field totals:

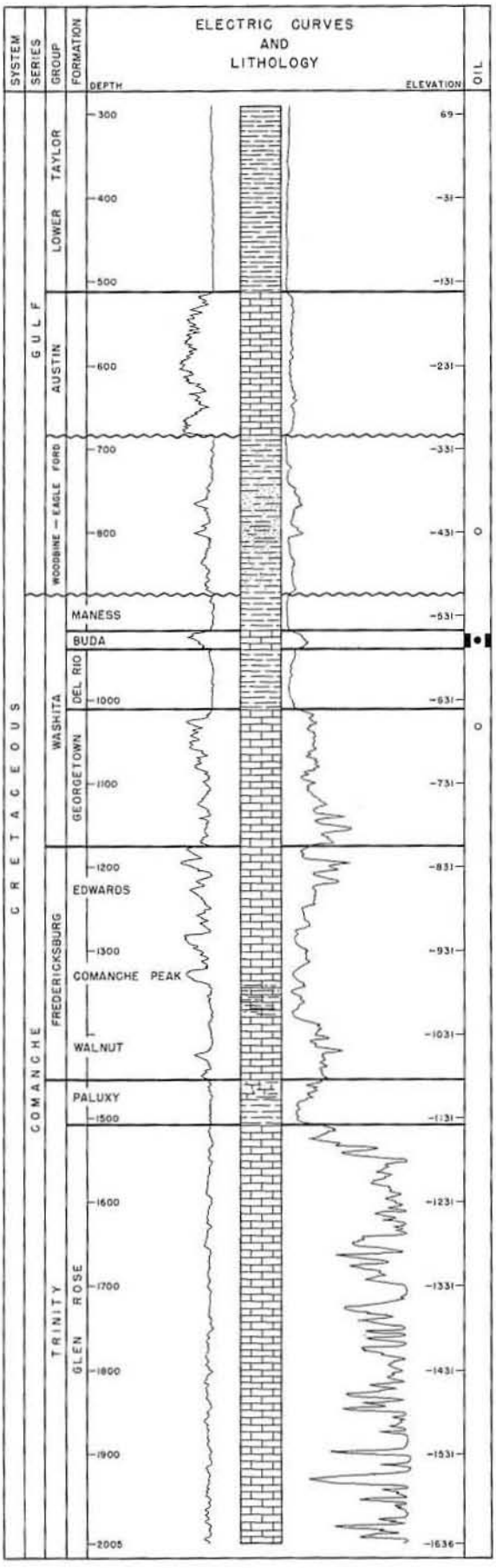
Year	WELLS PRODUCING at end of year: Oil-Pumping	OIL PRODUCTION (barrels): Yearly	Cumulative
1932	2*	5,600	5,600
1933	1	4,400	10,000
1934	1	1,200	11;200
1935	0	440	11,640

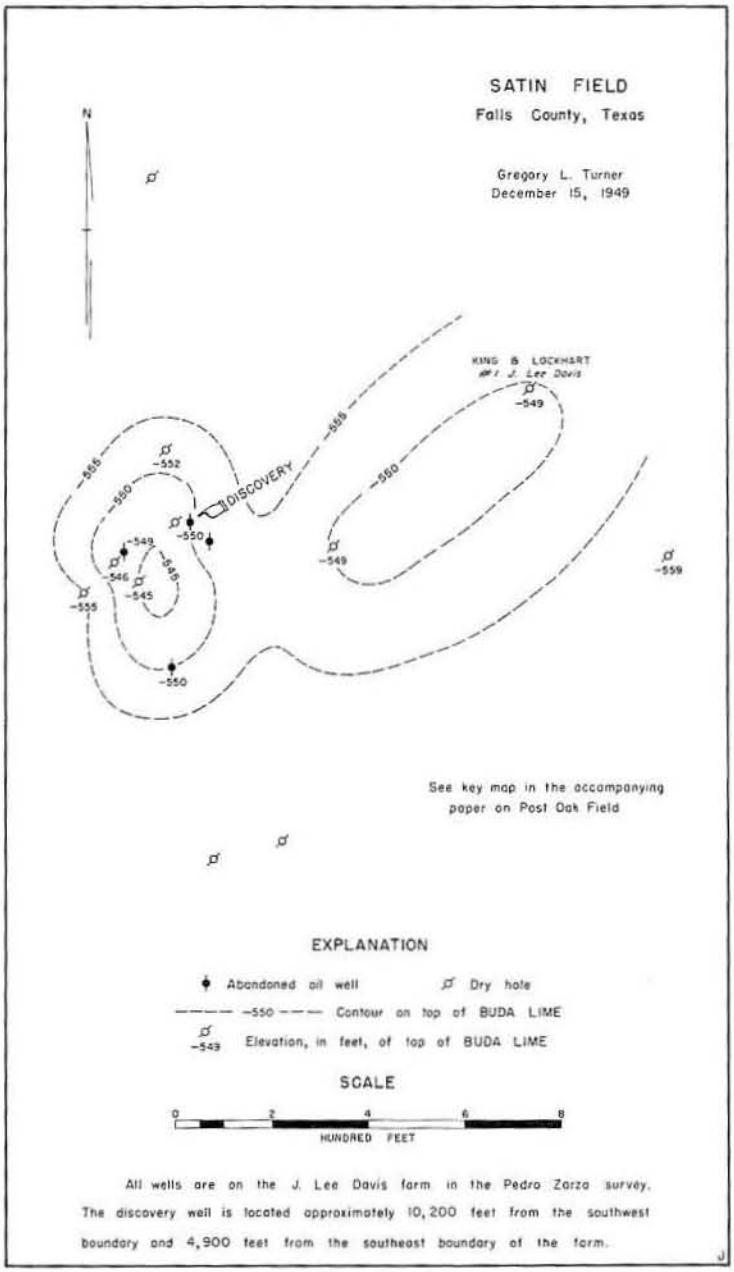
*Drillers records indicate that two additional wells produced a small amount of oil in 1932.

Data relative to water production and acid treatment are not available.

TYPE SECTION OF ROCKS PENETRATED

IN VICINITY OF SATIN FIELD





The accompanying TYPE SECTION OF ROCKS PENETRATED is based on the log of King & Lockhart, #1 J. Lee Davis.

EXPLANATION

- Oil production
- O Show of oil
- Shale
- Limestone
- Sand

SCOTTSVILLE FIELD
Harrison County, Texas

JACK M. DeLONG
Geologist, Stanolind Oil and Gas Company, Tyler, Texas
April 26, 1949

LOCATION

The Scottsville field, 11 miles east of Marshall, county seat of Harrison County, and 8 miles northwest of the Waskom field, is situated on the west flank of the Sabine uplift.

METHODS OF EXPLORATION LEADING TO DISCOVERY

The nature of the information which led to the drilling of the discovery well is not known to the writer. It is assumed, however, that the initial drilling was made on seismograph information as Arkansas Fuel Oil Co. conducted reflection seismograph and gravity meter surveys in the area in 1944 and 1945.

DISCOVERY

Travis Peak sand: April 19, 1947;
Arkansas Fuel Oil Co. #1 M. C. McCauley.

NATURE OF TRAP

Travis Peak sand: Lenticular reservoir.

THICKNESS OF RESERVOIR ROCK

Travis Peak sand: 10 feet with 4 feet net productive.

LITHOLOGY OF RESERVOIR ROCK

Travis Peak sand: Sandstone, gray to tan fine-grained ashy.

CONTINUITY OF RESERVOIR ROCK

Travis Peak sand: The continuity of the producing sand is not known as only 2 wells have been drilled in the area. The producing sand is not present in the second well, located 1,100 feet to the north.

PRODUCTION HISTORY

Travis Peak sand and Field: The one well in the field produced 1,630 barrels of oil and then ceased flowing. The well was worked over in July 1947 and put on pump. Total production for 1947 (April 19 to December 31) was 3,454 barrels of oil. The well produced 2,236 barrels of oil during 1948, and 1,489 barrels during 1949*.

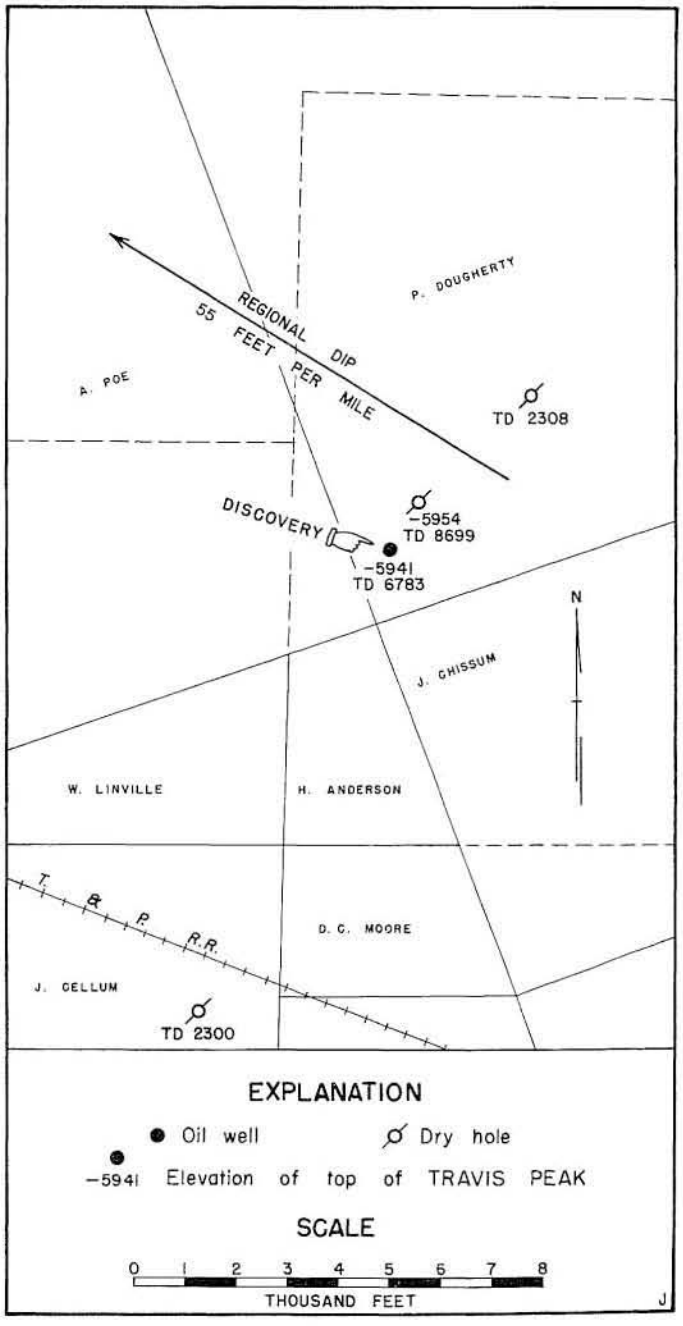
*P.S. - Amended to include the whole of 1949.

ELEVATION OF PRODUCTIVE ZONE

Travis Peak sand: -6,124 feet.

CHARACTER OF OIL

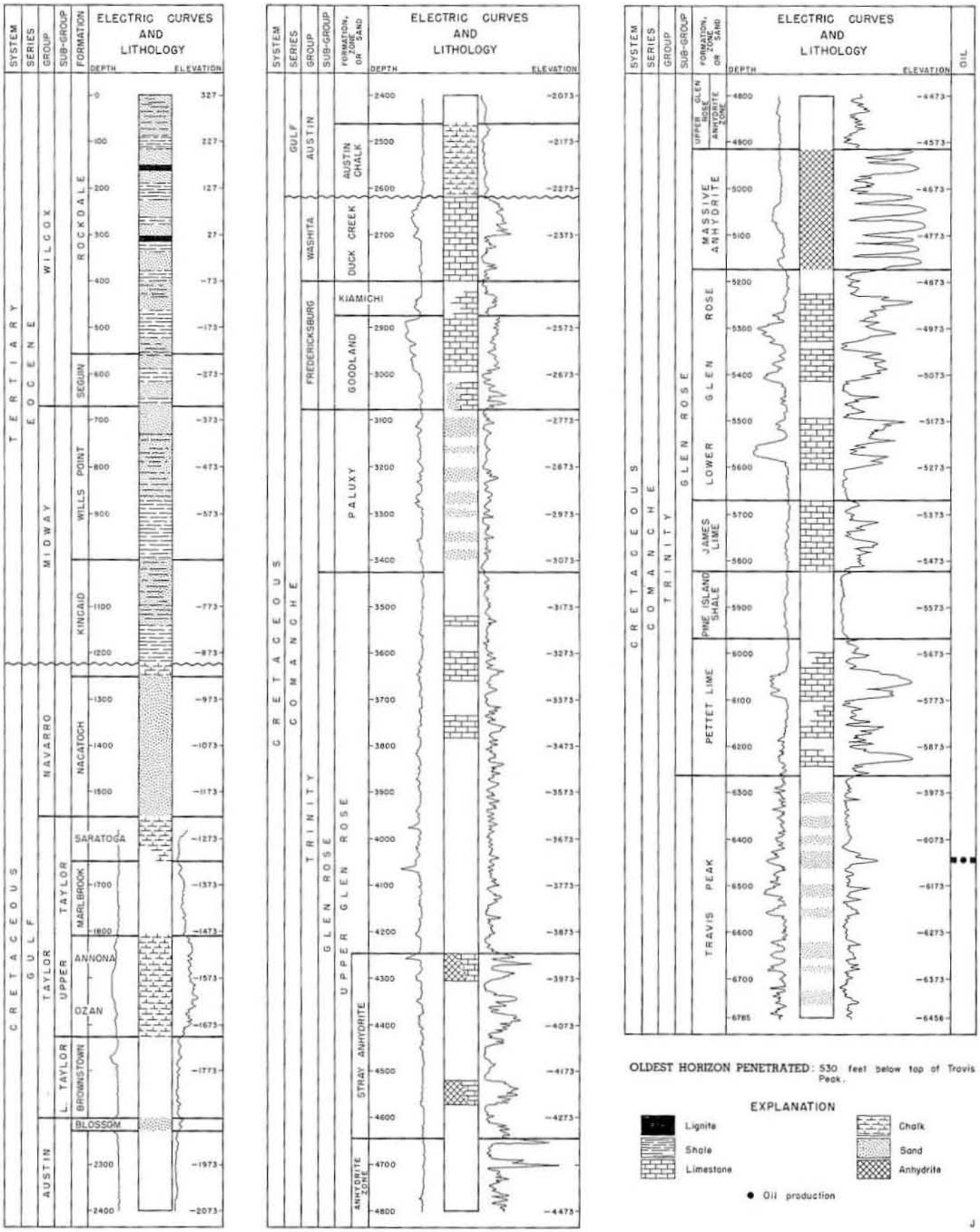
Travis Peak sand: Gravity, 41°.



SECTION OF ROCKS PENETRATED

SURFACE FORMATION: Rockdale

ELEVATION OF SURFACE: 322 feet



OLDEST HORIZON PENETRATED: 530 feet below top of Travis Peak.

EXPLANATION

Lignite
Shale
Limestone
Chalk
Sand
Anhydrite
● Oil production

SESSIONS FIELD
Cherokee County, Texas

W. ALLAN RATCLIFF
Research Assistant, Bureau of Economic Geology, Austin, Texas
November 20, 1950

LOCATION

The Sessions field is in the Jose Maria Musquez survey in east-central Cherokee County, about 10 miles east of Rusk, the county seat.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Interpretation of surface and subsurface data.

DISCOVERY

Woodbine sand: April 25, 1948;
R. J. Caraway #1 Aaron Sessions. Initial potential was 22,000 Mcf of gas per day from depth 4,403-4,417 feet.

ELEVATION OF SURFACE

At well locations: Highest, 280 ft.; lowest, 267 feet.

SURFACE FORMATION

Claiborne group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

118 feet below the top of the Woodbine.

STRUCTURE

Anticline.

PRODUCTIVE AREA

Woodbine sand and Total field: About 200 acres.

THICKNESS OF RESERVOIR ROCK

Woodbine sand: Net productive, 3 to 14 feet.

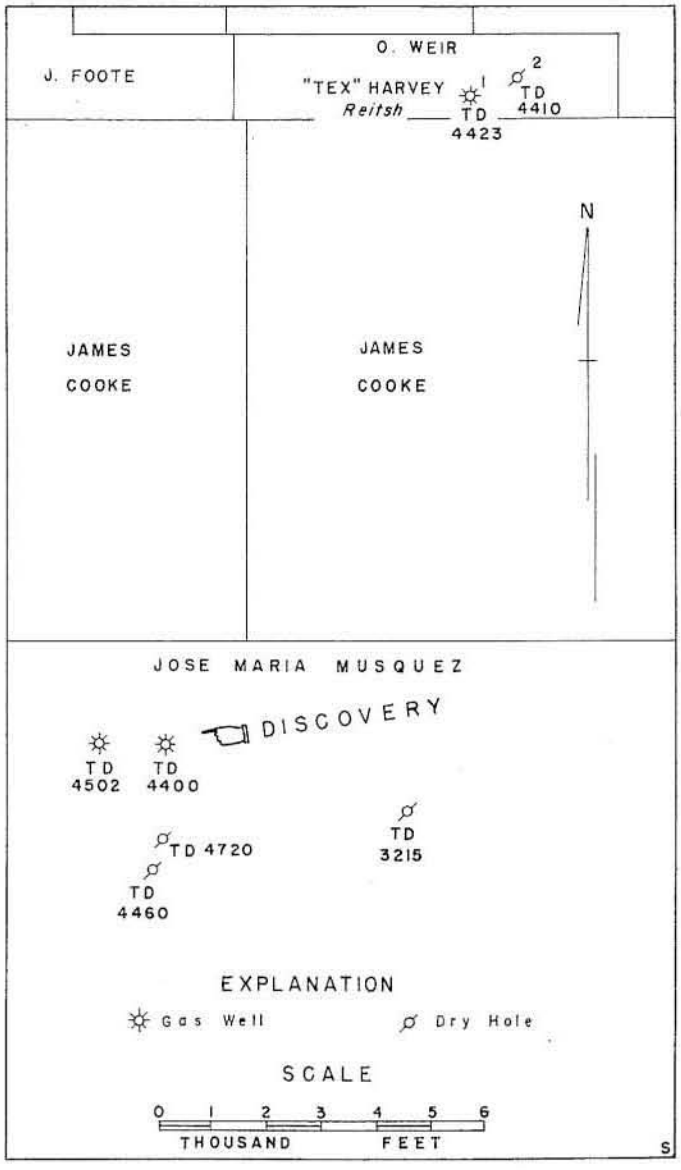
ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine sand	Feet
Elevation of top of gas	-4,105
Elevation of bottom of gas	-4,137
Relief	32

PRODUCTION HISTORY

On November 14, 1948, a second well was completed, the R. J. Caraway #1 L. N. Bolls, with an initial potential of 37,500 Mcf of gas per day. Both wells have been shut-in since completion and no production has been recorded.

A nearby well shown on the accompanying map was not generally regarded as discovering a commercial field at the time of its completion. In February 1946, "Tex" Harvey Oil Co. #1 Reitsh, on the O. Weir survey, about $2\frac{1}{2}$ miles northeast of the Sessions discovery well, was completed with an initial potential of 20 Mcf of gas per day. This well has been shut-in since completion.



SOUTH BOSQUE FIELD
McLennan County, Texas*

J. C. PRICE
Geologist, Magnolia Petroleum Company, Tyler, Texas
November 30, 1949

LOCATION and INTRODUCTION

The South Bosque field is located approximately 8 miles southwest of the city of Waco, McLennan County, Texas, and covers an area approximately ½ mile wide and 3 miles long, extending from the vicinity of the town of South Bosque to Hog Creek. At least 123 oil wells have been completed in the field since its discovery. Much of the information relative to this field is conflicting and unreliable. There are very few good records of the wells available at this time.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Shows of oil had been encountered in water wells in the area for a number of years before the discovery well was drilled. According to reliable information, a few barrels of oil were bailed from a water well dug in this vicinity in 1890 on the farm of Colonel William L. Prather. Mr. E. S. Cluck, who drilled many of the producing wells in the field, reports that one deep water well had been drilled to the Basal Trinity sands prior to discovery of the field. This well had shows of oil at a depth of approximately 470 feet.

DISCOVERY

Lower Walnut sand and Field: Approximately 1902; probably Goldstein - Migel #1 Grim.

ELEVATION OF SURFACE

At well locations: Highest, 551 ft.; lowest, 425 feet.

SURFACE FORMATIONS

Del Rio shale and Georgetown limestone of the Washita group outcrop within the limits of the field.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated within the actual limits of the field is a few feet below the top of the Glen Rose limestone. However, the Bellrose Deep Test, just southeast of the field, was drilled into the Basal Trinity sands.

*Published by permission of Magnolia Petroleum Co.

STRATIGRAPHIC SECTION

The accompanying TYPE SECTION OF ROCKS PENETRATED is based on the log of a water well which is located 5 miles east of, and considerably downdip from, the South Bosque field. This is the nearest well affording electric log control. The section encountered in it is considered as typical of rocks penetrated in the vicinity. In general, the stratigraphic units are thicker in this well than in the field. The section includes sediments above those penetrated within the area of the field.

In designing the accompanying TYPE SECTION, the surface elevation was arbitrarily indicated as 1,051 feet in order to indicate approximately the correct elevations of the stratigraphic units within the area of the field. This results in indicating depths about 500 feet greater than actual depths.

Although the reservoir rock is not productive at the location of this well, its stratigraphic position is indicated on the accompanying TYPE SECTION and at the approximate correct elevation of 65 feet above sea level.

NATURE OF TRAP and STRUCTURE

The producing sand is thin and erratic throughout the field. In some wells scattered throughout the field, the porosity pinches out completely. It is possible that a pinchout of porosity and permeability is influential in controlling the accumulation.

From available sub-surface data, the author is not able to definitely determine the structure. Surface reversal is present on Hog Creek near the north edge of the field, suggesting the existence of anticlinal closure. A field map by W. S. Adkins showing such closure was published in 1923.

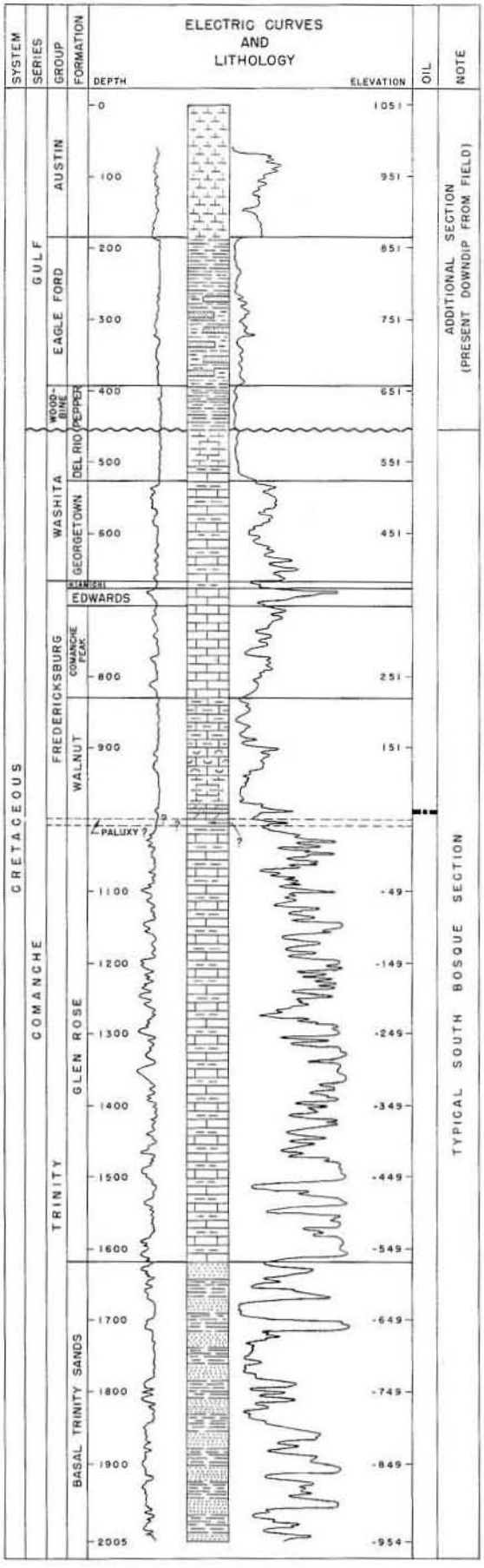
PRODUCTIVE AREA

Lower Walnut sand and Field: The accompanying map is based on one with well locations which was drawn in 1926 by Frank Bryan, now Consulting Geologist in Groesbeck, Texas. This map indicates a productive area of approximately 1,600 acres. Other reliable sources** report the productive area as high as 2,500 acres.

**A.I.M.E., Petroleum Division; Petroleum Development and Technology, Transactions, 1933-1945, and Statistics of Oil and Gas Development and Production, 1946-1949.

TYPE SECTION OF ROCKS PENETRATED

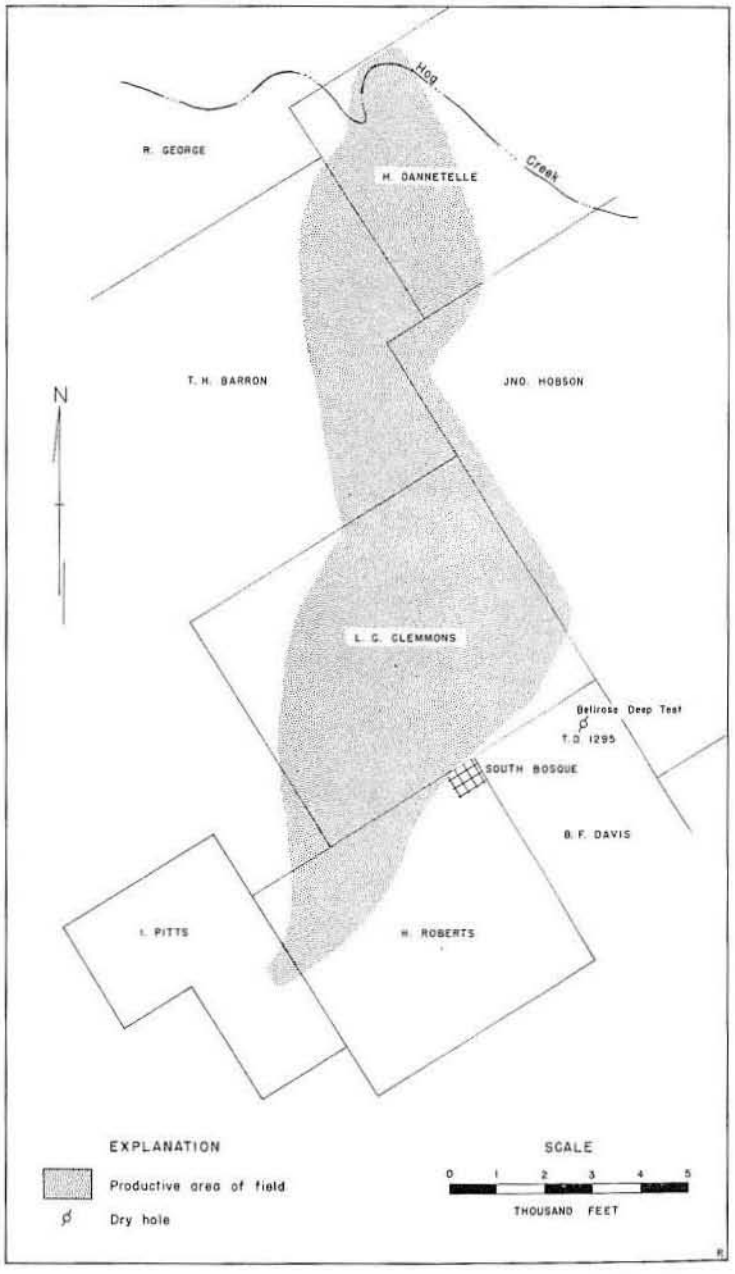
IN VICINITY OF SOUTH BOSQUE FIELD



EXPLANATION

- Chalk
- Limestone
- Dolomitic limestone
- Shale
- Argillaceous limestone
- Sand
- Shale and flaggy sandstone
- Alternating sands and shales
- Calcareous shale
- Oyster shell aggregate and limestone
- Limestone and shale
- Oil production

See "STRATIGRAPHIC SECTION" in text



THICKNESS OF RESERVOIR ROCK

Lower Walnut sand: Varies from ½ foot to 3 feet.

LITHOLOGY OF RESERVOIR ROCK

Lower Walnut sand: Lenticular sand grading into sandy limestone, shale or dolomite.

CONTINUITY OF RESERVOIR ROCK

Lower Walnut sand: The continuity of the reservoir rock is unknown due to lack of reliable logs in the vicinity.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Lower Walnut sand: Elevation of the productive zone is approximately 65 feet above sea level. Relief is unknown due to lack of reliable logs within the field.

CHARACTER OF OIL

Lower Walnut sand: Gravity, A. P. I., 42°.

WATER PRODUCTION

From available data the author is unable to definitely determine whether the producing formation ever made water. Most well abandonments have been due to casing failure or some other purely mechanical reason. Some wells have been abandoned because it was economically unfeasible to operate them due to the very small amount of oil they would produce by pumping or bailing.

SELECTED REFERENCES

Adkins, W. S. (1923) Geology and mineral resources of McLennan County: University of Texas Bulletin No. 2340.

Specific reference is made to the following publications which deal with the somewhat controversial Walnut-Paluxy-Upper Glen Rose interval in this area.

Lozo, F. E. (1949) Stratigraphic relations of Fredericksburg limestone, north-central Texas: Shreveport Geological Society, Guide Book, 17th Annual Field Trip, Cretaceous of Austin, Texas Area.

Thompson, S. A. (1935) Frecericksburg Group of the Lower Cretaceous, with special reference to north-central Texas: Amer. Assoc. Petr. Geol., Bull., vol. 19, no. 10, pp. 1508-37.

PRODUCTION HISTORY

Lower Walnut sand and Total field:

Year	WELLS PRODUCING at end of year — Oil — Pumping or bailing	OIL PRODUCTION (barrels) — Yearly	Cumulative
1902-1932	Not available.	Not avail.	57,450
1932		8,400	65,850
1933	60	8,550	74,400
1934		6,570	80,970
1935		3,480	84,450
1936		4,380	88,830
1937	30	4,531	93,361
1938	37	3,865	97,226
1939	54	3,402	100,628
1940	49	4,660	105,288
1941	49	4,297	109,585
1942	35	3,386	112,971
1943	35	2,766	115,737
1944	28	2,428	118,165
1945	28	2,550	120,715
1946	28	2,356	123,071
1947	28	2,656	125,727
1948	28	2,490	128,217
1949*	2	2,370	130,587

MONTHLY HISTORY*

1949	WELLS PRODUCING at end of month — Pumping or bailing	OIL PRODUCTION (barrels) — Monthly
August	28	212
September	19	204
October	2	64
November	11	235
December	2	145
1950		
January	2	23
February	2	90
March	2	16
April	2	98

*1949 and 1950 data added by amendment.

SOUTHERN PINE FIELD
Cherokee County, Texas

JAMES A. WEBB
Geologist, W. B. Hinton, Mt. Pleasant, Texas
March 10, 1951

LOCATION

This one-well field is located 10 miles southwest of Alto. It is at the west edge of Cherokee County near the common corner of Cherokee, Anderson and Houston counties.

METHODS OF EXPLORATION LEADING TO DISCOVERY

The discovery well was drilled on a Continental Oil Company farmout. Continental had taken the block on the basis of seismic work.

DISCOVERY

Woodbine: September 14, 1948; Geier-Jackson #1 Southern Pine Lumber Co., T. N. Jones survey. Flowed at daily rate of 219.43 barrels of oil and 73.55 barrels of salt water through perforations at 5,313 to 5,315 feet; 3/4-inch tubing choke; pressure, 125 psi. on tubing and 490 psi. on casing.

ELEVATION OF SURFACE

At discovery well, derrick floor: 332 feet.

SURFACE FORMATION

Queen City.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated in the one productive well is 212 feet below the top of the Woodbine group.

NATURE OF TRAP

Woodbine: Trap appears to be due to updip lensing.

PRODUCTIVE AREA

Woodbine and Field: Not more than 40 acres.

THICKNESS OF RESERVOIR ROCK

Woodbine: 4 feet.

LITHOLOGY OF RESERVOIR ROCK

Woodbine: Clean, medium-grained sand.

CONTINUITY OF RESERVOIR ROCK

Woodbine: The productive sand is evidently quite local. Wells 1/4 mile east, north, northwest and southwest did not find sand at this stratigraphic position.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine	Feet
Elevation of top of oil	-4,914
Elevation of bottom of oil	-4,918
Relief	4

The above figures merely represent elevations and relief in the one productive well.

CHARACTER OF OIL

Woodbine: Gravity, A. P. I.: 24°.

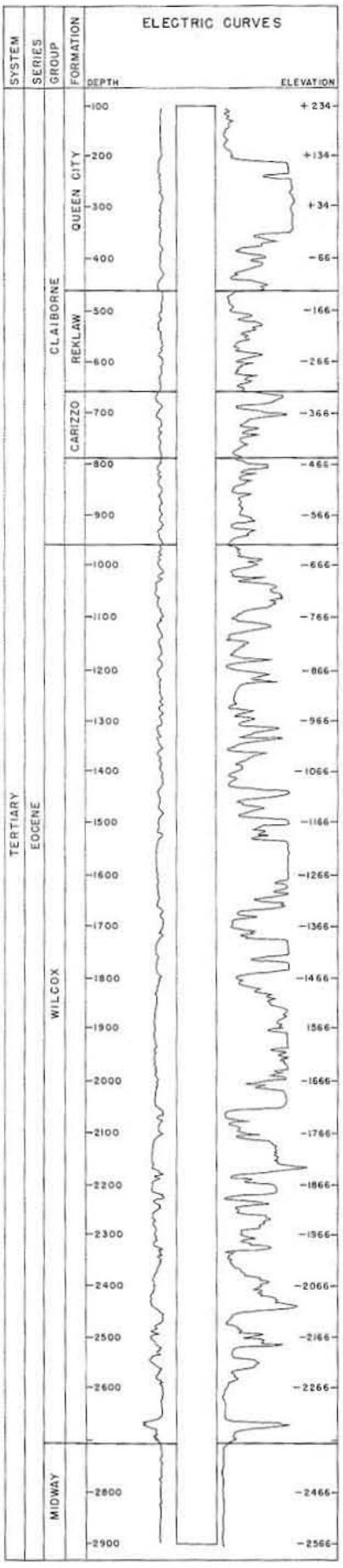
WATER PRODUCTION

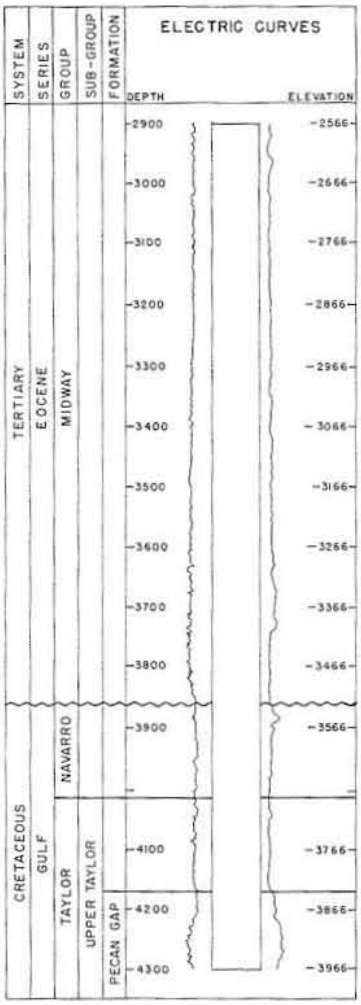
Woodbine: At time of discovery, water constituted about 25% of gross production. The ratio of water has considerably increased.

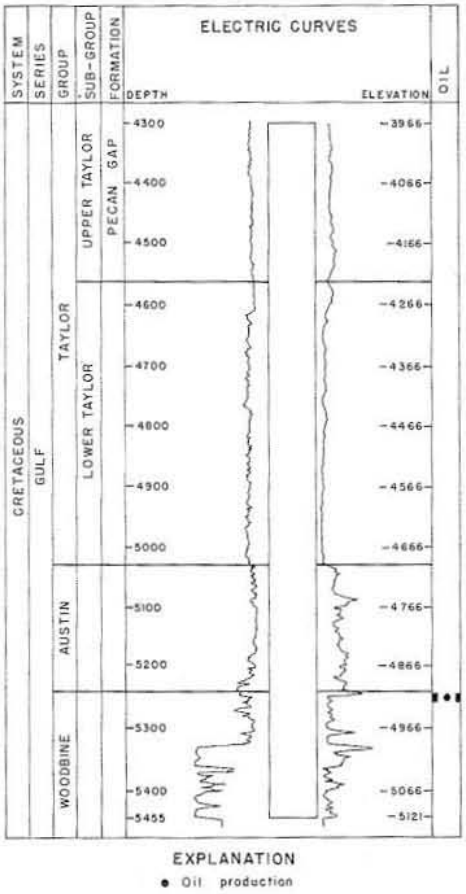
PRODUCTION HISTORY

Woodbine and Field: Total production of the one well to January 1, 1951, amounted to 9,533 barrels.

TYPE SECTION OF ROCKS PENETRATED

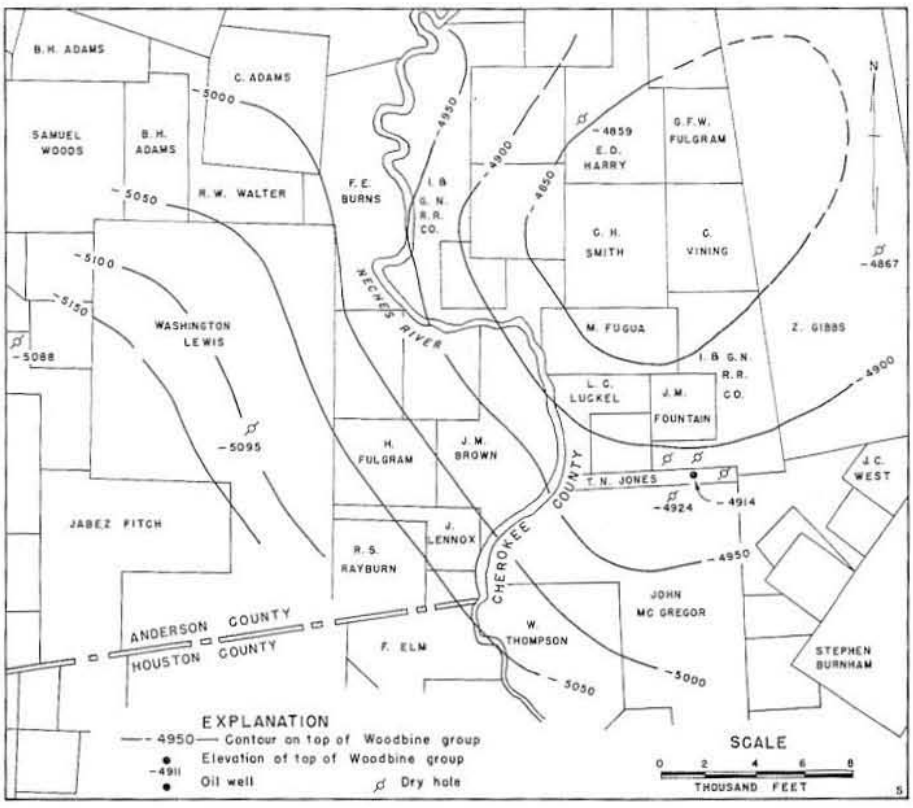






EXPLANATION

● Oil production



SOUTH GROESBECK FIELD
Limestone County, Texas

W. A. REITER
Consulting Geologist, Houston, Texas
February 24, 1950

LOCATION

The South Groesbeck field is a depleted field 3½ miles west of Groesbeck, county seat of Limestone County. It is in the Mexia-Tehuacana fault graben system. It is the southernmost field in which the Woodbine sand has been found productive. It is the southernmost field in which the Nacatoch sand has produced in important quantity.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Similarity of the outcrop of the Tehuacana limestone in this vicinity to the outcrop of the same limestone in the Mexia field is believed to have led to the drilling of the discovery well.

DISCOVERIES

Nacatoch sand: 1916
Frank Smith #1 W. J. Welch
Woodbine sand, gas: 1924
(?) #1 Dr. T. J. Holton
Woodbine sand, oil: About 1926
Pure Oil Co. #1 T. A. Stockton

TYPE SECTION OF ROCKS PENETRATED

For information relative to the stratigraphic section penetrated in this field, the reader is referred to the accompanying paper on the North Groesbeck field. The stratigraphic section is essentially the same in the two fields, which are separated by a distance of only about 1½ miles.

ELEVATION OF SURFACE

At well locations: Highest, 520 ft.; lowest, 480 feet.

SURFACE FORMATIONS

Wills Point clays and shale (upper Midway) and Tehuacana limestone (lower Midway.)

OLDEST STRATIGRAPHIC HORIZON PENETRATED

200 feet into the Travis Peak formation. This penetration was at the indicated location in the Wm. Jones survey.

PRODUCTIVE AREAS

	Acres (approx.)
Nacatoch sand, gas	430
Woodbine sand, gas	275
Woodbine sand, oil	30
South Groesbeck field	725

NATURE OF TRAPS and STRUCTURE

The traps, one in Nacatoch and two in Woodbine, are formed by a combination of folding and faulting as indicated by the accompanying maps. The Woodbine gas and the Woodbine oil were in separate distinct traps. The three traps are on a major faulted anticline trending northeast-southwest in a region where the regional dip is southeast. The accumulations were on the upthrown side of the fault, which branches within the area of the field. The fault is down to the northwest with a maximum throw at the top of the Woodbine sand of about 400 feet.

THICKNESSES OF RESERVOIR ROCKS

Nacatoch sand: 90 feet of sand.
Woodbine sand: 15 feet of poor sand.

LITHOLOGY OF RESERVOIR ROCKS

Nacatoch sand consists of several sands separated by shale.

Woodbine sand is a poor sand containing some shale.

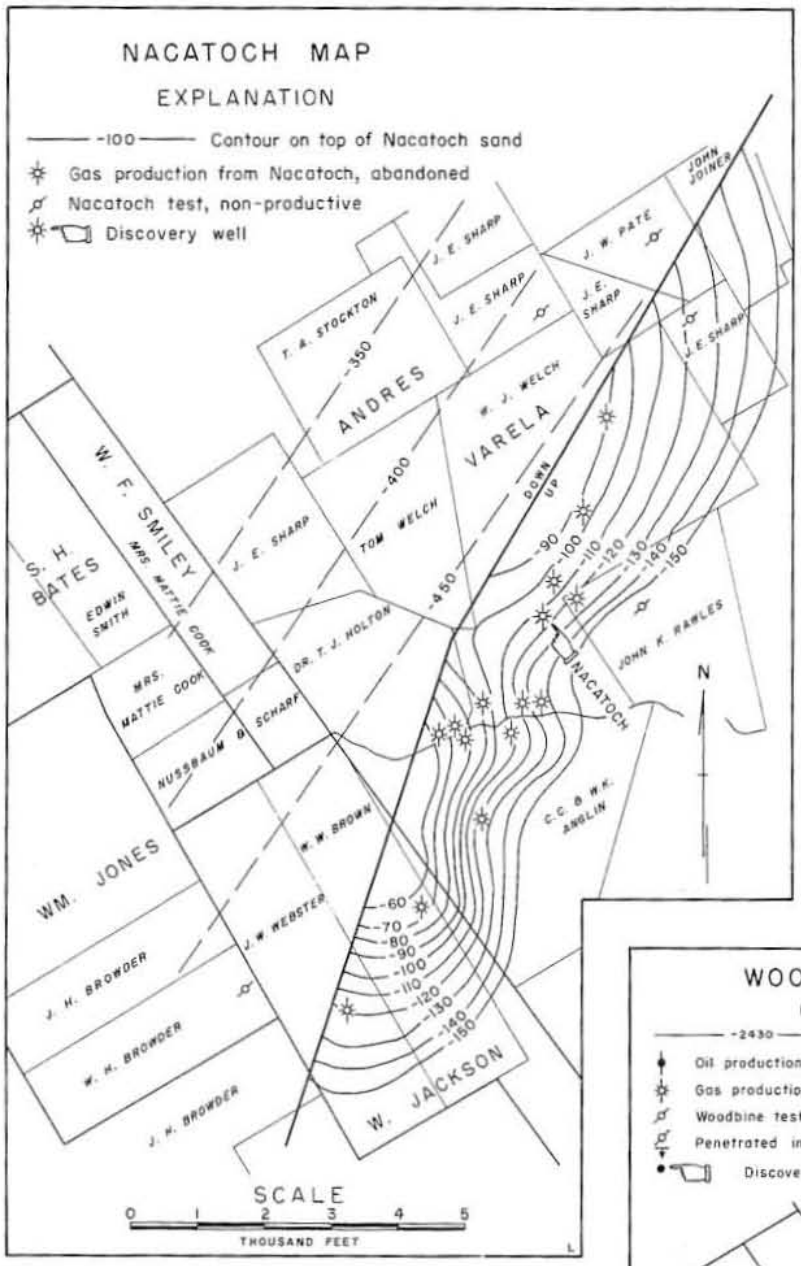
CONTINUITY OF RESERVOIR ROCKS

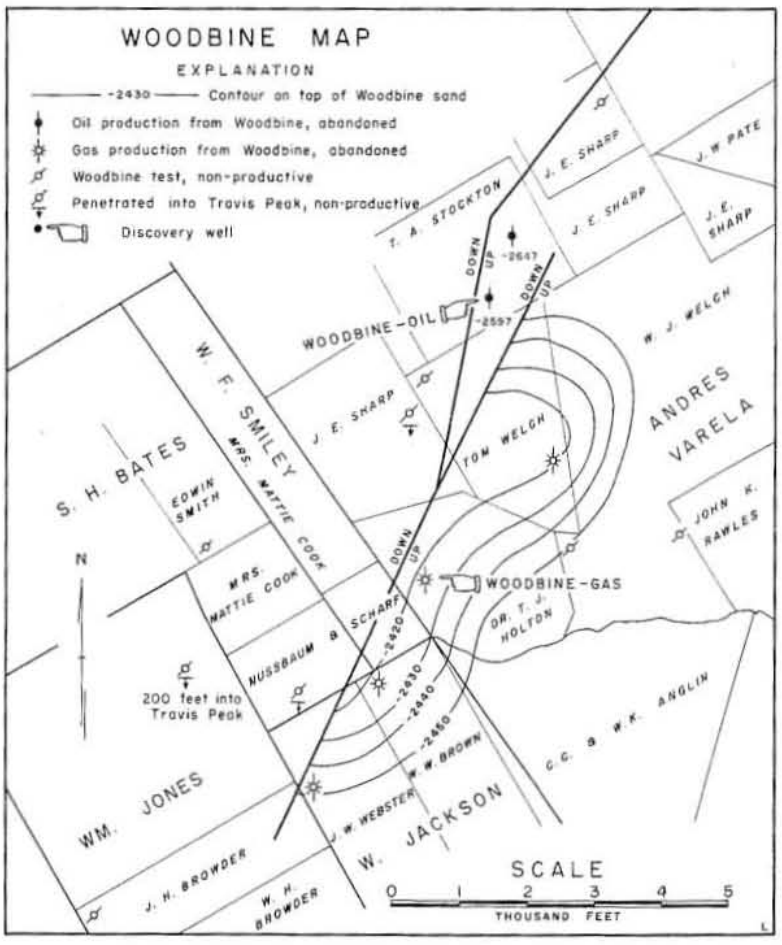
Nacatoch sand consists of several sands each of which thickens and thins and shales out completely and then appears again laterally as a good sand. The Nacatoch formation as a whole appears to be continuous over a very large area.

Woodbine sand in this field is correlative with the main pay sand of the Mexia field. It lenses out completely a few miles south of this field.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Feet
Nacatoch sand	
Elevation of top of gas	- 65
Elevation of bottom of gas	-140
Relief	75
No oil was found	
Woodbine sand	
Southeast of fault	
Elevation of top of gas	-2,410
Elevation of bottom of gas	-2,450
Relief	40
No oil was found	
Between branches of fault	
No free gas cap was found	
Elevation of top of oil	-2,597-
Elevation of bottom of oil	-2,647+
Relief	50+





PRODUCTION HISTORY

The records pertaining to the gas produced in this field are so confused with the records of other fields, particularly the Mexia and North Groesbeck fields, and are so indefinite that it appears impractical to endeavor to present such data as would have normal value in technical studies. At best, with any amount of effort, only gross approximations could be made. It appears that, at least as to most of the production, the quantity of gas was not determined, that royalty was on a well per year basis and that much of the gas from this field was intermingled with gas from other fields before metering.

Nacatoch sand: About 15 wells produced gas from the Nacatoch sand. This gas went into a pipe line system which supplied Angus, Corsicana, Groesbeck, Mart, Mexia, Teague, Tehuacana, Waco and Wortham. It appears that the reservoir was essentially depleted before the end of 1919.

Woodbine sand, gas: Four wells produced gas from the Woodbine sand. The gas was utilized by The Pure Oil Company in the production of oil from the Woodbine sand in the Mexia field. It appears that the reservoir was essentially depleted before the end of 1930.

Woodbine sand, oil: Two wells operated by The Pure Oil Company produced a total of about 4,000 barrels of high-gravity oil before their abandonment in about 1929.

SELECTED REFERENCES

Lahee, F. H. (1929) Oil and gas fields of the Mexia and Tehuacana fault zones, Texas: Amer. Assoc. Petr. Geol., Structure of typical American Oil fields, vol. 1, pp. 304, 307, 308, 311, 312, 339, 340, 352, 353, 357, 358, 362, 363.

Ley, H. A., and Willson, K. M. (1934) Gas fields in northeast Texas embayment: Amer. Assoc. Petr. Geol., Geology of natural gas, pp. 651, 667, 671, 673, 674, 678, 679.

Matson, G. C. (1916) Gas prospects south and southeast of Dallas: U. S. Geol. Sur., Bull. 629, pp. 77-110, plate VI.

SOUTH HENDERSON FIELD
Rusk County, Texas

HASTINGS MOORE
District Geologist, Danciger Oil & Refining Company, Henderson, Texas
January 15, 1950

LOCATION and DEFINITION

The only well in this field is about two miles south of the town of Henderson, county seat of Rusk County. Although the limits of the field are not definitely established, it seems unlikely that any further development would prove it to cover an area of more than about 640 acres. Although the structural contours on top of the Pettet lime as sketched on an accompanying map (fig. 3, Henderson field) are quite speculative, their positions seem to be sufficiently definite to preclude any materially different interpretation of the structural conditions. It appears that commercial accumulation of oil and gas may be limited to Pettet-F and Travis Peak, and that the productive area is limited by structural conditions. Therefore, the boundary of the field appears to be about as indicated on figure 1 in the paper on the Henderson field.

MAPS

Because of the geographic and geologic relationships with the Henderson field, certain data pertaining to this field are presented on a set of maps included in the accompanying paper on that field.

METHODS OF EXPLORATION LEADING TO DISCOVERY

The methods of exploration which led to discovery included mapping of surface outcrops, seismic surveys, and interpretation of subsurface data. The exploration history of the Henderson field applies also to this field.

DISCOVERIES

Pettet-F: May 5, 1949; Delta Drilling Co. #1 Rayford. The one well in the field was re-completed. Initial production, 12 barrels of 43° gravity oil per day on pump.

Travis Peak: March 26, 1946; Delta Drilling Co. #1 Rayford. Initial production, 655 Mcf per day plus 13 barrels condensate of 61° gravity.

STRATIGRAPHIC SECTION

The data pertaining to stratigraphic section presented in the paper on the Henderson field apply to this field with the exception that Pettet-A, B and C zones are thought to lack sufficient porosity and permeability to produce at a commercial rate.

The one well here was drilled into the Travis Peak formation to a total depth of 7,519 feet (sub-sea elevation, -7,124 feet). The top of the Travis Peak is at -6,910 feet.

ELEVATION OF SURFACE

The surface at the one well in the field is 395 feet above sea level.

SURFACE FORMATION

Delta Drilling Co. #1 Rayford started at about 1,200 feet above the bottom of the Wilcox group. The upper members of this group are at the surface throughout the area of the probable extent of the field.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest stratigraphic horizon penetrated in the one well in the field is in the Travis Peak formation, 214 feet below its top.

STRATIGRAPHIC POSITIONS OF OIL AND GAS

Pettet-B and C: Showings of oil and gas were observed during the drilling of Delta Drilling Co. #1 Rayford and these zones were tested through perforations, but the formation did not respond to acid. Some qualified observers are of the opinion that the acid went elsewhere.

Pettet-F: A strong showing of oil was observed during the drilling of Delta Drilling Co. #1 Rayford and on May 5, 1949, this well was re-completed as an oil producer from this reservoir.

Travis Peak: This reservoir produced gas and condensate at the one well in the field as reported below under PRODUCTION HISTORY.

AREAL DISTRIBUTION OF OIL AND GAS and STRUCTURE

The probable areal extent of occurrence of oil and gas is indicated on figure 1 in the accompanying paper on the Henderson field. The structural attitudes of two datum planes are indicated on other maps in the same paper.

NATURE OF TRAPS

The traps are at the apex of a regional anticline. The hydrocarbon accumulations are at the top of a local fold which may be either anticlinal or domal in form. The factors controlling accumulation are those of a simple convex trap on an anticlinal fold.

PRODUCTIVE AREA

Data defining the productive area are meager. On the basis of the data afforded by the one productive well and by interpretation of structural conditions, it is estimated that the productive area is limited to about 640 acres.

THICKNESSES OF RESERVOIR ROCKS

Pettet-F	Feet
From top to bottom	20
Net effective	2
Travis Peak	
From top to bottom	110
Net productive	50

CONTINUITY OF RESERVOIR ROCKS

Pettet-F: This zone is recognizable over a wide area. Porosity is probably very local.

Travis Peak: This reservoir is the top member of a formation bearing the same name, which formation is recognized throughout a large portion of northeast Texas and definitely correlated over a much larger area. The particular reservoir which is productive here appears to be continuous throughout the area covered by the maps included in the accompanying paper on the Henderson field. While the top portion of the Travis Peak formation commonly contains one or more productive zones, this particular reservoir cannot be proven to be continuous beyond the wells where it is indicated on figure 1 as having been penetrated.

LITHOLOGY OF RESERVOIR ROCKS

Pettet-F: Leached sandy dolomite.

Travis Peak: Fine-grained clean sand. The sand grains are so fine that the rock may properly be classified as a silty sandstone.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Pettet-F:	Feet
Elevation of top of oil	-6,880
Elevation of bottom of oil	Undetermined
Travis Peak	
Elevation of top of gas	-6,910
Elevation of bottom of gas	-7,020
Relief	110

The above figures represent conditions in the one productive well at the times of completion. No appreciable change has been observed to date. Of course, if the apexes of the traps are higher than found in this well, the hydrocarbon columns extend to higher elevations. Water was found in Travis Peak in Delta Drilling Co. #1 Rayford and in Delta Drilling Co. and Chicago Corp. #1 Morris at -7,020.

CHARACTER OF OIL AND CONDENSATE

Pettet-F: Oil: Gravity, A.P.I., 43°.

Travis Peak: Condensate: Gravity, A.P.I., 61°. In the reservoir, this liquid is in the form of gas

WATER PRODUCTION

Negligible water has been produced by the one well in this field.

PRODUCTION HISTORY

Year	WELLS PRODUCING at end of year: Gas	WELLS PRODUCING at end of year: Oil	OIL PRODUCTION (barrels): Pumping	OIL PRODUCTION (barrels): Yearly	CONDENSATE PRODUCTION (barrels): Yearly	TOTAL LIQUIDS (barrels): Yearly	TOTAL LIQUIDS (barrels): Cumulative	GAS PRODUCTION (Mcf): Yearly	GAS PRODUCTION (Mcf): Cumulative
1946	1	0	0	455	455	455	13,000	13,000	
1947	1	0	0	100	100	555	3,000	16,000	
1948	0	0	0	0	0	555	0	16,000	
1949	0	1	1,206	0	1,206	1,761	0	16,000	

All production has been from one well. That prior to 1948 was from Travis Peak and that during 1949 was from Pettet-F.

SOUTH TYLER FIELD
Smith County, Texas

GREGORY L. TURNER
District Geologist, The Pure Oil Company, Tyler, Texas
February 28, 1950

LOCATION

The South Tyler field is 6 miles south of Tyler, county seat of Smith County. It is situated on the northern end of a structural ridge separating the Brooks and Bullard salt dome basins.

METHOD OF EXPLORATION LEADING TO DISCOVERY

In January and February of 1943, Phillips Petroleum Co. conducted a reflection seismic survey over a large area in central and western Smith County, and in June of the same year it acquired leaseholds in the vicinity where this field was subsequently discovered. The initial test was drilled as a result of the interpretation of the seismic work.

DISCOVERIES

Rodessa lime: January 27, 1949; Phillips Petroleum Co. #1 Miss W. J. McMinn. Flowed 248 bbl. of 54.2° gravity crude and 2,958 Mcf gas per day from perforations at 9,550-70. G.O.R., 11,861:1.

James lime: July 28, 1944; Phillips Petroleum Co. #1 Miss W. J. McMinn. Flowed 281 bbl. of 45.8° gravity crude and 1,698 Mcf gas per day from perforations at 9,918-29. G.O.R., 6,040:1.

ELEVATION OF SURFACE

At well locations: Highest, 523 feet; lowest, 461 feet.

SURFACE FORMATION

Sparta formation of Claiborne group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

486 feet below the top of the Travis Peak.

NATURE OF TRAPS

Rodessa lime: Reservoir is a porous zone of the Rodessa which forms a simple convex trap on the anticlinal fold.

James lime: Reservoir is a local porosity development in the James which overlaps approximately three-quarters of an oval anticlinal fold.

PRODUCTIVE AREAS

Rodessa lime	80 acres
James lime	120 acres
Field	120 acres

THICKNESSES OF RESERVOIR ROCKS

	Feet		
	Min.	Max.	Avg.
Rodessa lime:			
Total porosity	17	36	28
Net productive	20	36	28
James lime:			
Total porosity	0	90	60
Net productive	10	24	15

LITHOLOGY OF RESERVOIR ROCKS

Rodessa lime: Dark brownish gray, crystalline to dense, fossiliferous, oolitic limestone with numerous shale partings. The top 100 feet contains bands of white anhydrite, and from 190 to 200 feet below the top there is a bed of fine-grained, nonporous to slightly-porous sandstone. The top of the producing zone is approximately 120 feet below the top of the formation.

James lime: Light gray to white, crystalline to chalky, fossiliferous, occasionally oolitic limestone with variable porosity developed at the top of the formation.

CONTINUITY OF RESERVOIR ROCKS

Rodessa lime: The Rodessa formation occurs over most of the East Texas area. The porosity zone which produces here may be correlated with the first Rodessa porosity in the Chapel Hill field, 12 miles to the northeast, and also with the Rodessa porosity present in the Larissa field 11 miles to the south. It is probably correlative with the Gloyd zone of the Carthage field in Panola County.

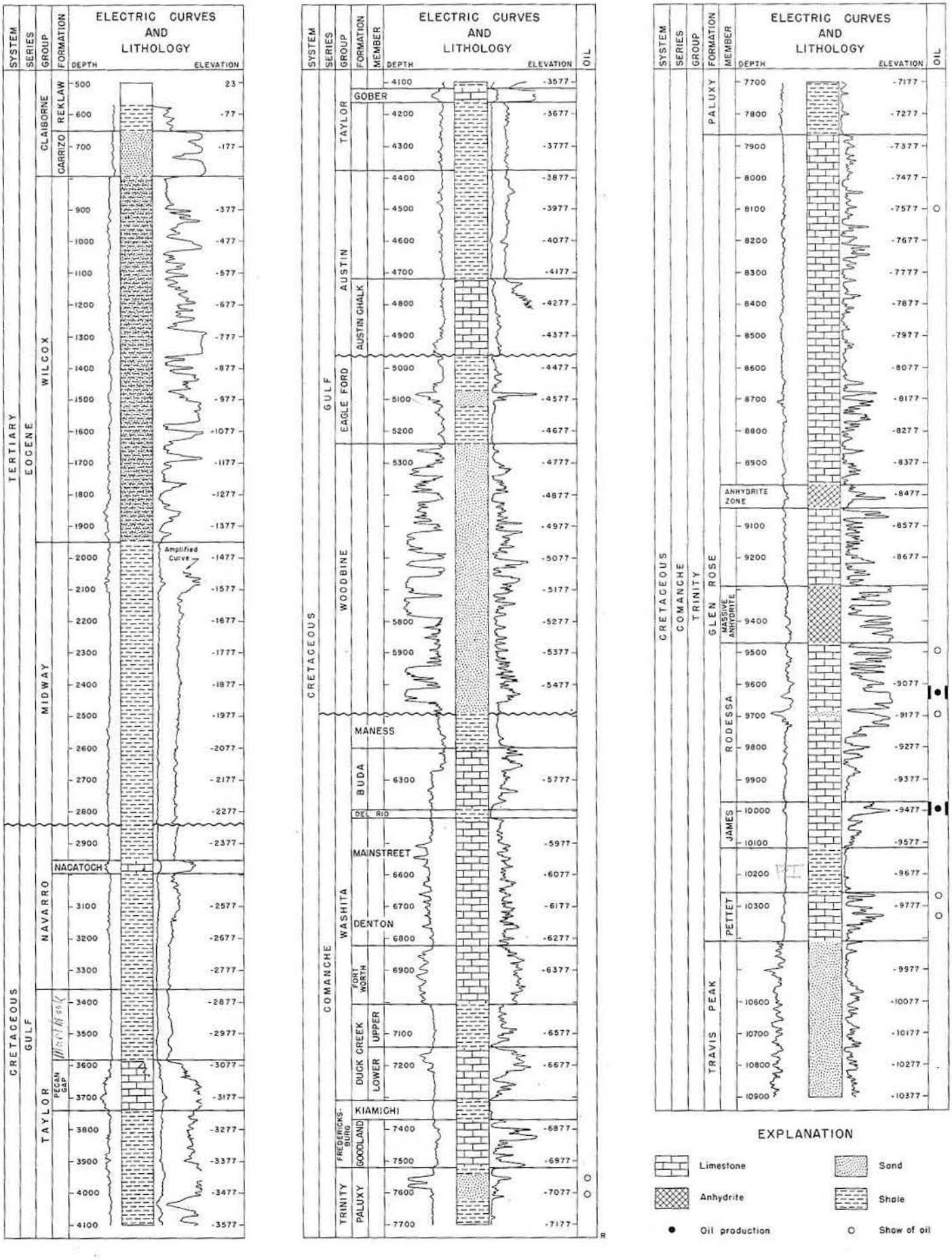
James lime: The James formation occurs over most of East Texas and adjacent portions of Louisiana; however, the porosity zone which produces in this field appears to be limited to the area immediately around the producing wells.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Feet	
	Rodessa	James
No free gas cap		
Elevation of top of oil	-9,045	-9,381
Elevation of bottom of oil	-9,095	-9,492
Relief	50	111*

*This figure is deceptive, as the #1 McMinn, on the crest of the structure, had completely gone to salt water (water level -9,381) while the #1 Grelling on the west flank of the field still produced some oil from below -9,449.

TYPE SECTION OF ROCKS PENETRATED



CHARACTER OF OIL

	Gravity			Sulphur
	Max.	Min.	Avg.	
Rodessa lime	58.4°	54.2°	56.3°	?
James lime	58.7°	54.2°	56.5°	0

CHARACTER OF GAS

Rodessa lime: An analysis of the Rodessa gas is not yet available.

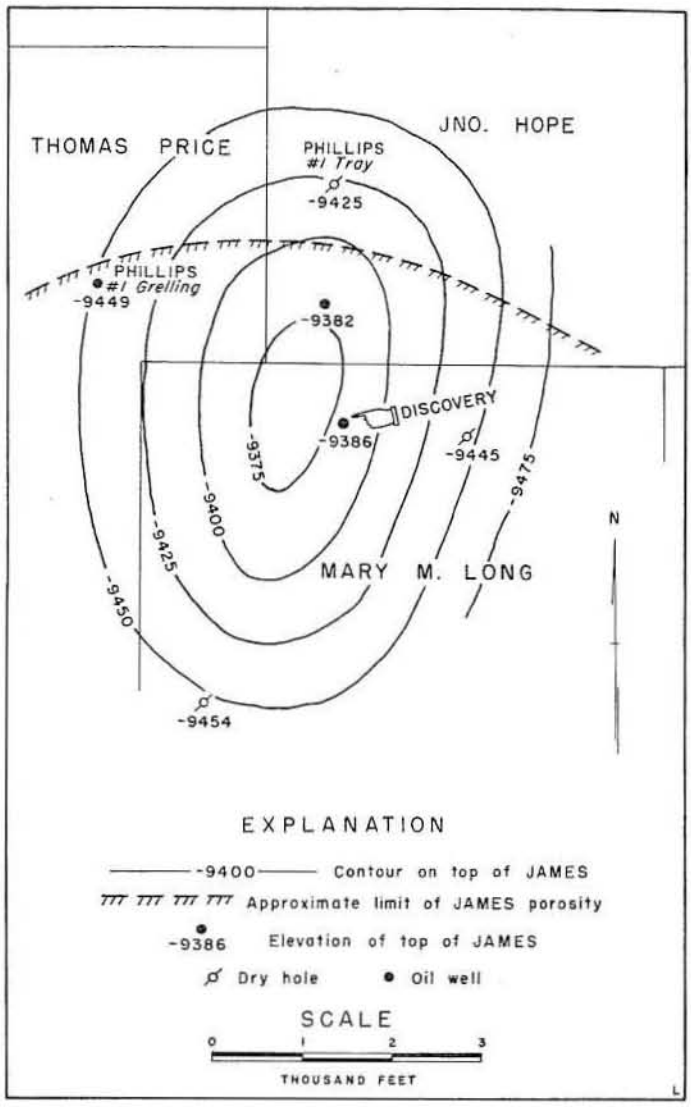
James lime: The following analysis of the James gas was made by the Lone Star Gas Co. of a sample taken from the pipe line on June 18, 1948.

Component	%	Recoverable liquids G.P.M.
Methane & lighter	88.85	
Ethane	6.11	
Propane	2.57	0.71
Iso-butane	0.57	0.19
Nor-butane	0.85	0.27
Iso-pentane	0.39	0.14
Pentane	0.21	0.08
Hexanes	0.45	0.21

Heating value: 1,105 B.t.u. per cubic ft.
Specific gravity: 0.675
Inert gases, calculated as nitrogen: 4.6%

WATER PRODUCTION

Several thousand barrels of salt water have been produced in this field from the James lime. This water is being injected into the Woodbine sand in the Phillips Petroleum Co. #1 Tray which was completed as a dry hole.



PRODUCTION HISTORY

	WELLS PRODUCING at end of year		OIL PRODUCTION * (barrels)			CASINGHEAD GAS PRODUCTION (millions cubic feet)		
	Oil		Rodessa	James	Total field	Rodessa	James	Total field
Year	Rodessa	James	Yearly	Yearly	Cumulative	Yearly	Yearly	Cumulative
1944	0	1	0	33,110	33,110	0	x	x
1945	0	2	0	84,381	117,491	0	x	x
1946	0	3	0	127,446	244,937	0	1,444	2,308
1947	0	3	0	156,620	401,557	0	2,233	4,541
1948	0	3	0	127,950	529,507	0	2,350	6,891
1949 to 8/1	1	2	19,023	33,684	582,214	0	0	6,891

Effective August 1, 1949, the producing wells were classified as gas-condensate producers.

	WELLS PRODUCING at end of year		CONDENSATE PRODUCTION (barrels)			GAS PRODUCTION (thousands cubic feet)		
	Gas Condensate		Rodessa	James	Total field	Rodessa	James	Total field
Year	Rodessa	James	Yearly	Yearly	Cumulative	Yearly	Yearly	Cumulative
1949 after 7/31	3**	1**	37,494	16,610	54,104	879,257	610,311	1,489,568

*Includes condensate from casinghead gas.

**Includes one dual completion.

STEWARD'S MILL FIELD
Freestone County, Texas

JACK M. DeLONG
Geologist, Stanolind Oil and Gas Company, Tyler, Texas
March 10, 1950

LOCATION

The Steward's Mill field is near the community of the same name, 7 miles north and slightly west of Fairfield, county seat of Freestone County.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Early drilling exploration in the area was based on seismograph and subsurface data. Four wells drilled in the immediate area between 1940 and 1942 recorded showings of gas and oil from the Woodbine. One of these wells, the J. L. Collins & Co. #1 W. W. Steward ($\frac{1}{2}$ mile SE of discovery well, TD 4,051), tested an estimated 10 to 15 million cubic feet of gas per day with no oil or salt water. The well was abandoned because of the thin productive section and the lack of a market for the gas. The subsurface information obtained from these wells prompted drilling of the discovery well in 1943.

DISCOVERIES

Woodbine: March 1, 1943; Carter-Gragg Oil Co. #1 W. W. Steward, James James Heirs survey A-333; flowed 25,000 Mcf of gas p/d; perforated 4,001 to 4,006; no condensate. Recompleted 1/20/47; flowed 2,500 Mcf of gas and 50 bbls. of 45.7° gravity crude per day.

Pettet: October 14, 1949; Carter-Gragg Oil Co. #1 C. B. Robinson Heirs, James James Heirs survey A-333; flowed 2,775 Mcf of gas and 76.31 bbls. of crude per day; 14/64-inch choke; GOR, 36,400:1, perforated 7,600 to 7,645. Repotentialed 12/28/49; flowed 9,500 Mcf of gas and 247 bbls. of 55° gravity crude per day; GOR, 38,500:1.

ELEVATION OF SURFACE

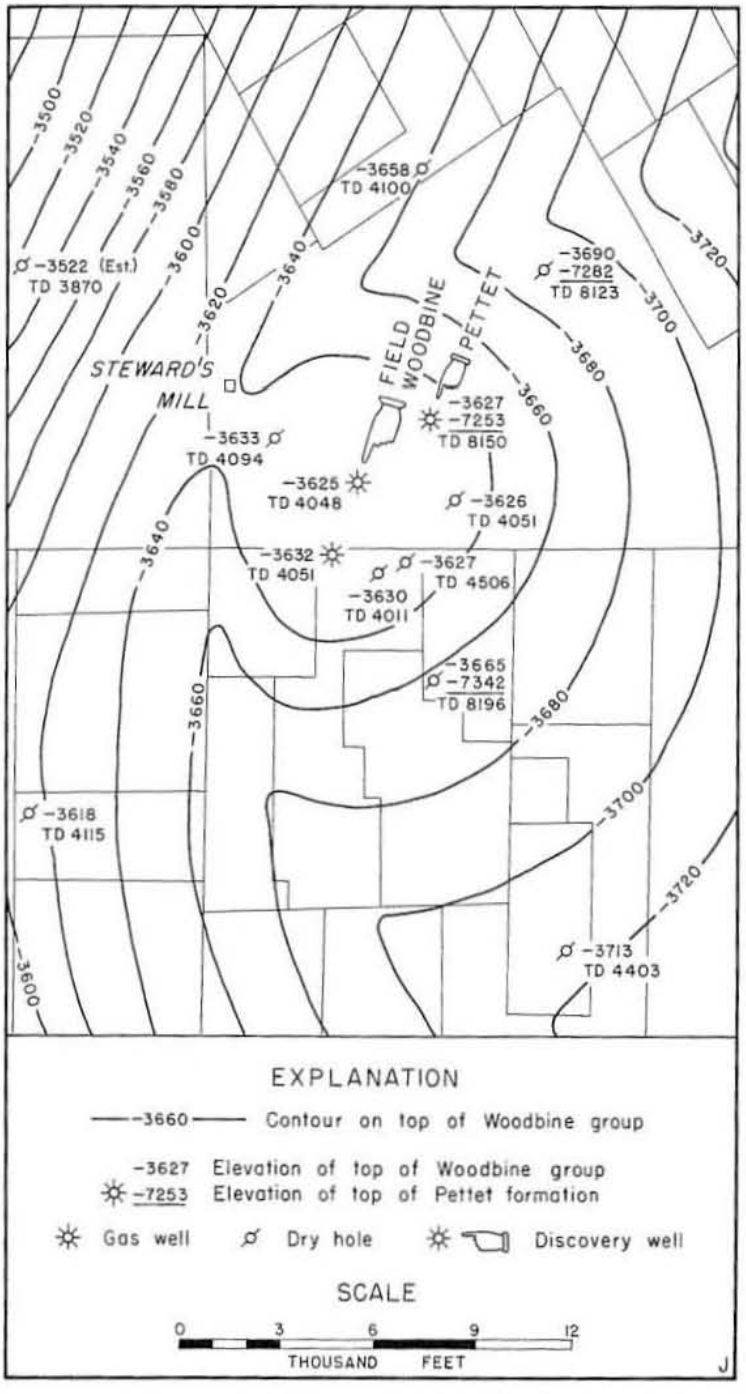
At well locations:
Highest, 386 feet; lowest, 310 feet.

SURFACE FORMATION

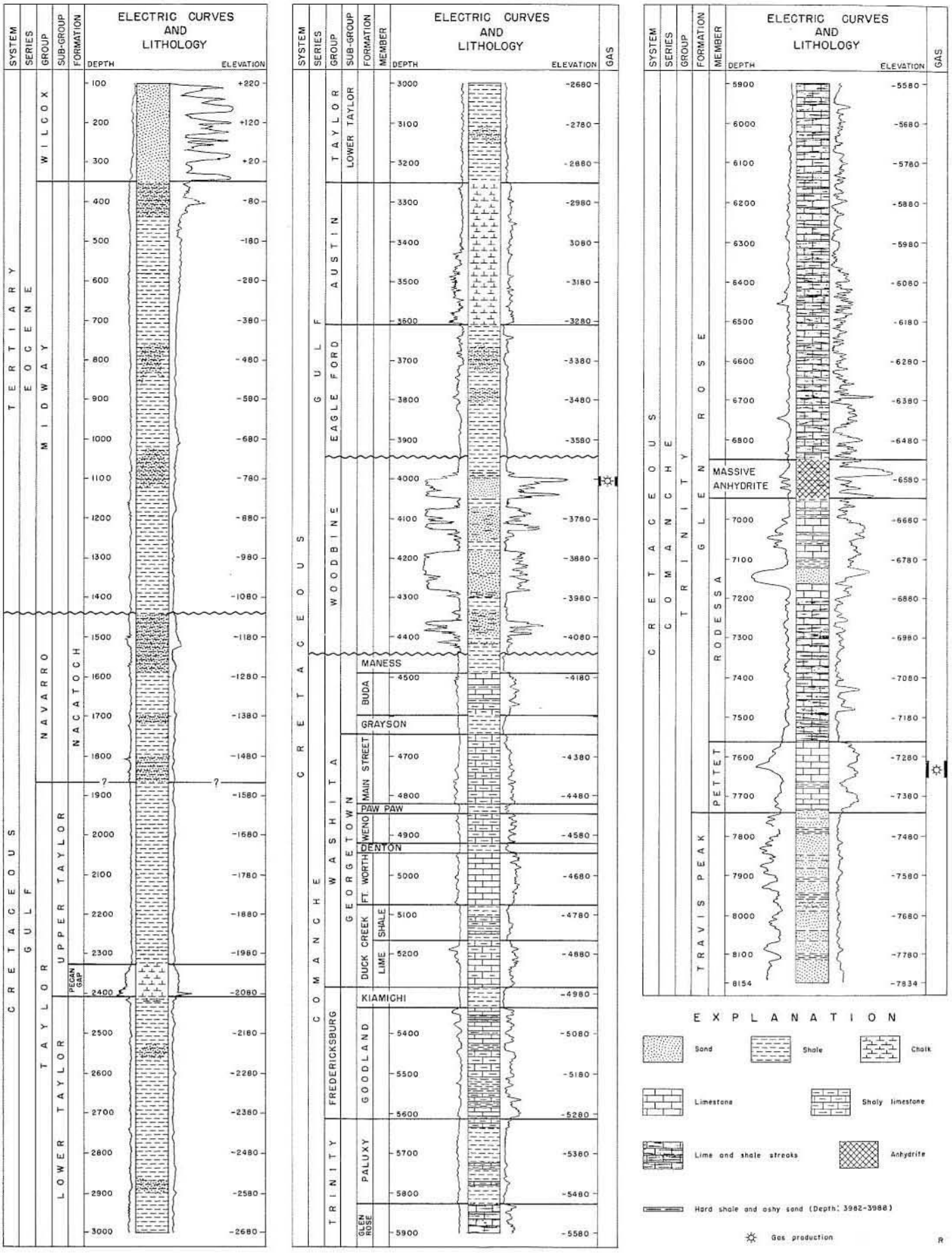
Wilcox group, undifferentiated.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

404 feet below top of Travis Peak. This penetration was in Carter-Gragg Oil Co. #1 C. B. Robinson Heirs, the Pettet discovery well.



TYPE SECTION OF ROCKS PENETRATED



NATURE OF TRAPS

The accumulation in each of the two reservoirs appears to be due to a convex trap on a terrace type structure.

PRODUCTIVE AREAS

Data defining the productive areas are meager. On the basis of available data, it is estimated that the productive area of each of the two reservoirs is limited to approximately 640 acres.

THICKNESSES OF RESERVOIR ROCKS

Woodbine: 38 feet; 15 feet net productive.
Pettet: 85 feet; 17 feet net productive.

LITHOLOGY OF RESERVOIR ROCKS

Woodbine: White to buff medium-grained ashy sandstone. There is a 4-foot shale parting 6 feet below the top, an 8-foot shale parting 15 feet below the top and a 1-foot shale parting 41 feet below the top.
Pettet: Gray to brownish-gray dense, crystalline, fossiliferous to oolitic and pseudo-oolitic limestone with argillaceous streaks.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Woodbine	Pettet
Elevation of top of gas, feet	-3,678	-7,287
Elevation of bottom of gas, feet	-3,693	-7,331
Relief, feet	15	44

The above figures for Pettet represent the elevations and relief in the one Pettet well.

CHARACTER OF OIL AND CONDENSATE

Woodbine: Gravity, 45.7° Paraffin base.
Pettet: Gravity, 55° Condensate.

CHARACTER OF GAS

Not available.

WATER PRODUCTION

Woodbine: The lower part of the Woodbine yielded some salt water in the discovery well. Salt water was found in the Woodbine in five other wells drilled in the area.
Pettet: The Pettet has yielded no water to date.

ACID TREATMENT

Neither of the reservoirs have been subjected to acid treatment.

PRODUCTION HISTORY

Field totals

	CONDENSATE PRODUCTION (barrels)		GAS PRODUCTION (Mcf)	
Year	Yearly	Cumulative	Yearly	Cumulative
1944	1,066	1,066	144,516	144,516
1945	983	2,049	183,330	327,846
1946	310	2,359	107,921	435,767
1947	2,224	4,583	207,570	643,337
1948	3,232	7,815	212,482	855,819
1949	7,306	15,121	302,020	1,157,839

All production prior to 10/14/49 was from Woodbine. All production was from one well prior to 3/18/49, when the second Woodbine well was completed with a daily capacity of 3,400 Mcf of gas with 4 bbls. of condensate per million cubic feet of gas. Since 10/14/49, the third well, producing from the Pettet reservoir, has been contributing to the production.

SULPHUR BLUFF FIELD
Hopkins County, Texas

W. J. AMIS
Geologist, Shell Oil Company, Tyler, Texas
July 18, 1950

LOCATION

The Sulphur Bluff field is in northeastern Hopkins County 3 miles south of the village of Sulphur Bluff and 15 miles northeast of Sulphur Springs, the county seat. It is in the zone of the Luling-Mexia-Talco fault system, which borders the East Texas basin on the west and north.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Surface mapping and shallow core drilling delineated the Sulphur Bluff fault. Subsequently four dry holes were drilled - one by Gulf in 1925, two by Hager & Ashby in 1933 and one by Hinton also in 1933. These tests provided the subsurface data by which the discovery well was located shortly after Paluxy production was discovered on the similar Talco fault 15 miles to the east-northeast.

DISCOVERY

Paluxy sand: July 15, 1936;
Hager, Luse & Russ #1 J. E. Worsham

ELEVATION OF SURFACE

At well locations: Highest, 442 ft.; lowest, 401 feet.

SURFACE FORMATION

Wills Point formation of the Midway group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

In Travis Peak formation 435 feet below its top. This penetration was in Walter Goldston et al. #10 J. H. Smith, which was drilled to the total depth of 6,600 feet at the location indicated on the accompanying map.

NATURE OF TRAP

Paluxy sand: Accumulation is occasioned by structural closure against the upthrown southeastern side of an east-northeast striking fault. Porous Paluxy sands are in juxtaposition with impermeable limestones and shales of the Washita group. The apparent closure is approximately 175 feet.

PRODUCTIVE AREA

Paluxy sand and Field: 1,100 acres.

THICKNESS OF RESERVOIR ROCK

Paluxy sand: Average net productive, 36 feet.

LITHOLOGY and CONTINUITY OF RESERVOIR ROCK

The Paluxy reservoir consists of medium- to fine-grained sandstones with local intercalations of grey sandy shale, streaks of ash, and ashy sandstones. Thin (5 to 8 feet) lenticular sandstones occur from 8 to 30 feet below the top of the formation, and a fairly continuous massive sand is present from 30 to 48 feet below the top. The porosity of the massive sand (which accounts for most of the production) averages 25 per cent.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Paluxy sand:	Feet
Elevation of top of oil	3,975
Elevation of bottom of oil	4,135
Relief	160

CHARACTER OF OIL

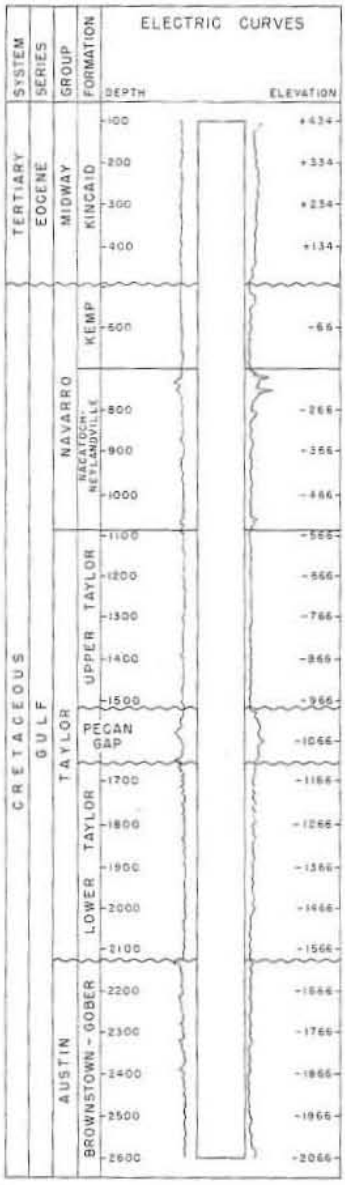
Paluxy sand:
Gravity: 22.4° Color: Black
Base: Mixed, predominantly asphaltic.
For analyses see:
Railroad Commission of Texas
Analyses of Texas Crude Oils (1940) pp. 31 and 59.
U. S. Bureau of Mines Lab. ref. No. 38330
Tabulated Analyses of Texas Crude Oils. T.P. 607 (1939) Grp. 4, Item 60
Analyses of Crude Oils from 283 Important Oil Fields of the U. S. R.I. 4289 (1948) 257

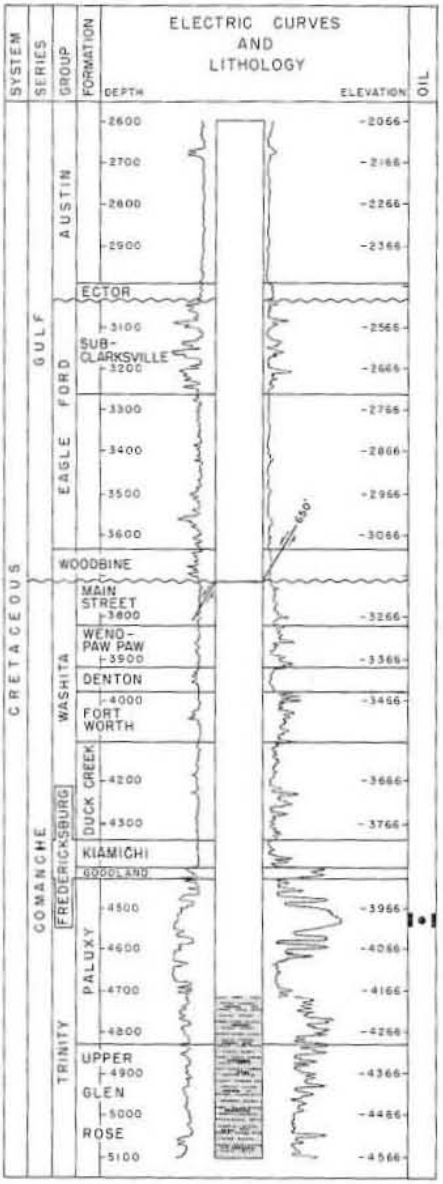
DEVELOPMENT AND PRODUCTION HISTORY

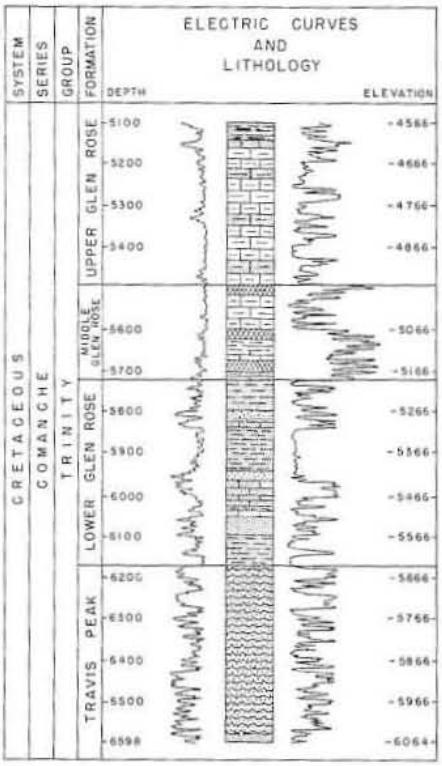
Paluxy sand and Field totals

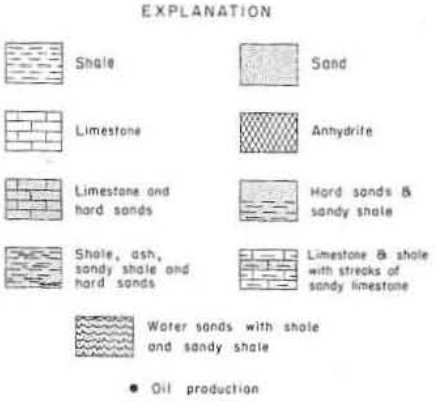
	NUMBER OF WELLS			OIL PRODUCTION (barrels)	
	Completed during	Producing at end of year			
Year	year	Flow.	Artif.	Yearly	Cumulative
1936	12	5	7	40,856	40,856
1937	61	13	60	1,714,349	1,755,205
1938	1	14	60	1,645,707	3,400,912
1939	0	12	62	1,538,860	4,939,772
1940	0	7	66	1,518,699	6,458,471
1941	0	3	70	1,579,204	8,037,675
1942	0	0	73	1,537,833	9,575,508
1943	0	0	73	1,509,342	11,084,850
1944	0	0	73	1,418,921	12,503,771
1945	0	0	69	1,340,931	13,844,702
1946	0	0	67	1,246,221	15,090,923
1947	0	0	68	1,171,245	16,262,168
1948	0	0	66	1,049,094	17,311,262
1949	0	0	65	730,520	18,041,782

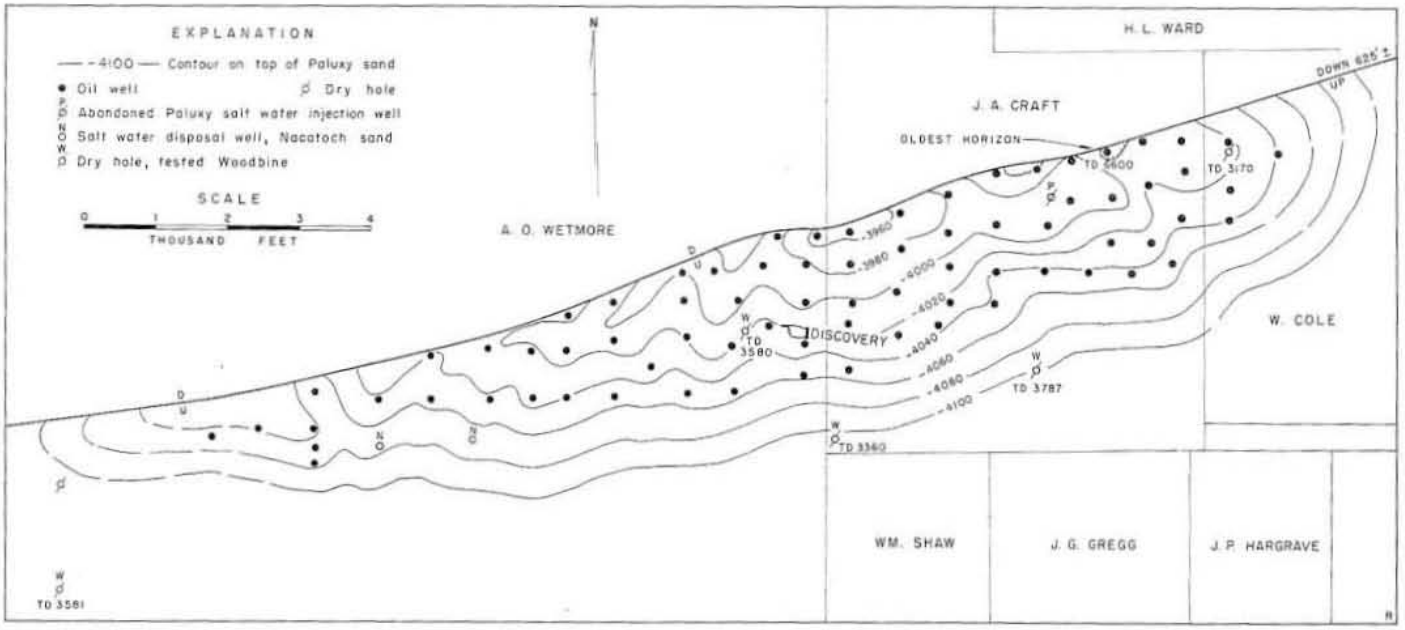
TYPE SECTION OF ROCKS PENETRATED











TALCO FIELD
Franklin and Titus Counties, Texas

T. H. SHELBY, Jr.*
Geologist, Tyler, Texas
January 1, 1949

LOCATION

The Talco oil field in northwest Titus and northeast Franklin counties is located in the north-central part of the East Texas basin on a fault structure which is a part of the Mexia-Powell-Talco fault zone.

METHODS OF EXPLORATION LEADING TO DISCOVERY

The Talco fault structure was mapped on the surface for the Humble Oil & Refining Co. during the early part of 1924 by R. L. Cannon. During 1924 and 1925, both the Marland Oil Co. and the Humble Oil & Refining Co. drilled shallow core-tests in the area which more accurately defined the faults. In 1931, following further detailed surface work by Carroll E. Cook, Humble Oil & Refining Co. purchased a lease block in the area. During 1933, two dry Woodbine tests were drilled by Fred Prince et al. within the later defined Paluxy producing area, and in 1934, Humble Oil & Refining Co. drilled a dry Woodbine test on the southwest part of the structure. These tests confirmed the existence of a large closed fault structure in the area. In 1936, a number of independent operators became interested in the possibilities for production from the Trinity group and acquired favorably located leases subject to the drilling of a Trinity test. With contributions from the Humble, Gulf, Magnolia, and Tide Water Associated companies, W. B. Hinton et al. drilled their #1 C. M. Carr one mile east of the Talco townsite and discovered the first major Paluxy oil production in East Texas.

DISCOVERY

Paluxy: March 13, 1936;
W. B. Hinton et al. #1 C. M. Carr.

STRUCTURE

The structure in the area of the Talco field is essentially a southward dipping monocline with the stratigraphic units terminated updip against the Talco fault. As indicated on the accompanying structural map, there is a local northward dip into the fault, but this feature is of only minor importance. There is a structural closure of 450 feet on the top of the productive zone.

The accompanying map includes a large area north of the field in order to show the relationship of the Talco structural trap to the general structure of the region. The field occurs on the south side of a crescent-shaped graben, which is a part of the Mexia-Powell-Talco fault zone. The structure is remarkably simple, in contrast to the rather complex cross-faulting and secondary faulting commonly present in the southwest part of this fault zone. Only one secondary fault, with less than 20 feet of displacement, is known within the area of the field.

The faults on either side of the graben have a maximum surface displacement of about 360 feet which increases with depth to more than 1,400 feet on the base of the upper Glen Rose. The two fault planes dip toward each other at angles ranging from 45° to 58°, becoming generally steeper with depth.

VARIATIONS IN THICKNESSES

The stratigraphy of the Talco area was influenced by the sinking of the graben which began at least as early as upper Glen Rose time. The later Comanche and early Gulf formations display a large amount of thickening in the graben, demonstrating that early and long continued movement occurred on this structure.

STRATIGRAPHIC POSITIONS OF OIL

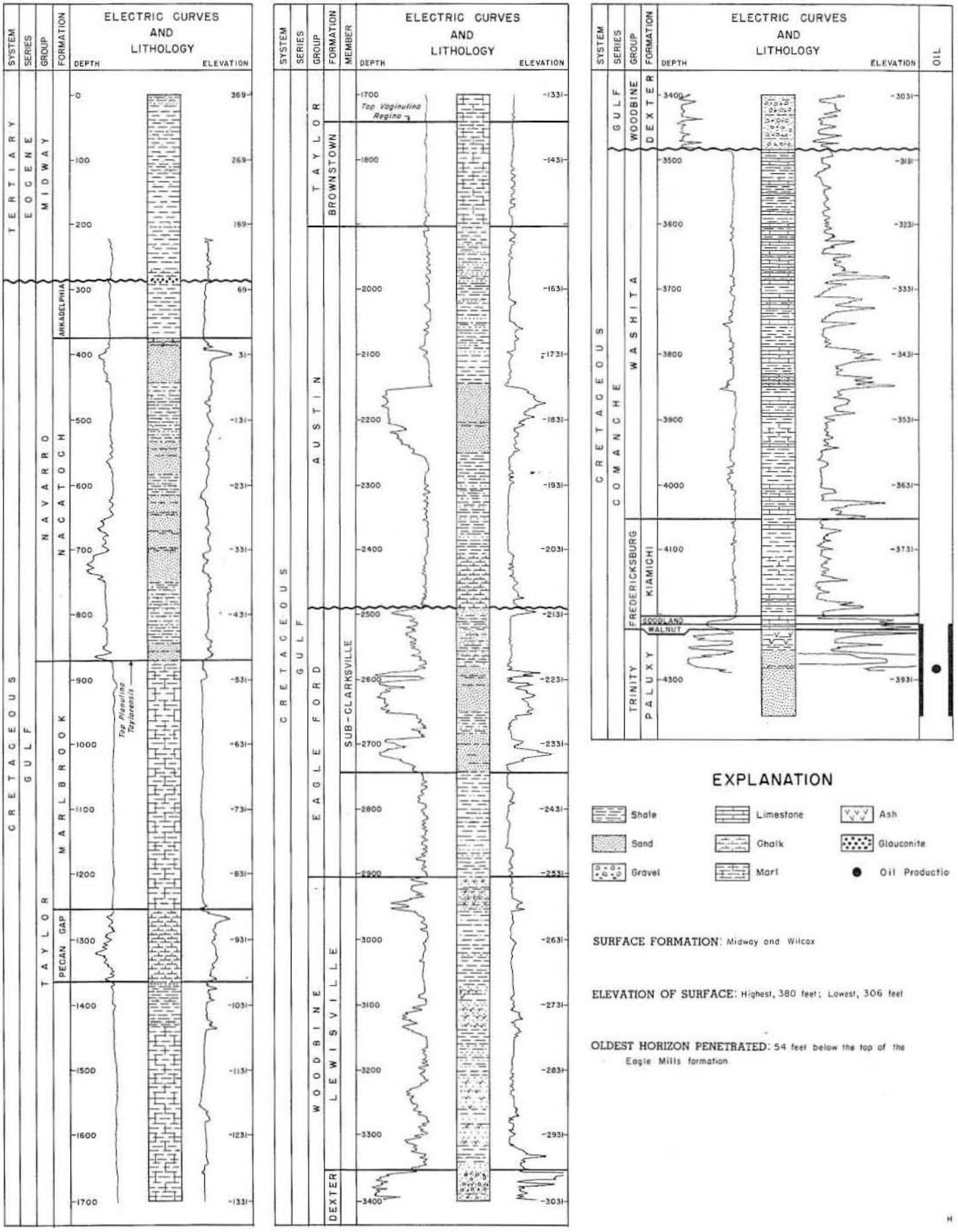
While all but a very small portion of the total production has come from rocks of Paluxy age, it is recognized that a minor amount of oil has come from rocks of Walnut age. Stratigraphic proximity, operating practices and the nearly negligible quantity of oil from rocks of Walnut age appear to warrant treatment herein as if Paluxy were the sole productive zone.

The numerous dead and residual oil stains found in deep tests indicate that a much greater quantity of oil was once present on the upthrown south side of the Talco fault, particularly in the lower Glen Rose and Smackover formations. It is believed that faulting subsequent to these accumulations brought porous zones into juxtaposition with these formations, thereby allowing the oil to escape updip. Some geologists have suggested that these early oil accumulations have migrated up the fault planes into the Paluxy formation. However, there is no direct evidence indicating that vertical migration has occurred.

*In the preparation of this paper, the author has extracted extensively from a previous paper by E. A. Wendlandt and T. H. Shelby, Jr., published by American Association of Petroleum Geologists, in Structure of Typical American Oil Fields, Vol. III, 1948.

(Attach TALCO map)

TYPE SECTION OF ROCKS PENETRATED



LITHOLOGY OF RESERVOIR ROCKS

Paluxy:

The porous and permeable sands of the Paluxy formation are generally variable and erratic in their development over most of the field, both east and west and north and south. Individual sand bodies commonly lens in and out in short distances, particularly in the upper part of the Paluxy. The upper sands are generally better developed near the fault and shale out downdip southward. Although most of the sands are intercommunicating, the connection is rather poor between some of them, as indicated by their pressure behavior. In two places in the field, isolated sand lenses containing salt water were found above the field water level. About one-fourth of the Paluxy section in the oil column is considered to be effective oil sand with an average porosity of about 25 per cent. The permeabilities are variable, with an average of about 2,460 millidarcys. The minimum effective permeability is about 100 millidarcys, ranging upward to a maximum of 10,550 millidarcys.

Following is a generalized section which includes descriptions of the productive members of the Paluxy formation:

Age	Zone	Description	Approximate Thickness (feet)
Fredericksburg	Goodland	Dense white fossiliferous limestone. Cap rock of oil reservoir.	14
	Walnut	Gray fossiliferous oil-stained sandy limestone, Gryphaea shell coquina, thin fine-grained oil-stained sand and sandy shale with little effective porosity.	13
Paluxy	Stringer sand	Hard fine-grained fossiliferous oil sand. Locally slightly porous and permeable.	2-5
	Carr zone	Greenish ashy argillaceous fine-grained sand and sandy shale. Contains spotted oil stains. No permeability.	5
		Mottled sandy redbeds, gray lignitic shale and bentonitic siltstone. Some oil stains.	30
		Fine- to medium-grained ashy argillaceous oil sand.	10
		Sandy redbeds and gray lignitic shale. Oil in spots.	20
		Medium-grained slightly ashy oil sand.	30
		Sandy redbeds and gray lignitic shale. Oil in spots.	40
	Galt zone	Hard black laminated shale interbedded with very fine-grained silty laminated sand. Oil in sand streaks.	10
		Medium-grained porous oil sand gradually becoming coarse-grained with depth.	30±

The "stringer sand" is persistent over most of the field. During early development a number of wells produced from this sand and the overlying Walnut beds. However, the pressure has declined in this sand over most of the field to the extent that it no longer is commercially productive alone.

Effective oil sand may occur at any level in the Carr zone. Where good sands occur at the top of this zone, the productive area extends farther southward than in those parts of the field with poor sand development in the upper part of this zone. Edge water is present on the south side of the field in these sands.

The Galt zone is oil-productive only on the higher parts of the structure. The sands in this zone are commonly more uniformly developed than those in the overlying Carr zone, excepting in the extreme east end of the field, where they are somewhat erratic. It varies from practically zero to 100 feet or more in thickness and contains bottom water beneath the oil throughout the field. The permeability of the Galt sands, both vertically and horizontally, is generally considerably higher as compared with the sands in the Carr zone.

NATURE OF TRAP

Paluxy: Fault segment type reservoir formed on upthrown south side of crescent-shaped graben. The reservoir is terminated updip by a fault, where it is in contact with impervious Washita and Fredericksburg sediments.

PRODUCTIVE AREA

Paluxy and Field: Approximately 9,000 acres. The field is 13.25 miles long and averages about 1 mile wide.

THICKNESSES OF RESERVOIR ROCKS

Paluxy:

	Feet		
	Max.	Min.	Avg.
From top to bottom	275±	275±	275±
Net productive	166	0	44

CONTINUITY OF RESERVOIR ROCKS

Paluxy: Sand development is variable. The individual sand bodies are generally intercommunicating, forming a common reservoir. Porous sands in the Paluxy formation are known to be widely distributed in the northern part of the East Texas basin. However, the individual sand bodies which are productive in this field cannot be correlated individually with sands in other fields.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Paluxy:

No free gas cap.

	Feet
Elevation of top of oil.	-3,719
West part of field, as of discovery date	
Elevation of bottom of oil.	-3,957
Relief	238
East part of field, as of discovery date	
Elevation of bottom of oil.	-4,035
Relief	316

CHARACTER OF OIL

Paluxy:

Gravity, A.P.I. @ 60° F.: Maximum, 25°; Minimum, 14°; Weighted average, 20°.
Sulphur: 1.27% Color: Brownish-black to black Base: Asphalt
Solution-gas ratio: 20 cubic feet per barrel (greatly undersaturated)
Saturation pressure at the reservoir temperature of 147° F.: About 180 psi.
Viscosity at reservoir conditions: About 30 centipoises.

For analyses see:

Railroad Commission of Texas
Analyses of Texas Crude Oils (1940), pp. 31 and 59.

U. S. Bureau of Mines	Laboratory reference No.	36060	36061	38329
Tabulated Analyses of Texas Crude Oils. T. P. 607 (1939)	Group 4, Item	63	62	61
Analyses of Crude Oils from 283 Important Oil Fields of the United States. R. I. 4289 (1948)	Item			259

RESERVOIR ENERGY

The recovery mechanism functioning at Talco is solely an imperfect water drive. Because of the permeability variations, the high viscosity of the crude, and the low solution-gas ratio, water channeling became a serious problem. As a result, the ultimate recovery will be relatively low.

The original bottom-hole pressure was 1,920 pounds per square inch. The pressure declined rapidly as the field developed, with the result that it became necessary to place nearly all wells on the pump early in the life of the field. By August 1946, the average bottom-hole pressure had declined to 1,034 pounds per square inch. Although some water drive is exerted from the south by edge water, pressure studies indicate that much of the drive is derived from the bottom water in the Galt sands, where bottom-hole pressures have been better sustained than in the Carr zone. At several places in the field, a water drive is being applied from the fault plane southward. This fault drive is believed to result from fault crevices which extend downward into the Galt sand zone on the upthrown side of the fault. Analyses of Paluxy water in the graben and that of the field indicate there is little, if any, communication of water across the Talco fault.

Since the Paluxy reservoir quickly reached a subnormal bottom-hole pressure, serious difficulties resulted from casing leaks which permitted the ingress of salt water from various overlying water sands.

(Attach TALCO cross section)

WATER PRODUCTION

Water production early became a major problem. On November 1, 1947, salt water amounted to 69.81% of the gross fluid produced. Disposition of most of the salt water has been by injection into the Paluxy and various overlying salt water sands, including the Nacatoch, Blossom, Sub-Clarksville and Lower Woodbine.

ACID TREATMENT

Not used on initial completion. Acid wash sometimes used to clean scale from perforations in casing.

SELECTED REFERENCES

Wendlandt, E. A. (1936) Talco field, Titus and Franklin counties, Texas: Amer. Assoc. Petr. Geol., Bull., vol. 20, p. 978. (Brief geologic note on discovery.)

Wendlandt, E. A., and Shelby, T. H., Jr. (1948) Talco oil field, Franklin and Titus counties, Texas: Amer. Assoc. Petr. Geol., Structure of Typical American Oil Fields, vol. III, p. 432. (Detailed description of field; considerably more inclusive than this paper.)

PRODUCTION HISTORY

Paluxy and Field total

Year	NUMBER OF WELLS Producing at end of year Flow.	Pump.	**	OIL PRODUCTION (barrels) Yearly	Cumulative
1936	72	105	-	1,387,000	1,387,000
1937	0	637	-	9,778,000	11,165,000
1938	0	699	-	9,648,337	20,813,337
1939	3	682	-	9,698,154	30,511,491
1940	14	712	-	8,882,038	39,393,529
1941	17	736	-	9,088,216	48,481,745
1942	16	730	2	9,570,126	58,051,871
1943	14	708	3	9,314,761	67,366,632
1944	7	706	3	8,685,207	76,051,839
1945	7	703	3	8,192,308	84,244,147
1946	8	720	3	8,757,990	93,002,137
1947	4	720	2	8,849,986	101,852,123
1948	0	724	0	8,804,723	110,656,846
1949*	0	731		6,164,747	116,821,593

*P.S. - 1949 data added by amendment.

**Injecting water into Paluxy.

TEAGUE FIELD
Freestone County, Texas

ERNEST B. HILL
District Geologist, The Texas Company, Tyler, Texas
December 20, 1950

LOCATION and OTHER NAME

The Teague field is 4 miles east and slightly south of Teague and approximately 9 miles south and slightly west of Fairfield, the county seat of Freestone county. It is one of the fields on a trend down-dip from, and approximately 17 miles east of, the Luling-Mexia-Talco fault zone.

The field has been known by the name of Stony Point about as much as it has been by its presently accepted name of Teague.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Surface mapping of the Denny sands in the Wilcox group first revealed an anomaly which was later substantiated by shallow subsurface control. A subsequent geophysical survey by The Texas Co. confirmed the presence of favorable structural conditions and led to the leasing of a 6,000 acre block. The discovery well was commenced on June 18, 1945 and was completed later in the year as a shut-in gas well.

DISCOVERY

Pettet lime: September 6, 1945;
The Texas Co. #1 Nancy Ham.

ELEVATION OF SURFACE

At well locations: Highest, 519 ft.; lowest, 414 feet.

SURFACE FORMATION

Wilcox group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated within the field is 340 feet below the top of the Travis Peak formation. This penetration was in the discovery well.

PRODUCTIVE AREA

Pettet lime and Field: 2,500 acres.

CONTINUITY OF RESERVOIR ROCK

Pettet lime: There are two distinguishable zones of porosity in the upper portion of the Pettet member of the Lower Glen Rose formation. The upper zone is at the top and the second zone is approximately 60 feet below the top of the Pettet member. The upper zone is continuous throughout the present extent of the field. The lower zone is well developed in only the southwest portion of the field. Regionally, porosity development in the Pettet limestone is very erratic; characteristically, the porosity varies decidedly in short distances, as in the lower zone in this field.

NATURE OF TRAPS

Pettet lime: A simple convex trap of low-relief on a trend of mild folding.

THICKNESS OF RESERVOIR ROCK

Pettet lime: Net productive, ft., Max.: 28 Avg.: 21

LITHOLOGY OF RESERVOIR ROCK

Pettet lime: Several zones of medium hard, fossiliferous, tan, porous to slightly porous limestone separated by streaks of hard gray dense limestone and black shale.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Pettet lime:	Feet
Elevation of top of gas	-7,476
Elevation of bottom of gas	-7,586±
Relief	110±

CHARACTER OF GAS AND CONDENSATE

	Gas	Condensate
Gravity, A.P.I.	0.628°	49.8°

WATER PRODUCTION

Water production is negligible. The maximum quantity of water produced by any one well is approximately one barrel per million cubic feet of gas.

ACID TREATMENT

Pettet lime: Each well has been successfully treated with 3,000 to 5,000 gallons of acid.

RESERVOIR PRESSURES

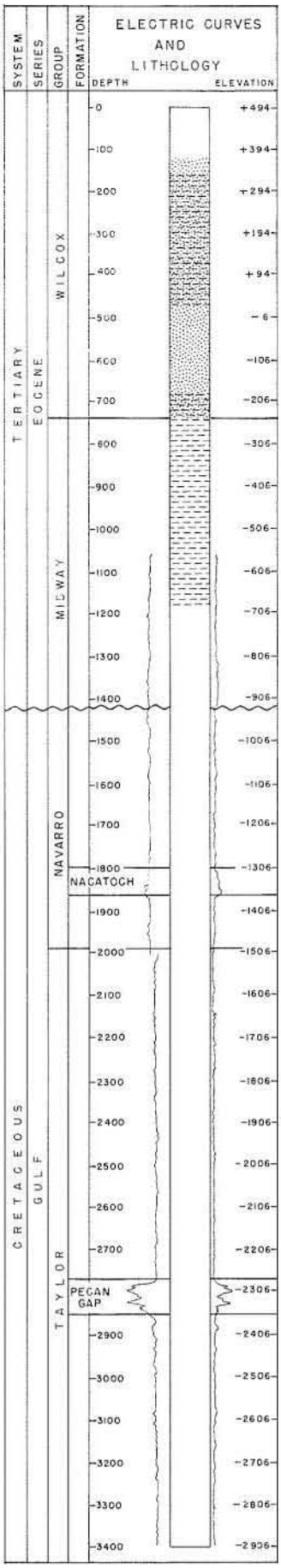
Pettet lime:	Psi.
Average bottom hole pressures	
December 1948	3,685
March 1950	3,393
Average monthly decline	19

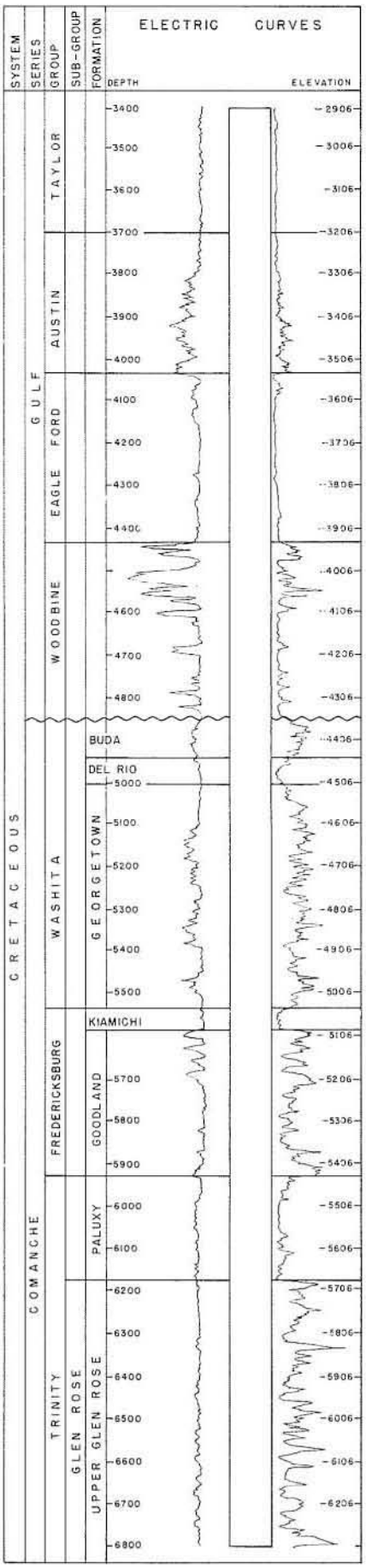
PRODUCTION HISTORY

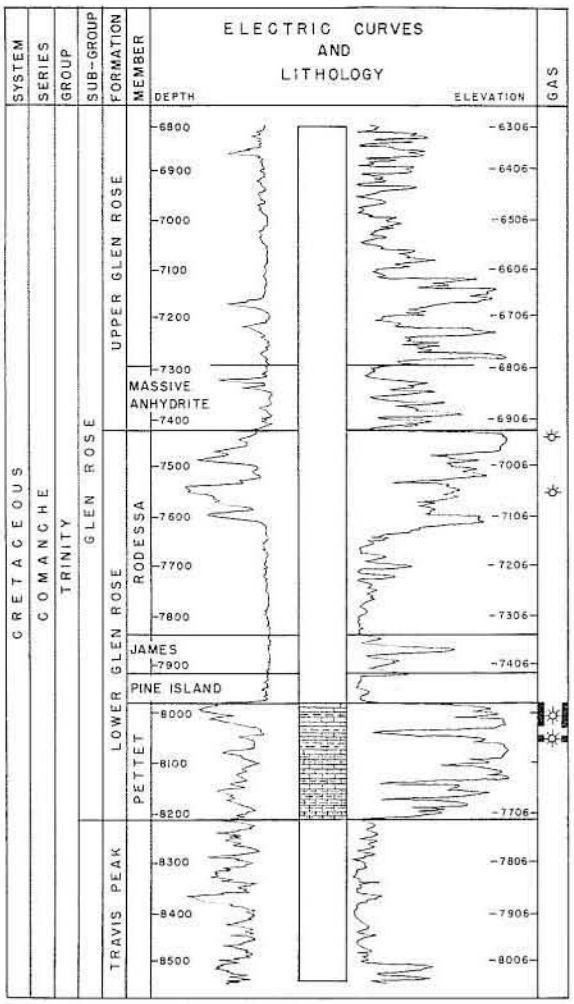
Pettet lime and Field total:

	WELLS PRODUCING at end of year	CONDENSATE PRODUCTION (barrels)		GAS PRODUCTION (Mcf)	
Year		Yearly	Cum.	Yearly	Cum.
1947	1	783	783	74,xxx	74,xxx
1948	2	105	888	24,xxx	98,xxx
1949	2	2,129	3,017	913,xxx	1,012,xxx
1950 to 4/1	3	741	3,758	308,xxx	1,320,xxx

TYPE SECTION OF ROCKS PENETRATED



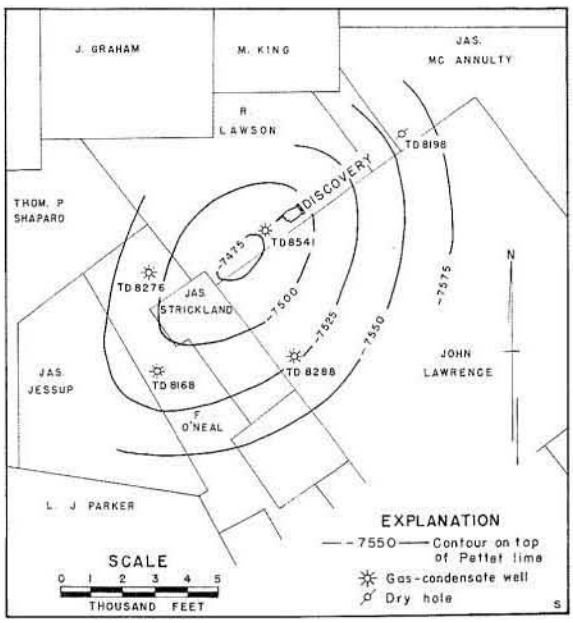




EXPLANATION

Sand | Shale | Limestone

Gas production | Show of gas



TEHUACANA FIELD
Limestone County, Texas

DONALD T. GIBSON
Geologist, Stanolind Oil and Gas Company, Tyler, Texas
April 29, 1949

LOCATION

The Tehuacana field, two miles southwest of Tehuacana in north-central Limestone County, is one of a series of small fields west of and paralleling the Mexia-Powell fault line.

METHODS OF EXPLORATION LEADING TO DISCOVERY

The first test in the vicinity of the field was drilled on the basis of combined surface and subsurface data in search of a fault line accumulation. The initial test had a show of oil, but was dry and abandoned; however, the second test encountered a small amount of free oil. The shows of oil in the two dry holes led to the drilling of the third well which resulted in the discovery of the field on September 30, 1940.

DISCOVERY

Woodbine sand: September 30, 1940;
Zephyr Oil Co. #3 Peoples.

NATURE OF TRAP

Woodbine sand: Fault wedge block on an anticline. The crest of the anticline at Woodbine depth is a horst formed by the intersection of two faults at approximate base of Austin chalk. The horst forms a sealed reservoir except at the northeast flank, where there is a water drive from the northeast. The closed southwest portion of the reservoir contains a gas cap, while water determines the northeast limit of the field.

PRODUCTIVE AREA

Woodbine sand and Field: 20 acres.

THICKNESSES OF RESERVOIR ROCKS

	Feet		
	Min.	Max.	Avg.
Woodbine sand:			
From top to bottom	14	40	25
Net productive	5	5	5

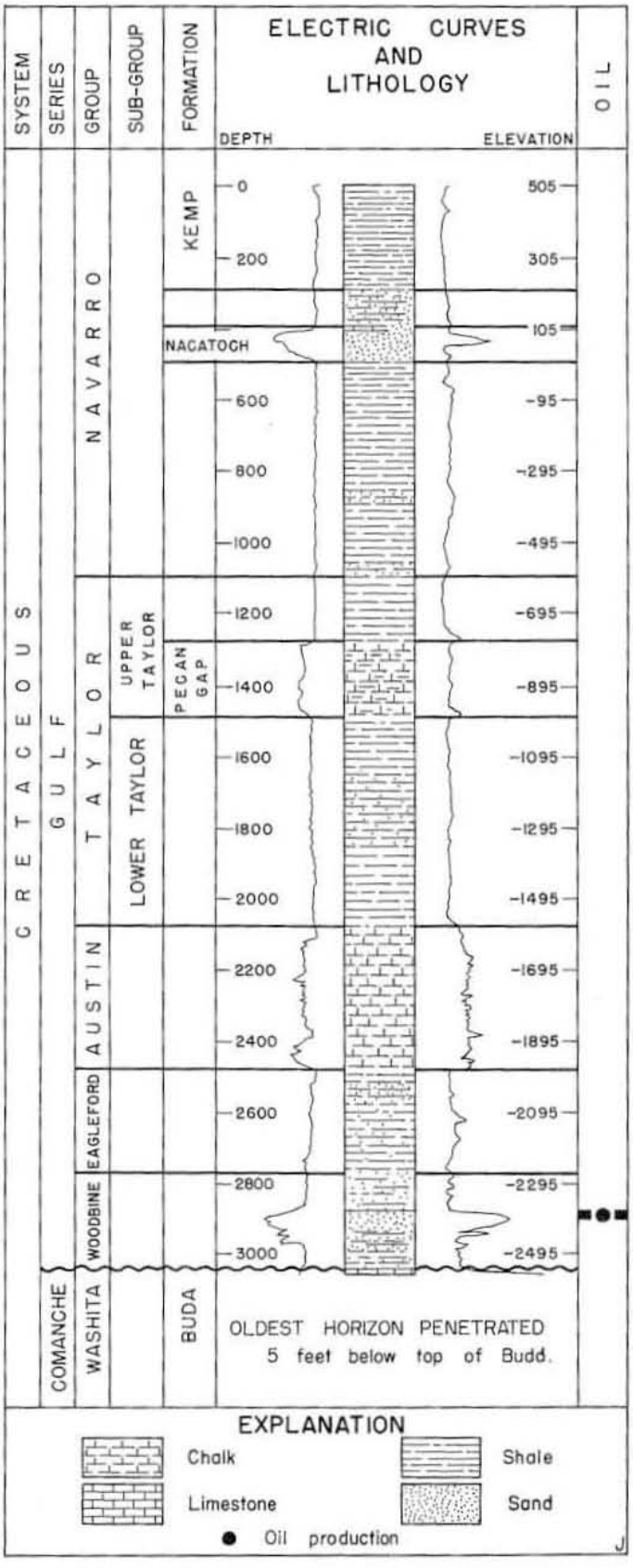
ELEVATION OF SURFACE

At well locations: Highest, 512 ft.; lowest, 500 feet.

SURFACE FORMATION

Within area of field: Kemp formation.

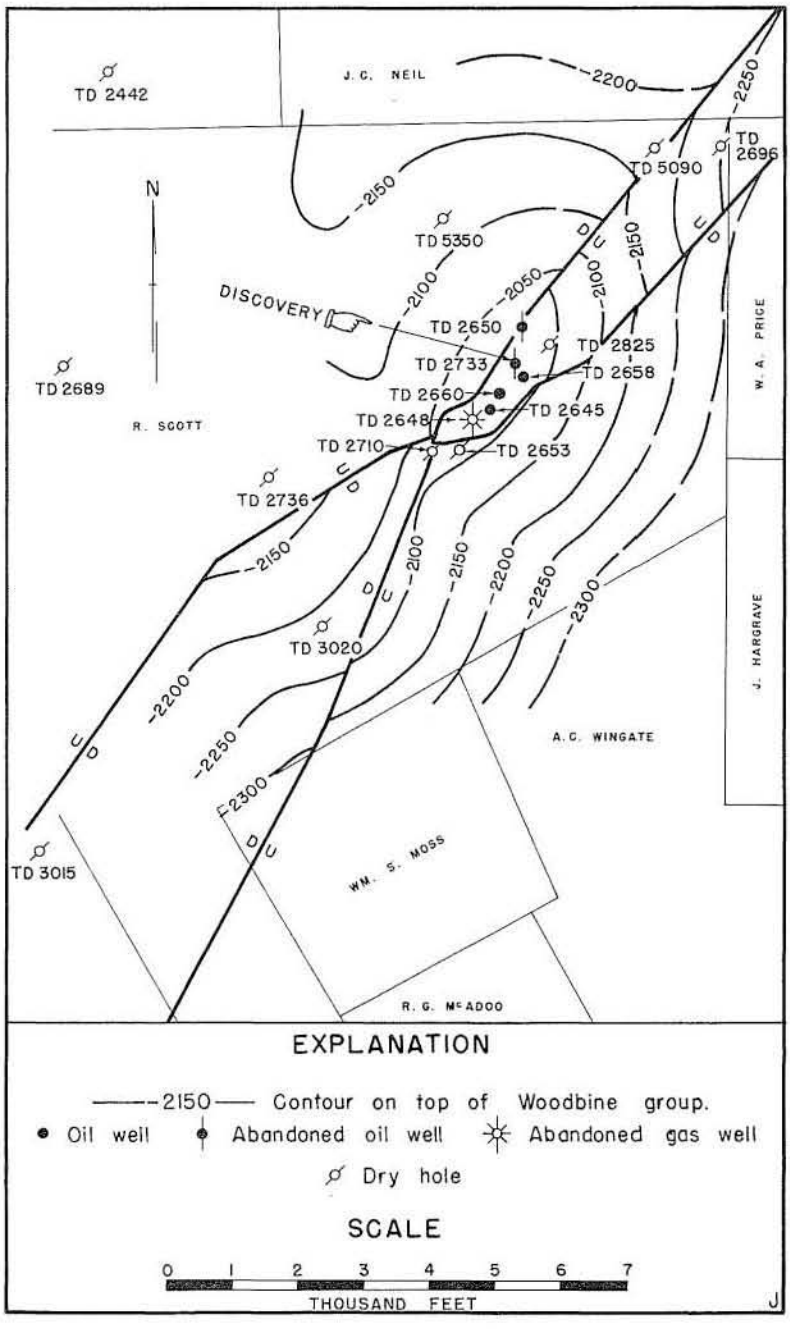
TYPE SECTION OF ROCKS PENETRATED



ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine sand:	Feet
Elevation of top of gas	-2,065
Elevation of bottom of gas	-2,138
Relief	73
Elevation of top of oil	-2,138
Elevation of bottom of oil	-2,143
Relief	5

The above figures are as of discovery date.



LITHOLOGY OF RESERVOIR ROCK

Woodbine sand: Sandstone, fine-grained.

Shale partings: At 8 feet below top of the sand there is a 2-foot shale parting. In dry offset tests the sand body thickens rapidly and shale partings vary from one on the crest of the anticline to innumerable thin partings only a few inches in thickness, none of which can be correlated in marginal tests.

CONTINUITY OF RESERVOIR ROCK

Woodbine sand: The reservoir sand is the only well-developed sand in the Woodbine group at this locality. This sand is apparently continuous to the Woodbine pinchout 7 miles to the southwest. It is known to extend $4\frac{1}{2}$ miles to the west and at least 4 miles to the east in the Mexia field, but the sand grades into numerous alternate sands and shales about 7 miles to the north near the Limestone-Navarro County line. Beyond these limits, except to the southwest, there is a sand at or near the same stratigraphic position, but continuity is very doubtful.

CHARACTER OF OIL

Weighted avg. gravity, A.P.I. @ 60° F., 19°
Sulphur content .002%
There is very little gas in solution.

WATER PRODUCTION

At the present time, salt water constitutes about 95% of the gross liquid being produced.

PRODUCTION HISTORY

Woodbine sand and Field:

	WELLS PRODUCING at end of year	OIL PRODUCTION (barrels)	
Year	Pumping	Yearly	Cumulative
1940	3	9,040	9,040
1941	3	19,710	28,750
1942	3	10,878	39,628
1943	3	7,955	47,583
1944	3	3,359	50,942
1945	3	2,461	53,403
1946	3	5,179	58,582
1947	3	5,923	64,505
1948	3	5,556	70,061
1949*	3	4,754	74,815

*P.S. - 1949 data added by amendment.

TENNESSEE COLONY FIELD

Anderson County, Texas

GEORGE N. ELY
Division Geologist, Continental Oil Company, Tyler, Texas
January 30, 1950

LOCATION

The Tennessee Colony field is in the immediate vicinity of the Tennessee Colony townsite in western Anderson County, approximately 12 miles northwest of Palestine, the county seat.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Subsurface and gravity indications of a structural anomaly led to the acquisition of leases. Reflection seismic work in 1943 and 1945 confirmed the presence of favorable structural conditions.

DISCOVERIES

First Rodessa zone: November 19, 1949; Continental Oil Co. #1 Royall National Bank. Initial potential: flowed 108.5 barrels of 45.5° gravity oil per day through perforations at 8,865 to 8,885 feet; gas-oil ratio, 1,855 to 1.

Second Rodessa zone: November 19, 1949; Continental Oil Co. #1 Royall National Bank. Initial potential: from perforations at 8,965 to 8,990 feet, the calculated daily open flow was 2,800 Mcf of gas plus 137 barrels of 58.8° gravity condensate per million cubic feet of gas; gas-oil ratio, 7,612 to 1.

Pettet: October 2, 1950; Continental Oil Co. #2 Royall National Bank. Initial potential; from perforations at 9,626 to 9,646 feet, flowed 492 barrels of 53.4° gravity oil per day; gas-oil ratio, 1,747 to 1.

ELEVATION OF SURFACE

At well locations: Highest, 395 ft.; lowest, 316 feet.

SURFACE FORMATION

The Reklaw formation is at the surface throughout the present extent of the field. The field discovery well commenced drilling at or near the greensand member of the Reklaw.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated is about 367 feet below the top of the Travis Peak formation. This penetration was in field discovery well. The accompanying TYPE SECTION is based on the log of that well.

NATURE OF TRAPS

Local closure on a north-south structural trend, complicated by some faulting, and with variations in porosity and permeability playing some part in forming traps.

PRODUCTIVE AREAS

Development to date has not been sufficient to determine the areal extent of production in any one of the reservoirs.

THICKNESSES OF RESERVOIR ROCKS

Net productive, in feet	Max.	Avg.
First Rodessa zone (4 wells)	7	5
Second Rodessa zone (9 wells)	45	37
Pettet (3 wells)	5	5

LITHOLOGY OF RESERVOIR ROCKS

First Rodessa zone: Medium to light grayish-brown, crystalline, fossiliferous, oolitic, coquina-like limestone with fine to cellular type porosity.

Second Rodessa zone: Tan to grayish-brown, crystalline to dense, fossiliferous, oolitic to pseudo-oolitic, slightly argillaceous limestone with fine to cellular type porosity. Some streaks of dark grayish brown, dense, non-porous limestone.

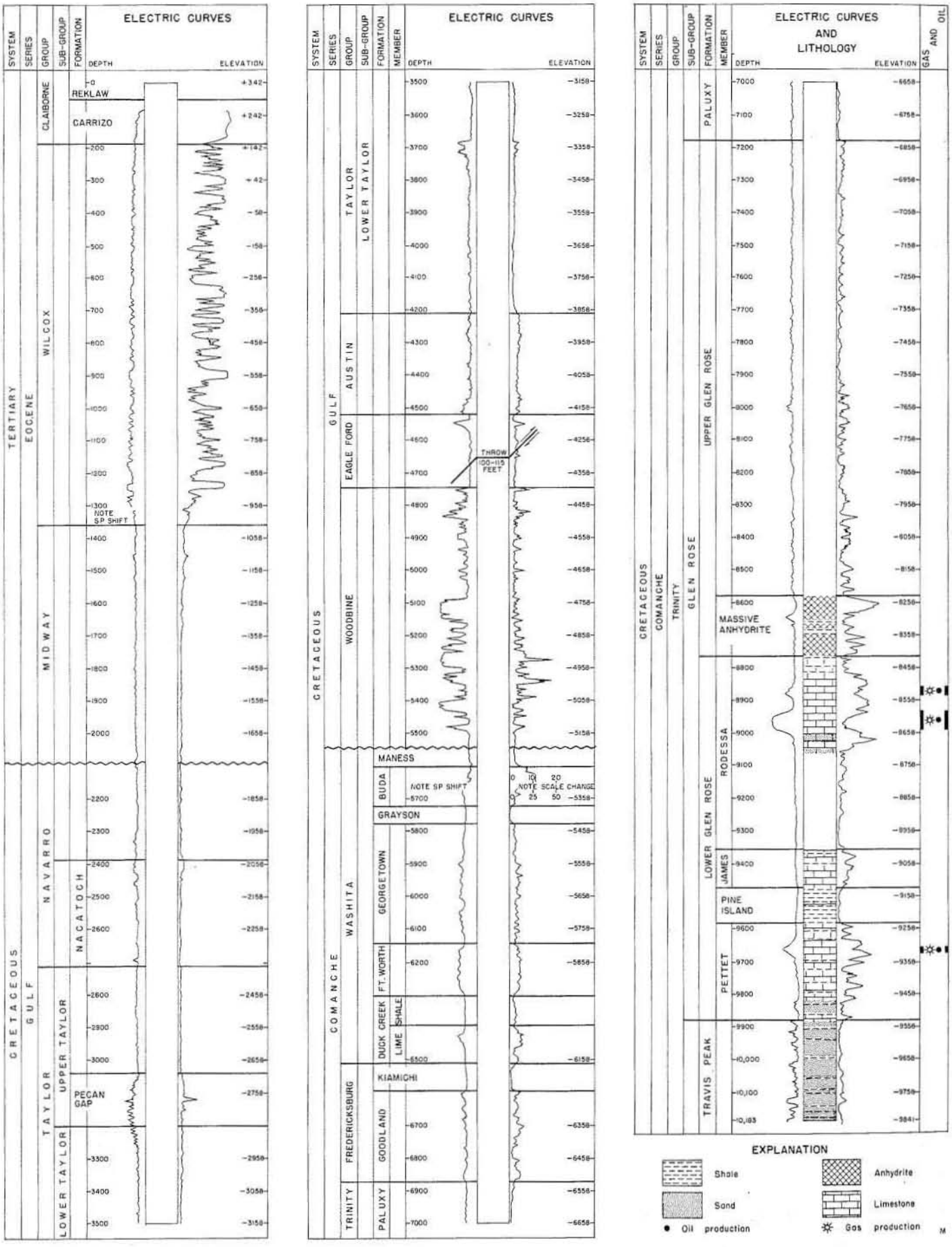
Pettet: Grayish-brown to tan, crystalline to dense, very fossiliferous, oolitic, fractured limestone, fine to medium porosity.

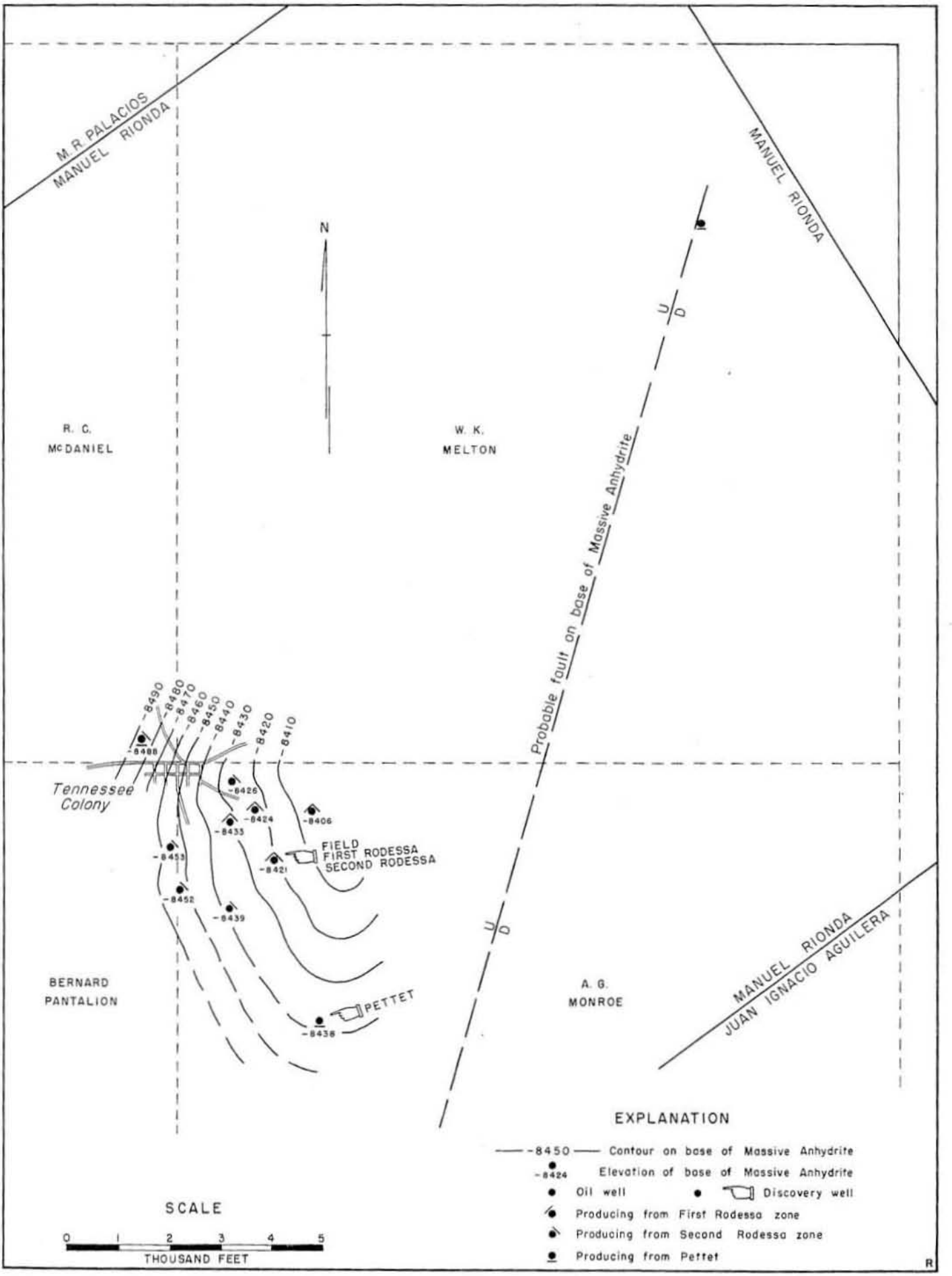
CONTINUITY OF RESERVOIR ROCKS

Rodessa: The Rodessa member of the Glen Rose is continuous throughout the entire East Texas basin. However, the zones of porosity and permeability are not continuous and vary greatly from place to place, even from one well to another within a field.

Pettet: Like the Rodessa, the Pettet member is recognizable over the entire basin area, and the porous and permeable zones are not continuous.

TYPE SECTION OF ROCKS PENETRATED




M. R. PALACIOS
MANUEL RIONDA
MANUEL RIONDA
N
R. C.
McDANIEL
W. K.
MELTON
U
D
Probable fault on base of Massive Anhydrite
-8490
-8480
-8470
-8460
-8450
-8440
-8430
-8420
-8410
-8488
Tennessee
Colony
-8426
-8424
-8433
-8406
-8453
-8421
FIELD
FIRST RODESSA
SECOND RODESSA
-8452
-8439
PETTET
-8438
BERNARD
PANTALION
A. G.
MONROE
MANUEL RIONDA
JUAN IGNACIO AGUILERA
U
D
EXPLANATION
-8450 Contour on base of Massive Anhydrite
-8424 Elevation of base of Massive Anhydrite
Oil well
Discovery well
Producing from First Rodessa zone
Producing from Second Rodessa zone
Producing from Pettet
SCALE
0 1 2 3 4 5
THOUSAND FEET
R

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

The upper and lower extents of reservoir fluids have not yet been established, with the exception that the water level in the Second Rodessa zone has been found at -8,690 feet on the northwest side of the field. The following figures merely represent the extreme known elevations and relief of hydrocarbons established by wells completed to date.

	First Rodessa	Second Rodessa	Pettet
Highest known hydrocarbon, ft.	-8,508	[illegible]	-9,311
Lowest known hydrocarbon, ft.	-8,546	[illegible]	-9,418
Relief, feet	38	105	107

CHARACTER OF OIL

	Gravity	Color
First Rodessa zone	60.8° - 43.2°	Water white to green
Second Rodessa zone	61.2° - 45.2°	Water white to green
Pettet	53.4°	Amber

CHARACTER OF GAS

Not available.

ACID TREATMENT

First Rodessa zone: All wells in this zone have been acidized, the amount of acid ranging from 3,000 to a maximum of 9,000 gallons.

Second Rodessa zone: One well in this zone was completed natural. All others were acidized with 1,000 to 3,000 gallons.

Pettet: The three wells in this zone were all acidized, one with 8,000 gallons, one with 4,000 gallons and the other with 3,000 gallons.

WATER PRODUCTION

A small amount of water has been obtained from both the First and Second Rodessa zones in some of the wells. No accurate figures are available.

PRODUCTION HISTORY

Field totals

Year	WELLS PRODUCING at end of year: Oil or Oil & Gas Flowing	WELLS PRODUCING at end of year: Gas or Gas & Conds.	OIL PRODUCTION (barrels): Yearly	CONDENSATE PRODUCTION (barrels): Yearly	TOTAL LIQUIDS (barrels): Yearly	TOTAL LIQUIDS (barrels): Cumulative	GAS PRODUCTION (Mcf): Yearly	GAS PRODUCTION (Mcf): Cumulative
1949	1 (1)	1 (1)	3,479	1,430	4,909	4,909	11,182	11,182
1950	11 (5)	0 *	198,531	27,193	225,724	230,633	852,410	863,592

Figures in parentheses indicate number of wells producing from two reservoirs (see map.)

*Former gas-condensate wells had been reclassified as oil wells.

Cumulative production to and number of wells as of 12/31/50.

Reservoir	WELLS PRODUCING Oil	OIL PRODUCTION (barrels)	CONDENSATE PRODUCTION (barrels)	TOTAL LIQUIDS (barrels)	GAS PRODUCTION (Mcf)
First Rodessa	4 (4)	81,142		81,142	233,042
Second Rodessa	9 (5)	96,863	28,623*	125,486	611,655
Pettet	3 (1)	24,005		24,005	18,895
Total	16	202,010	28,623*	230,633	863,592

Figures in parentheses indicate number of wells producing from another reservoir also. (see map).

*Produced by the first two wells in the field. These wells were originally classed as gas-condensate wells; reclassified as oil wells in 1950.

TRAWICK FIELD
Nacogdoches County, Texas

HARRY S. PHILLIPS
Geologist, Tyler, Texas
January 1, 1950

LOCATION

The Trawick field is in northwestern Nacogdoches County in the vicinity of Trawick community about 13 miles north-northwest of Nacogdoches, county seat of Nacogdoches County.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Surface studies conducted in 1931 and subsurface studies conducted subsequently both indicated the presence of favorable structure in the Trawick area. A lease block was taken in 1944 and the area was mapped by reflection siesmograph in the latter part of 1946 and early 1947. After low relief anticlinal closure was confirmed by the seismic work, the lease block was enlarged. On January 23, 1949, Humble Oil & Refining Co. began drilling operations on its #1 Thurman Crawford, the discovery well.

DISCOVERY

After testing non-commercial and commercial gas shows in various lower Glen Rose zones, Humble Oil & Refining Co. #1 Thurman Crawford was completed as a gas condensate well on June 3, 1949 with production being obtained from a porous limestone in the Pettet member of the Glen Rose. The calculated potential was 47,000 Mcf per day with an estimated 4.73 barrels of 48.4° gravity condensate per million cubic feet of gas.

ELEVATION OF SURFACE

Surface elevation at the discovery well is 478 feet.

SURFACE FORMATION

Reklaw formation of Claiborne group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated is about 300 feet below the top of the Travis Peak formation, which to this depth consists of hard sandstones and redbeds. This penetration was at the total depth of 8,257 feet in the discovery well, the only well completed to date.

PRODUCTIVE AREA

Proven productive area is regarded as 640 acres. Further development will probably prove a much larger productive area.

NATURE OF TRAPS

Rodessa: Simple convex trap on a low relief anticline with local permeability variations.

Pettet: Simple convex trap on a low relief anticline with a possible permeability barrier to the east.

Pettet-Travis Peak transition zone: Probably locally developed lenticular porosity which may occur erratically in the area.

THICKNESSES OF RESERVOIR ROCKS

Rodessa	Feet in discovery well
From top to bottom	52
Net productive	16
Pettet	
From top to bottom	32
Net productive	31
Pettet-Travis Peak transition zone	
From top to bottom	7
Net productive	7

LITHOLOGY OF RESERVOIR ROCKS

Rodessa: Brown porous granular and fossiliferous limestone.

Pettet: Light gray to brown porous oolitic and coquinoidal limestone.

Pettet-Travis Peak transition zone: Slightly porous fine-grained silty sandstone.

CONTINUITY OF RESERVOIR ROCKS

Rodessa: The Rodessa member of the lower Glen Rose formation is recognized over much of the East Texas basin. The porous zones are erratic in occurrence and often lenticular in character. In the Trawick area, the porous zones vary somewhat in thickness, but are believed to be generally continuous over most of the productive area of the field.

Pettet: The Pettet is continuous and correlative over most of the East Texas basin. It consists of shales and nonporous lime together with porous limes which vary greatly in development and thickness both laterally and vertically.

Pettet-Travis Peak transition zone: The transition zone exists over the majority of the East Texas basin and consists of a gradational section of alternating fine- to medium-grained sands, siltstones, shales, and limes diagnostic of both the Pettet and Travis Peak sections. Porosities are lenticular and generally have limited lateral extent.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Elevation of known top of gas	Feet
Rodessa	-6,244
Pettet	-7,015
Pettet-Travis Peak transition zone	-7,362

To date, no salt water has been encountered in the known productive zones.

CHARACTER OF CONDENSATE

Gravity, A. P. I. @ 60° F.	
Rodessa	Not determined
Pettet	52°
Pettet-Travis Peak transition zone	51°

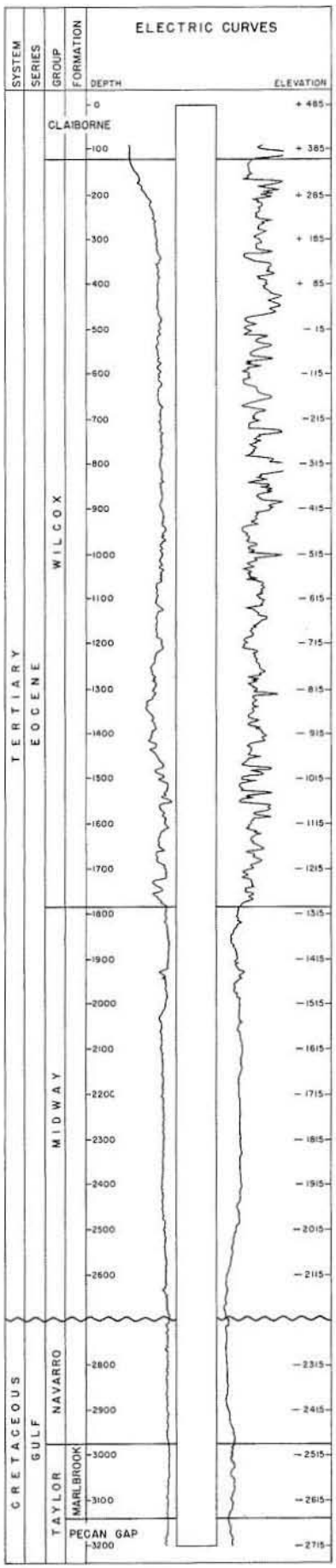
ACID TREATMENT

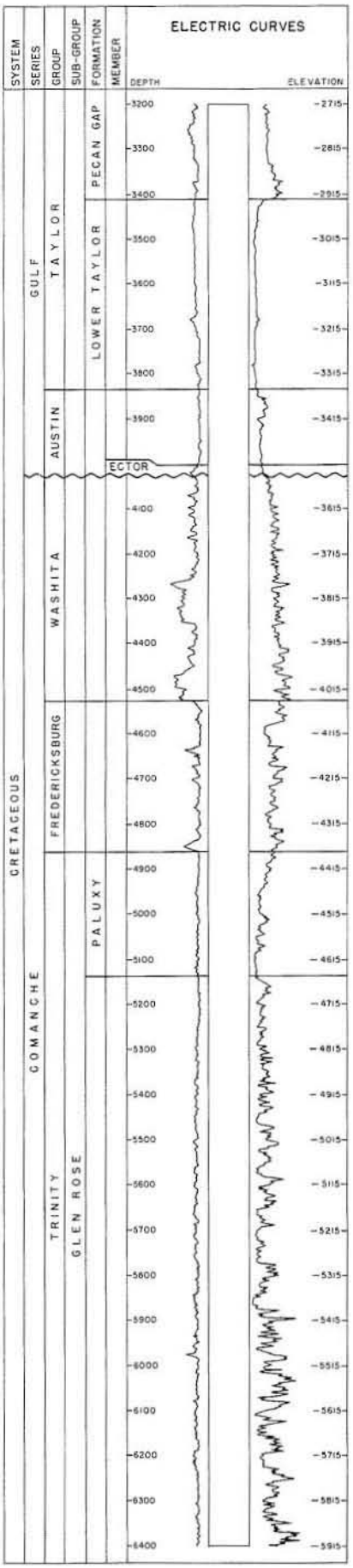
No acid treatment was attempted on the discovery well, the only producer completed in the field to date.

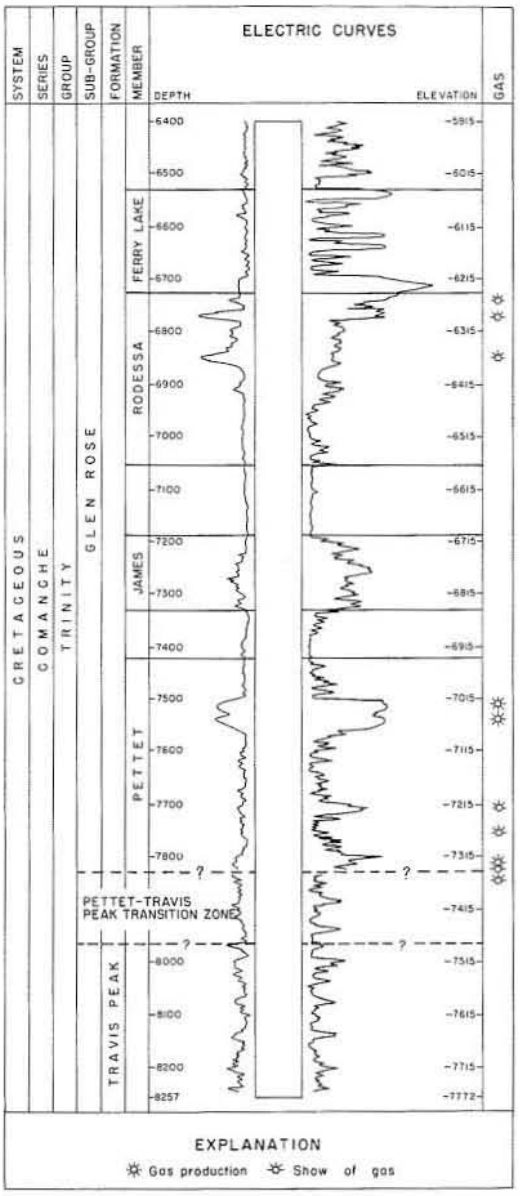
PRODUCTION HISTORY

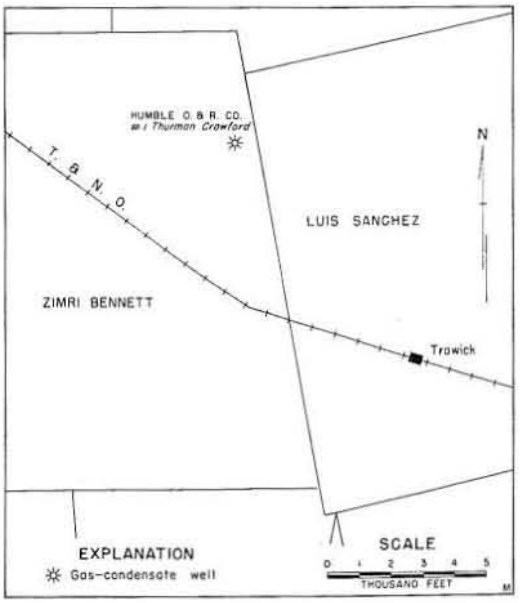
Discovery well has been shut in due to lack of market.

TYPE SECTION OF ROCKS PENETRATED









TRI-CITIES FIELD
Henderson County, Texas

E. L. HOWARD
Consulting Geologist, Tyler, Texas
June 15, 1949

LOCATION

Tri-Cities field is located 7 miles southwest of Athens, county seat of Henderson County, Texas.

METHODS OF EXPLORATION LEADING TO DISCOVERY

The structure was first located by surface work and by correlation of strata in core holes drilled for exploring lignite beds which might be of commercial value. A lease block was assembled in 1933 and the area was then surveyed by reflection seismograph. John Doering was the geologist on the surface work and with John R. Black and others, he assembled a block of leases covering 5,000 acres. After a seismograph survey, Stanolind Oil and Gas Co. purchased a one-half interest and Darby Petroleum Co. a one-fourth interest. The Cayuga field, approximately 10 miles southwest of the area, had been discovered, thus improving the outlook for Woodbine production in this trend. On May 4, 1934, a well was spudded by John R. Black et al. on the C. H. Meridith tract in the Wiley Kay survey. This well (about 1,000 feet west of the location where the Pettet lime reservoir was later discovered) encountered the Woodbine sand at 4,089 feet and penetrated this formation to a depth of 4,235 feet before being abandoned. This well showed that the area was high regionally but eliminated any hopes for Woodbine production on the structure. In 1940, the author became interested in the area and secured open leases and contributions which were turned to Harper & Turner Oil Co. and British-American Oil Producing Co. for a deep test on the Texie Young tract in the Joseph Rice survey which was the discovery well for the area.

DISCOVERY WELLS

Bacon lime: Condensate: November 1, 1941; British-American Oil Producing Co. and Harper & Turner Oil Co. #1 Texie Young. Perforations, 7,624 to 7,641 feet. The well produced 355 barrels of 61° gravity crude with 31 barrels of salt water flowing on a 3/8-inch tubing choke. The tubing pressure was 1,870 psi. and the gas-oil ratio was 14,324 cubic feet per barrel.

Oil: June 22, 1948, W. B. Hinton and James Webb #1-B Mrs. E. K. Gladney. Perforations, 7,720 to 7,734 feet. During a 24-hour potential test the well produced 237 barrels of oil through a 12/16-inch tubing choke. The pressures were 820 psi. flowing on tubing and 850 psi. on casing closed. The gas-oil ratio was 1111:1 and the gravity was 42.6°.

Rodessa lime: October 14, 1947; M. B. Chastain et al. #1 L. R. Riddlesperger. Perforations, 7,674 to 7,737 feet. Initial production was at the rate of 533 barrels per day through a 16/64-inch tubing choke. The tubing pressure was 400 psi. and the casing pressure was 800 psi. sealed. The gravity of the oil was 46° and the gas-oil ratio was 4,800:1. The well was acidized with 5,000 gallons. In previous wells this pay had been cased off without proper testing.

Pettet lime: September 29, 1948; Stanolind Oil & Gas Co. et al. #1 C. H. Meridith. Perforations, 8,184 to 8,213 feet. On potential test the well produced at the rate of 123 barrels of oil per day through a 17/64-inch tubing choke. The pressure on tubing while flowing was 850 psi. The gravity of the oil was 47.7° and the gas-oil ratio was 7,880:1. The well was acidized with 4,000 gallons.

Travis Peak: June 22, 1948; W. B. Hinton and James Webb #1 Mrs. J. L. Evans. Perforations, 8,609 to 8,728 feet in broken sands. On potential test the well produced at the daily rate of 10 million cubic feet of gas with an estimated 15 barrels of water-white condensate. Shut-in surface pressure was 3,200 psi. This well produced from this reservoir during only a short time before it was plugged in this reservoir.

NATURE OF TRAPS

Bacon lime: The accumulations of gas and oil are due primarily to a trap formed by convex folding, with porosity playing a minor role around the periphery. The accumulation of gas is at the apex of a faulted anticline or dome and the accumalation of oil is well down on the southeast side of the structural uplift. Porosity decreases generally away from the apex of the uplift. Between the gas producing area and the oil producing area, there is a zone where porosity and permeability are so low that oil migration appears to be precluded.

Rodessa lime: The trap is formed by convex folding. Porosity is continuous over the entire area of the field and beyond the periphery of the field.

Pettet lime: The trap is formed essentially by convex folding. However, decrease of porosity appears to be a trap-forming factor at the northern extent of this reservoir.

Travis Peak: The reservoirs in the Travis Peak are sand lenses. The fact that such lenses do not contain gas in commercial quantities at locations off the structural uplift indicate that the convex folding is a dominating factor in forming traps.

PRODUCTIVE AREAS

	Acres
Bacon lime, gas	2,300
Bacon lime, oil (undefined)	200
Rodessa lime	1,000
Pettet lime (undefined)	3,000
Travis Peak (undefined)	3,200
Tri-Cities field (undefined)	3,200

It seems probable that future drilling may add to the above estimates for the reservoirs for which the areas are indicated as undefined.

LITHOLOGY OF RESERVOIR ROCKS

Bacon lime: The Bacon lime is a fossiliferous gray limestone grading from rather dense brownish limestone at top to oolitic porous limestone at bottom. Porosity and permeability are quite variable horizontally within the area of the field, generally decreasing toward the periphery. It appears that the oil area is separated from the gas area by a zone where the porosity is extremely low.

Rodessa lime: The Rodessa lime grades from a fossiliferous gray limestone at the top to a brown calcareous sandstone at the base of the formation. Its porosity is continuous over the entire area of the field. Water is yielded downdip beyond the extent of the oil in the reservoir.

Pettet lime: The Pettet lime is a gray fossiliferous medium porous oolitic limestone. Porosity decreases toward the northern edge of the field where there is no effective porosity.

Travis Peak: The Travis Peak formation is a series of interbedded hard to medium porous sandstones and hard shales. The sandstones vary in thickness from a few feet to 20 feet.

THICKNESSES OF RESERVOIR ROCKS

	Average feet
Bacon lime	
From top to bottom	30
Net productive	12
Rodessa lime	
From top to bottom	120
Net productive	30
Pettet lime	
From top to bottom	50
Net productive	15
Travis Peak	
From top to bottom	640*
Net productive	50

*The deepest penetration of Travis Peak to date is 640 feet of a possible 2,000-foot section.

CONTINUITY OF RESERVOIR ROCKS

All of the reservoir rocks seem to be continuous throughout the area of the field. However, as reported under a previous heading, the Bacon lime and the Pettet lime are not continuously porous and permeable. While the Travis Peak everywhere contains one or more productive sands, no one of these sands is believed to be continuous over more than a small part of the area.

CHARACTER OF OIL AND CONDENSATE

	Gravity (A.P.I. @ 60° F.)		
	Max.	Min.	Wtd. avg.
Bacon condensate	70	50	60
Bacon oil	43	41	42
Rodessa oil	50	42	47
Pettet oil	50	46	48
Travis Peak condensate: water-white			70

There is no sulphur in any of the oil or condensate.

CHARACTER OF GAS

The following is an analysis of the gas after being stripped by high and low pressure separators. This gas is a mixture of the Bacon lime and Rodessa lime gases.

Constituent	Mol. %	Gal/Mcf
Methane and lighter	84.25	--
Ethane	8.17	--
Propane	3.83	1.05
Iso-butane	.94	.31
Nor-butane	1.44	.45
Iso-pentane	.52	.19
Pentane	.36	.13
Hexanes plus	.49	.23
Total	100.00	2.36

Sampling method: Purged
Heating value: 1,170 B.t.u./cf
Specific gravity: 0.716

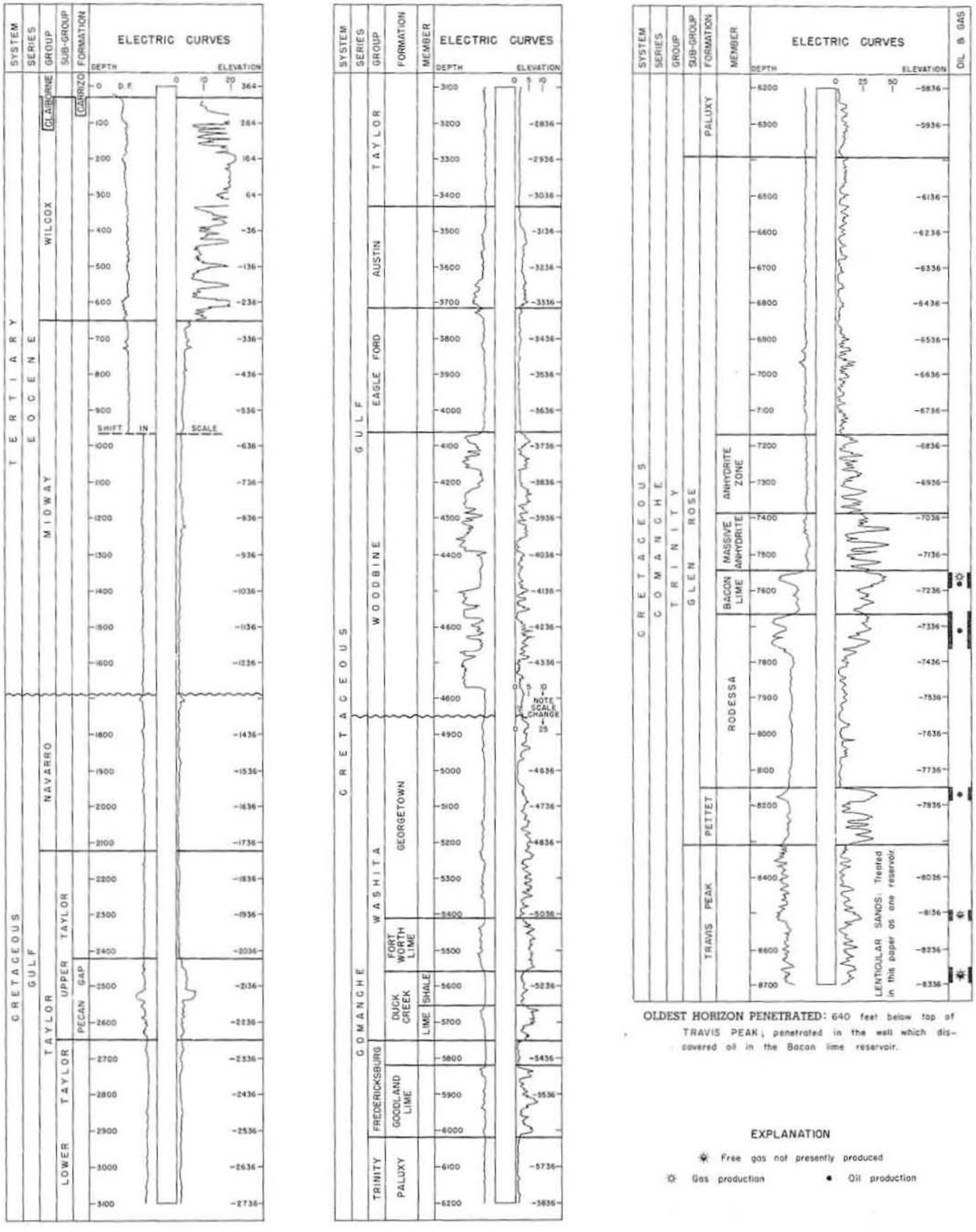
WATER PRODUCTION

The only reservoir giving evidence of a water drive in the field is the Rodessa lime. Two drill stem tests have been taken in this reservoir beyond the productive limits and salt water flowed on testing. It is believed that water will tend to maintain the reservoir pressures. Only a small amount of water is now being produced by Rodessa wells.

TYPE SECTION OF ROCKS PENETRATED

SURFACE FORMATION: Carrizo

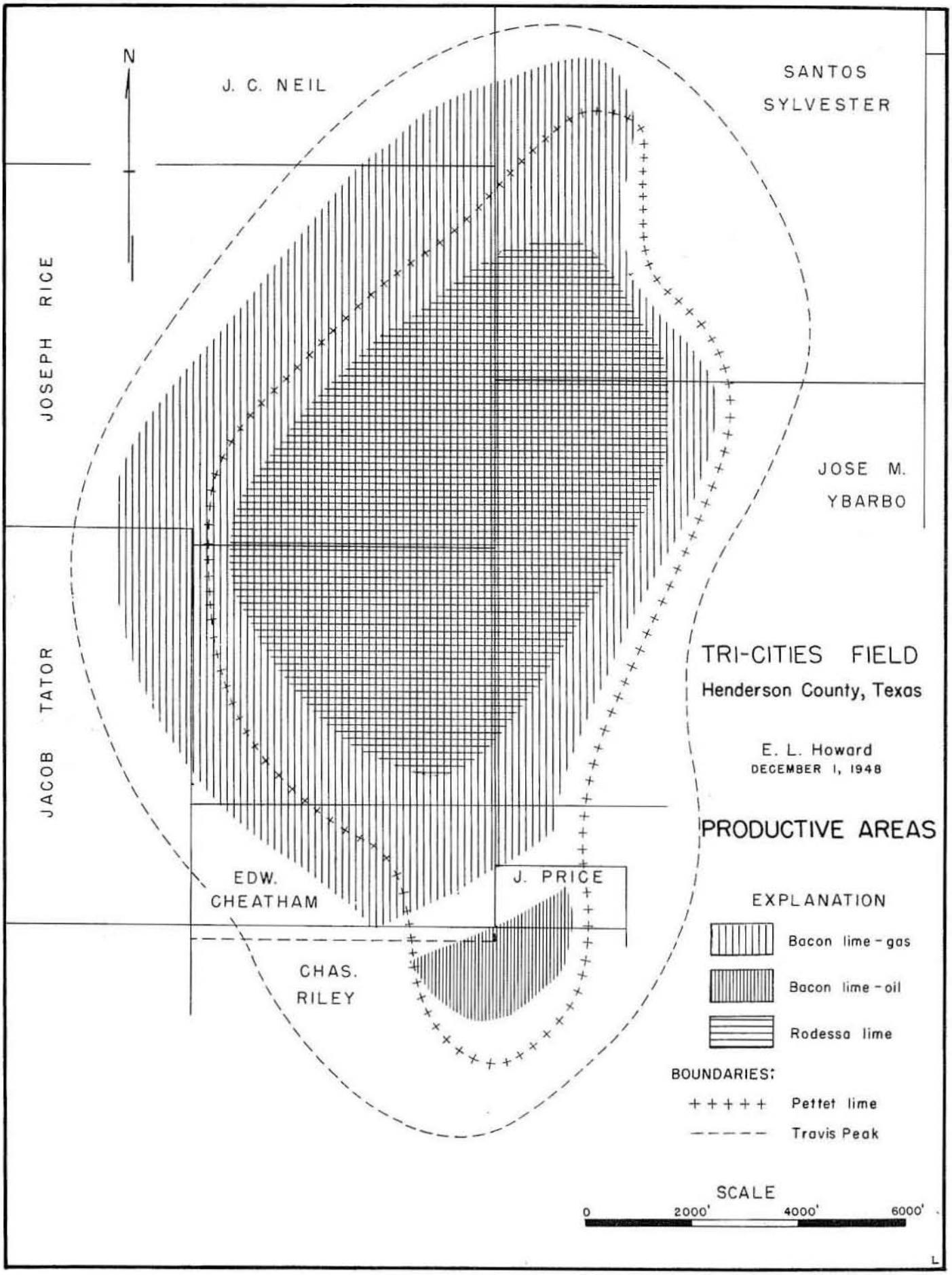
ELEVATION OF SURFACE: Highest, 450 feet; lowest, 330 feet

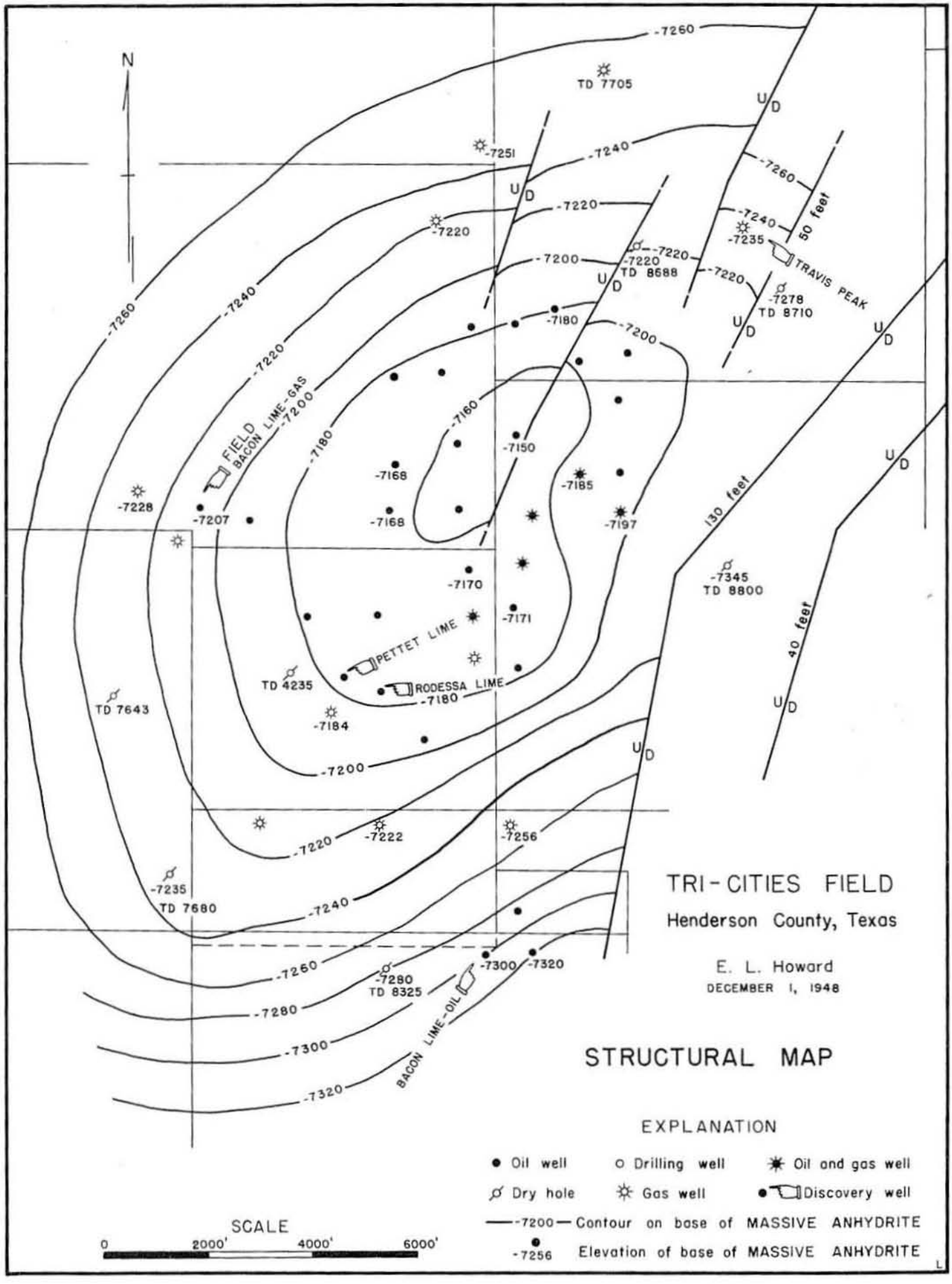


OLDEST HORIZON PENETRATED: 640 feet below top of TRAVIS PEAK, penetrated in the well which discovered oil in the Bacon lime reservoir.

EXPLANATION

- Free gas not presently produced
- Gas production
- Oil production


N
J. C. NEIL
SANTOS
SYLVESTER
JOSEPH RICE
JOSE M.
YBARBO
JACOB TATOR
EDW.
CHEATHAM
J. PRICE
CHAS.
RILEY
TRI-CITIES FIELD
Henderson County, Texas
E. L. Howard
DECEMBER 1, 1948
PRODUCTIVE AREAS
EXPLANATION
Bacon lime - gas
Bacon lime - oil
Rodessa lime
BOUNDARIES:
Pettet lime
Travis Peak
SCALE
0
2000'
4000'
6000'


N
-7260
TD 7705
-7251
-7240
-7220
-7200
-7180
-7160
-7150
-7168
-7185
-7197
-7207
-7228
FIELD
BACON LIME-GAS
-7170
-7171
PETTET LIME
RODESSA LIME
-7180
TD 4235
TD 7643
-7184
-7222
-7256
-7235
TD 7680
-7280
TD 8325
-7300
-7320
BACON LIME-OIL
U D
50 feet
-7235
TRAVIS PEAK
-7220
TD 8688
-7278
TD 8710
130 feet
-7345
TD 8800
40 feet
TRI-CITIES FIELD
Henderson County, Texas
E. L. Howard
DECEMBER 1, 1948
STRUCTURAL MAP
EXPLANATION
Oil well
Drilling well
Oil and gas well
Dry hole
Gas well
Discovery well
-7200 Contour on base of MASSIVE ANHYDRITE
-7256 Elevation of base of MASSIVE ANHYDRITE
SCALE
0
2000'
4000'
6000'

PRODUCTION HISTORY

Field totals

Year	WELLS PRODUCING at end of year: Gas	Oil	OIL PRODUCTION (barrels): Yearly	CONDENSATE PRODUCTION (barrels): Yearly	TOTAL LIQUIDS (barrels): Yearly	Cumulative	GAS PRODUCTION (Mcf): Yearly	Cumulative
1941	0	1	5,959	0	5,959	5,959	250,000	250,000
1942	0	1	29,298	0	29,298	35,257	504,363	754,363
1943	3	1	18,677	12,495	31,172	66,429	837,008	1,591,371
1944	5	1	22,818	43,507	66,325	132,754	1,551,005	3,142,376
1945	5	1	29,818	87,513	117,331	250,085	3,281,577	6,423,953
1946	8	1	50,792	203,393	254,185	504,270	8,960,242	15,384,195
1947	12	7	71,413	286,350	357,763	862,033	5,942,555	21,326,750
1948	17	20	718,966	102,543	821,509	1,683,542	5,480,659	26,807,409
1949*	8	29	337,765	49,035	386,800	2,070,342	3,398,450	30,205,859

It is impossible to present the production history by reservoirs due to the complexity of the completions. On December 1, 1948, there were 39 physically completed producers in the field, of which 30 were each producing from one reservoir, 2 testing for production from one reservoir, and 7 were producing from two reservoirs, as indicated in the following tabulation:

WELL COMPLETIONS as of 12/1/48

Single	Dual	Bacon: Gas	Bacon: Oil	Rodessa: Gas	Rodessa: Oil	Pettet: Gas	Pettet: Oil	Travis Peak: Gas
9		9						
2*						2*		
2			2					
19					19			
	1				1		1	
	4	4			4			
	1			1				1**
	1	1						1**
32	7	14	2	1	24	2*	1	2**

*Testing on 12/1/48.

**Travis Peak now plugged. Although several wells have tested Travis Peak, only two wells have produced from it. There are no wells producing from this reservoir at present (6/15/49).

The British-American Oil Producing Co. and Harper & Turner Oil Co. #1 Texie Young, discovery well for the field and completed in the Bacon lime, was classified as an oil well by the Railroad Commission despite its high gravity and gas-oil ratio. No more wells were drilled until 1943 when Stanolind Oil & Gas Co. et al. started drilling and completing gas wells in the Bacon lime. After the completion of the M. B. Chastain et al. #1 L. R. Riddlesperger in the Rodessa lime in October of 1947, the Railroad Commission reclassified several wells as oil wells and set an oil allowable for same. This is reflected in the increase in oil production and decrease in condensate production in 1948.

There are no casinghead or cycling plants in the field. The gas production is purchased by the Lone Star Gas Co. at the separators in the field and this gas is stripped at the Lone Star Trinidad plant west of the field.

*P.S. - 1949 data added by amendment.

The total quantity of oil produced during 1949 has been reported as from the Rodessa zone, but it appears that some of the total was produced by British-American and Harper & Turner #1 Texie Young from the Bacon lime and some by M. B. Chastain #1 Texie Young from the Pettet lime.

Nine gas wells were reclassified as oil wells.

1949 GAS PRODUCTION (Mcf)

	Oil wells	Gas wells	Total
Bacon lime	98,763	1,261,364	1,360,127
Rodessa lime	1,629,590	228,990	1,858,580
Pettet lime	15,791	163,952	179,743
Total	1,744,144	1,654,306	3,398,450

TUNDRA FIELD
Van Zandt County, Texas

JACK M. DeLONG
Geologist, Stanolind Oil and Gas Company, Tyler, Texas
March 28, 1949

LOCATION

The Tundra field is located 4 miles west of Tundra and 8½ miles south of Canton, county seat of Van Zandt County.

METHODS OF EXPLORATION LEADING TO DISCOVERY

The Texas Co. obtained a lead on the area from surface work done in 1931. Subsurface work was carried on to some extent until 1935, at which time a seismograph crew was moved into the area.

DISCOVERY

Rodessa lime: December 29, 1944;
The Texas Co. #1 J. F. Stout.

ELEVATION OF SURFACE

At well locations: Highest, 595 ft; lowest, 537 feet.

SURFACE FORMATION

Wilcox group; comprised of sandy clays, cross-bedded river sands, non-calcareous lacustrine or lagoonal clays, lignite lentils and stratified deltaic silts.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

480 feet below top of Travis Peak formation.

NATURE OF TRAP

Rodessa lime: Permeability trap.

PRODUCTIVE AREA

Rodessa lime and Field: 40 acres (one well).

THICKNESS OF RESERVOIR ROCK

Rodessa lime: 6 feet with 4 feet net productive.

LITHOLOGY OF RESERVOIR ROCK

Rodessa lime: Limestone, tan oolitic to fossiliferous.

CONTINUITY OF RESERVOIR ROCK

Rodessa lime: The limestone seems to be present throughout the area, as it appears on the electric logs of the wells 1,700 feet northeast and 2,700 feet to the south, but the permeability is variable throughout the area. The accumulation apparently is due to the permeability development.

ELEVATION OF PRODUCTIVE ZONE

Rodessa lime: -7,598 feet.

CHARACTER OF OIL

Rodessa lime: Gravity: 44.6° (corrected).

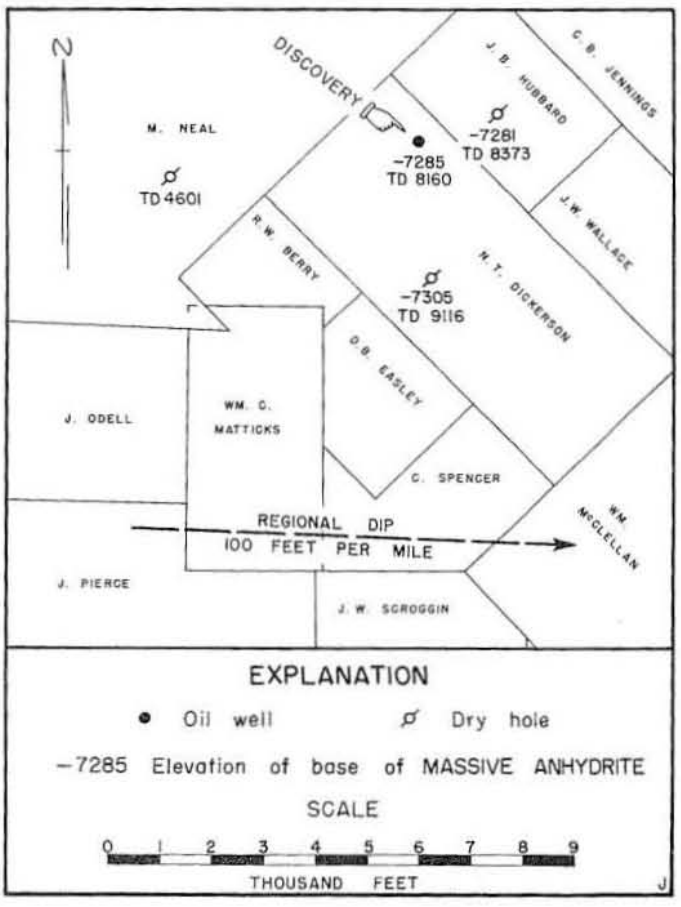
WATER PRODUCTION

On several completion tests of the well, salt water was recovered, the percentage varying from 2 to 10%. No information is available on the amount of salt water being produced now.

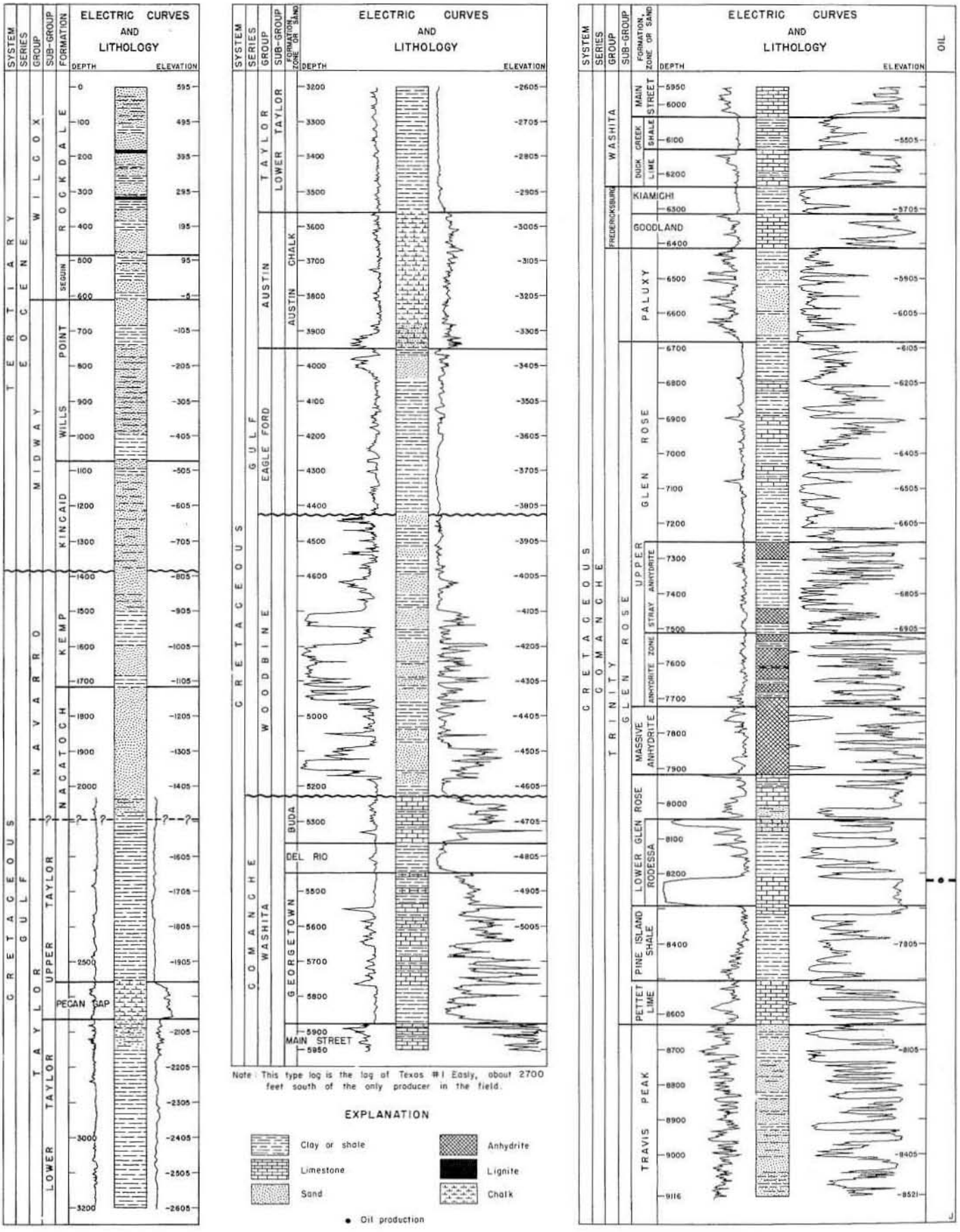
PRODUCTION HISTORY

Year	WELLS PRODUCING at end of year: Flowing	OIL PRODUCTION (barrels): Yearly	Cumulative
1945	1	3,809	3,809
1946	1	3,143	6,952
1947	1	4,172	11,124
1948	1	4,124	15,248
1949*	1	4,176	19,424

*P.S. - Amended to include the whole of 1949.



TYPE SECTION OF ROCKS PENETRATED



TYLER FIELD
Smith County, Texas

C. W. TORRANS
Petroleum Engineer, Delta Drilling Company, Tyler, Texas
June 12, 1950

LOCATION

The Tyler field is located two miles south of the city of Tyler, county seat of Smith County. Dry holes have apparently indicated the east and west limits, but the productive area may be extended both northward and southward.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Subsurface data and seismic surveys were bases for drilling of the discovery well. Several companies contributed.

DISCOVERY

Paluxy sand: September 28, 1948;
Delta Drilling Co. #1 Max Rice.

ELEVATION OF SURFACE

At well locations: Highest, 565 ft.; lowest, 520 feet.

SURFACE FORMATION

Sparta sand of the Claiborne group, Eocene.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated within the area of the field is approximately 15 feet below the top of the upper Glen Rose.

NATURE OF TRAP

Paluxy sand: Apparently an accumulation in lenticular sands on a domal anticline. Faulting is present but is not thought to influence accumulation.

PRODUCTIVE AREA

Paluxy sand and Field: Approximately 200 acres.

THICKNESS OF RESERVOIR ROCK

Paluxy sand: From 5 to 18 feet net productive.

LITHOLOGY OF RESERVOIR ROCK

Paluxy sand: Brown to gray, medium- to fine-grained, porous to slightly porous, hard sandstone.

CONTINUITY OF RESERVOIR ROCK

Paluxy sand: The reservoir is characterized by spotty and irregular sand deposition.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Elevation of top of oil, feet	-7,050±
Elevation of bottom of oil, feet	-7,105±
Relief, feet	55±

CHARACTER OF OIL

Gravity, A.P I., 29.5°
Sulphur, 1.4%
Base, intermediate

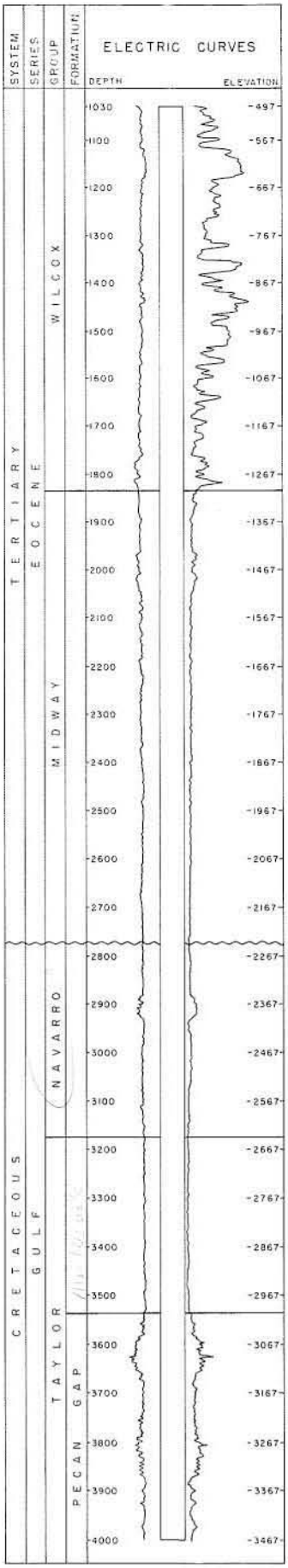
WATER PRODUCTION

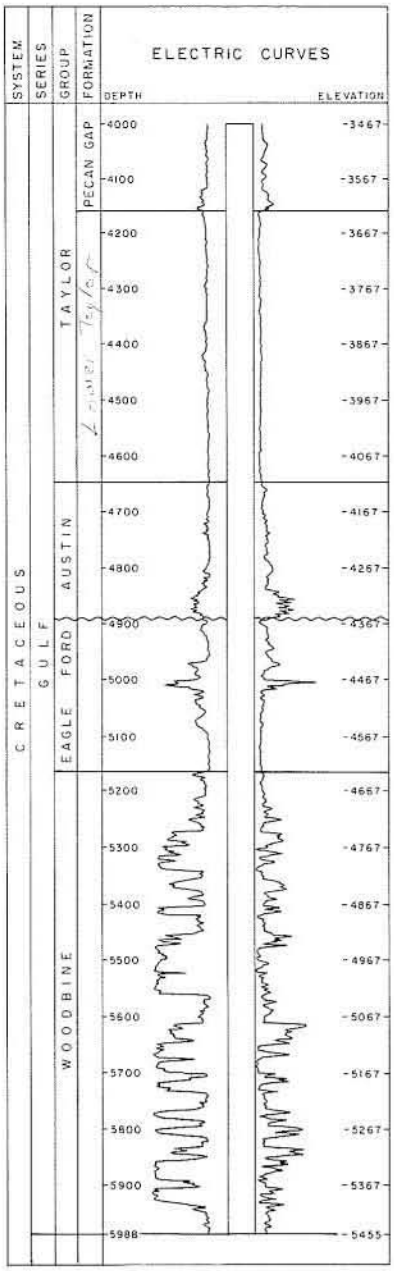
Paluxy sand: To date a negligible amount of water has been produced.

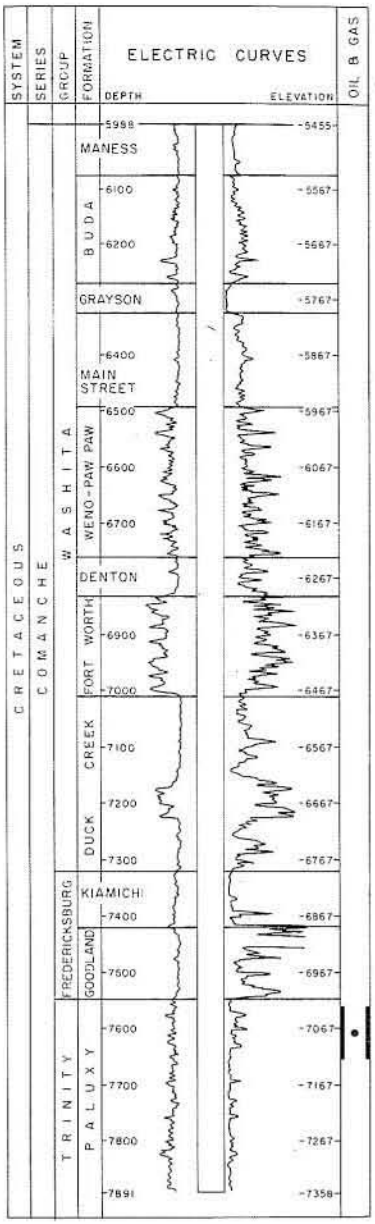
PRODUCTION HISTORY

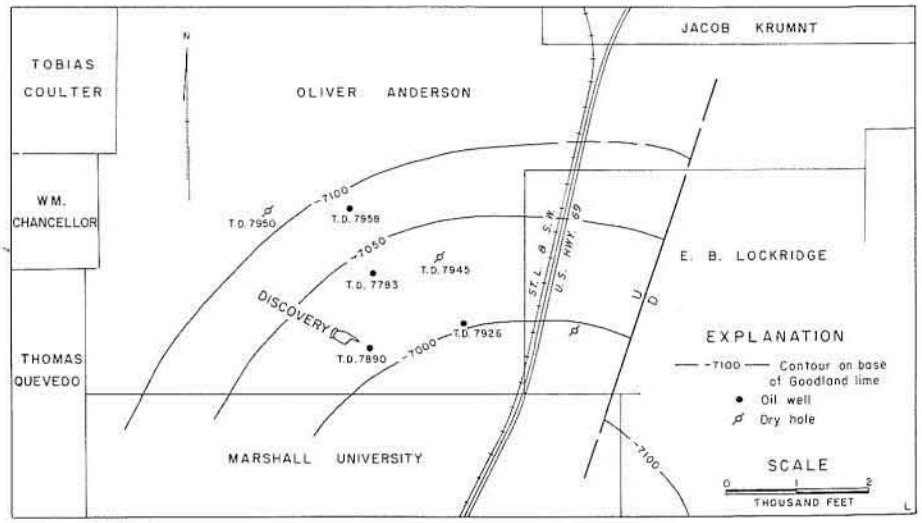
Year	WELLS PRODUCING at end of year		OIL PRODUCTION (barrels)	
	Flowing	Pumping	Yearly	Cumulative
1948	0	1	7,421	7,421
1949	2	2	82,227	89,648

TYPE SECTION OF ROCKS PENETRATED









VAN FIELD
Van Zandt County, Texas

A. J. BETTS
Geologist, The Pure Oil Company, Fort Worth, Texas
December 22, 1950

LOCATION

The Van field is located 12 miles east of Canton, the county seat of Van Zandt County. The field presently surrounds the town of Van, from which it got its name.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Surface work, which commenced in February of 1927, indicated an uplift with its crest near the town of Van. Refraction seismograph work done during May and June of 1927 confirmed the presence of a large anticline with its apex apparently just north of the town of Van. Following this seismograph work, a reconnaissance torsion balance survey was made. This indicated a large, deep-seated mass of lower specific gravity than the surrounding sedimentary rocks, which was interpreted to be a deep-seated salt dome. A subsequent magnetic survey suggested a magnetic minimum located near the focal point of interest, which may also be interpreted to indicate the presence of a large, deep-seated salt dome. In July and August of 1928, leasing of the original block of approximately 17,000 acres took place. In order to more definitely locate the highest point on the structure, two lines of core holes, one north-south and one east-west through the town of Van, were drilled during the period from January through July 1929, and this concluded the exploratory work done prior to the drilling of the first test.

DISCOVERY

Woodbine: October 13, 1929;
Pure (Van Joint Account) #1 Jarman 37.

ELEVATION OF SURFACE

Surface elevations range from a high of 534 feet to a low of 433 feet.

SURFACE FORMATIONS

Surface rocks at the top of the Van structure are of the basal part of the Wilcox formation. The Reklaw greensand overlaps the Wilcox on the south, east and northeast flanks of the dome.

NATURE OF TRAPS

Complexly faulted domal anticline.

PRODUCTIVE AREAS

Van Shallow (Nacatoch)	200 acres
Van Deep (Woodbine)	4,520 acres

THICKNESS OF RESERVOIR ROCK

Woodbine: 650 to 710 feet.

LITHOLOGY OF RESERVOIR ROCKS

The Woodbine at Van has been arbitrarily divided into an upper, or bentonitic, and a lower, or non-bentonitic, section. The upper, or bentonitic section, frequently called the Lewisville, is composed of greenish-gray ashy or bentonitic, fine- to medium-grained, rounded to slightly angular sands, and mottled red, white, blue and greenish shales. In this section, ash or bentonite is always the cementing material, but in scattered areas there are found some clean, non-bentonitic sands. Porosity in the Lewisville sands averages 25% and permeability averages approximately 100 millidarcys. The lower non-bentonitic, or brown sand section, is commonly called the Dexter, and is composed mainly of white, friable, non-calcareous, medium- to coarse-grained, well-assorted, loosely cemented, rounded to slightly angular quartz grains. Porosity in the Dexter averages 30% and permeability averages 4,000 millidarcys. The varicolored shales characteristic of the Lewisville separate the several clean sand members of the Dexter section, and considerable lignite is found throughout the Woodbine section.

CONTINUITY OF RESERVOIR ROCKS

The sands of the Lewisville section are for the most part very lenticular and, with several exceptions in certain portions of the field, do not extend for any great lateral distance. The main sand members of the Dexter are fairly consistent, and for the most part, can be correlated over the entire field.

RESERVOIR ENERGY

Reservoir energy in the lenticular Lewisville sands is a dissolved-gas drive. Reservoir energy in the Dexter section of the Woodbine is an active water drive.

WATER PRODUCTION

Water production from the Van field at present averages 310,000 barrels per month. All of this water is reinjected into the Dexter section of the Woodbine.

DEEPER DRILLING

Lone Star, Humble and Pure (Van Joint Account) have all drilled deep tests around the periphery of the Van structure, all of which were dry. The deepest test was the Pure (Van Joint Account) Davis 6-T-1, which was bottomed at a depth of 7,501 feet. This well encountered the Travis Peak at 6,490 feet and was still in the Travis Peak at total depth.

CHARACTER OF OIL

Gravity, 34.8° Sulphur, 0.98% Color, Black

For analyses see:

Railroad Commission of Texas
Analyses of Texas Crude Oils (1940), pp. 31 & 59.

U. S. Bureau of Mines	Reference designation
Properties of Typical Crude Oils from East Texas Field. R. I. 3030 (1931)	A
Tabulated Analyses of Texas Crude Oils. R. I. 3252 (1934)	B
Tabulated Analyses of Texas Crude Oils. T. P. 607 (1939)	C
Analyses of Crude Oils from 283 Important Oil Fields of the United States. R. I. 4289 (1948)	D

Lab. ref. No.	31061	33118	33119	33120	33121
Reference designation	**	**	**	**	*
A Page	3				
B, Grp. 4, Item	45	46	47	48	49
C, Grp. 4, Item	65	66	67	68	64
D, Item				265a	265b

*Nacatoch **Woodbine

CHARACTER OF GAS

Component	Mol. %
Methane	67.48
Ethane	9.90
Propane	7.96
I-butane	4.35
N-butane	3.98
I-pentane	2.36
N-pentane	1.43
Hexanes plus	2.54

Recoverable liquid	G/Mcf
Propane	1.2
I-butane, 35-40 lb. gasoline	5.7
Heating value	
B.t.u. per cu. ft.	1,000+
Specific gravity	0.941

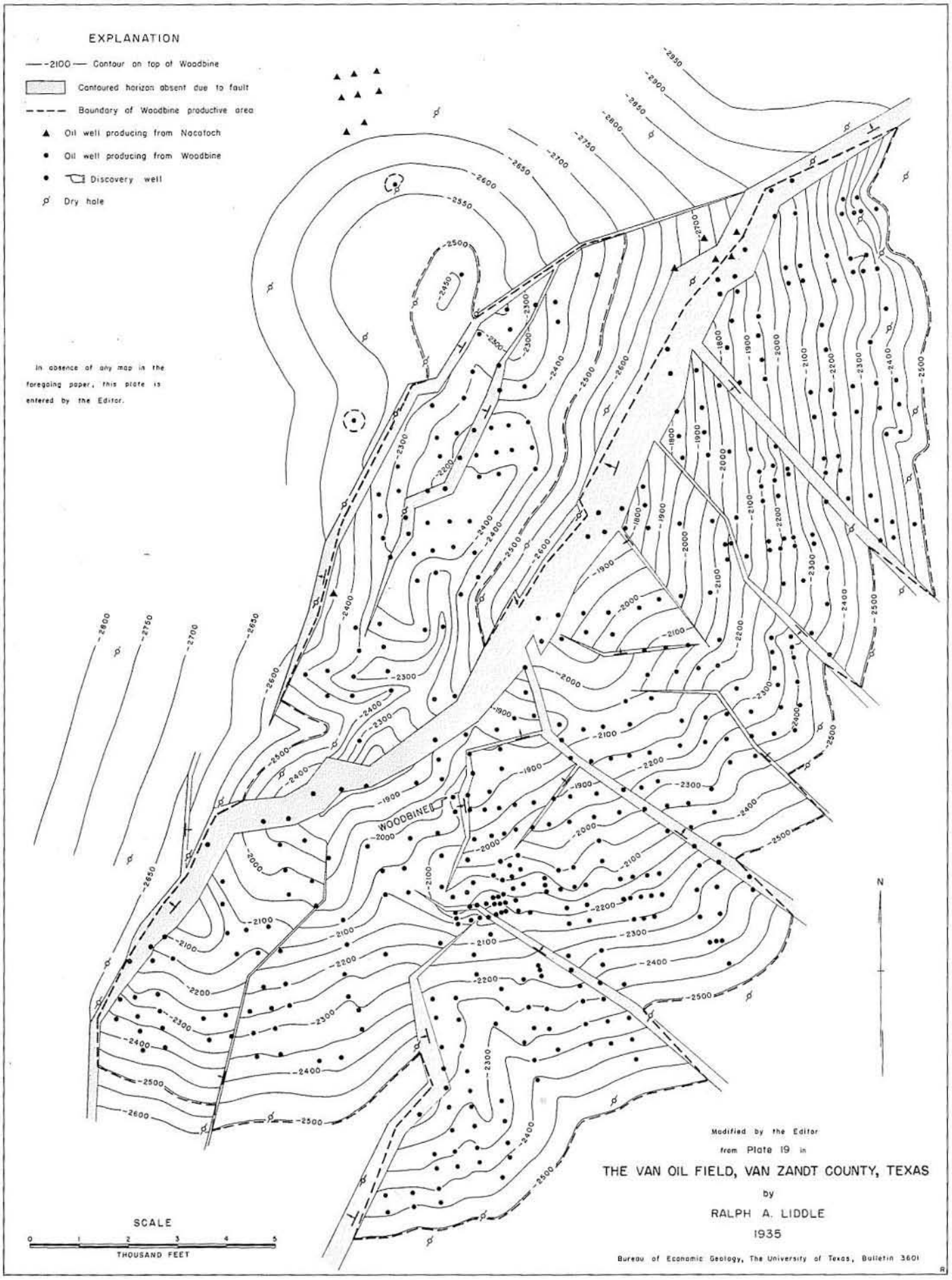
SELECTED REFERENCES

Liddle, Ralph A. (1935) The Van oil field, Van Zandt County, Texas: Bureau Econ. Geology, Univ. Texas, Bulletin 3601, 79 pp. 27 plates.

PRODUCTION HISTORY

Year	OIL (barrels)	GAS (Mcf)	WATER (barrels)
1929	150,388	42,494	-
1930	7,686,576	2,322,430	-
1931	15,696,137	4,114,878	-
1932	17,192,857	5,105,402	105,630
1933	17,078,938	5,539,697	604,680
1934	14,573,710	5,446,588	1,316,952
1935	13,967,709	5,153,431	2,108,994
1936	12,465,819	4,386,855	2,480,247
1937	11,218,147	4,233,299	2,681,308
1938	5,562,017	2,106,149	2,054,217
1939	5,248,758	1,751,478	1,980,640
1940	4,434,723	1,524,885	2,266,937
1941	3,669,735	1,265,262	2,260,305
1942	3,389,973	1,201,950	1,872,331
1943	6,201,763	2,020,078	2,258,094
1944	11,612,750	4,022,973	3,220,133
1945	10,945,992	4,125,983	4,555,675
1946	10,557,592	3,818,148	5,586,751
1947	10,421,695	3,719,823	3,600,881
1948	12,090,048	4,482,717	3,370,090
1949	8,274,889	3,212,368	3,272,490
1950-7/1	3,026,415	1,104,918	1,729,020
Total	205,406,631	70,701,806	47,329,375

Entries on pages 126 and 127 of Journal of Petroleum Technology (A.I.M.E.), August 1950, indicate oil production to end of 1949 as 501,000 barrels from Nacatoch and 203,015,900 barrels from Woodbine; wells completed in Nacatoch totaled 51 with 32 still producing, all by artificial lift; wells completed in Woodbine totaled 586 with 553 still producing, 260 by flowing and 293 by artificial lift.


EXPLANATION
—2100— Contour on top of Woodbine
Contoured horizon absent due to fault
Boundary of Woodbine productive area
Oil well producing from Nacatoch
Oil well producing from Woodbine
Discovery well
Dry hole
In absence of any map in the foregoing paper, this plate is entered by the Editor.
WOODBINE
N
SCALE
0 1 2 3 4 5
THOUSAND FEET
Modified by the Editor
from Plate 19 in
THE VAN OIL FIELD, VAN ZANDT COUNTY, TEXAS
by
RALPH A. LIDDLE
1935
Bureau of Economic Geology, The University of Texas, Bulletin 3601

WALTER FAIR FIELD
Kaufman County, Texas

HASTINGS MOORE
District Geologist, Danciger Oil & Refining Company, Henderson, Texas
July 20, 1950*

LOCATION

The Walter Fair field is located on the Cedarvale fault 10 miles east-southeast of Kaufman, the county seat of Kaufman County.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Surface geology: Immediately following the discovery of Woodbine oil at Mexia in 1920, the entire Luling-Mexia-Talco fault system was mapped by several teams of surface geologists. F. B. Plummer was one of several who found and mapped the southwest end of the Cedarvale fault at the Kincaid-Wills Point contact. His map of this area is published on page 538, The Geology of Texas: Bureau of Economic Geology, The University of Texas, Bulletin 3232.

Core drilling and early deep drilling: Marland Oil Co. core drilled the Cedarvale and Prairieville faults in 1922 and 1923. Marland drilled two dry holes to the Woodbine near the Cedarvale fault short distances away from the present Walter Fair field. Following these Woodbine failures, Marland released its leases in the area.

When Paluxy oil was found at Talco in 1936, Shell Oil Co. promptly leased the Cedarvale prospect.

Subsequent deep drilling: On a farmout from Shell Oil Co. in 1941, T. G. Shaw drilled his #1 Wynne, a Paluxy test, which was junked after having had a Paluxy showing.

Seismic: Shell Oil Co. conducted a detailed seismic survey and then drilled its #1 F. E. Lumpkin, a dry hole, into the Smackover limestone in 1948.

Subsurface: By this time, subsurface data clearly indicated that it was possible to locate a Paluxy test considerably higher than in the T. G. Shaw #1 Wynne, where oil showings had been found in Paluxy. R. W. Fair of Tyler effected a farmout from Shell Oil Co. and drilled his #1 Angus G. Wynne, the discovery well for Paluxy and for the field.

DISCOVERIES

Lower Woodbine sand: July 12, 1950; R. W. Fair #B-7 Angus G. Wynne. Flowed 172 barrels of oil and 34 barrels of salt water in 18 hours on 22/64-inch choke through perforations from 4,155 to 4,174 feet.

Paluxy sand: July 6, 1949; R. W. Fair #1 Angus G. Wynne. Flowed at daily rate of 230 barrels 30° gravity crude on 10/64-inch choke through perforations from 4,965 to 4,983 feet.

*Amended in part to November 4, 1950.

ELEVATION OF SURFACE

At well locations: Highest, 417 ft.; lowest, 386 feet.

SURFACE FORMATION

The Wills Point member of the Midway.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest stratigraphic horizon penetrated in the immediate vicinity of the field is in the Smackover limestone 315 feet below its top. This penetration was in Shell Oil Co. #1 Lumpkin.

NATURE OF TRAPS

Lower Woodbine sand: Stratigraphic.
Paluxy sand: Closure against fault.

PRODUCTIVE AREAS

Lower Woodbine sand: Undetermined.
Paluxy sand: 200 acres.

THICKNESSES OF RESERVOIR ROCKS

Lower Woodbine sand: 30 feet net productive.
Paluxy sand: 60 feet net productive.

LITHOLOGY OF RESERVOIR ROCKS

Lower Woodbine sand: Medium-grained sand interbedded with variegated shale.

Paluxy sand: Firm, uniform, fine-grained, clean sand with tendency toward lenticularity and cross-bedding.

CONTINUITY OF RESERVOIR ROCKS

Lower Woodbine sand: Present as blanket deposit over the north central portion of the East Texas basin.

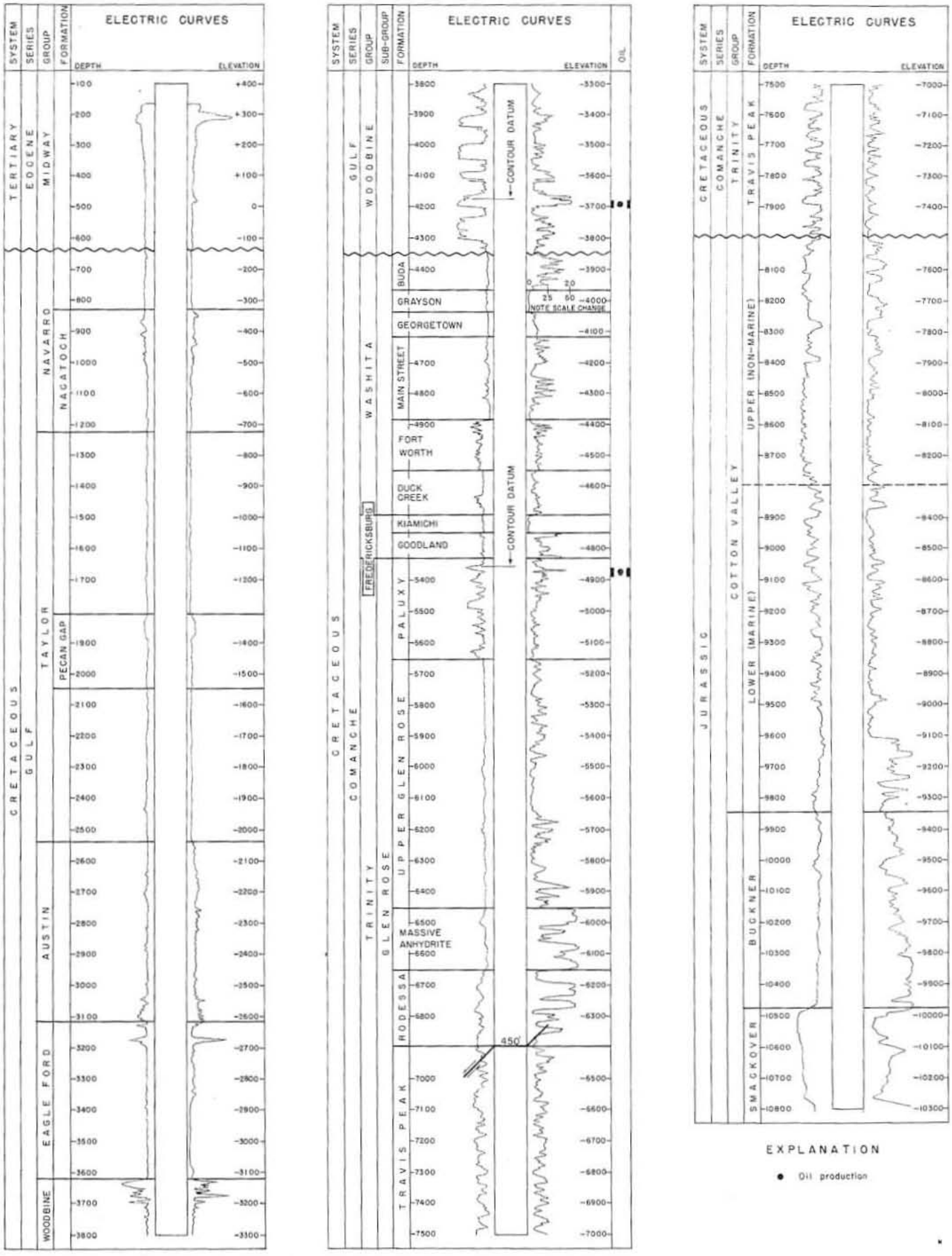
Paluxy sand: The Paluxy formation of which this sand is a member, is made up of alternating beds of sand and shales. Sand development is erratic and lenticular with rapid lateral variations.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Lower Woodbine sand: Undetermined.

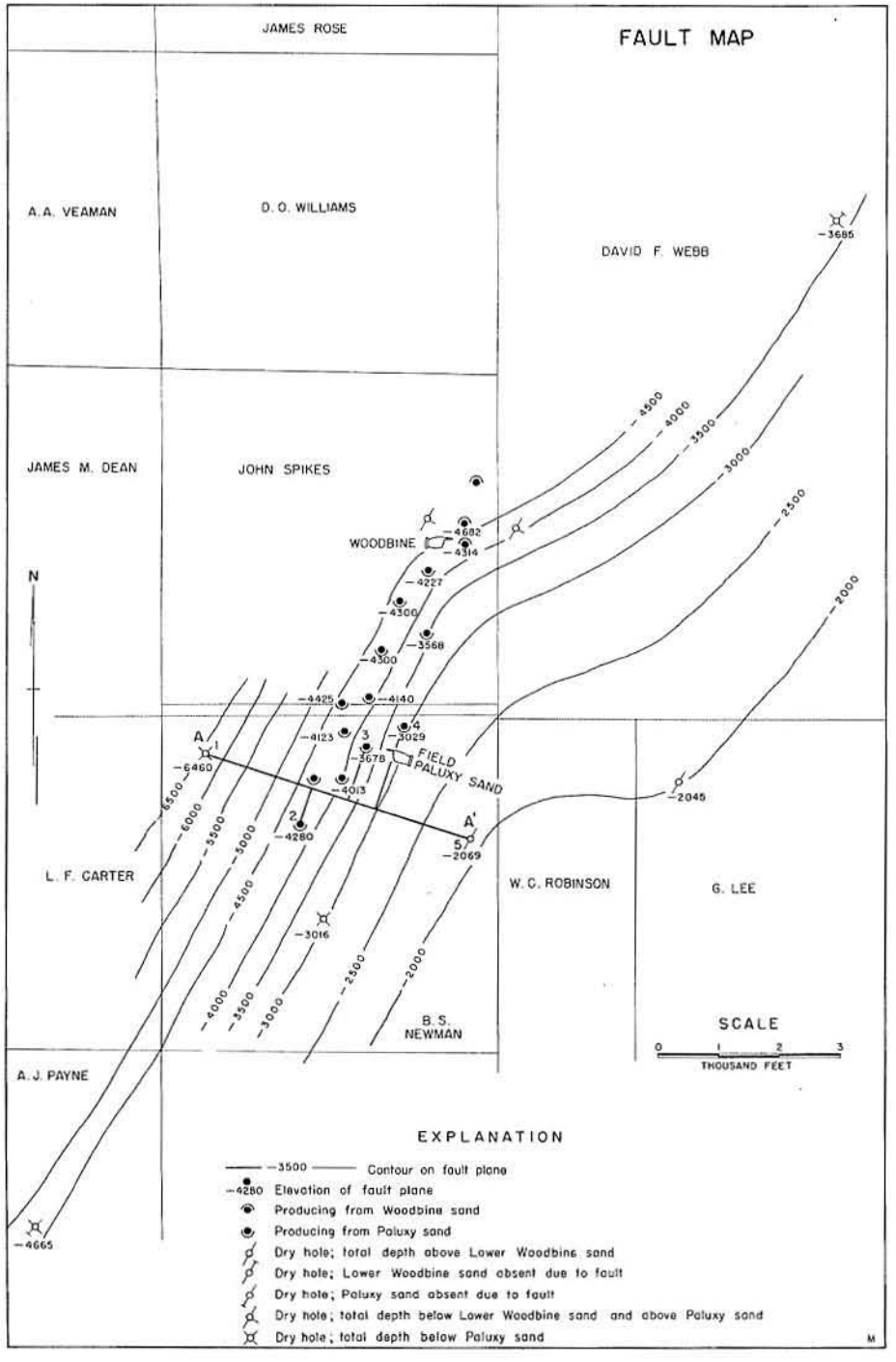
Paluxy sand:	Feet
Elevation of top of oil	-4,519
Elevation of bottom of oil	-4,581
Relief	62

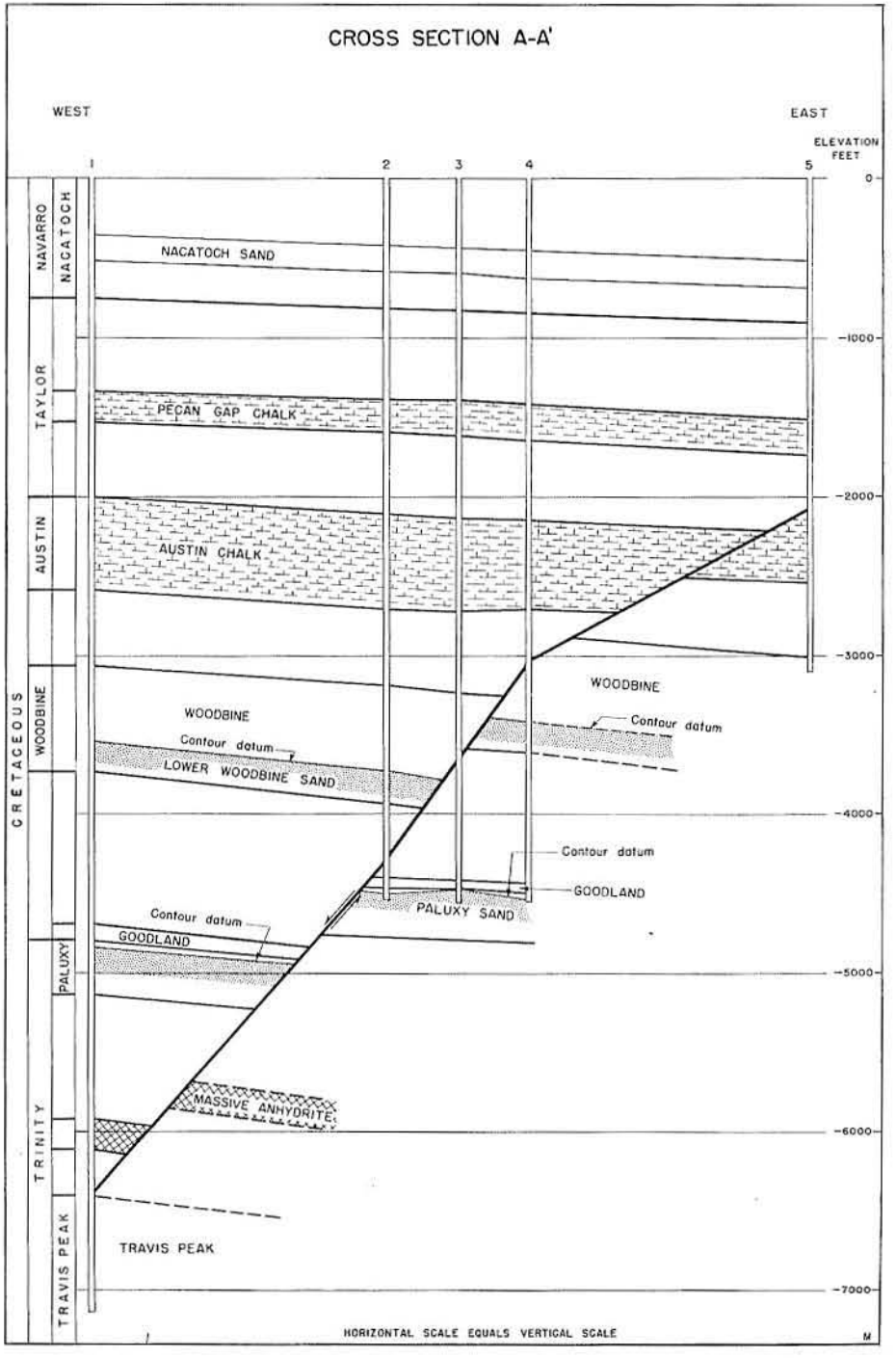
TYPE SECTION OF ROCKS PENETRATED



EXPLANATION

● Oil production


FAULT MAP
JAMES ROSE
A. A. VEAMAN
D. O. WILLIAMS
DAVID F. WEBB
JAMES M. DEAN
JOHN SPIKES
WOODBINE
FIELD
PALUXY SAND
L. F. CARTER
W. C. ROBINSON
G. LEE
B. S. NEWMAN
A. J. PAYNE
N
A
A'
SCALE
0 1 2 3
THOUSAND FEET
EXPLANATION
—3500— Contour on fault plane
−4280 Elevation of fault plane
Producing from Woodbine sand
Producing from Paluxy sand
Dry hole; total depth above Lower Woodbine sand
Dry hole; Lower Woodbine sand absent due to fault
Dry hole; Paluxy sand absent due to fault
Dry hole; total depth below Lower Woodbine sand and above Paluxy sand
Dry hole; total depth below Paluxy sand


CROSS SECTION A-A'
WEST
EAST
ELEVATION FEET
CRETACEOUS
NAVARRO
TAYLOR
AUSTIN
WOODBINE
PALUXY
TRINITY
TRAVIS PEAK
NACATOCH
NACATOCH SAND
PECAN GAP CHALK
AUSTIN CHALK
WOODBINE
Contour datum
LOWER WOODBINE SAND
GOODLAND
PALUXY SAND
MASSIVE ANHYDRITE
TRAVIS PEAK
HORIZONTAL SCALE EQUALS VERTICAL SCALE

CHARACTER OF OIL

Lower Woodbine sand: Not available.

Paluxy sand:

Gravity, A. P. I.	30°
Sulphur	1.8%w
Color	Very dark green
Pour point	30°F.
Viscosity, SU @ 80° F.	108

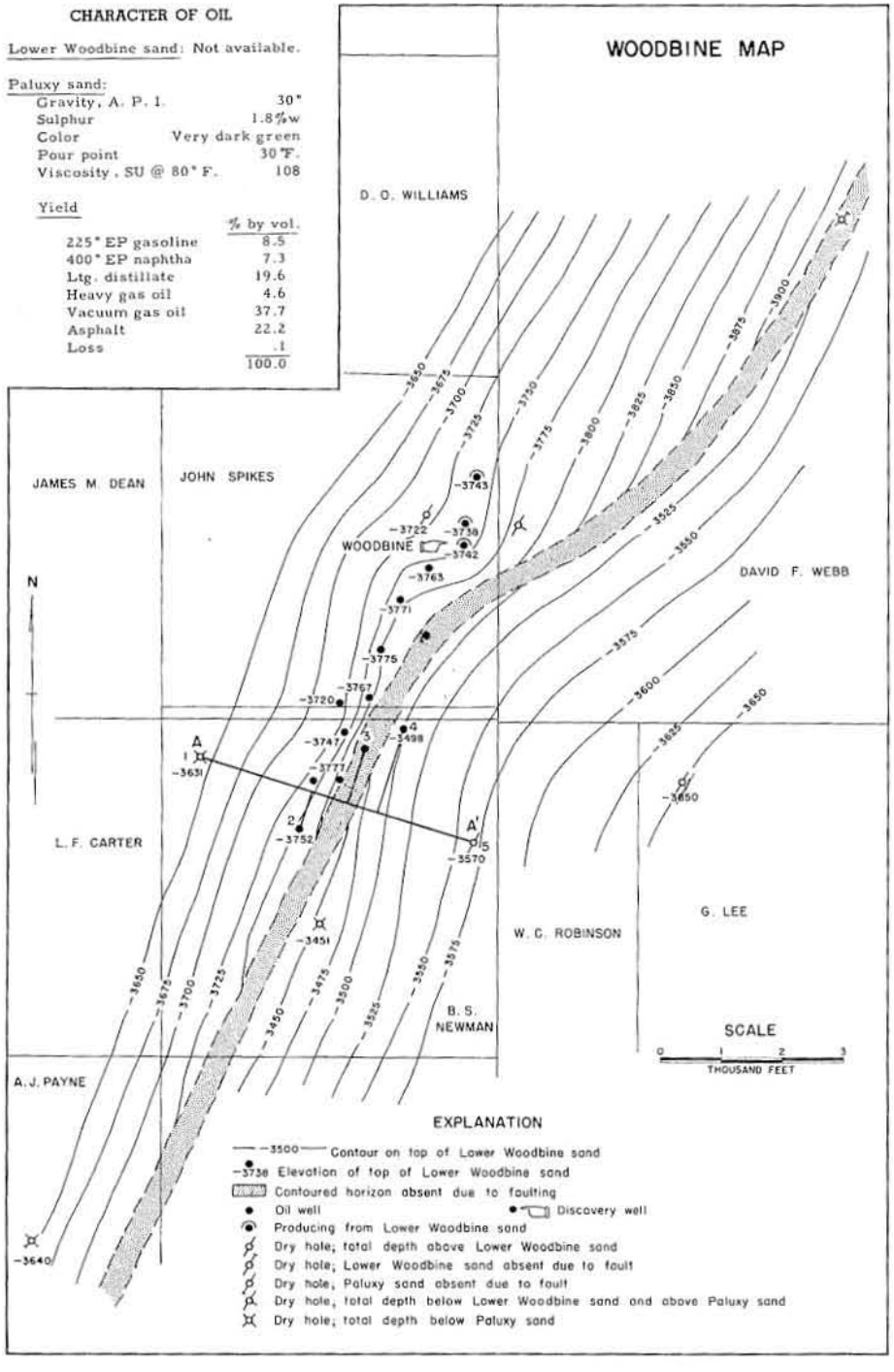
Yield

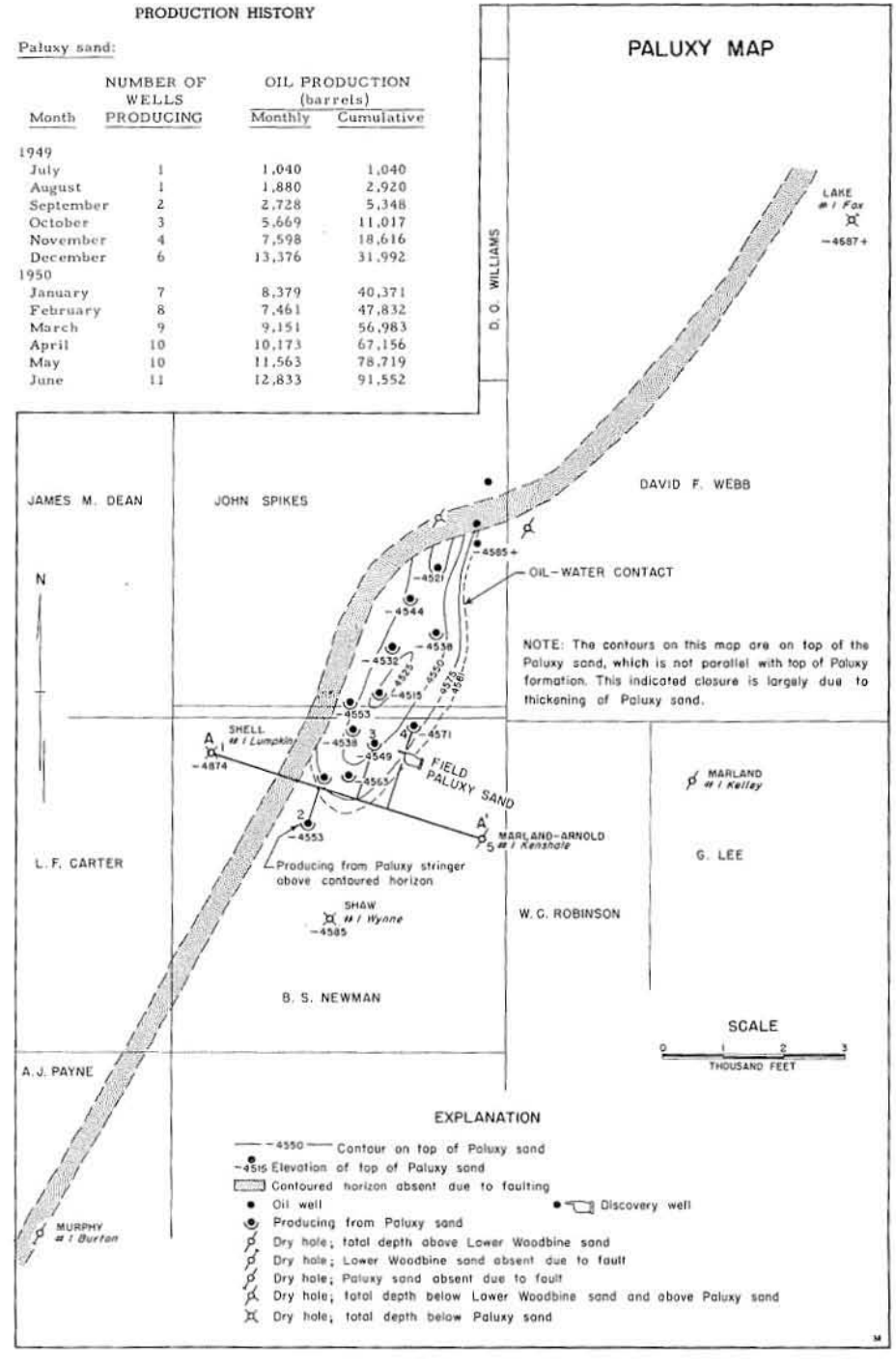
	% by vol.
225° EP gasoline	8.5
400° EP naphtha	7.3
Ltg. distillate	19.6
Heavy gas oil	4.6
Vacuum gas oil	37.7
Asphalt	22.2
Loss	.1
	100.0

PRODUCTION HISTORY

Paluxy sand:

Month	NUMBER OF WELLS PRODUCING	OIL PRODUCTION (barrels) Monthly	Cumulative
1949			
July	1	1,040	1,040
August	1	1,880	2,920
September	2	2,728	5,348
October	3	5,669	11,017
November	4	7,598	18,616
December	6	13,376	31,992
1950			
January	7	8,379	40,371
February	8	7,461	47,832
March	9	9,151	56,983
April	10	10,173	67,156
May	10	11,563	78,719
June	11	12,833	91,552





WASKOM FIELD

Harrison County, Texas and Caddo Parish, Louisiana

G. J. LOETTERLE
Consulting Geologist, Hudnall, Pirtle & Loetterle, Tyler, Texas
January 24, 1950

LOCATION

The Waskom field is situated in the southeast corner of Harrison County, Texas, and in the adjoining portion of Caddo Parish, Louisiana. The town of Waskom, Texas, is in the northeast part of the field. Regionally, the Waskom field is located near the crest of the Sabine uplift. It is one of several fields which produce from local culminations superimposed on this large structural feature. It is separated from the Bethany gas field, some 4 miles to the south in Panola County, by a low structural saddle.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Surface geologic mapping, supplemented by subsurface control afforded by wells previously drilled in the region, led to the discovery of the field.

DATA CONCERNING SHALLOWER RESERVOIRS

The writer has not been able to obtain satisfactory data concerning the reservoirs above the Hill. These reservoirs have long been considered essentially depleted, with the result that little interest has been taken in reporting accurately concerning them. The available records are meagre and confused. In the belief that some approximations and studied opinions are better than nothing, the writer presents only incomplete data concerning these reservoirs, and those with the warning that they probably contain minor inaccuracies.

A total of about 225 wells have produced gas from the shallower reservoirs. Most of these wells are now abandoned. Except for the discovery well, they are not shown on the accompanying map.

The publication cited below under SELECTED REFERENCE contains a good summary of the information available to the time of its publication in 1925. Following are quotations from that publication: "The initial open flow of the Nacatoch wells has been from 2,000,000 cubic feet to 26,500,000 cubic feet, with a rock-pressure of 400 to 415 pounds. The Nacatoch formation varies greatly in thickness, being much thicker off structure than on top of the structure; and the wells drilled low on the structure do not go to water as rapidly as those in the center." "Wells producing from the Blossom horizon have an initial open flow of from 6,000,000 cubic feet to 42,500,000 cubic feet with a rock-pressure of 800 pounds."

DISCOVERIES

Nacatoch, Blossom and Barlow: May 13, 1924; Fuller & Scott #1 Furrh, James Short survey. Gas in Nacatoch and Blossom; oil and some gas in Barlow.

Florsheim: Between September 11, 1924, and March 20, 1925. The discovery well was a gas producer in the Texas portion of the field. Its designation and definite location have not been determined by the writer.

Hill: Gas: May 25, 1938; Arkansas-Louisiana Gas Co. #1 C.M. Abney Estate, Eason Little survey. Tested 18,318 Mcf/d wet gas, open flow. Rock-pressure, 2,070 psi. Completed through perforated liner in sidetracked hole opposite a porous limey sand zone at depth of 4,822 to 4,836 ft.

Oil: February 17, 1949; LaGloria Corp. #1 Smith & Lindsey, S. Holloway survey. Flowed 58 barrels of 42.3° gravity oil in 24 hours through .25-inch tubing choke. Gas-oil ratio, 2,900 to 1. Perforated from 4,930 to 4,965 ft.

Upper Pettet: May 1, 1945; Arkansas-Louisiana Gas Co. #B-1 C.M. Abney, J. Shandoin survey. Tested 6,500 Mcf/d gas, open flow. Perforated from 5,650 to 5,688 feet. Acidized with 15,000 gallons. This well was originally completed June 20, 1940, in the Travis Peak.

Lower Pettet: October 31, 1945; Bert Fields #1 G. Vincent, R. W. Bedford survey. Tested 1,000 Mcf/d, open flow, plus 20 barrels of 57° gravity condensate. Rock-pressure, 2,234 psi. Perforated from 5,784 to 5,796 feet.

Travis Peak: Gas: May 29, 1939; Arkansas-Louisiana Gas Co. #1 Jim Davis, Jas. Adams survey. Tested 5,040 Mcf/d gas through .25-inch tubing choke, with small amount of condensate. Perforated from 5,970 to 6,000 feet and from 6,150 to 6,185 feet.

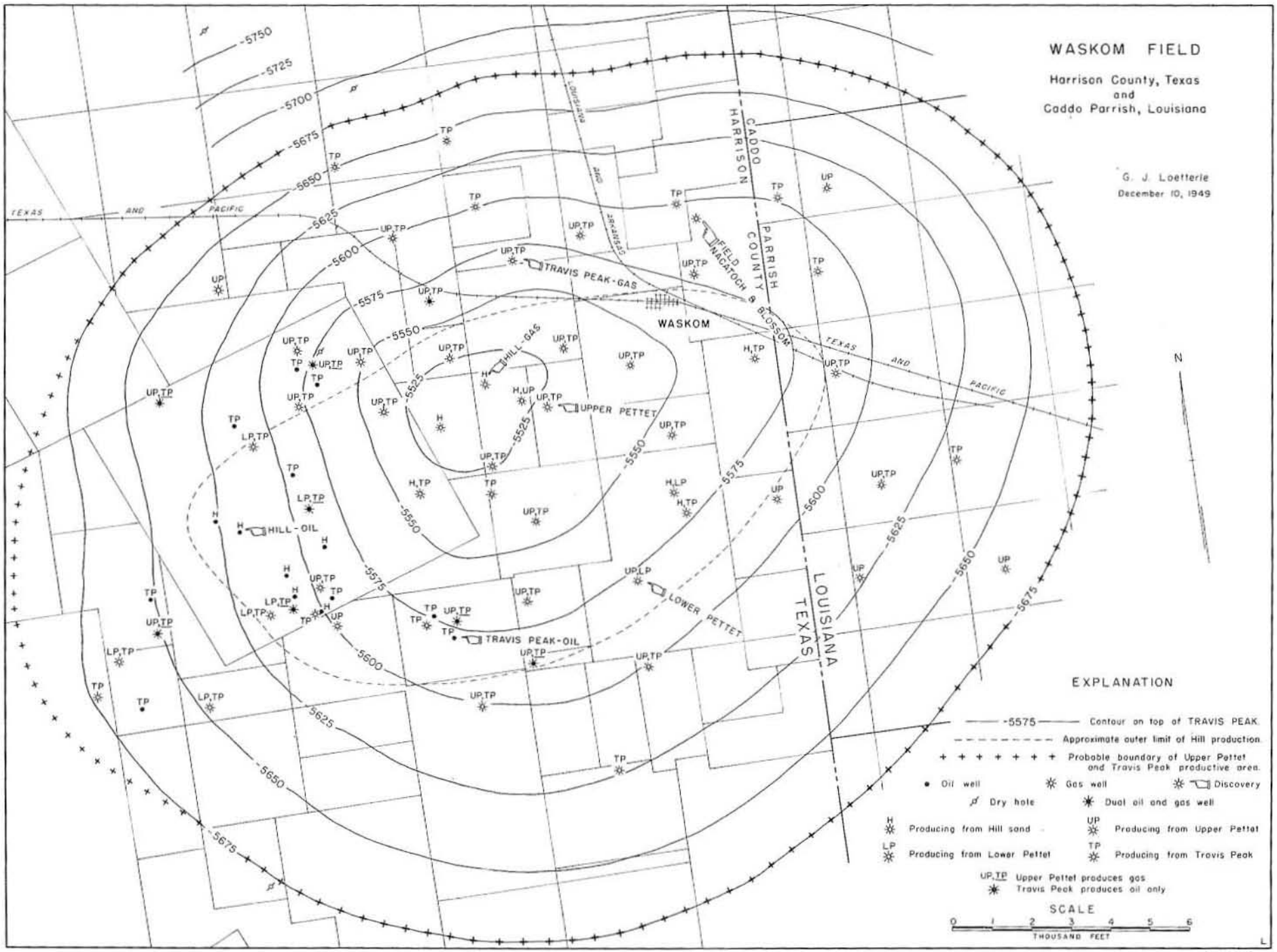
Oil: April 26, 1946; Arkansas-Louisiana Gas Co. #1 Zack Abney, J. B. Bryant survey. Flowed 54 barrels of 43° gravity oil in 24 hours through 12/64-inch tubing choke. Gas-oil ratio, 1,210 to 1. Perforated from 5,976 to 6,035 feet.

ELEVATION OF SURFACE

220 to 230 feet.

SURFACE FORMATION

Wilcox.


WASKOM FIELD
Harrison County, Texas
and
Caddo Parrish, Louisiana
G. J. Loetterle
December 10, 1949
TEXAS AND PACIFIC
LOUISIANA AND ARKANSAS
CADDO PARISH
HARRISON COUNTY
FIELD
NACATOCH & BLOSSOM
TRAVIS PEAK-GAS
WASKOM
HILL-GAS
UPPER PETTET
HILL-OIL
LOWER PETTET
TRAVIS PEAK-OIL
LOUISIANA
TEXAS
N
EXPLANATION
-5575- Contour on top of TRAVIS PEAK
Approximate outer limit of Hill production
Probable boundary of Upper Pettet and Travis Peak productive area
Oil well
Gas well
Discovery
Dry hole
Dual oil and gas well
H Producing from Hill sand
UP Producing from Upper Pettet
LP Producing from Lower Pettet
TP Producing from Travis Peak
UP,TP Upper Pettet produces gas
Travis Peak produces oil only
SCALE
0 1 2 3 4 5 6
THOUSAND FEET

OLDEST STRATIGRAPHIC HORIZON PENETRATED

584 feet below top of Travis Peak.

PRODUCTIVE AREAS

Field as a whole: The exact outer limits of commercial production have not been established except locally on the north and southwest flanks. Here dry holes have been drilled which found each of the productive zones either tight or below the respective water levels. It now appears likely that the eventual productive limits will prove to be quite irregular due to variable porosity and permeability at the approximate elevations of water levels, and that commercial wells will be completed at outlying locations near dry holes. The problem of estimating outer limits is further complicated by variable water levels, which appear, in general, to be higher on the west flank than on the east flank. The following estimates are based on a careful review of the available data and are believed to be approximately correct, especially as regards the two principal zones, Upper Pettet and Travis Peak, the productive limits of which essentially coincide.

Hill: The productive area of this reservoir cannot be accurately delimited because of "islands" of dense material, especially on the north flank. Moreover, in many wells where the zone is of intermediate character on the electric log it was not tested, and, therefore, it is impossible to say whether it would have produced.

Lower Pettet: The productive area of this zone is relatively small because of inadequate porosity at the locations of most of the wells which penetrated it. The productive area is determined by the extent of lenses where the degree of porosity is sufficient for production. Commercial production to date is limited to two localities, one on the southeast flank and the other on the southwest flank.

Travis Peak: Production is from thin, hard sands in the upper 200 to 250 feet of the Travis Peak formation. Experience has shown that, in general, it is necessary to have all of this production section above water level in order to obtain a commercial well. Consequently, on the accompanying map, the outer limit of commercial production is indicated, generally, at the -5,675 contour. At this position, the base of the production section is at about the average water level of -5,880 feet.

	Productive acres
Shallower reservoirs (essentially depleted)	10,000
Hill	5,000
Upper Pettet	40,000
Lower Pettet	2,000
Travis Peak	41,000
Waskom field	41,000

THICKNESSES OF RESERVOIR ROCKS

	Feet		
	Min.	Max.	Avg.
Nacatoch			
From top to bottom	20	70	50
Net productive	5	35	20
Blossom			
From top to bottom	30	75	55
Net productive	5	30	15
Barlow			
From top to bottom	0	25	15*
Net productive	0	20	5*
Florsheim			
From top to bottom	0	20	10*
Net productive	0	15	7*
Hill			
From top to bottom	0	40	20*
Net productive	0	16	8-10*
Upper Pettet			
From top to bottom	10	50	30
Net productive	5	20	10
Lower Pettet			
From top to bottom	0	10	8*
Net productive	0	8	6*
Travis Peak			
From top to bottom	200	250	225**
Net productive	10	30	20

*Average for only those wells where it is present.
**Refers to upper 225 feet of Travis Peak formation.

LITHOLOGY OF RESERVOIR ROCKS

Nacatoch: Soft, chalky, glauconitic, microfossiliferous, medium-grained sandstone, becoming increasingly argillaceous toward base.

Blossom: Ashy, mostly non-calcareous, fairly soft and predominantly coarse-grained sandstone. There are commonly 3 or 4 intercalated shale beds ranging in thickness from 3 to 10 feet.

Barlow: Tan to cream-colored dense limestone (Goodland) with calcite veinlets. Soft and chalky and slightly porous at unconformable contact with overlying Austin.

Florsheim: Zone consists of two thin, slightly porous, calcareous sandstone stringers separated by some 130 feet of shale. Developed in porous form in only few wells.

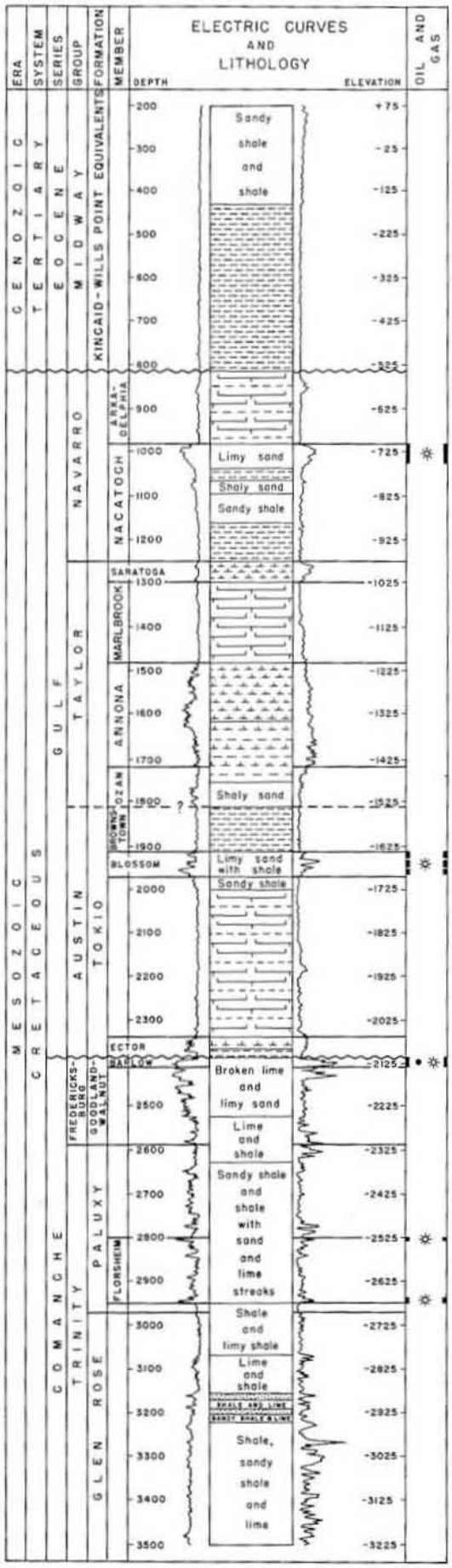
Hill: Slightly- to fairly-porous, limy sandstone to sandy limestone.

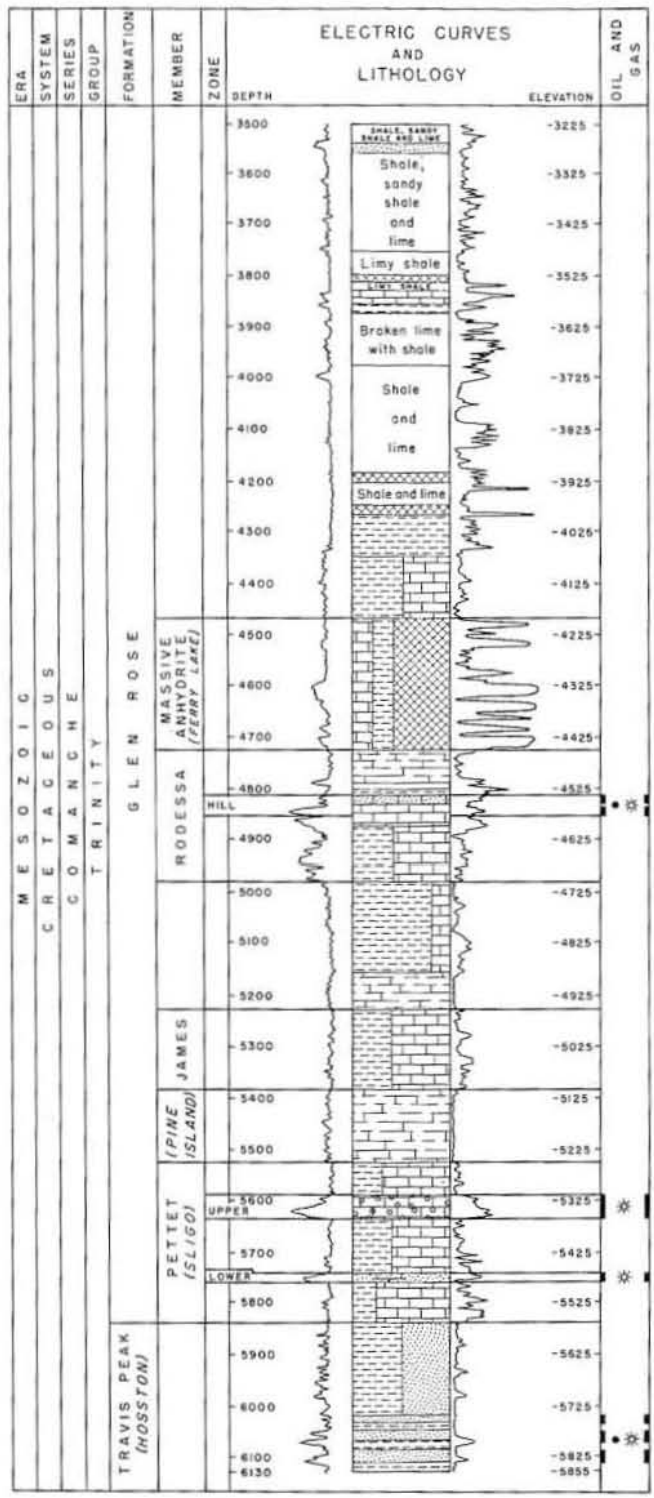
Upper Pettet: Porous to slightly-porous, oolitic limestone.

Lower Pettet: Slightly-porous, sandy limestone to limy sandstone.

Travis Peak: Hard, fine-grained, clean sandstone with relatively low porosity and permeability. In thin beds alternating with thick beds of red shale, sandy shale and siltstone. Productive sands occur in the upper 200 to 250 feet of the Travis Peak formation.

TYPE SECTION OF ROCKS PENETRATED





(NORTH LOUISIANA TERMINOLOGY IN *ITALICS*)

EXPLANATION

Sand · Shale · Marl · Limestone · Chalk · Anhydrite · Oolitic limestone

• Oil production ☼ Gas production

NATURE OF TRAPS and STRUCTURE

The accumulation in each reservoir is primarily the result of a structural trap and is not associated with any general stratigraphic pinchout or truncation. Local variations in lithology have had minor influence in forming traps, particularly in Lower Pettet, but such variations are of only minor importance in forming traps in the reservoirs of this field. The field is on a nearly circular dome which represents a local culmination on the regional Sabine uplift. The dip on all flanks of this dome is quite gentle, and the productive area is correspondingly large. On the south flank, which is the steepest, the dip averages 65 feet per mile, and on the other flanks it approximates 30 to 35 feet per mile. There are apparently no faults of any consequence.

CONTINUITY OF RESERVOIR ROCKS

All the productive zones in the Waskom field extend over most of the East Texas basin, and they are also present through northern Louisiana and southern Arkansas. Individual sands within the Travis Peak are quite lenticular, however, and cannot be correlated with certainty beyond the confines of the field. The Lower Pettet is an erratic zone which is not everywhere developed in porous form. The same is true, to a lesser extent, of the Upper Pettet and Hill zones. The so-called Hill producing zone is thickest on the west flank because of a porous limestone at the base which is not developed on the east flank. This limestone may correlate with portion of the Gloyd lime of the Rodessa field. In that field, where it was first named, the Hill sand is the uppermost producing zone of the Rodessa section. The term "Hill" is applied very loosely throughout East Texas to the first porous zone in the Rodessa.

The so-called Barlow zone is developed by secondary leaching of the Goodland limestone along an unconformity (see TYPE SECTION).

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

	Nacatoch	Blossom	Barlow	Florsheim	Hill	Upper Pettet	Lower Pettet	Travis Peak
Highest top, feet	-635	-1,590	-2,056	-2,485	-4,507	-5,286	-5,500	-5,522
Gas-oil contact, feet	?	?	?	?	-4,565±	No oil	No oil	-5,870±
Water level, feet	?	?	?	?	-4,625±	-5,390	-5,575	-5,880
Overall productive column, feet	?	?	?	?	118±	104	75±	358

Shallower reservoirs: The gas-fluid contacts cannot be determined from the limited data available to the writer.

Hill: In the Hill sand the gas-oil contact and water level have not been definitely established. The figures given above, however, appear to be correct to within about 10 feet for the gas-oil contact and 20 feet for the water level. This is because both contacts are fairly well bracketed by existing wells.

Upper Pettet: Certain wells in the Upper Pettet have produced both gas and salt water, and there is apparently no oil column in this zone. The water level is quite variable, ranging from as high as 5,365 feet subsea on the west flank to as low as 5,425 feet subsea on the east flank. The value of 5,390 feet given above is a good average figure.

Lower Pettet: In the erratic Lower Pettet zone the water level has not been established, but it is somewhere below 5,575 feet subsea unless complicated by discontinuous lentils of porosity. No oil has yet been found in this zone.

Travis Peak: In the Travis Peak the water level varies from 5,870 to 5,930 feet subsea. It averages close to 5,880 feet subsea, however, and this figure will fit most of the wells to within 10 feet. A few wells have found a thin oil column in the general range of 5,870 to 5,880 feet subsea. Because of thick intercalated shales, the chances of encountering porous sand at this exact subsea interval are relatively small. Most of the oil production in the Travis Peak is from thin, isolated, stray lenses of sand which pinch out up the flank and which carry oil at elevations considerably above those at which the main sands produce gas. Though a few rather large wells have been obtained at strategic positions, this is primarily a gas reservoir, as are all the other zones at Waskom.

CHARACTER OF GAS

Upper Pettet	%	G.P.M.
Carbon Dioxide	.95	
Methane	92.08	
Ethane	4.08	
Propane	.97	
Iso-butane	.15	.049
N-butane	.37	.116
Pentanes	.25	.091
Hexane	.13	.053
Heptanes	.01	.005
Nitrogen	1.01	
Total	100.00	.314

Specific gravity	.6124
Heating value, B.t.u./cf (wet)	1043
Gasoline content based on 26/70 gasoline	.199

Travis Peak	%	G.P.M.
Carbon Dioxide	.50	
Methane	88.00	
Ethane	4.86	
Propane	1.47	
Iso-butane	.39	.127
N-butane	.33	.104
Pentanes	.14	.051
Hexanes	.08	.033
Heptanes & heavier	.06	.031
Nitrogen	4.17	
Total	100.00	.346

Specific gravity (calculated)	.6355
Heating value, B.t.u./cf (wet)	1032
Gasoline content based on 26/70 gasoline	.153

The above analyses were furnished by United Gas Pipe Line Company. Each is of a sample from the Union Producing Co. #1 Karslake, which is a dual completion.

CHARACTER OF OIL

From a study of completion records it appears that the A.P.I. gravity of the oil from the Hill zone ranges from 39.7° to 42.3°, and averages near 42°. Similarly, the reported gravity of the Travis Peak oil ranges from 38° to 43° and averages 42°. These oils are predominantly of a paraffin base.

For analysis of oil from the Barlow limestone see:
U. S. Bureau of Mines Lab. ref. no. 38328
Tabulated Analyses of Texas Crude Oils
T. P. 607 (1939) Group 4, Item 69

WATER PRODUCTION

Very little water is produced in this field. Water production does not cause any operating problems.

ACID TREATMENT

The Hill, Upper Pettet and Lower Pettet, which are either limestone or limey sandstone reservoirs, are commonly acidized with anywhere from 1,000 to 15,000 gallons. The usual treatment is around 5,000 gallons.

COMPLETIONS IN THE DEEPER RESERVOIRS

As of December 1, 1949

	Hill	Upper Pettet	Lower Pettet	Travis Peak	Totals
Gas	7	8	35	40	90
Oil	7	0	0	17	24
Totals	14	8	35	57	114

As of December 1, 1949, a total of 75 wells had been drilled in the Waskom field, excluding the old shallow production. Of these, 39 were dual completions, 7 being dual oil and gas completions. In all of the dually-completed oil-gas wells the oil is from the Travis Peak. There were also 19 singly-completed gas wells and 17 singly-completed oil wells.

SELECTED REFERENCE

Grim, M. W. and Howe, Henry V. (1925) New Waskom gas field of Louisiana and Texas: Pan-American Geologist, vol. 43, no. 5, pp. 333-335, 1 pl. (map).

PRODUCTION HISTORY

Year	WELLS PRODUCING at end of year: Gas	Oil: Flow.	Oil: Artif.	GAS PRODUCTION (Mcf @ 14.65 psi. and 60° F.): Yearly	Cumulative	CONDENSATE PRODUCTION (barrels) *: Yearly	Cumulative	OIL PRODUCTION (barrels) *: Yearly	Cumulative	TOTAL LIQUIDS (barrels): Yearly	Cumulative
Field totals											
1924-1930	Not available.				79,832,000						
1931				2,797,000	82,629,000	Condensate production data for 1924-1938 not available.		Oil production data for 1924-1934 not available.			
1932	97			2,100,000	84,729,000						
1933	83	0	0	1,736,000	86,465,000						
1934	81			1,756,000	88,221,000			?	8,465		
1935	82			1,817,000	90,038,000			372	8,837		
1936	88			1,878,000	91,916,000			4,503	13,340		
1937	73	0	17	1,665,000	93,581,000			17,660	31,000		
1938	72	0	19	2,132,000	95,713,000	?	26,358	19,746	50,746	?	77,104
1939	72	0	20	3,231,882	98,944,882	14,000	40,358	21,811	72,557	35,811	112,915
1940	76	0	20	3,952,653	102,897,535	25,322	65,680	19,901	92,458	45,223	158,138
1941	75	0	16	7,219,314	110,116,849	63,812	129,492	14,486	106,944	78,298	236,436
1942	69	3	14	8,279,331	118,396,180	84,016	213,508	13,724	120,668	97,740	334,176
1943	70	1	16	10,964,641	129,360,821	152,913	366,421	12,428	133,096	165,341	499,517
1944	66	0	17	8,889,801	138,250,622	138,242	504,663	13,121	146,217	151,363	650,870
1945	19	3	17	8,206,764	146,457,386	104,079	608,742	18,159	164,376	122,238	773,108
1946	32	7	11	9,785,698	156,243,084	81,080	689,822	79,965	244,341	161,045	934,153
1947	53	7	11	10,723,179	166,966,263	19,498	709,320	195,302	439,643	214,800	1,148,953
1948	69	11	2	18,072,747	185,039,010	50,026	759,346	104,000	543,643	154,026	1,302,979
1949	—	—	—								

* Inconsistency in reporting liquids separately has probably led to some inaccuracies in these two columns.

Year	WELLS PRODUCING at end of year: Gas	Oil: Flow.	Oil: Artif.	GAS PRODUCTION (Mcf @ 14.65 psi. and 60° F.): Yearly	Cumulative	CONDENSATE PRODUCTION (barrels): Yearly	Cumulative	OIL PRODUCTION (barrels): Yearly	Cumulative	TOTAL LIQUIDS (barrels): Yearly	Cumulative
Shallower reservoirs											
Total											
1924-1930	Not available.				79,832,000						
1931				2,797,000	82,629,000	Oil and condensate production data for 1924-1936 and 1939-1942 not available.					
1932	97			2,100,000	84,729,000						
1933	83	0	0	1,736,000	86,465,000						
1934	81			1,756,000	88,221,000						
1935	82			1,817,000	90,038,000						
1936	88			1,878,000	91,916,000			?	13,340		
1937	73	0	17	1,665,000	93,581,000			17,660	31,000		
1938	71	0	19	1,734,002	95,315,002	?	26,358	19,746	50,746	?	77,104
1939	67	0	20	1,678,724	96,993,726						
1940	64	0	20	1,306,325	98,300,051						
1941	59	0	16	1,041,789	99,341,840						
1942	52	2	14	872,502	100,214,342						
1943	52	0	16	879,765	101,094,107	0		0		0	
1944	48	0	16	759,072	101,853,179	0		0		0	
1945	43			595,703	102,448,882	0		0		0	
1946	37	0	11	599,181	103,048,063	0		39		39	
1947	8	—	—	207,274	103,255,337	0		0		0	
1948	2	—	—	30,568	103,285,905	0		0		0	
1949	—	—	—			—		—		—	

Year	WELLS PRODUCING at end of year: Gas	GAS PRODUCTION (Mcf @ 14.65 psi. and 60° F.): Yearly
Nacatoch		
1924-1936	Not segregated.	
1937	24	461,595
1938	22	543,119
1939	20	525,909
1940	17	327,964
1941	17	229,107
1942	14	186,613
1943	14	150,800
1944	11	145,565
1945	10	125,637
1946	8	118,781
1947	0	6,408
1948	0	0
1949	—	
Blossom		
1924-1936	Not segregated.	
1937	19	306,024
1938	19	336,841
1939	19	393,875
1940	20	321,264
1941	16	285,509
1942	14	257,304
1943	13	222,984
1944	13	139,695
1945	12	128,603
1946	10	125,258
1947	6	63,405
1948	2	28,976
1949	—	

Year	WELLS PRODUCING at end of year: Gas	GAS PRODUCTION (Mcf @ 14.65 psi. and 60° F.): Yearly
Barlow		
1924-1936	Not segregated.	
1937	28	732,515
1938	28	673,842
1939	26	644,057
1940	25	573,547
1941	24	458,933
1942	22	376,015
1943	23	445,834
1944	22	406,505
1945	21	341,463
1946	19	324,413
1947	2	137,461
1948	0	1,592
1949	—	
Florsheim		
1924-1936	Not segregated.	
1937	2	91,464
1938	2	169,757
1939	2	114,883
1940	2	83,550
1941	2	68,240
1942	2	52,570
1943	2	60,147
1944	2	67,307
1945	0	0
1946	0	30,729
1947	0	0
1948	0	0
1949	—	

PRODUCTION HISTORY

Year	WELLS PRODUCING at end of year: Gas	Oil: Flowing	Oil: Artif. Lift	GAS PRODUCTION (Mcf @ 14.65 psi. and 60° F.): Yearly	Cumulative	OIL & CONDENSATE PRODUCTION (barrels): Yearly	Cumulative
Deeper reservoirs							
Total							
1938	1			397,998	397,998		
1939	5			1,553,158	1,951,156	21,811	21,811
1940	12			2,646,328	4,597,484	19,901	41,712
1941	16			6,177,525	10,775,009	63,812	105,524
1942	17	1		7,406,829	18,181,838	84,016	189,540
1943	18	1		10,084,876	28,266,714	165,341	354,881
1944	18	0	1	8,130,729	36,397,443	151,363	506,244
1945	19	3		7,611,061	44,008,504	122,238	628,482
1946	32	12		9,186,517	53,195,021	161,006	789,488
1947	53	13		10,515,905	63,710,926	214,800	1,004,288
1948	69	11	2	18,042,179	81,753,105	154,026	1,158,314
1949	—	—	—	—	—	—	—
Hill							
1938	1			397,998	397,998		
1939	1			997,207	1,395,205		
1940	1			505,936	1,901,141		
1941	1			217,558	2,118,699	1,554	1,554
1942	1			381,496	2,500,195	2,634	4,188
1943	1			418,114	2,918,309	2,840	7,028
1944	1			628,999	3,547,308	3,917	10,945
1945	1			415,228	3,962,536	2,505	13,450
1946	2			293,981	4,256,517	1,814	15,264
1947	3			197,606	4,454,123	967	16,231
1948	6	3	0	1,719,688	6,173,811	740	16,971
1949	—	—	—	—	—	—	—
Upper Pettit							
1945	1			52,276	52,276	329	329
1946	7	5		1,785,948	1,838,224	13,273	13,602
1947	25	6		3,756,410	5,594,634	10,685	24,287
1948	27			5,783,172	11,377,806	8,665	32,952
1949	—	—		—	—	—	—
Lower Pettit							
1946	1			30,955	30,955	313	313
1947	0			14,286	45,241	463	776
1948	4			134,074	179,315	1,315	2,091
1949	—			—	—	—	—
Travis Peak							
1939	4			555,951	555,951	21,811	21,811
1940	11			2,140,392	2,696,343	19,901	41,712
1941	15			5,959,967	8,656,310	62,258	103,970
1942	16	1		7,025,333	15,681,643	81,382	185,352
1943	17	1		9,666,762	25,348,405	162,501	347,853
1944	17	0	1	7,501,730	32,850,135	147,446	495,299
1945	17	3		7,143,557	39,993,692	119,404	614,703
1946	22	7		7,075,633	47,069,325	145,606	760,309
1947	25	7		6,547,603	53,616,928	202,685	962,994
1948	32	8	2	10,405,245	64,022,173	143,306	1,106,300
1949	—	—	—	—	—	—	—

WECHES FIELD
Houston County, Texas

ERWIN K. KRAUSE
Research Assistant, Bureau of Economic Geology, Austin, Texas
August 18, 1950

LOCATION

The Weches field (one well) is in the Daniel McLean survey in northwestern Houston County, 2½ miles southwest of Weches.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Seismograph and subsurface.

DISCOVERY

Woodbine: September 12, 1948; A. D. Adams et al. #1 Lula A. Holcomb et al. Pumped 112 barrels of oil and 55 barrels of salt water per day on test through perforations at 5,742-5,746 feet.

ELEVATION OF SURFACE

314 feet.

SURFACE FORMATION

Weches formation of Claiborne group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

155 feet below the top of the Woodbine group.

STRUCTURE

Anticline.

PRODUCTIVE AREA

Woodbine: 1 well; 40 acres.

THICKNESS OF RESERVOIR ROCK

Woodbine:	Feet
Net productive	4±

CHARACTER OF OIL

Woodbine: Gravity, A. P. I., 25.5°.

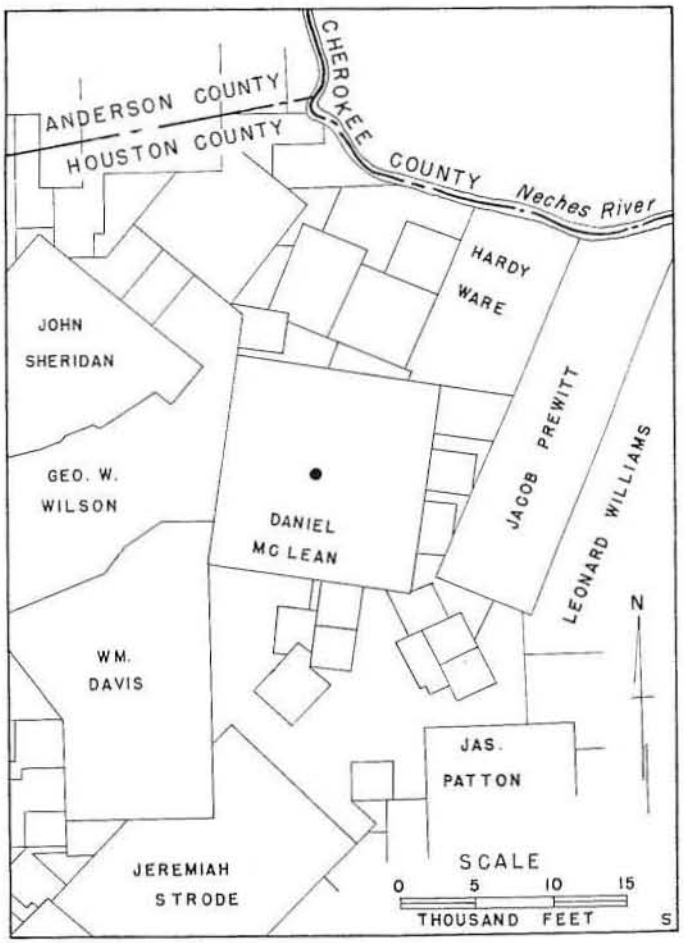
WATER PRODUCTION

On test, half the production was salt water.

PRODUCTION HISTORY

Woodbine and Total field:

Year	WELLS PRODUCING at end of year	OIL PRODUCTION (barrels)	
	Pumping	Yearly	Cumulative
1948	1	1,906	1,906
1949	1	3,155	5,061
1950 to 7/1	1	1,215	6,276



WEST SHELBYVILLE FIELD
Shelby County, Texas

T. C. CASH
Geologist, Tyler, Texas
September 9, 1949

LOCATION and OTHER NAME

The West Shelbyville field is in the eastern part of Shelby County, 6 miles southeast of Center, the county seat, and immediately west of the town of Shelbyville. In certain publications, data pertaining to this field have been presented under the name Shelbyville, which name had prior application to a nearby field discovered in 1917.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Shows of oil encountered in three early shallow wells accounted for the drilling of the discovery well in the West Shelbyville area.

DISCOVERY

Fredericksburg limestone: May 18, 1936;
Shelby County Crude Oil Co. #1 W. C. Windham.

ELEVATION OF SURFACE

At well locations: Highest, 384 ft.; lowest, 208 feet.

SURFACE FORMATIONS

Wilcox and alluvium.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The deepest well drilled in the area penetrated the Fredericksburg section approximately 100 feet.

NATURE OF TRAP

Fredericksburg limestone: Localized porosity development in limestone.

PRODUCTIVE AREA

Fredericksburg limestone and Field: 20 acres.

THICKNESS OF RESERVOIR ROCK

Fredericksburg limestone: 6 feet.

CONTINUITY OF RESERVOIR ROCK

Fredericksburg limestone: The Fredericksburg section is continuous in the East Texas basin. The upper part of the section, however, is truncated in the northeastern part of the basin. Local porosity developments in the Fredericksburg occur throughout northeast Texas, but very little oil has been produced from the formation in this area. This oil reservoir is limited to a very small area.

LITHOLOGY OF RESERVOIR ROCK

Fredericksburg limestone: Cream-colored, fossiliferous, calcitic, chalky, slightly porous limestone.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Fredericksburg limestone	Feet
Elevation of top of oil	-3,126
Elevation of bottom of oil	-3,144
Relief	18

CHARACTER OF OIL

Fredericksburg limestone:
Gravity, A.P.I., 36.4°
Base, paraffin, intermediate
Viscosity, Saybolt seconds, @ 77° F., 48
Viscosity, Saybolt seconds, @ 100° F., 42
Color, dark green

For analysis see:
U. S. Bureau of Mines Lab. ref. No. 38327
Tabulated Analyses of Texas Crude Oils. T. P. 607 (1939) Group 4, Item 59

(Field name indicated as Shelbyville.)

WATER PRODUCTION

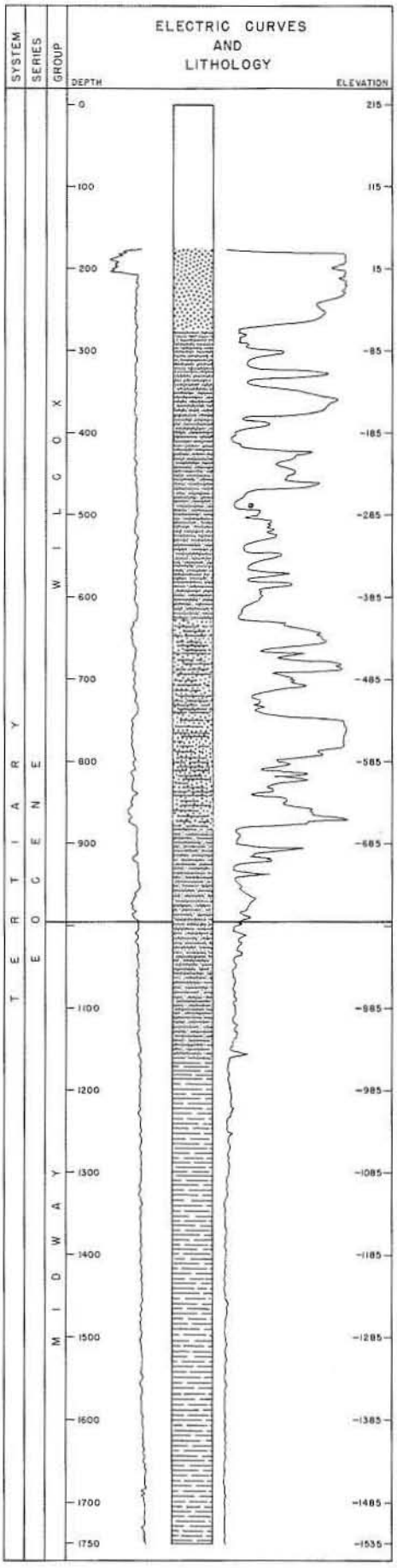
Fredericksburg limestone: Very little water has been produced. The only well now producing is currently making 10 barrels of water per day.

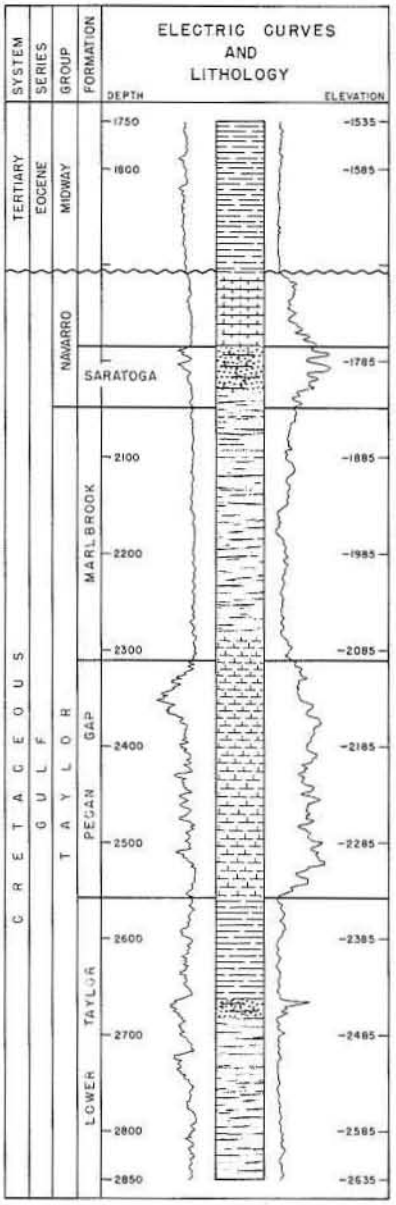
PRODUCTION HISTORY

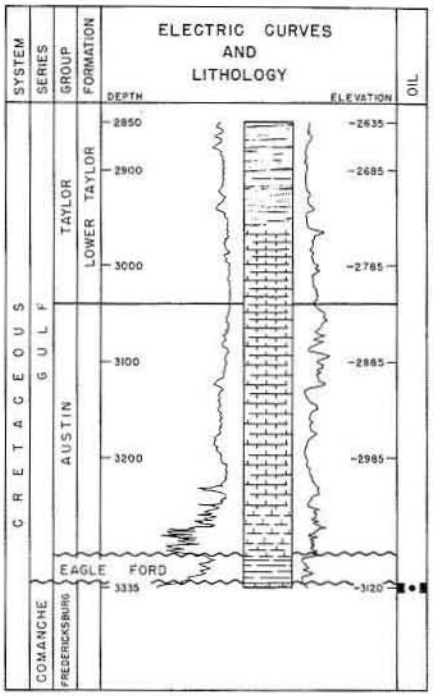
Year	OIL PRODUCTION (barrels) Yearly	Cumulative
1936	753	753
1937	2,260	3,013
1938	598	3,611
1939	598	4,209
1940	2,555	6,764
1941	85	6,849
1942	1,823	8,672
1943	1,628	10,300
1944	1,809	12,109
1945	1,538	13,647
1946	1,584	15,231
1947	1,226	16,457
1948	1,397	17,854
1949*	1,305	19,159

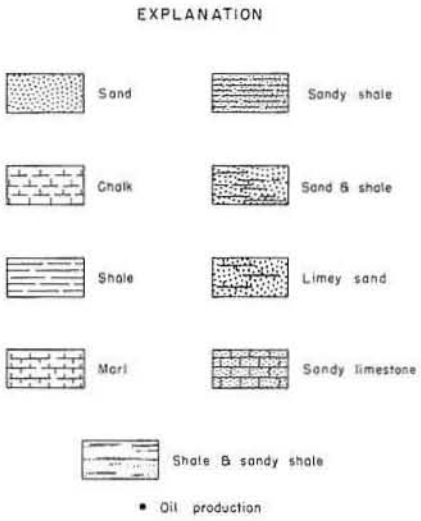
*P.S. - 1949 data added by amendment.

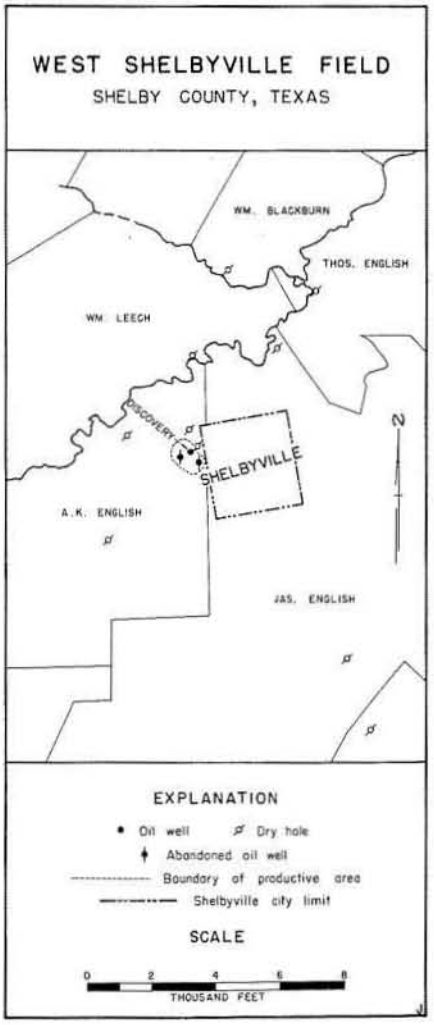
TYPE SECTION OF ROCKS PENETRATED











WEST WASKOM FIELD
Harrison County, Texas

ERWIN K. KRAUSE
Research Assistant, Bureau of Economic Geology, Austin, Texas
August 18, 1950

LOCATION

The one gas well constituting West Waskom field is located in southeastern Harrison County in the central part of Lucinda Wallace survey. It is 3 miles west of Waskom field and 7 miles northwest of the town of Elysian Fields.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Extensive drilling and subsurface work.

DISCOVERY

Travis Peak: July 1, 1948; E. C. Johnston #1 Edna Hood. After extensive tests of Pettet and Travis Peak this well was abandoned as noncommercial on October 1, 1947. It was reworked and recompleted July 1, 1948 in Travis Peak. Flowed 1,270 Mcf gas per day through perforations at 6,276-6,294; rock pressure, 2,350 pounds.

ELEVATION OF SURFACE

340 feet.

SURFACE FORMATION

Wilcox group.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

322 feet below the top of the Travis Peak.

NATURE OF TRAP

Travis Peak: Porous stratigraphic trap along western flank of Sabine uplift.

PRODUCTIVE AREA

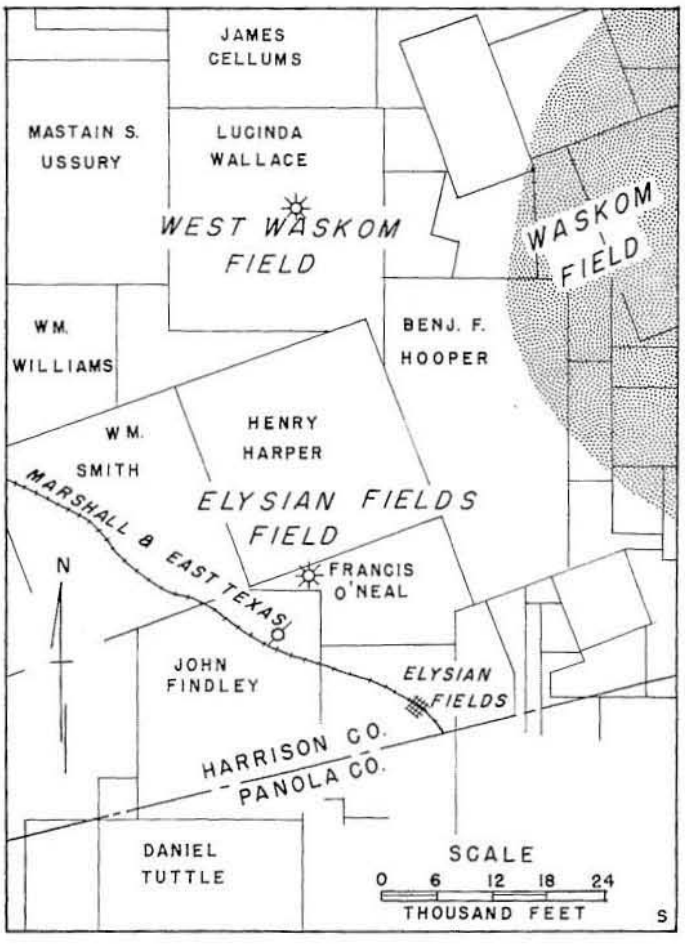
Travis Peak: One well.

THICKNESS OF RESERVOIR ROCK

Travis Peak:	Feet
Net productive	18±

PRODUCTION HISTORY

Year	GAS PRODUCTION (Mcf) Yearly	GAS PRODUCTION (Mcf) Cumulative	CONDENSATE PRODUCTION (barrels) Yearly	CONDENSATE PRODUCTION (barrels) Cumulative
1948	43,224	43,224	423	423
1949	196,155	239,379	1,379	1,802



WHELAN FIELD
Harrison County, Texas

W. H. McKENZIE and F. M. ADAIR
Zone Geologist and Geologist, respectively, Gulf Oil Corp., Tyler, Texas
February 2, 1950

LOCATION and OTHER NAME

The Whelan field is in northwestern Harrison County about 14 miles northwest of Marshall, the county seat. The town of Harleton, by which name the field is also known, is at the extreme eastern edge of the field.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Seismic surveying led to the original leasing and afforded the basis for the location of the well which discovered the field.

DISCOVERIES

Rodessa: July 16, 1945;
D. E. & R. J. Whelan #1 W. N. Peal Estate.
Travis Peak: September 7, 1945;
Rogers Lacy #1 Peteet.

ELEVATION OF SURFACE

At well locations: Highest, 403 ft.; lowest, 274 feet.

SURFACE FORMATION

Queen City.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

Within the productive limits of the field, the oldest horizon penetrated is 679 feet below the top of the Travis Peak formation. This penetration was in the well in the Sam N. Hall survey where, on the accompanying map, the datum elevation is indicated as -6,112 feet. On the southwest flank of the field, Placid Oil Co. #1 Katherine Bosch had penetrated approximately 630 feet of Cotton Valley at its total depth of 9,570 feet.

NATURE OF TRAPS

Rodessa: The Rodessa reservoir is a porous limestone arched over a very low-relief anticlinal structure in which gas-condensate is trapped with approximately 56 feet of productive closure.

Travis Peak: The Travis Peak formation over this structure consists of several tight sandstone reservoirs which produce gas-condensate. The outline of Travis Peak production follows very nearly that of the Rodessa, with approximately the same amount of productive closure. The sands are lensing in character.

PRODUCTIVE AREAS

	Acres
Rodessa	8,500
Travis Peak	6,500
Whelan field	8,500

THICKNESSES OF RESERVOIR ROCKS

	Feet	
	Max.	Avg.
Rodessa	28	18
Travis Peak	?	?

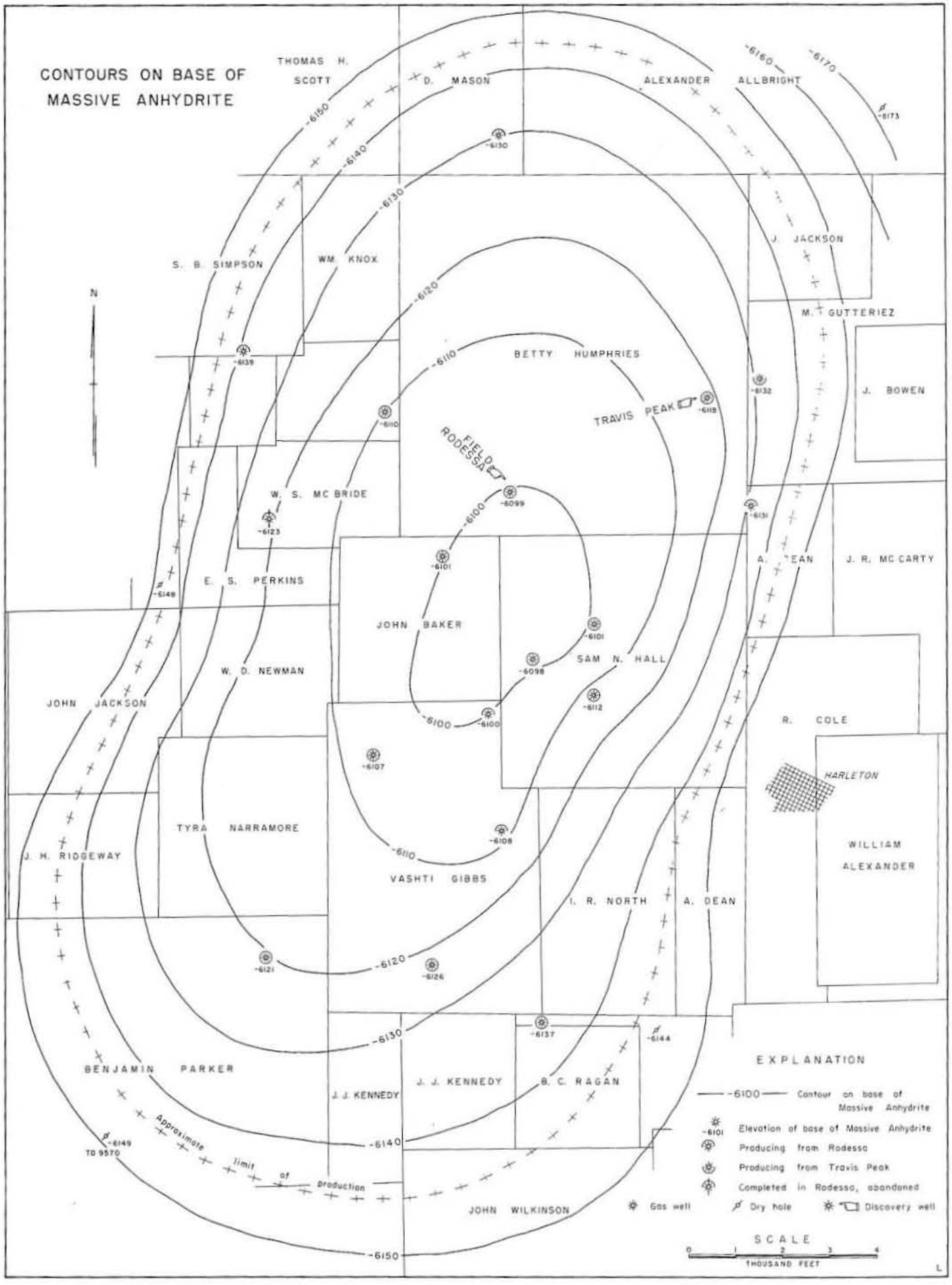
LITHOLOGY OF RESERVOIR ROCKS

Rodessa: The producing section in the Rodessa formation is a gray limestone with coquina-type porosity. Apparently there is good permeability communication throughout the area of the field.

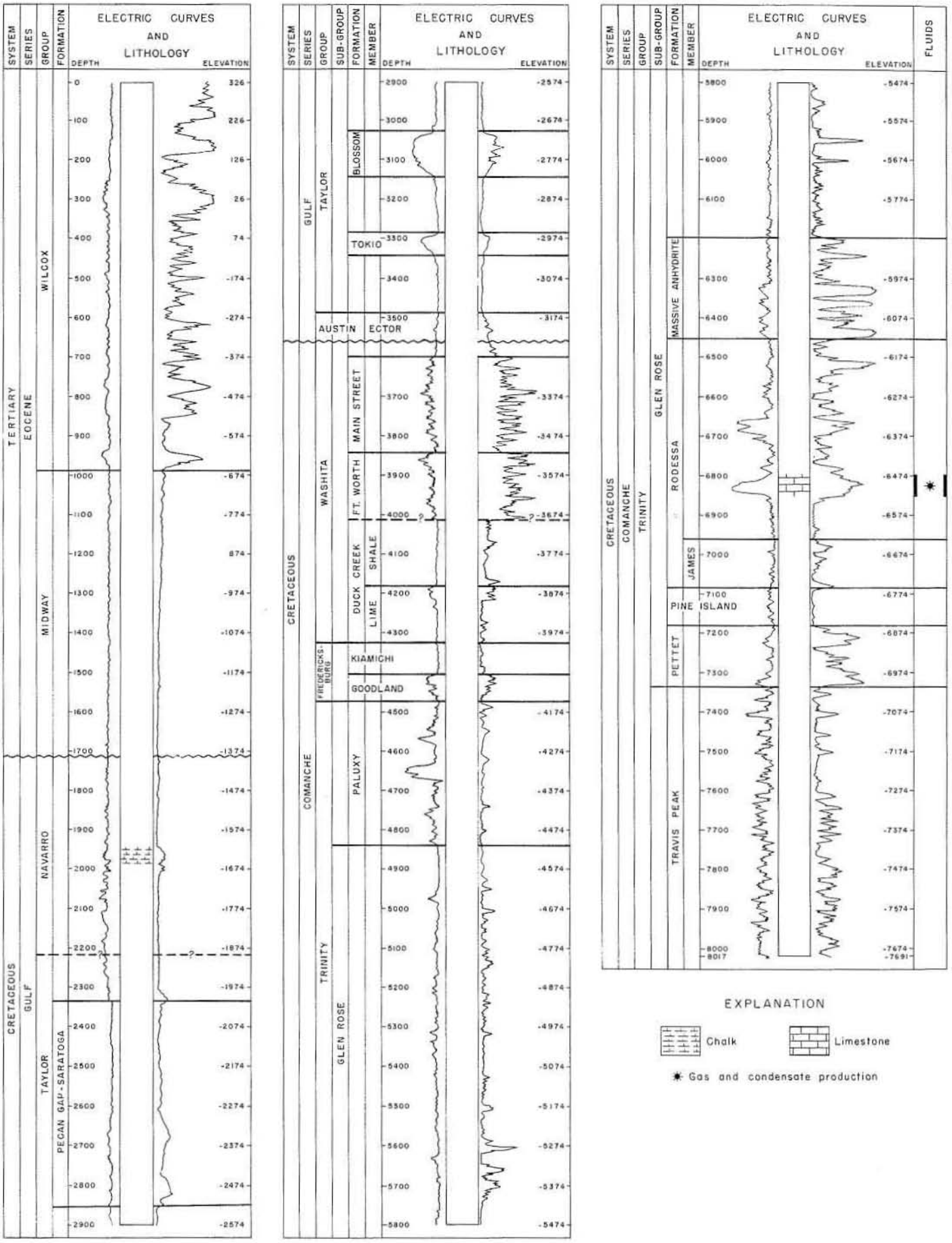
Travis Peak: The Travis Peak sands are fine-grained, tightly-cemented and, in places, quartzitic. The sands are lensing and are interbedded with red shales and shaly red sandstone.

ACID TREATMENT

The porosity and permeability of the Rodessa producing zone is such that the early wells in the field were completed as good gas wells without the use of acid, but because of the appreciable increase in potential, the wells were later acidized.


CONTOURS ON BASE OF MASSIVE ANHYDRITE
THOMAS H. SCOTT
D. MASON
ALEXANDER ALLBRIGHT
S. B. SIMPSON
WM. KNOX
J. JACKSON
M. GUTTERIEZ
BETTY HUMPHRIES
J. BOWEN
TRAVIS PEAK
FIELD RODESSA
W. S. MC BRIDE
E. S. PERKINS
A. DEAN
J. R. MC CARTY
JOHN BAKER
SAM N. HALL
W. D. NEWMAN
JOHN JACKSON
R. COLE
HARLETON
TYRA NARRAMORE
J. H. RIDGEWAY
WILLIAM ALEXANDER
VASHTI GIBBS
I. R. NORTH
A. DEAN
BENJAMIN PARKER
J. J. KENNEDY
J. J. KENNEDY
B. C. RAGAN
JOHN WILKINSON
TD 9570
Approximate limit of production
EXPLANATION
-6100 Contour on base of Massive Anhydrite
-6101 Elevation of base of Massive Anhydrite
Producing from Rodessa
Producing from Travis Peak
Completed in Rodessa, abandoned
Gas well
Dry hole
Discovery well
SCALE
0 1 2 3 4
THOUSAND FEET

TYPE SECTION OF ROCKS PENETRATED



ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Rodessa:	Feet
Elevation of top of gas	-6,450
Elevation of condensate-water contact	-6,506
Productive relief	56

Travis Peak:

The Travis Peak reservoir is believed to have approximately the same amount of productive relief (56 feet) as the Rodessa, but, because of sand lensing and insufficient data on individual sands, it is not considered feasible to try to determine hydrocarbon relief in each lens in this section.

CHARACTER OF GAS AND CONDENSATE

Rodessa:	GAS	CONDENSATE
Component	Mol. %	Mol. %
Methane	96.91	1.13
Ethane	1.66	.52
Propane	.81	.38
Iso-butane	.19	.29
N-butane	.24	.41
Pentane	.19	
Iso-pentane		.11
N-pentane		.50
Hexanes		96.64
	100.00	100.00

Travis Peak: No analysis available.

PRODUCTION HISTORY

	WELLS PRODUCING at end of year	CONDENSATE PRODUCTION (barrels)		GAS PRODUCTION (Mcf)	
		Yearly	Cumulative	Yearly	Cumulative
Field totals					
1945	3 (1)	7,512	7,512	490,946	490,946
1946	7 (1)	41,257	48,769	2,982,161	3,473,107
1947	14 (6)	170,643	219,412	17,109,669	20,582,776
1948	16 (9)	281,905	501,317	19,353,091	39,935,867
1949	18 (11)	385,447	886,764	23,110,984	63,046,851
Rodessa					
1945	2 (1)	6,910	6,910	458,524	458,524
1946	6 (1)	36,402	43,312	2,641,400	3,099,924
1947	13 (6)	149,598	192,910	15,755,382	18,855,306
1948	15 (9)	122,044	314,954	15,889,860	34,745,166
1949	17 (11)	57,798	372,752	19,557,353	54,302,519
Travis Peak					
1945	2 (1)	602	602	32,422	32,422
1946	2 (1)	4,855	5,457	340,761	373,183
1947	7 (6)	21,045	26,502	1,354,287	1,727,470
1948	10 (9)	59,775	86,277	3,463,231	5,190,701
1949	12 (11)	50,200	136,477	3,553,631	8,744,332
Processing plants					
1948		100,086	100,086		
1949		277,449	377,535		

Figures in parentheses indicate number of wells producing from two reservoirs (See map.)

WIELAND FIELD
Hunt County, Texas

MACK HAYS, Jr.
Geologist, Tyler, Texas
September 9, 1949

LOCATION and OTHER NAME

The Wieland field is 8½ miles southeast of Greenville, county seat of Hunt County. It is in the Luling-Mexia-Talco fault zone. It is known also as the Club Lake field, after an artificial lake at the site.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Surface reconnaissance, which indicated faulting in this area, was carried out as early as 1924 by Humble Oil & Refining Co. Additional surface and core-drill work during 1936 indicated the presence of favorable closure along the Wieland fault. During 1941, Cable Tool Drilling Co. drilled the first test in the area, its #1 Williams, on a tract farmed out by Humble Oil & Refining Co. This test proved to be on downthrown side of fault and was abandoned in the lower Fredericksburg at the depth of 4,632 feet. The discovery well was drilled by Hollandsworth Drilling Co. et al. with the support of Humble Oil & Refining Co. and Gulf Oil Corp.

DISCOVERY

Woodbine sand: June 27, 1942;
Hollandsworth Drilling Co. et al. #1 J. D. Baker.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

About 4 feet below the top of Eagle Mills salt.

NATURE OF TRAP

Woodbine sand: Closure against fault.

PRODUCTIVE AREA

Woodbine sand and Field: Approximately 210 acres.

THICKNESS OF RESERVOIR ROCK

Woodbine sand: 10 to 14 feet maximum net productive.

LITHOLOGY OF RESERVOIR ROCK

The upper Woodbine sands constitute the reservoir in this field and consist of fine- to medium-grained, soft, porous, ashy sand, interbedded with shale.

CONTINUITY OF RESERVOIR ROCK

The Woodbine sands are generally considered to be intercommunicative throughout the East Texas basin.

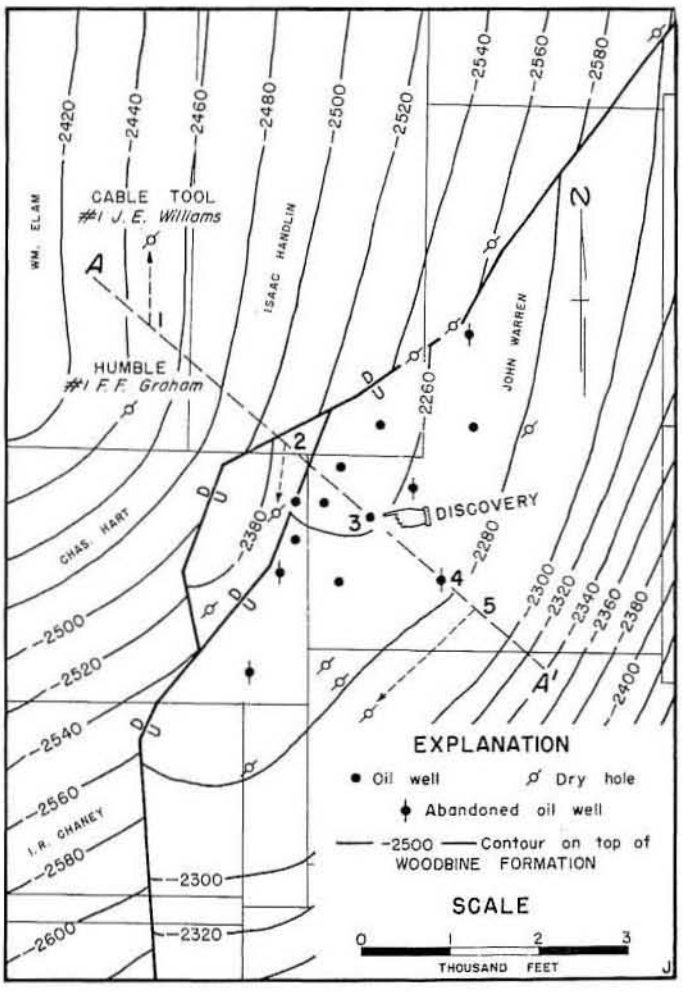
CHARACTER OF OIL

Woodbine sand:
Gravity, A.P.I. @ 60° F., 37.9° Base - Paraffin
Color: Dark brown Sulphur: 0.75%
Viscosity @ 40° F. - 99 sec.; @ 60° F. - 61 sec.;
@ 80° F. - 50 sec.; @ 100° F. - 43 sec.

PRODUCTION HISTORY

Year	WELLS PRODUCING at end of year		OIL PRODUCTION (barrels)	
	Flowing	Artif. lift	Yearly	Cumulative
1942	6	-	26,363	26,363
1943	2	5	112,082	138,445
1944	0	10	156,823	295,268
1945	0	10	166,231	461,499
1946	0	7	160,979	622,478
1947	0	7	153,890	776,368
1948	0	8	154,879	931,247
1949*	0	8	121,322	1,052,569

*P.S. - Amended to include the whole of 1949.



ELEVATION OF SURFACE

At well locations: Highest, 518 ft.; lowest, 474 feet.

SURFACE FORMATION

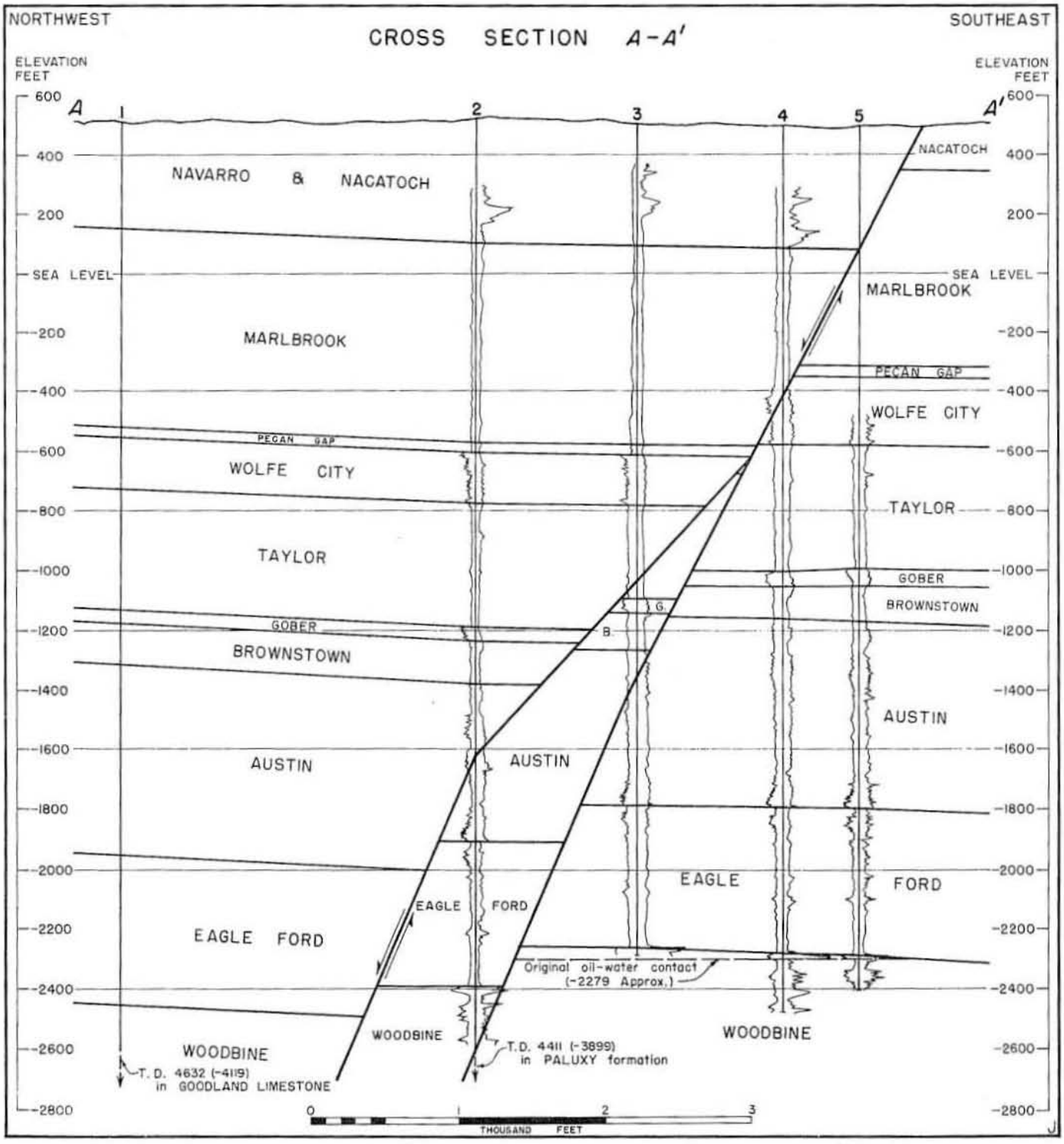
Within area of field: Navarro group.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine sand:	Feet
Elevation of top of oil	-2,254
Elevation of bottom of oil	-2,279
Relief	25

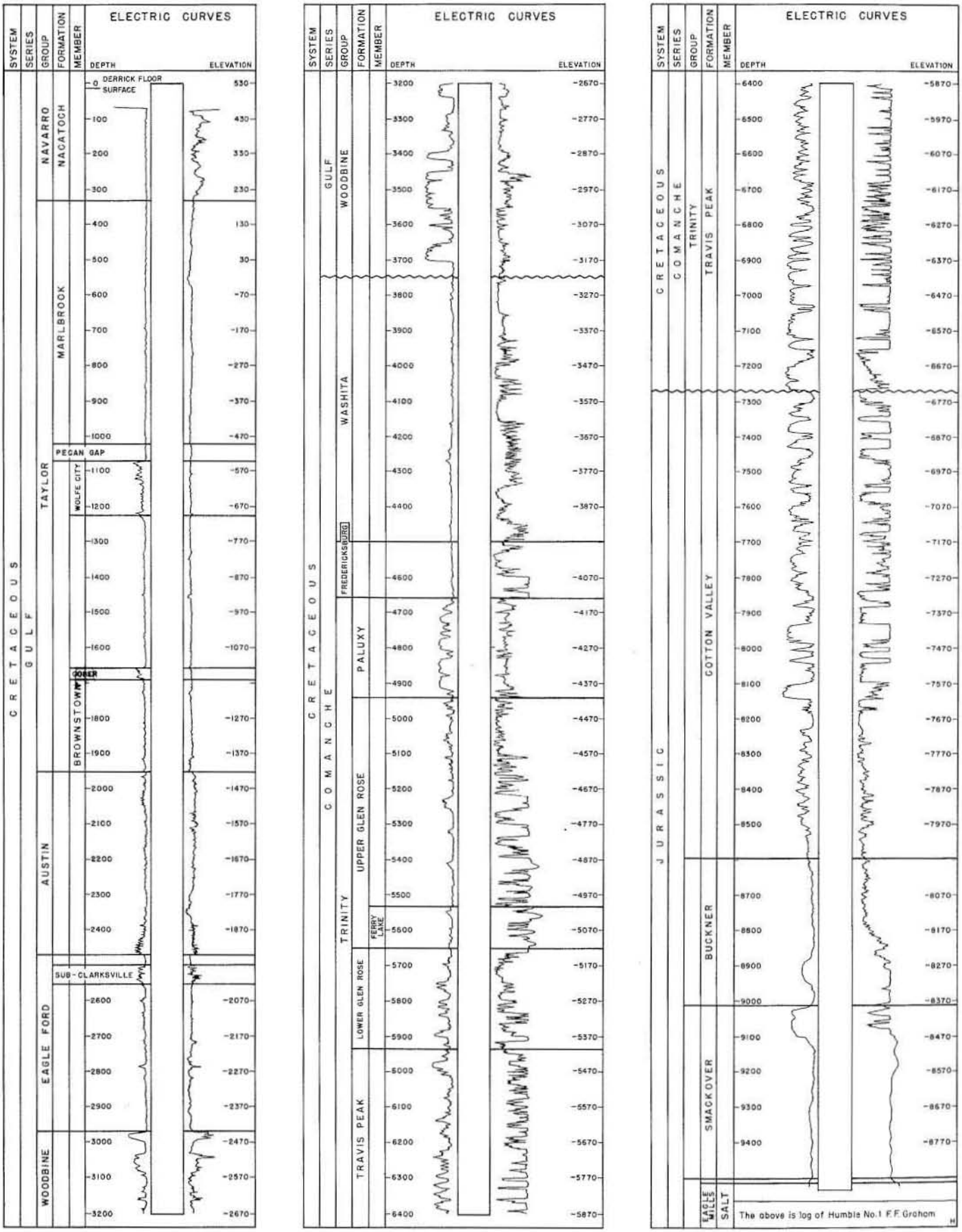
WATER PRODUCTION

Woodbine sand: As of January 1, 1949, the field's daily water production exceeded oil production by 200 to 300 barrels. A number of wells have been abandoned due to water encroachment.



TYPE SECTION OF ROCKS PENETRATED

IN VICINITY OF WIELAND FIELD



WILLIAM WISE FIELD
Cherokee County, Texas

ELVIN M. HURLBUT, Jr.
Geologist, Shell Oil Company, Tyler, Texas
September 25, 1950

LOCATION

The William Wise field is in west-central Cherokee County about 7½ miles south-southwest of Rusk, the county seat, and 2 miles south of the Rusk field.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Study of subsurface information, including a show of oil in one of the dry holes offsetting the discovery well.

DISCOVERY

Woodbine sand: August 8, 1946;
Watson Wise and Delta Drilling Co. #1 J. O. Huggins.

ELEVATION OF SURFACE

At well locations: Highest, 452 ft.; lowest, 357 feet.

TYPE SECTION OF ROCKS PENETRATED

The section here is essentially the same as that at the Rusk field. The reader is referred to the accompanying paper on that field.

SURFACE FORMATION

Queen City formation, Claiborne group.

OLDEST STRATIGRAPHIC ZONE PENETRATED

Woodbine sand.

NATURE OF TRAPS and STRUCTURE

There are two low-relief domes on a structural terrace associated with a southwest-plunging nose. Since there is a distinct and separate accumulation on each of the two domes, it is apparent that a convex upper surface is a dominant trap-forming factor in the case of each of the reservoirs. The Austin chalk overlies truncated Woodbine, and it appears that this relationship is an important factor.

PRODUCTIVE AREA

Woodbine sand and Field: 200 acres.

THICKNESSES OF RESERVOIR ROCKS

Woodbine sand:	Feet
Northern accumulation	7±
Southern accumulation	9±

LITHOLOGY OF RESERVOIR ROCK

Woodbine sand: Medium-grained, friable sand.

CONTINUITY OF RESERVOIR ROCK

Woodbine sand: The sand appears to be continuous within the immediate vicinity of the field. However, truncation and the presence of sand lenses make correlation uncertain. The difference in the gravity of the oil in the two domes indicates two separate and distinct accumulations and also suggests that they may be in separate sand bodies although at or near the same stratigraphic position.

CHARACTER OF OIL

Woodbine sand:
Northern accumulation: Gravity, A.P.I., 36.5° - 38°.
Southern accumulation: Gravity, A.P.I., 41° - 43.2°.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Woodbine sand:	Feet
Northern accumulation	
Elev. of top of oil in highest well	-4,717
Elevation of oil-water contact	-4,734
Relief	17
Southern accumulation	
Elev. of top of oil in highest well	-4,719
Elevation of oil-water contact	-4,731
Relief	12

WATER PRODUCTION

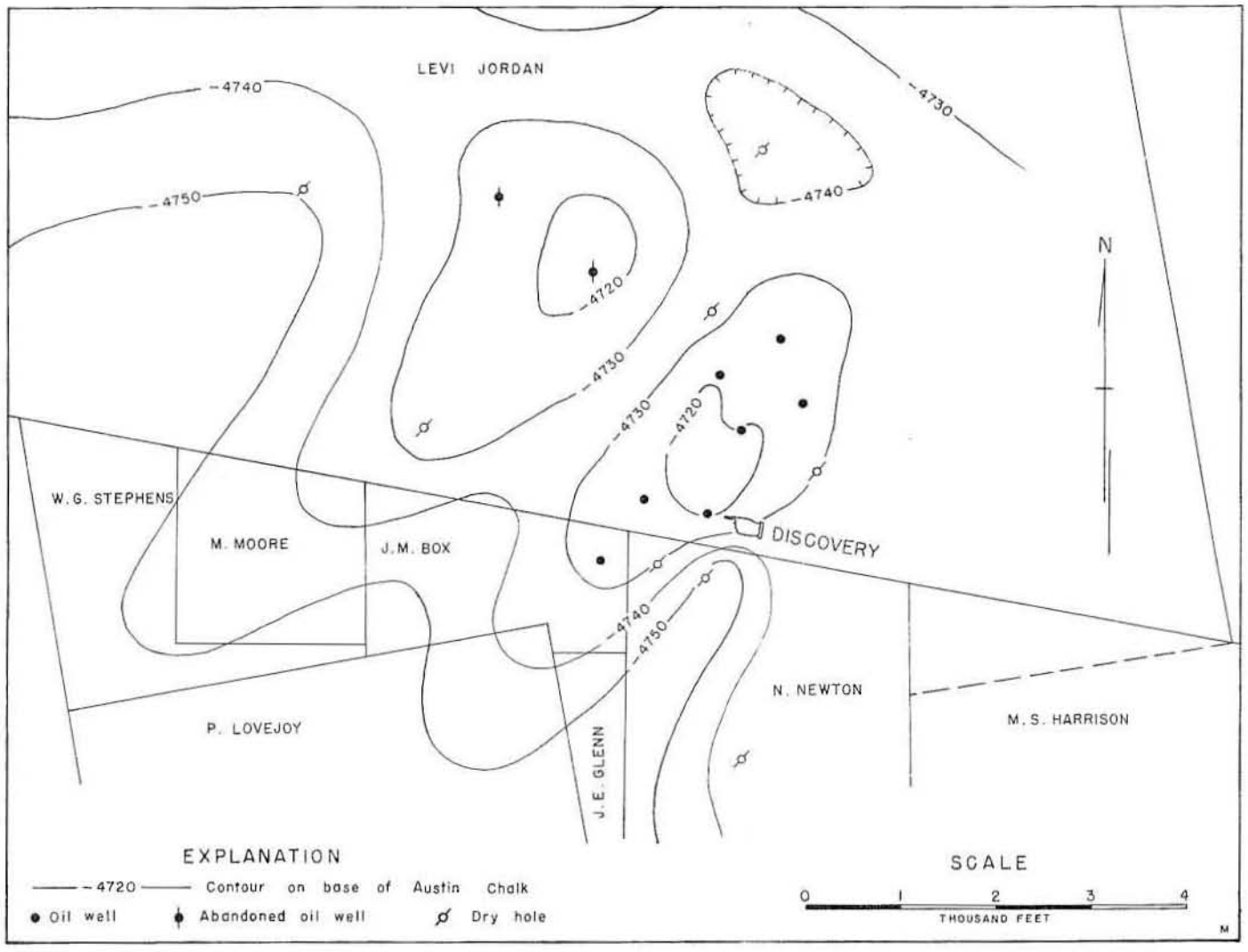
Woodbine sand: Since completion, the gross production of the southernmost well has been about 50% water and that of the northeasternmost well has been about 60 to 70% water. A well on the eastern flank has produced 1% water constantly since completion. High production of water necessitated the plugging of the wells in the northern reservoir.

DEVELOPMENT AND PRODUCTION HISTORY

Woodbine sand and Field totals:

	NUMBER OF WELLS		OIL PRODUCTION (barrels)	
Year	Completed	Producing at end of year	Yearly	Cumulative
1946	5	5	24,151	28,163*
1947	2	7	126,111	154,274
1948	1	8	109,657	263,931
1949	0	7	80,003	343,934

*This figure includes 4,012 barrels previously produced by T. J. Wood #1 J. E. Huggins, the northwesternmost abandoned well indicated on the accompanying map. This well was completed, produced, and abandoned long prior to the recognized discovery of the field. Since it was not a commercial well and did not lead directly to the development of the field, it is not considered the discovery well. It was completed at its total depth of 5,189 feet on June 23, 1936, producing at the hourly rate of 7.2 barrels of liquid, 57% of which was salt water. Pumping equipment was installed and the well produced 1,400 barrels of oil in 1936 and 2,612 barrels of oil in 1937. Plug date on this well is uncertain but probably was in 1938.



WILLOW SPRINGS FIELD

Gregg County, Texas

RICHARD R. SCURLOCK
Geologist, Tyler, Texas
October 11, 1949

LOCATION

The Willow Springs field is located about 3 miles southwest of Longview, county seat of Gregg County, Texas.

METHODS OF EXPLORATION LEADING TO DISCOVERY

A lease block was acquired in this area during 1928 by Humble Oil & Refining Co. and Gulf Oil Corp. as a result of surface geologic work by G. M. Knebel. Additional leases were acquired following core drill work conducted in the area during 1930. After a reflection seismic survey was made, drilling operations were initiated in 1938 on the discovery well, Humble Oil & Refining Co. and Gulf Oil Corp. #1 E. D. Robertson.

DISCOVERIES

Rodessa limestone: October 2, 1941;
Roger Lacy #1 Horton & Dickson.
Pettet limestone: July 12, 1938;
Humble Oil & Refining Co. and Gulf Oil Corp. #1 E. D. Robertson.

ELEVATION OF SURFACE

At well locations: Highest, 344 ft.; lowest, 265 feet.

SURFACE FORMATIONS

Reklaw, Carrizo and Wilcox formations.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated by any well within the area of the field is 668 feet below the top of the Cotton Valley formation. This penetration was in the Pettet discovery well.

NATURE OF TRAPS and STRUCTURE

Anticline with major axis trending north-south.

PRODUCTIVE AREAS

	Acres
Rodessa limestone (estimated)	5,800
Pettet limestone (estimated)	5,800
Willow Springs field (estimated)	5,800

THICKNESSES OF RESERVOIR ROCKS

	Feet
Rodessa limestone, net productive	20
Pettet limestone, net productive	30

LITHOLOGY OF RESERVOIR ROCKS

Rodessa limestone: Sparsely oolitic, sandy, fossiliferous, slightly porous to porous limestone.
Pettet limestone: Hard, oolitic, fossiliferous, slightly porous to porous limestone.

CONTINUITY OF RESERVOIR ROCKS

Rodessa and Pettet limestones: Both the Rodessa and Pettet members of the Glen Rose formation are present over a widespread area in the East Texas basin. The limestone porosity developments in both members are lenticular and are generally difficult to correlate over widespread areas.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Rodessa limestone:
Due to the high lenticularity of the porosity developments of the limestones in the Rodessa section, each producing zone forms a separate reservoir, and no definite water table or gas column has been established.

Pettet limestone:	Feet
Elevation of top of gas	-6,964
Elevation of bottom of gas	-6,999
Relief	35±

CHARACTER OF GAS AND CONDENSATE

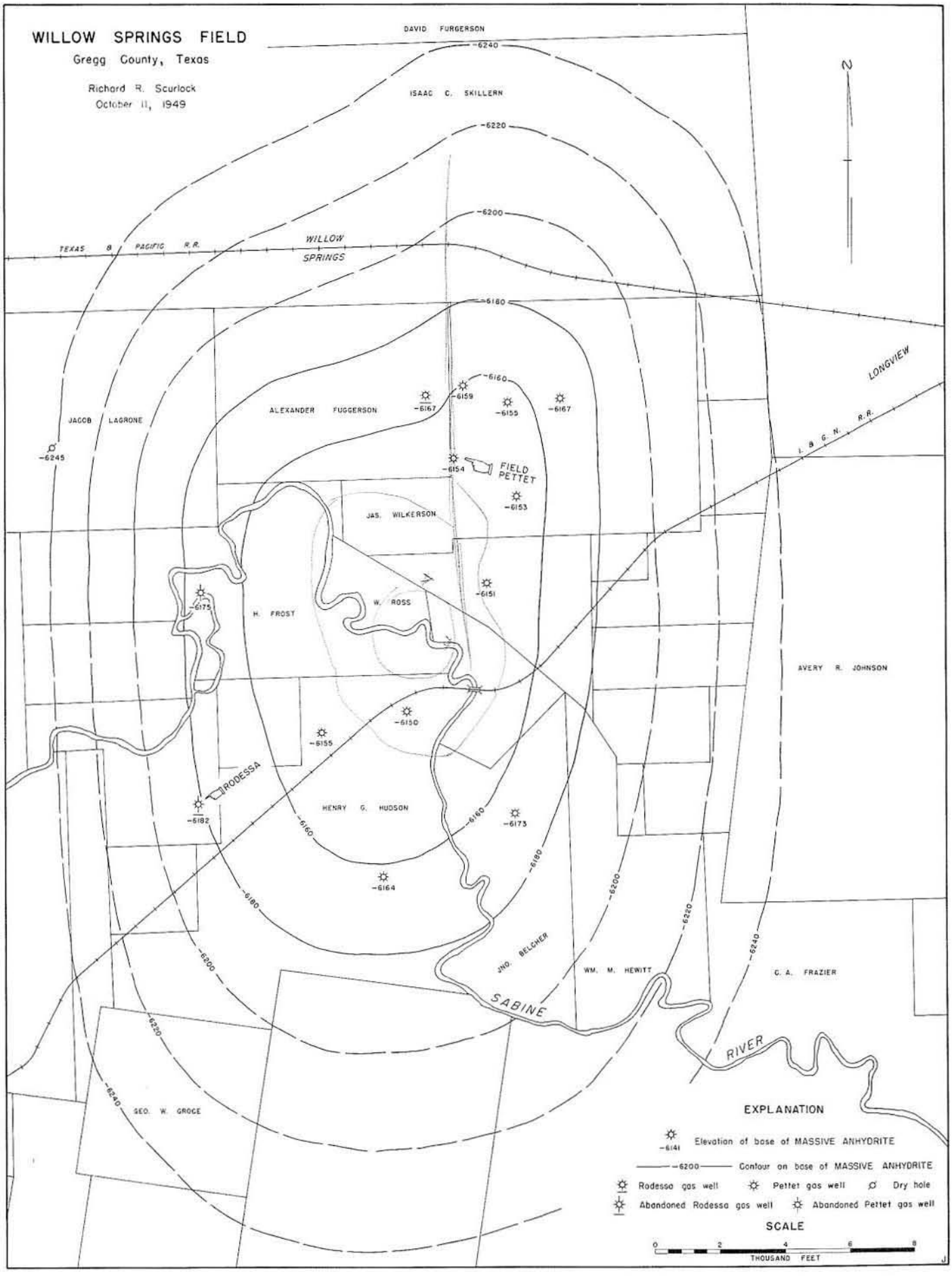
No analyses available.

CHARACTER OF OIL

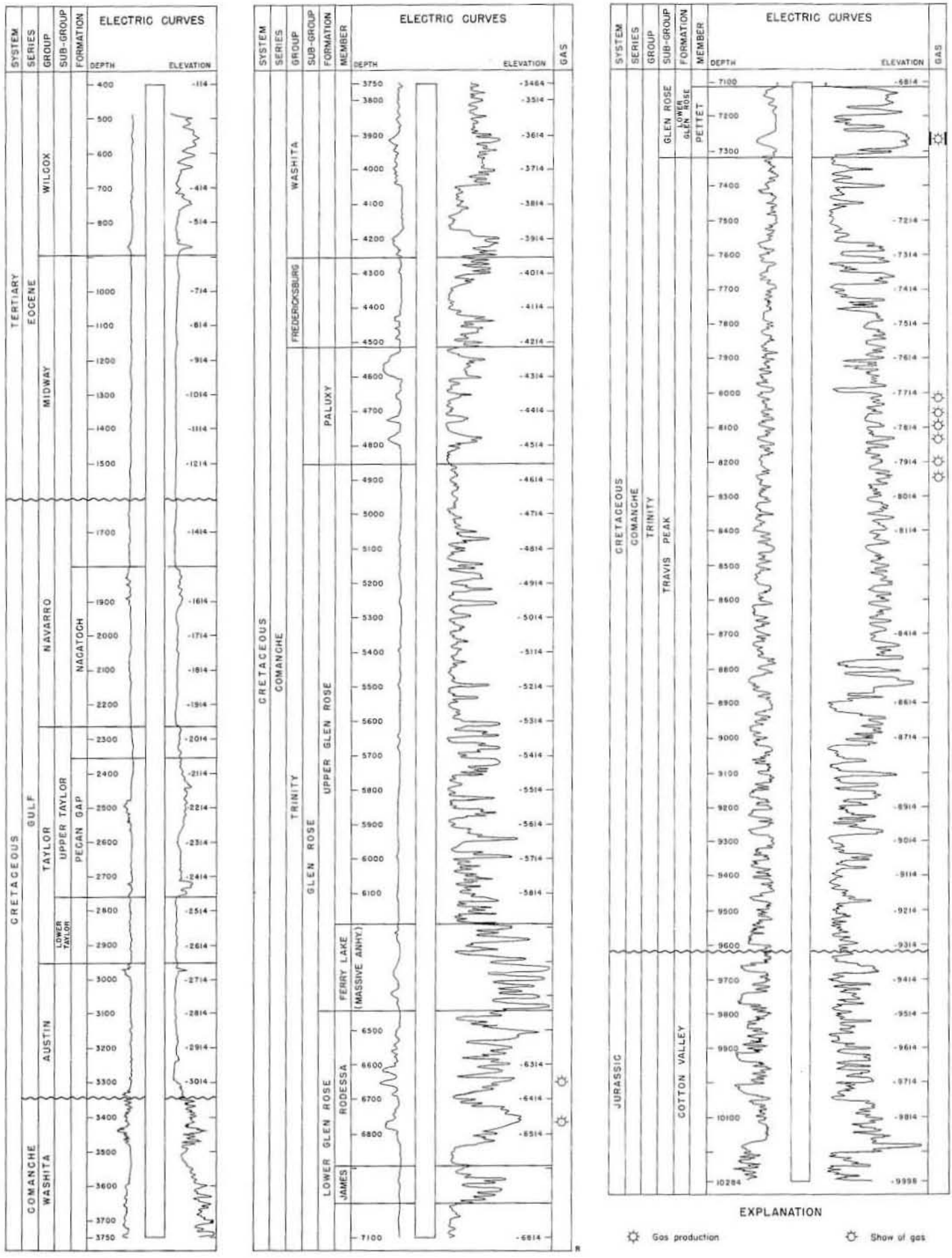
Pettet limestone:
A small amount of 41.1° gravity oil was produced but not on a commercial scale. No analysis of the oil is available.

WATER PRODUCTION

Water production has been negligible.


WILLOW SPRINGS FIELD
Gregg County, Texas
Richard R. Scurlock
October 11, 1949
DAVID FURGERSON
ISAAC C. SKILLERN
TEXAS & PACIFIC R.R.
WILLOW SPRINGS
LONGVIEW
I. & G. N. R.R.
JACOB LAGRONE
ALEXANDER FUGGERSON
FIELD
PETTET
JAS. WILKERSON
H. FROST
W. ROSS
AVERY R. JOHNSON
RODESSA
HENRY G. HUDSON
JNO. BELCHER
WM. M. HEWITT
G. A. FRAZIER
SABINE
RIVER
GEO. W. GROCE
-6240
-6220
-6200
-6180
-6160
-6245
-6167
-6159
-6155
-6167
-6154
-6153
-6151
-6175
-6150
-6155
-6182
-6173
-6164
EXPLANATION
-6141 Elevation of base of MASSIVE ANHYDRITE
-6200- Contour on base of MASSIVE ANHYDRITE
Rodessa gas well
Pettet gas well
Dry hole
Abandoned Rodessa gas well
Abandoned Pettet gas well
SCALE
0 2 4 6 8
THOUSAND FEET

TYPE SECTION OF ROCKS PENETRATED



PRODUCTION HISTORY

Year	WELLS PRODUCING at end of year: Oil Art. Lift	WELLS PRODUCING at end of year: Gas or Gas & Conds.	**	GAS PRODUCTION (Mcf): Gross	Injected	Net	Cumulative	CONDENSATE PRODUCTION (barrels): On lease	In plant	Total	Cumulative
Field totals											
1938	0	2		197,151		197,151	197,151	1,868		1,868	1,868
1939	0	2		344,233		344,233	541,384	3,890		3,890	5,758
1940	0	4		994,314		994,314	1,535,698	10,587		10,587	16,345
1941	1	8		3,058,420		3,058,420	4,594,118	31,447		31,447	47,792
1942	0	8(1)*		16,638,291	9,712,187	6,926,104	11,520,222	27,949	181,179	209,128	256,920
1943	0	8(1)*		17,420,683	6,742,699	10,677,984	22,198,206	25,384	170,108	195,492	452,412
1944	0	10		15,898,497	2,397,754	13,500,743	35,698,949	13,288	142,557	155,845	608,257
1945	0	7		13,422,030	2,668,911	10,753,119	46,452,068	11,473	150,330	161,803	770,060
1946	0	7		8,546,191	194,839	8,351,352	54,803,420	9,942	23,533	33,475	803,535
1947	0	9		11,017,645	***	11,017,645	65,821,065	58,115	***	58,115	861,650
1948	0	12		9,937,374		9,937,374	75,758,439	51,804		51,804	913,454
1949+	0	12		8,483,442		8,483,442	84,241,881	63,169		63,169	976,623
Totals				105,958,271	21,716,390	84,241,881		308,916	667,707	976,623	
Rodessa limestone											
1941				126,304		126,304	126,304	1,986			1,986
1942				4,307,222	5,807,387	(-1,500,165)	(-1,373,861)	0			1,986
1943				4,364,001	1,237,742	3,126,259	1,752,398	0			1,986
1944				6,319,843		6,319,843	8,072,241	0			1,986
1945				5,854,847		5,854,847	13,927,088	0			1,986
1946				2,350,959	***	2,350,959	16,278,047	0			1,986
1947				2,007,325		2,007,325	18,285,372	14,799			16,785
1948				2,144,507		2,144,507	20,429,879	12,881			29,666
1949+				3,594,668		3,594,668	24,024,547	32,650			62,316
Totals				31,069,676	7,045,129	24,024,547		62,316			
Pettit limestone											
1938				197,151		197,151	197,151	1,868			1,868
1939				344,233		344,233	541,384	3,890			5,758
1940				994,314		994,314	1,535,698	10,587			16,345
1941				2,932,116		2,932,116	4,467,814	29,461			45,806
1942				12,331,069	3,904,800	8,426,269	12,894,083	27,949			73,755
1943				13,056,682	5,504,957	7,551,725	20,445,808	25,384			99,139
1944				9,578,654	2,397,754	7,180,900	27,626,708	13,288			112,427
1945				7,567,183	2,668,911	4,898,272	32,524,980	11,473			123,900
1946				6,195,232	194,839	6,000,393	38,525,373	9,942			133,842
1947				9,010,320	***	9,010,320	47,535,693	43,316			177,158
1948				7,792,867		7,792,867	55,328,560	38,923			216,081
1949+				4,888,774		4,888,774	60,217,334	30,519			246,600
Totals				74,888,595	14,671,261	60,217,334		246,600			

*Figures in parentheses indicate number of wells producing from both reservoirs.

**OIL PRODUCTION: During 1941, one well produced 2,065 barrels of 41.1° gravity oil from the Pettet limestone.

***Plant dismantled in 1946.

+P.S. - 1949 data added by amendment.

WINNSBORO FIELD
Wood County, Texas

W. H. McKENZIE and F. M. ADAIR
Zone Geologist and Geologist, respectively, Gulf Oil Corp., Tyler, Texas
June 9, 1950

LOCATION

The Winnsboro field is in the northern part of Wood County. It is approximately 2 miles southwest of the town of Winnsboro. It is one of several fields near the axis of the East Texas geosyncline.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Subsurface mapping stimulated the first interest in oil prospecting in the Winnsboro area. Seismograph work, conducted later, gave favorable indications of structure and led to the drilling of the discovery well.

DISCOVERIES

Downthrown reservoirs:
Bacon: March 22, 1944;
Gulf Oil Corp. #1 Mrs. K. C. Brewer et al.
Gloyd: November 27, 1944;
Gulf Oil Corp. #1 Mrs. K. C. Brewer et al.
Upthrown reservoirs:
Bacon: January 31, 1945;
Amerada Petroleum Corp. #1 G. H. Gamblin
Gloyd: October 24, 1944;
Gulf Oil Corp. #1 Mrs. Willie Hornbuckle et al.

ELEVATION OF SURFACE

At well locations: Highest, 510 ft.; lowest, 466 feet.

SURFACE FORMATION

Queen City.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

The oldest horizon penetrated is 490 feet below the top of the Travis Peak formation. This penetration was in Gulf Oil Corp. #1 Willie Hornbuckle, Benj. Lee survey.

NATURE OF TRAPS

Accumulation in each of the four reservoirs is occasioned by a combination of folding and faulting, as indicated by the accompanying maps. Each accumulation is in a convex fold terminated against a fault. Reservoir data indicate that there is no communication between the reservoirs on the opposite sides of the fault. Variation in porosity may be a minor trap-forming factor on the downthrown side of the fault. One of the two wells which penetrated the reservoir rocks on the downthrown side of the fault was non-productive because of low porosity in both zones.

PRODUCTIVE AREAS

	Proven acres	
	Bacon	Gloyd
Upthrown reservoirs	582	739
Downthrown reservoirs (depleted)	40	40
Winnsboro field	779	

THICKNESSES OF RESERVOIR ROCKS

	Feet	
	Max.	Avg.
Bacon, net productive	12	8
Gloyd, net productive	10	5

LITHOLOGY OF RESERVOIR ROCKS

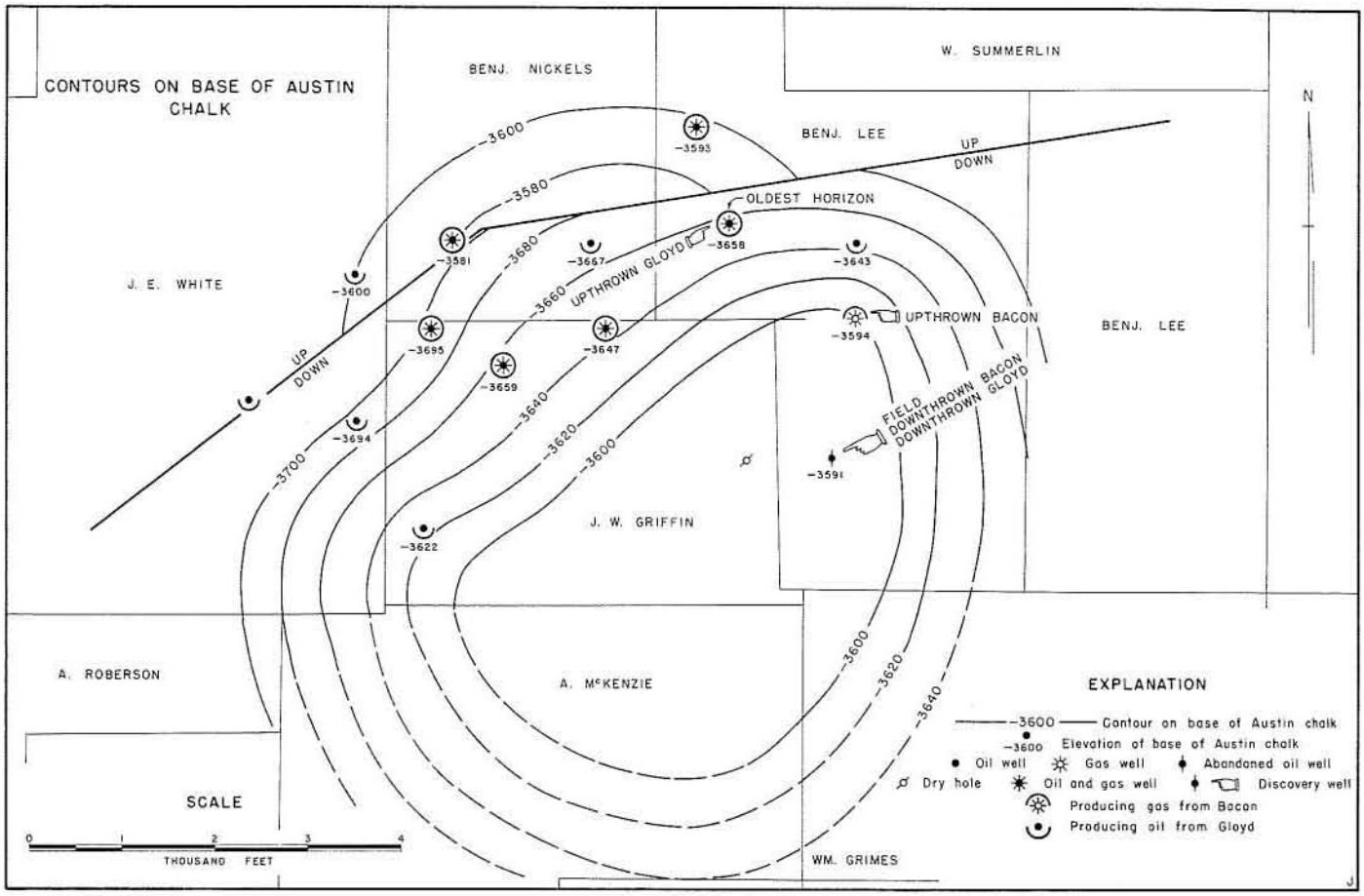
Bacon: Slightly oolitic, coquina-type, porous limestone. Grades laterally into dense, crystalline, gray non-porous limestone on westerly side of structure.

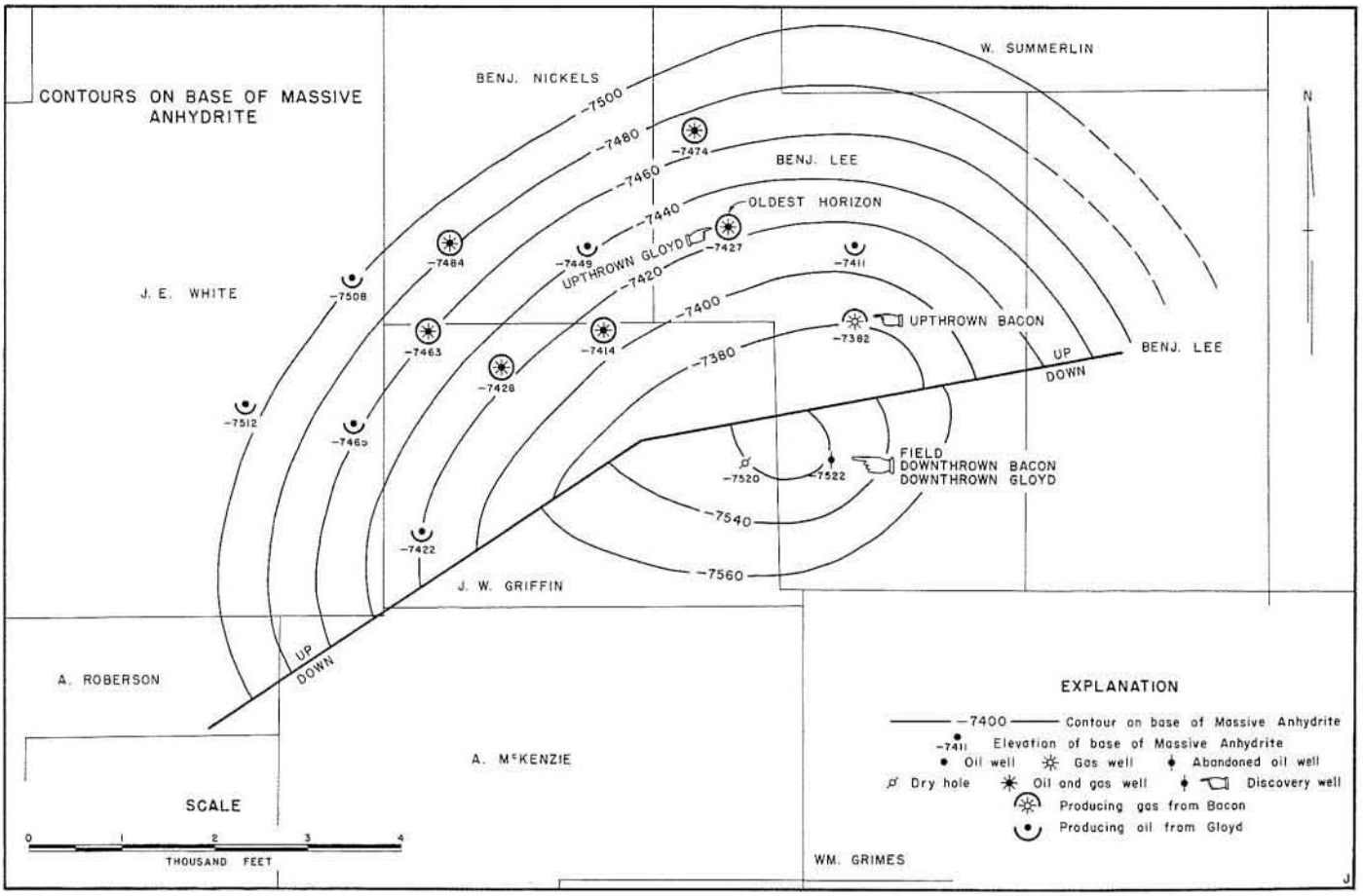
Gloyd: The Gloyd consists of sandstone members and limestone members. The sandstones are generally medium-grained, calcareous, porous and permeable, but locally they are ashy and silty with resulting low porosity and with little to no permeability. The limestone members are crystalline, slightly chalky, porous limestones which are generally low in permeability. All gradations between sandstones and limestones are present, such as limy sands and sandy limestones. It is believed that most of the oil production is from sandstone members.

CONTINUITY OF RESERVOIR ROCKS

Bacon: This porous limestone grades laterally into dense, non-porous limestone on the westerly flank of the Winnsboro structure. This lensing of porosity is a characteristic of the zone generally. It produces in the nearby Pickton and New Hope fields but, because of lack of porosity, is non-productive in other nearby areas where it is present under favorable structural conditions. It is probable that the porous condition at Winnsboro is continuous for only a short distance beyond the extent of the field.

Gloyd: The condition which permits free movement of fluids is probably continuous for only a short distance beyond the limits of the field. A stratigraphic equivalent of this zone is present over a large part of the East Texas basin. Porosity development is erratic and lenticular in character.


CONTOURS ON BASE OF AUSTIN CHALK
BENJ. NICKELS
W. SUMMERLIN
BENJ. LEE
OLDEST HORIZON
UPTHROWN GLOYD
UPTHROWN BACON
FIELD
DOWNTHROWN BACON
DOWNTHROWN GLOYD
J. E. WHITE
J. W. GRIFFIN
A. ROBERSON
A. McKENZIE
WM. GRIMES
UP
DOWN
N
SCALE
0 1 2 3 4
THOUSAND FEET
EXPLANATION
-3600 Contour on base of Austin chalk
-3600 Elevation of base of Austin chalk
Oil well
Gas well
Abandoned oil well
Dry hole
Oil and gas well
Discovery well
Producing gas from Bacon
Producing oil from Gloyd


CONTOURS ON BASE OF MASSIVE ANHYDRITE
BENJ. NICKELS
W. SUMMERLIN
BENJ. LEE
OLDEST HORIZON
UPTHROWN GLOYD
UPTHROWN BACON
FIELD
DOWNTHROWN BACON
DOWNTHROWN GLOYD
J. E. WHITE
J. W. GRIFFIN
A. ROBERSON
A. McKENZIE
WM. GRIMES
UP
DOWN
N
SCALE
0 1 2 3 4
THOUSAND FEET
EXPLANATION
-7400 Contour on base of Massive Anhydrite
-7411 Elevation of base of Massive Anhydrite
Oil well
Gas well
Abandoned oil well
Dry hole
Oil and gas well
Discovery well
Producing gas from Bacon
Producing oil from Gloyd

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Upthrown reservoirs:	Bacon	Gloyd
Elevation of top of gas, feet	-7,382	
Elevation of bottom of gas, ft.	-7,517+	
Relief, feet	135+	
Elevation of top of oil, feet		-7,652
Elevation of bottom of oil, ft.		-7,797+
Relief, feet		145+

Data are not yet available for determining the elevation of the top of water in either of the reservoirs.

Downthrown reservoirs:		
No free gas		
Elevation of top of oil, feet	-7,522	7,786
Elevation of bottom of oil, ft.	-7,531	7,807
Relief, feet	9+	21+

The above figures represent conditions in the single well on the downthrown side of the fault. The two reservoirs produced in the same well, which is now abandoned.

ACID TREATMENT

Bacon: Most of the Bacon wells were completed without acid. They were later acidized because acidization occasioned an appreciable increase in potential.

Gloyd: The Gloyd zone was acidized in three wells with up to 1,500 gallons of acid.

CHARACTER OF OIL AND CONDENSATE

Upthrown reservoirs:	Bacon	Gloyd
Gravity, A.P.I., average	61.3°	47.4°
Odor	Sweet	Sweet
Base	Paraffin	Paraffin
Downthrown reservoirs:		
Gravity, A.P.I.	42.3°	39.9°
Odor	Sweet	Sweet
Base	Paraffin	Paraffin

CHARACTER OF GAS

Component	Mol. %
Methane	87.17
Ethane	6.13
Propane	3.19
Iso-butane	1.37
N-butane	1.25
Iso-pentane	.41
N-pentane	.23
Hexanes	.25
	100.00

The above analysis is of a sample taken from a line to the dehydrator after the gas had passed through a separator.

Specific gravity at 60° F., 0.694
Heating value, B.t.u./cf 1,119
Inert gases calculated as nitrogen 5.6%

WATER PRODUCTION

Negligible.

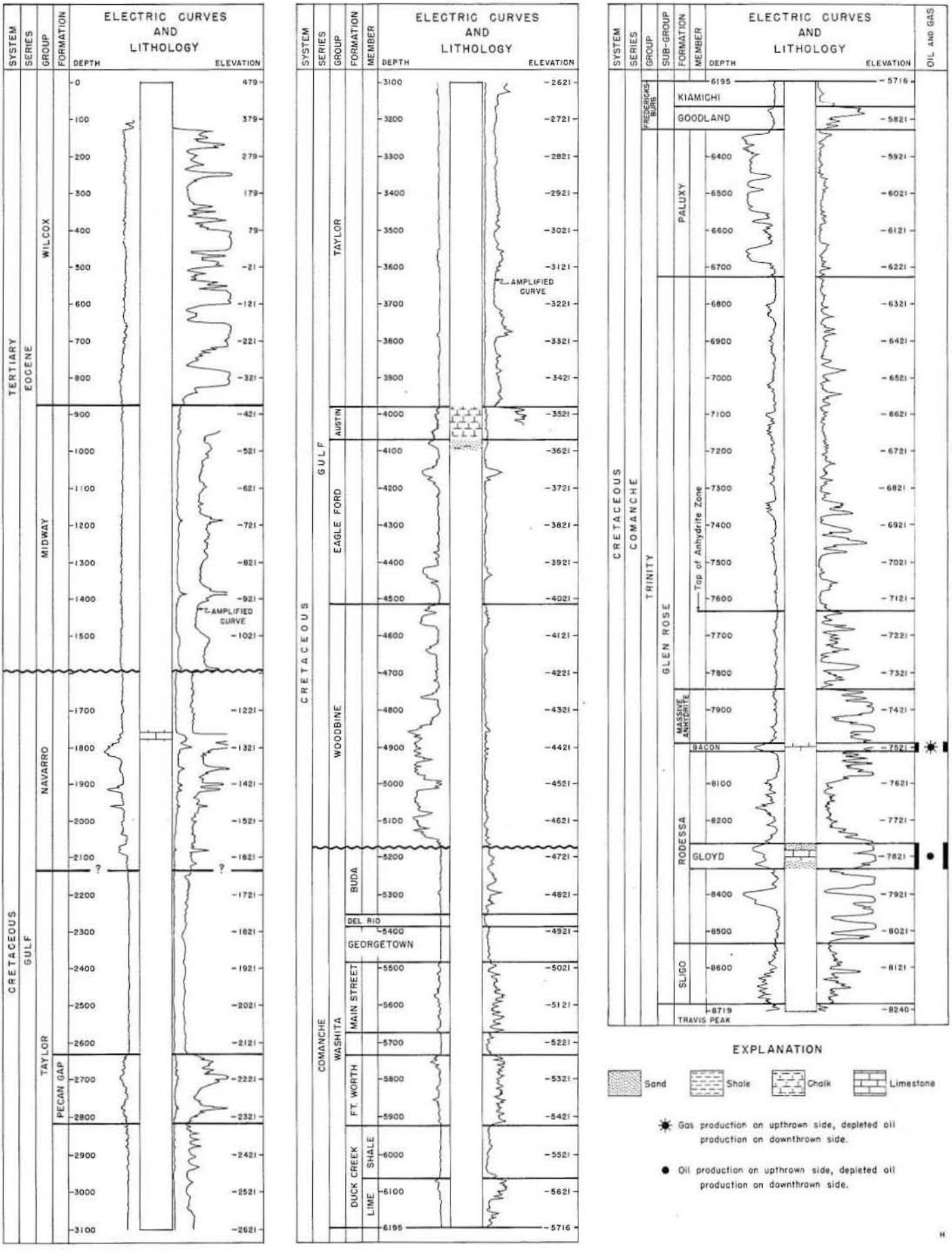
PRODUCTION HISTORY

	WELLS PRODUCING at end of year			OIL PRODUCTION (barrels) (Gloyd)	CONDENSATE PRODUCTION (barrels) (Bacon)	TOTAL LIQUIDS (barrels) (Bacon & Gloyd)		GAS PRODUCTION (Mcf) (Bacon)	
	Bacon	Gloyd	Total	Yearly	Yearly	Yearly	Cumulative	Yearly	Cumulative
Upthrown reservoirs:									
1944		1	1	7,099		7,099	7,099		
1945	2	7	7	203,971*	32,700*	236,671	243,770	*	*
1946	6	12	12	213,757*	54,257*	268,014	511,784	141,261	141,261*
1947	6	12	12	152,714	31,223	183,937	695,721	319,557	460,818*
1948	7	12	12	110,757	47,653	158,410	854,131	653,615	1,114,433*
1949	7	12	12	59,274	115,185	174,459	1,028,590	1,832,353	2,947,286*
Downthrown reservoirs:									
1944	1	1	1	221**		16,449	16,449		
1945	1	1	1	6,596**		8,596	25,045		
1946	0	1	1	3,615		3,615	28,660		
1947	0	0	0	588		588	29,248		

*Data not available to accurately separate oil and condensate for 1945 and a portion of 1946; allocation carefully estimated. The Bacon was produced as an oil zone from the time of its discovery until May 1946 and its fluid production (condensate) was accounted for as oil; there was no accounting for its gas production.

**Oil production during 1944 amounted to 16,449 barrels; estimated 16,228 barrels from Bacon and 221 barrels from Gloyd. During 1945, the production amounted to 8,596 barrels; estimated 2,000 barrels from Bacon and 6,596 barrels from Gloyd. The one well was abandoned on July 11, 1947.

TYPE SECTION OF ROCKS PENETRATED



WOODLAWN FIELD
Harrison County, Texas

GERALD H. TEFFT
Geologist, Stanolind Oil and Gas Company, Tyler, Texas
April 10, 1950

LOCATION

The Woodlawn field is 8 miles northeast of Marshall, county seat of Harrison County, and 2½ miles southeast of Woodlawn, in the northeastern portion of the county.

METHODS OF EXPLORATION LEADING TO DISCOVERY

Acreage was purchased in the Woodlawn area on subsurface data by Continental Oil Co. during 1940. Subsequently, the area was surveyed with reflection sesimograph. Stanolind Oil & Gas Co. also made a reflection seismograph survey in 1944 and 1945, after which it purchased a one-half interest in the acreage block from Continental. The two companies then drilled a joint test, the #1 Mae Harris, located in the Thomas Gray survey (TD 6,872). Favorable showings of oil and gas in the Rodessa and Pettet zones caused the operators to drill a second well located 1½ miles north which resulted in discovery.

DISCOVERY

Pettet lime: Summer of 1947; Stanolind Oil & Gas Co. and Continental Oil Co. #1 George Slaughter.

NATURE OF TRAP

Pettet lime: Trap due to decrease in permeability.

PRODUCTIVE AREA

Pettet lime and Field: 6,400 proven acres.

LITHOLOGY OF RESERVOIR ROCK

The Pettet formation consists of a gray to brown, crystalline to dense limestone with streaks of oolitic and fossiliferous porous limestone. Numerous shale partings are present in the bottom 100 feet of the formation.

CONTINUITY OF RESERVOIR ROCK

Continuity of the reservoir is determined locally by change in character of sediments. The same general zone is productive on favorable structures throughout the major portion of the East Texas district.

CHARACTER OF CONDENSATE

Gravity, 68°.

PRODUCTION HISTORY

There was only one well in the field prior to 1949 and it had not been on production. Three additional wells were completed during 1949, and 6 thus far during 1950. To the end of 1949 two wells had produced a total of 187,239 Mcf of gas and 7,309 barrels of condensate. The gas was utilized in field development. No pipeline outlet is yet available.

THICKNESS OF RESERVOIR ROCK

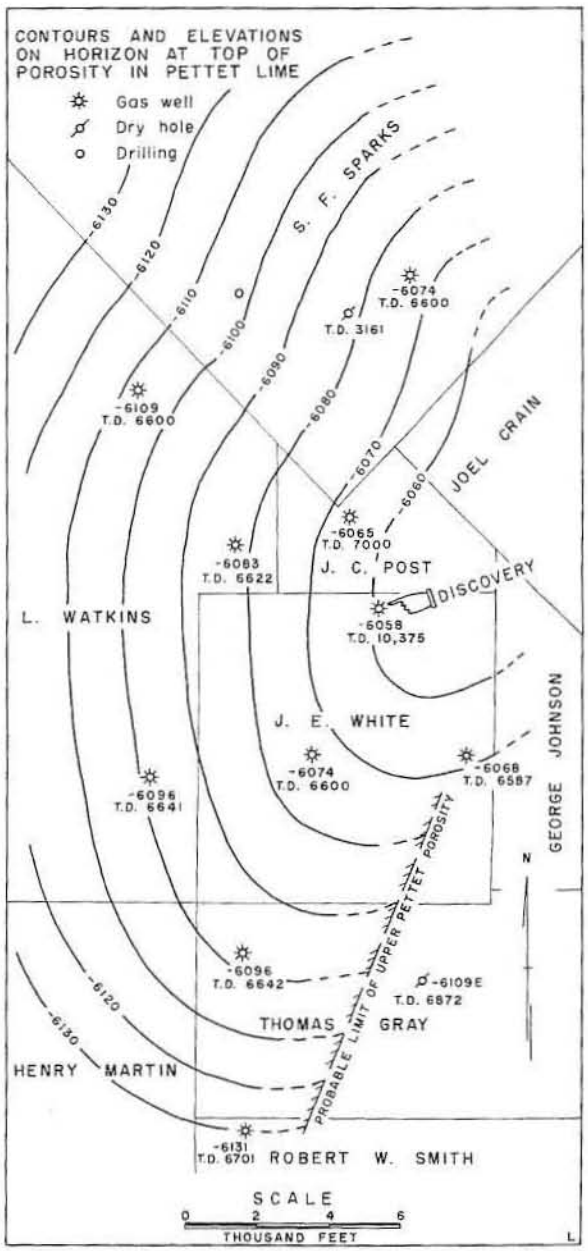
Pettet lime:	Feet
From top to bottom	279
Net productive	24

ACID TREATMENT

The pay zones of the Pettet lime are acidized with an average of 8,500 gallons of 15% hydrochloric acid.

WATER PRODUCTION

No water has been produced.

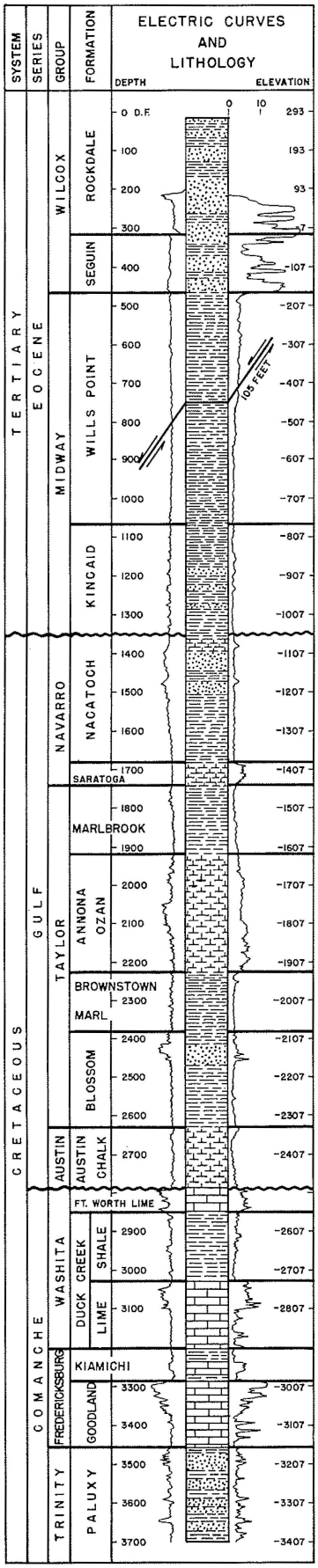


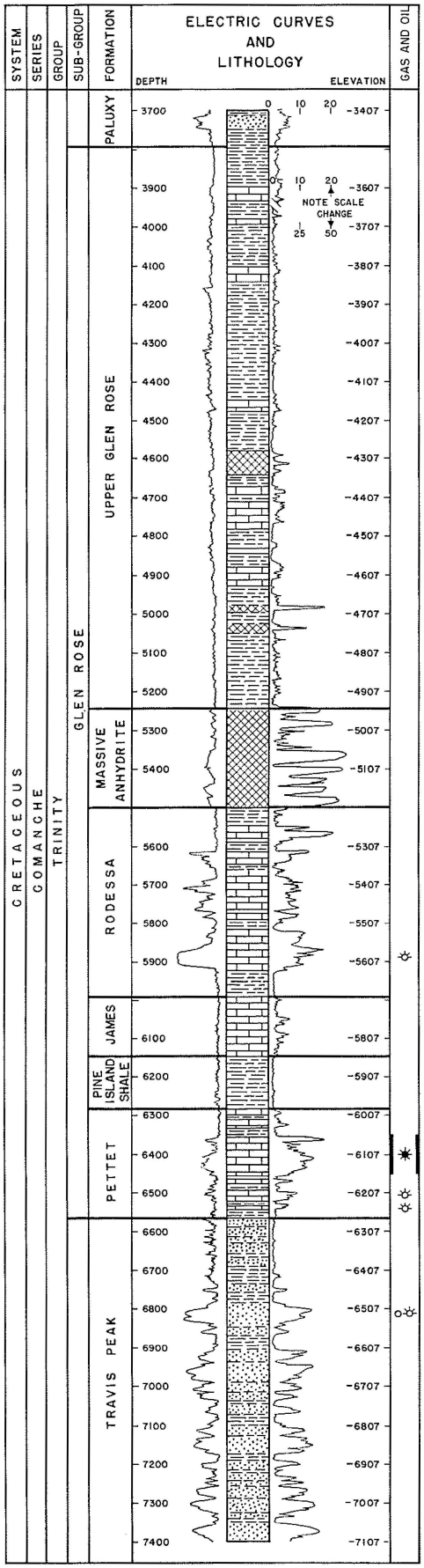
TYPE SECTION OF ROCKS PENETRATED

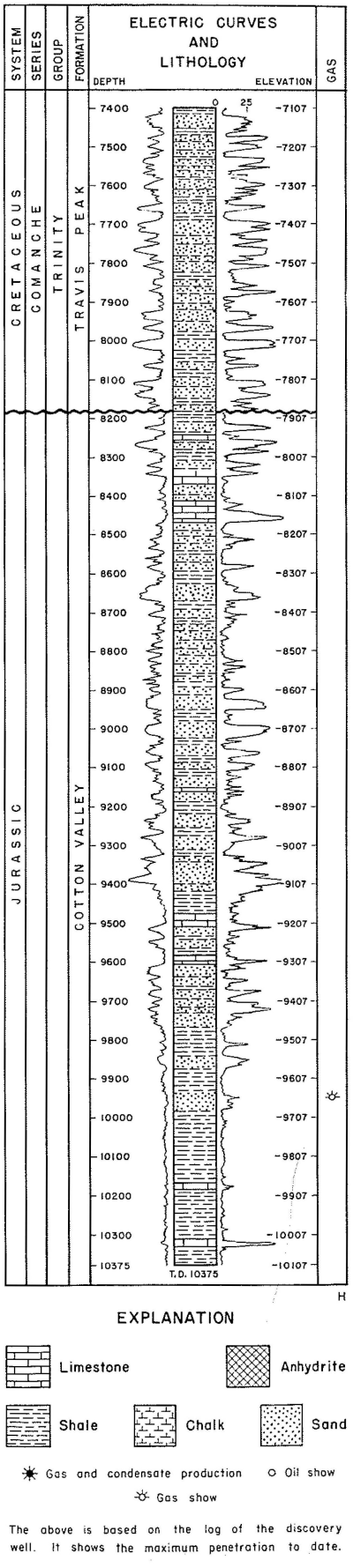
SURFACE FORMATIONS : Reklaw, Carrizo and Wilcox

ELEVATION OF SURFACE : Highest, 356 feet; lowest, 288 feet

OLDEST HORIZON PENETRATED : 2,189 feet below top of Cotton Valley formation







EXPLANATION

Limestone
Anhydrite
Shale
Chalk
Sand
Gas and condensate production
Oil show
Gas show

The above is based on the log of the discovery well. It shows the maximum penetration to date.

WORTHAM FIELD
Freestone and Limestone Counties, Texas

JASPER L. STARNES
Geologist, The Atlantic Refining Company, Tyler, Texas
June 1, 1950

LOCATION

The Wortham field is at the eastern edge of the City of Wortham, in Freestone County, and extends southwestward to Tehuacana Creek in Limestone County. It is in the zone of the Luling-Mexia-Talco fault system and is between the Mexia field and the Currie field.

DATA CONCERNING SHALLOWER RESERVOIRS

Although it appears that the Woodbine production was the only production which could be operated profitably, there were spectacular showings of oil and gas in Nacatoch sand bodies. The available data relative to such showings are too meager to afford entries under the various headings in this paper.

Gas was first discovered at Wortham in May 1912, when a well within the townsite was completed flowing a large volume of gas and a little oil from a sand at the depth of 1,260 to 1,280 feet. This led to the drilling of some 25 other shallow wells, some of which flowed some gas and oil, but only in small quantities. After the discovery of Woodbine oil, Carter & Lytle #2 Manning was completed at a depth of approximately 600 feet and flowed an estimated 5,000 Mcf of gas per day. Humble #10-A Crouch was completed in January 1925, at a depth of 628 feet flowing 7,000 Mcf of gas per day. A sand at 1,330 to 1,401 feet flowed 60 barrels of oil per day for two weeks in October 1925 from Pure Oil Co. #25-S Boyd, located in the southwest end of the field. Several wells were completed in this sand but they were not considered commercially important. Also, disappointing results were obtained in shallow wells in the north end of the field.

It appears that all of the shallow oil and gas production came from Nacatoch sands. The wide differences in depths appear to be due mainly to the relative positions of the sand bodies with respect to the upthrown and downthrown sides of the major fault.

METHOD OF EXPLORATION LEADING TO DISCOVERY

Fairly accurate knowledge of the surface position of the fault and an assumption that this fault was similar to faults forming petroleum traps in other pools along the Mexia fault zone, caused Frank W. DeWolf and the geological staff of the Boyd Oil Co. to locate the discovery well in a favorable position for production near the south end of the field. Three days after the discovery well was completed, a second well was completed in the central portion of the field based upon the same structural interpretation.

DISCOVERY

Woodbine sand: November 22, 1924;
Boyd Oil Co. #1 N. B. Boyd.

ELEVATION OF SURFACE

At well locations: Highest, 475 ft.; lowest, 435 feet.

SURFACE FORMATION

Midway shale, Eocene, is the only formation exposed within the area of the field.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

Approximately 150 feet below the top of the Woodbine sand.

TYPE SECTION OF ROCKS PENETRATED

The section here is essentially the same as that at the North Currie field. The reader is referred to the accompanying paper on that field.

NATURE OF TRAP

Woodbine sand: Closure against fault with displacement of 600 to 650 feet and with hade of 45°.

PRODUCTIVE AREA

Woodbine sand and Field: 760 acres. The productive area is three miles long and has a maximum width of less than a half-mile.

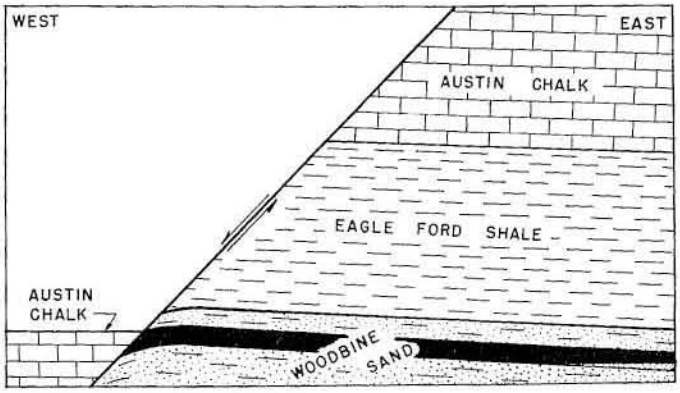
THICKNESS OF RESERVOIR ROCK

Woodbine sand: 19.8 to 27.3 feet; avg., 24.8 feet.

CONTINUITY OF RESERVOIR ROCK

Woodbine sand: The Woodbine sand is a blanket sand in this area, the sandy phase disappearing southward in southern Limestone County, but persisting northward into the deep East Texas geosyncline and covering a large part of northeast Texas.

CROSS SECTION



LITHOLOGY OF RESERVOIR ROCK

Woodbine sand: Soft sand with shale partings and sandy shale.

ELEVATION AND RELIEF OF PRODUCTIVE ZONE

Woodbine sand:	Feet
Elevation of top of oil	-2,500
Elevation of bottom of oil	-2,550
Relief	50

CHARACTER OF OIL

Woodbine sand: Gravity, A.P.I.: 39° to 40°.
Base: Paraffin-intermediate.

For analyses see:

U. S. Bureau of Mines	Reference designation
Petroleum Engineering in Wortham Oil Field, Limestone and Freestone Counties, Texas. U. S. Bureau of Mines, Engineering Field Report (1927)	A
Tabulated Analyses of Texas Crude Oils, R. I. 3252 (1934)	B
Tabulated Analyses of Texas Crude Oils, T. P. 607 (1939)	C

Lab. ref. No.	24916	24932	24933	25008	Avg.	38331
Reference designation						
A				Table 5*		
B, Grp. 4, Item 50	51	52	53			
C, Grp. 4, Item 70	71	72	73			74

*Each figure in the analysis is an average of the corresponding figures for all samples of the preceding four reference numbers.

WATER PRODUCTION

Woodbine sand: Both edge water and bottom water was produced in the early life of the Wortham field due to the rapid rate of production. In this connection, 93% of the estimated ultimate production had been yielded during the first 5 years after discovery. Solids in the Woodbine water from this field range from 21,494 ppm. to 24,379 ppm. by weight.

SELECTED REFERENCES

Hill, H. B., and Guthrie, R. K. (1943) Analysis of oil production in the near-depleted Mexia-Powell fault-line fields of Texas: Bureau of Mines, R. I. 3712, 83 pages, 30 figures.

Hill, H. B., and Sutton, C. E. (1927) Petroleum engineering in Wortham oil field, Limestone and Freestone counties, Texas: U. S. Bur. of Mines, Eng. Fld. Rpt., 55 pages, 6 plates, 11 figures.

Lahee, Frederic H., (1929) Oil and gas fields of the Mexia and Tehuacana fault zones, Texas: Amer. Assoc. Petr. Geol., Structure of Typical American Oil Fields, vol. 1, pp. 304-388

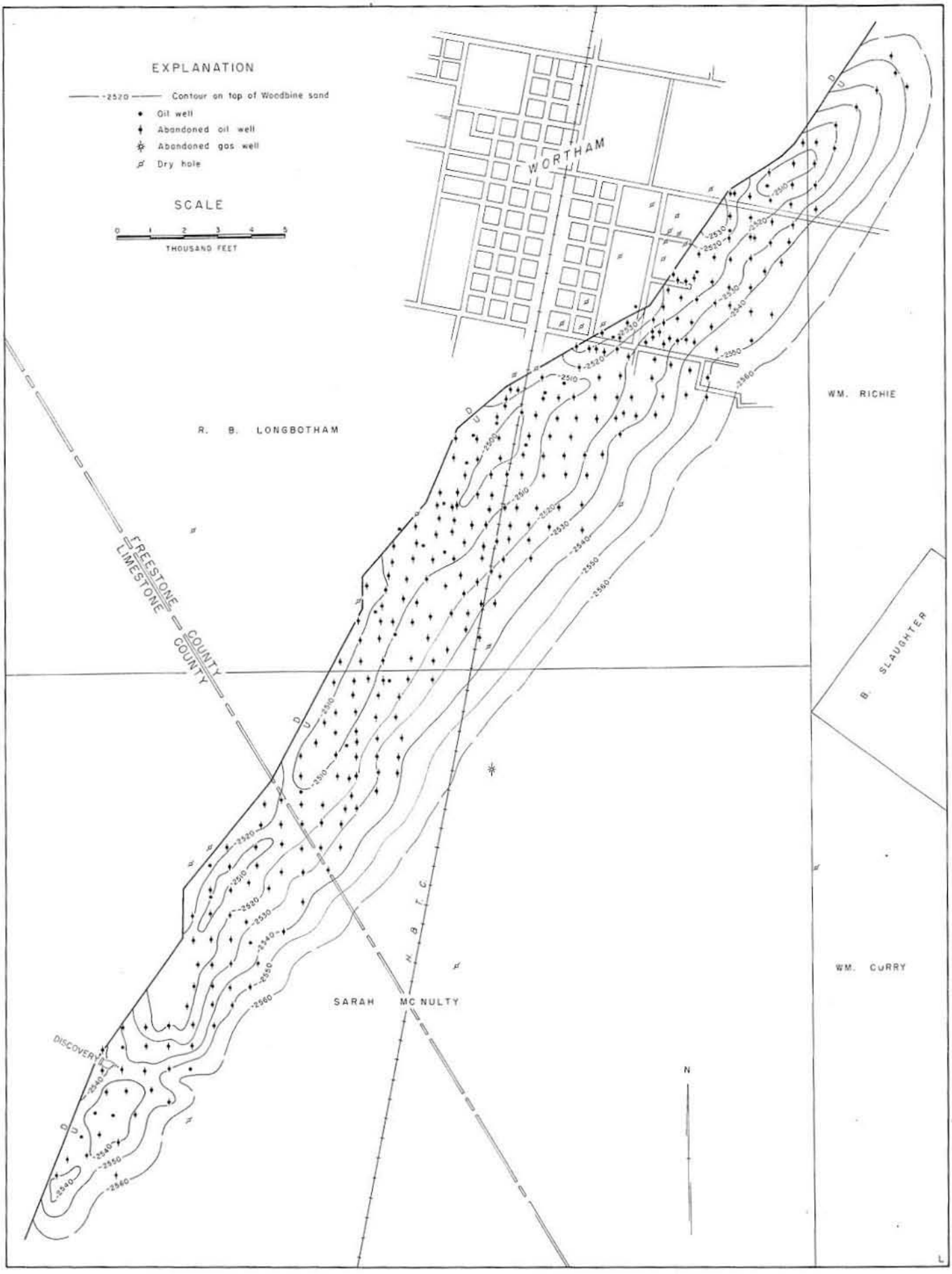
PRODUCTION HISTORY

A drilling campaign noteworthy for its intensity and magnitude resulted in the field being completely drilled up seven months after its discovery. The 328 wells then considered adequate for total development were completed before the end of June 1925. Before the end of 1924, 18 wells had been completed, and 159 were added during January. As a result of this very rapid development, the third month after discovery (January 1925) was the month of greatest production during the life of the field. From the monthly production of 3,509,768 barrels during January, the monthly production gradually declined to 1,075,231 barrels during June, by the end of which month the field had produced 13,061,534 barrels, or over half the total amount produced to date.

A delayed drilling program commencing in 1940 on local highs along the axis of the structure near the fault accounts for the increased rate of production beginning in 1940.

Year	NUMBER OF WELLS PRODUCING *	OIL PRODUCTION (barrels) Yearly	Cumulative
1924		888,856	888,856
1925	284	15,971,125	16,859,981
1926	288	2,801,123	19,661,104
1927	245	1,134,222	20,795,326
1928	175	647,472	21,442,798
1929	125	410,810	21,853,608
1930	86	288,166	22,141,774
1931	43	126,569	22,268,343
1932	20	53,883	22,322,226
1933	15	44,823	22,367,049
1934	14	38,641	22,405,690
1935	10	35,706	22,441,396
1936	9	29,679	22,471,075
1937	7	28,914	22,499,989
1938	9	27,943	22,527,932
1939	10	23,817	22,551,749
1940	11	29,397	22,581,146
1941	22	159,960	22,741,106
1942	31	174,322	22,915,428
1943	28	132,xxx	23,047,xxx
1944	29	104,xxx	23,151,xxx
1945	27	82,863	23,233,528
1946	28	73,405	23,306,933
1947	29	74,525	23,381,458
1948	29	79,562	23,461,020
1949	26	81,429	23,542,449

*Figures for the years 1924 to 1941 represent the average number of wells producing during the year. Figures for the years 1942 - 1949 represent the actual number of wells producing at the end of the year.


EXPLANATION
-2520- Contour on top of Woodbine sand
Oil well
Abandoned oil well
Abandoned gas well
Dry hole
SCALE
0 1 2 3 4 5
THOUSAND FEET
WORTHAM
R. B. LONGBOTHAM
WM. RICHIE
B. SLAUGHTER
WM. CURRY
SARAH MC NULTY
FREESTONE COUNTY
LIMESTONE COUNTY
H.B.T.C.
DISCOVERY
D U
N

YANTIS FIELD
Wood County, Texas

W. H. McKENZIE and F. M. ADAIR
Zone Geologist and Geologist, respectively, Gulf Oil Corporation, Tyler, Texas
December 5, 1950

LOCATION

The Yantis field is in northwestern Wood County near the northern boundary. It is about 4 miles east of Yantis townsite.

METHODS OF EXPLORATION LEADING TO DISCOVERY

The first oil and gas leasing in this area was a result of indications of favorable structure by seismograph work. In the early part of 1939, the George Strake #1 W. G. Farrier, in the Jesse Walker survey, was drilled into the Paluxy formation and abandoned at the total depth of 6,505 feet as a failure. The structural position of this test was favorable, but at that location the Eagle Ford sand is shaled out. The hole was not drilled deep enough to test the Rodessa section. The elevations of the stratigraphic markers in the Strake well indicated a local structural high, with considerable evidence favoring production in the Lower Glen Rose - Travis Peak portion of the stratigraphic section. Consequently, during the next year, some of the major oil companies showed brisk interest in the area around the Strake well by paying substantial prices for any leases that became available. Additional seismograph work confirmed other indications of structural closure and gave further encouragement toward the drilling of the discovery well.

DISCOVERIES

Blalock sand: February 27, 1948;
Humble Oil & Refining Co. #1 P. M. Rhodes.
Rodessa: August 15, 1947;
Humble Oil & Refining Co. #1 Rio Oil Corp. et al. (now, Humble #1 Yantis Gas Unit, #3).

ELEVATION OF SURFACE

At well locations: Highest, 444 ft.; lowest, 385 feet.

SURFACE FORMATION

Wilcox.

OLDEST STRATIGRAPHIC HORIZON PENETRATED

In Travis Peak formation 164 feet below its top. This penetration was in the Rodessa discovery well.

NATURE OF TRAPS

Blalock sand: The oil accumulation in this reservoir is due to a combination of structural closure and stratigraphic changes. This sand is present on the southwestern flank of the fold, but, due to shaling-out plus thinning-out updip, is not present elsewhere on the structural feature.

Rodessa: The hydrocarbon accumulation in the Rodessa is trapped due to closure on an anticlinal fold. Since the producing zone lacks porosity on the south and southeastern flanks of the fold, it is possible that future development might prove minor stratigraphic influence in determining the boundary of the productive area.

PRODUCTIVE AREAS

Blalock sand	1,200 acres
Rodessa	2,954 acres
Yantis field	3,597 acres

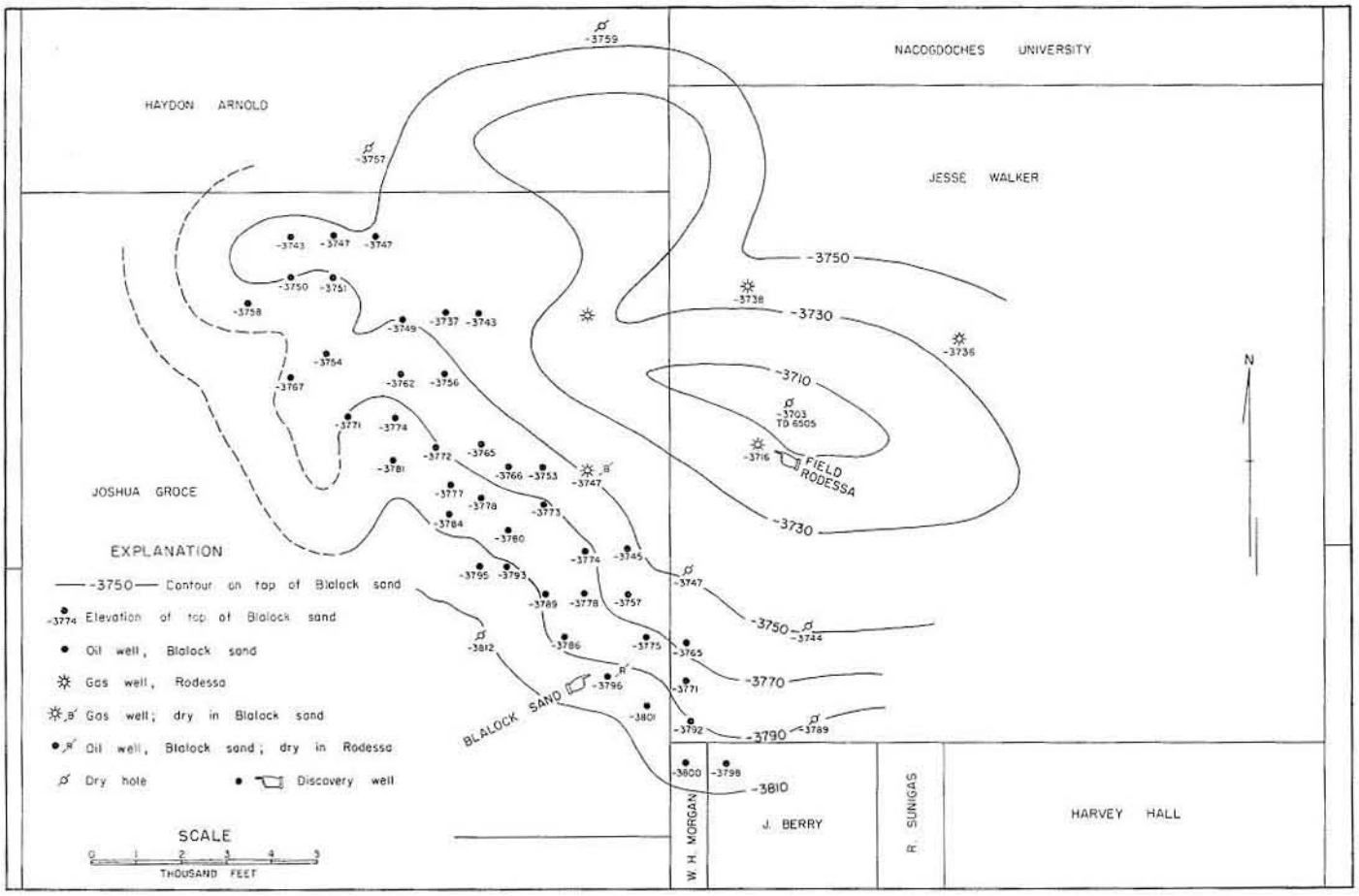
THICKNESSES OF RESERVOIR ROCKS

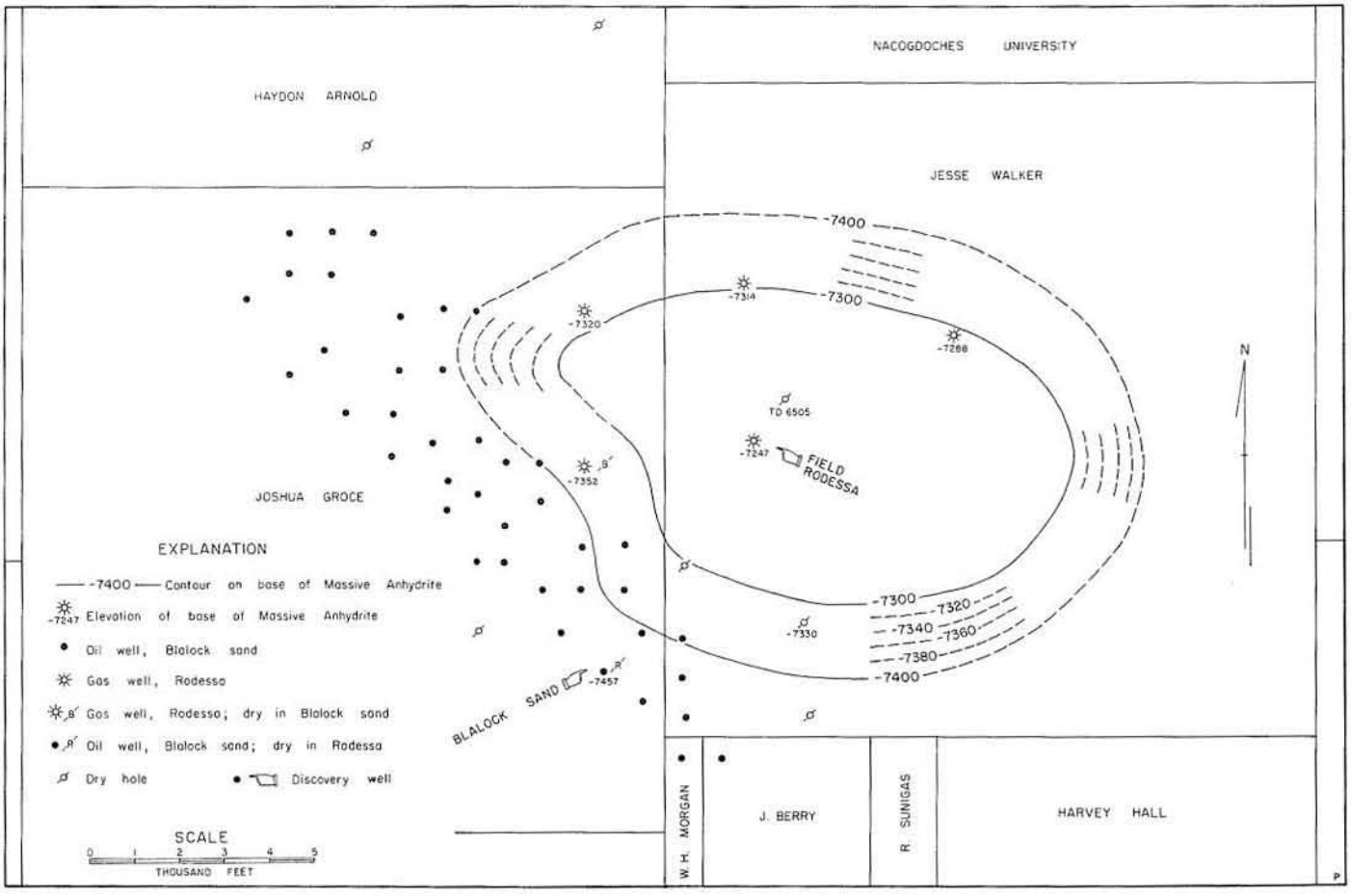
	Maximum	Average
Blalock sand, net productive, feet	8	4
Rodessa, net productive, feet	30	10

LITHOLOGY OF RESERVOIR ROCKS

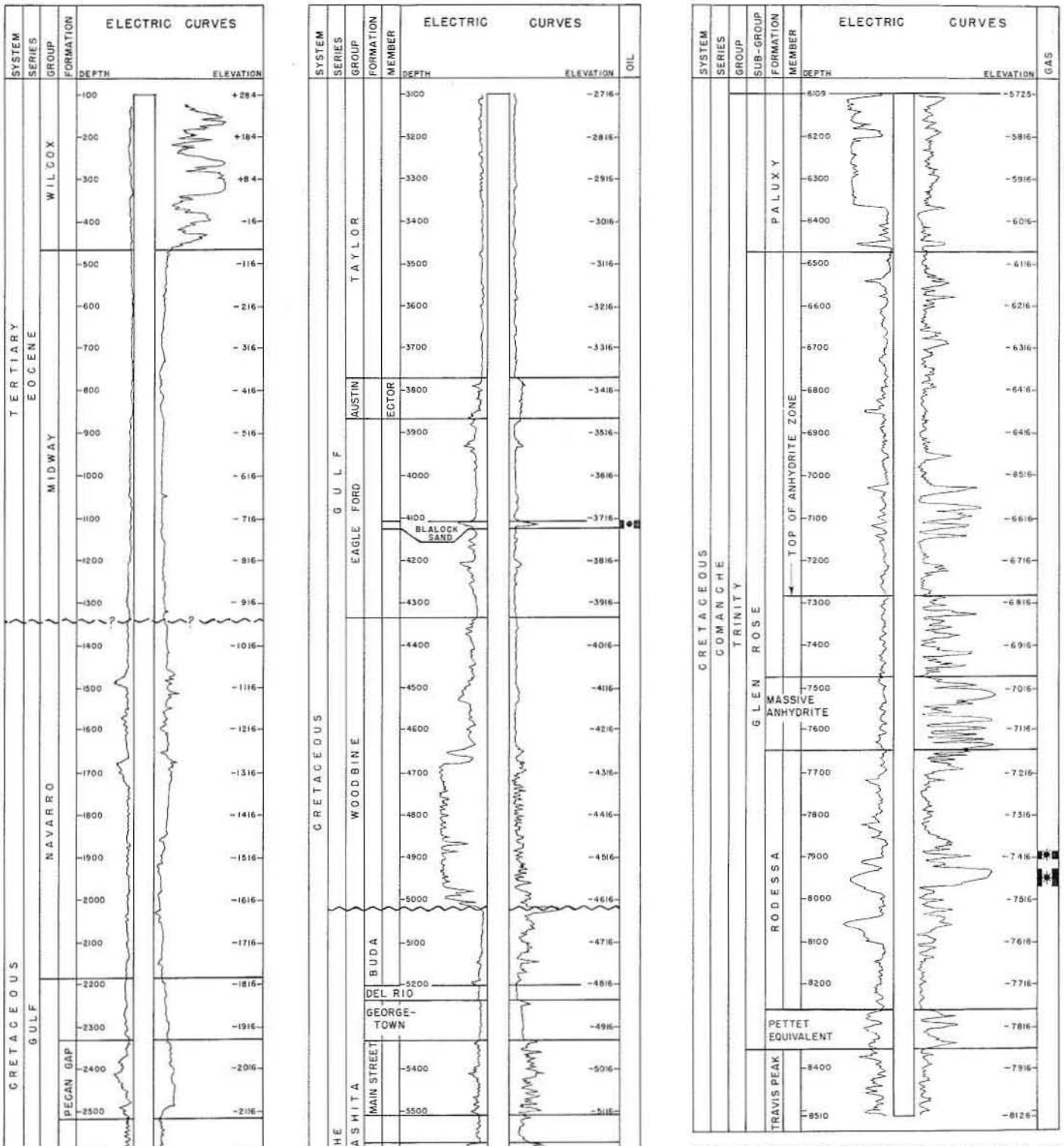
Blalock sand: Generally a medium-grained, fairly clean, porous and permeable sandstone, brown when oil-saturated, medium- to coarse-grained locally. Where the sand section was found developed to a thickness of 8 to 10 feet, the oil-saturated sand was underlain by approximately 2 to 3 feet of gray, ashy, argillaceous sand with spotted, irregular brown stain and with no permeability.

Rodessa: Gray to light-gray, crystalline, porous, permeable, coquina limestone with coquina- and cellular-type porosities. Locally, fossiliferous and finely oolitic. This limestone grades downward into a gray, tight, fine-grained, hard, limy sandstone and a hard, tight, sandy limestone with slight to no porosity, and with little to no permeability. The thickness of the basal limy sandstone and sandy limestone is generally about 1/4 to 1/3 of that of the reservoir rock. On the south and southeastern flanks of the anticline, the porous rocks grade laterally into hard, non-porous, argillaceous, fine-grained sandstones and sandy limestones.


NACOGDOCHES UNIVERSITY
HAYDON ARNOLD
JESSE WALKER
JOSHUA GROCE
-3759
-3757
-3743 -3747 -3747
-3750 -3751
-3758
-3749 -3737 -3743
-3754
-3767
-3762 -3756
-3771 -3774
-3772 -3765
-3781
-3766 -3753
-3777 -3778 -3773
-3784
-3780
-3795 -3793
-3774 -3745
-3789 -3778 -3757
-3812
-3786 -3775
-3796
-3801
-3792
-3800 -3798
-3810
-3765
-3771
-3747
-3744
-3750
-3770
-3790
-3789
-3738
-3730
-3736
-3710
-3703 TD 6505
-3716
FIELD RODESSA
-3730
N
EXPLANATION
-3750 Contour on top of Blalock sand
-3774 Elevation of top of Blalock sand
Oil well, Blalock sand
Gas well, Rodessa
Gas well; dry in Blalock sand
Oil well, Blalock sand; dry in Rodessa
Dry hole
Discovery well
SCALE
0 1 2 3 4 5
THOUSAND FEET
BLALOCK SAND
W. H. MORGAN
J. BERRY
R. SUNIGAS
HARVEY HALL


NACOGDOCHES UNIVERSITY
HAYDON ARNOLD
JESSE WALKER
JOSHUA GROCE
-7400
-7314
-7300
-7320
-7288
TD 6505
-7247
FIELD RODESSA
-7352
-7330
-7457
-7300
-7320
-7340
-7360
-7380
-7400
N
EXPLANATION
-7400 Contour on base of Massive Anhydrite
-7247 Elevation of base of Massive Anhydrite
Oil well, Blalock sand
Gas well, Rodessa
Gas well, Rodessa; dry in Blalock sand
Oil well, Blalock sand; dry in Rodessa
Dry hole
Discovery well
SCALE
0 1 2 3 4 5
THOUSAND FEET
BLALOCK SAND
W. H. MORGAN
J. BERRY
R. SUNIGAS
HARVEY HALL

TYPE SECTION OF ROCKS PENETRATED



NOTE: The above TYPE SECTION is based on the log of the Rodessa discovery well, the deepest well in the field. The electric curves of the position of the Blalock sand have been modified to present curves more representative of that sand where productive.

EXPLANATION

- ● Oil production
- ✷ Gas-condensate production

CONTINUITY OF RESERVOIR ROCKS

Blalock sand: This sand occurs in the Yantis field only on the southwest flank, where it is lenticular. It is erratically distributed over a small area embracing southeastern Hopkins County and northwestern Wood County. By the use of electric logs, a thin sand at this stratigraphic position can be correlated over a larger area.

Rodessa: The stratigraphic equivalent of this zone is present over most of the East Texas basin. Due to absence of effective porosity, this zone does not produce on the south and southeast flanks of the Yantis structure. Erratic and lenticular development of porosity is a characteristic of this zone. It is probably continuously permeable for only a short distance downdip beyond the productive area.

ELEVATION AND RELIEF OF PRODUCTIVE ZONES

Blalock sand:	Feet
Elevation of top of oil	-3,737
Elevation of bottom of oil	-3,809
Productive relief	72

The above figure of -3,809 represents the estimated position of the oil-water contact at the time of discovery. The oil-water contact now appears to be about -3,805.

Rodessa:	
Elevation of top of gas	-7,540
Elevation of bottom of gas	-7,689+
Productive relief	149+

The liquid produced from the Rodessa is believed to have been in gaseous form in the reservoir. The above figure of -7,689 represents the lowest elevation at which the Rodessa has been found productive; the elevation of the bottom of the gas has not been determined.

CHARACTER OF OIL AND CONDENSATE

	Blalock Oil	Rodessa Condensate
Gravity, A. P. I., average	21.7°	64.6°
Odor	Sweet	Sweet
Base	Mixed	Paraffin

CHARACTER OF GAS

Rodessa: Analysis of sample of gas from separator:

Component	Mol. %
Methane	89.36
Ethane	6.05
Propane	2.42
Iso-butane	0.41
N-butane	1.17
Iso-pentane	0.22
N-pentane	0.26
Hexanes	.11
Total	100.00

WATER PRODUCTION

Blalock sand: A few wells at a structural position near the original oil-water contact were producing up to 10% water at the end of 1949.

Rodessa: Water production is negligible.

ACID TREATMENT

Blalock sand: Not acidized.

Rodessa: A majority of the Rodessa wells were acidized with up to 5,000 gallons of acid.

PRODUCTION HISTORY

Blalock sand:

Year	WELLS COMPLETED at end of year	OIL PRODUCTION (barrels)
1948	18	188,429
1949	40	288,418
	Total	476,847

Rodessa

	WELLS COMPLETED at end of year	CONDENSATE PRODUCTION (barrels)	GAS PRODUCTION (Mcf)
1947	1 (Shut-in)		
1948	1	22,000	100,000
1949	5	138,000	2,330,000
	Total	160,000	2,430,000

SUGGESTIONS TO AUTHORS OF FIELD PAPERS

Purpose of Project:

"Occurrence of Oil and Gas in Texas" is compiled for the purpose of making readily available to exploration geologists, exploitation geologists and petroleum engineers, as nearly as practicable, all available information relative to conditions of nature which may be of assistance in finding new fields and in accomplishing maximum recovery from known fields everywhere. It must be recognized that certain practical limitations will preclude accomplishment to the full extent desired by the group for whom the data are especially compiled.

Check-list:

Herewith is a check-list of items of information. It is hoped that each author will include in his paper such of these items as are reasonably available. Many items germane to the project have been omitted to keep the project on a practical basis under the existing set of conditions -- conditions which will probably prohibit most authors giving as much time to the preparation of their papers as they would like. So far as we are concerned, a paper complete as to the reasonably available items on this list will be regarded as COMPLETE for the project. However, there is no intention to limit authors to the information on this list. To the extent that any additional information is within the purpose of this project and presented in a manner consistent with the aims of the project, it will be gratefully included in the publication. Our goal is to do a good job for our readers as to the items on the list -- with that done, we feel that the cooperative efforts will have been justified. It will be recognized that this list is designed for state-wide usage; that it will be of only minor service in designing papers for certain special areas and conditions.

Exclude confidential information:

Each author will, of course, take due precaution to avoid inclusion of any information which he has obtained only in confidence.

Conciseness is essential:

Even with the best possible planning, the compilation will necessarily be voluminous. It should not be so voluminous as to seriously impair its usefulness as a source for basic data. Choose manners of presentation which preclude misinterpretation and which facilitate accuracy, availability and compactness. Avoid verbosity.

Coordination with regional papers:

Your field is one unit in a region concerning which there will be several regional papers. The plan for complemental regional papers should obviate repetition in several field papers. Please check with your regional committee to determine that any available significant data omitted from your paper are incorporated in one or more regional papers. If this procedure is not convenient, please attach to your paper a list of the items which you are presuming to be treated in regional papers.

Uniformity:

Field papers generally should be essentially uniform in style and arrangement and also uniform in contents to the extent consistent with pertinence and availability of data. The data should be so presented that, as to any particular item, a reader can either quickly find it or determine that it is not presented. Your reader interest will be generally by items rather than in the paper as a whole.

Deviation from uniformity:

Conditions of nature preclude absolute uniformity, but they do not preclude the primary objective of presenting all available material facts in such manner that each particular item is readily available for every field throughout the State of Texas to the extent that it is presented by the several authors. Presentation of facts is of first importance; manner of presentation is secondary. Manner of presentation is of such importance, however, that an author should deviate from the standard only to the extent required for adequate presentation of the data pertaining to his field. In no case should the effort to attain uniformity defeat the primary objective of best presentation in view of the aims of the project.

Headings:

Headings will be standardized to the greatest extent practicable. This is essential not only to accomplish maximum usableness, but also to facilitate preparation of copy for printing by the offset process, which is to be used for this project. Capitalization on the accompanying check-list indicates contemplated headings in the text. Please use those headings to the extent that they include your data. However, if those headings do not include all your data, be free to enter additional headings. Please do not enter any data under a heading which does not comprehend such data. Over-comprehensive headings are undesirable.

Page size:

Your paper will be printed on pages $8\frac{1}{2}$ x 11 inches. Tabulations, maps, cross sections, charts, diagrams, etc., should be so designed that they will come within 7.25 x 9.675 inches when printed. Only in very special cases will it be permissible for any page of a field paper to exceed these dimensions when printed. Necessarily, a few items in the regional papers will be so large that they will have to be folded, but we hope that this will be exceedingly rare for field papers. Some figures may well be designed for placement of two or more on a single page. You need not solve the problems of arrangement of your material on the printed page -- merely bear in mind the general limitations.

Tabulations:

In designing your tabulations, please endeavor to stay within an area 14 x 24 inches with pica typewriter type (ten spaces per inch) or within 12 x 21 inches with elite type (twelve spaces per inch.) Slightly larger tabulations can be used, but we prefer to avoid them. Small tabulations will be arranged by the Bureau to make best use of the page area consistent with order of presentation, convenience in reading, etc. You may forward your tabulations in any size type convenient to you, but if the boundaries exceed the above measurements, please bear in mind that the Bureau will probably have to either modify your arrangement or print in very small type.

Final drafting to be done by Bureau:

Your maps, etc., may be forwarded in rough draft, and in any size convenient for you. The Bureau will standardize symbols, lettering, etc., and will prepare drawings appropriately for reduction. Please see that your legends are clear and that all lettering is legible. Bear in mind the ratio of 7.25 to 9.675 when choosing your boundaries for full-page maps. The most convenient size for the Bureau would be anywhere between 9.06 x 12.09 inches (for 20% reduction) and 14.5 x 19.35 inches (for 50% reduction).

Expression of approximations:

In entries under definite headings where the correct figure is known only approximately, the author should enter "x" in the position of each unknown digit and enter in the position next leftward the figure believed nearest correct for that position. For example, if the correct figure is known to be between 1,800,000 and 1,850,000, the entry should be either "1,82x,xxx" or "1,83x,xxx".

Commonly where production is from more than one sand, you cannot determine accurately the quantity from each sand, yet you can make a better guess than your readers. Such guesses are worth while, particularly in view of this system of using "x", which permits sufficient range to cover your uncertainties and yet go a long way in assisting readers in estimating total quantities from traps of different types, rocks of different ages, etc. The definite total which would be reported for all sands can be allocated by you better than by your readers. Of course, if the various sands are of the same character, of about the same geologic age, occur at near the same depths, and yield oil of the same character from traps of the same type, then estimates of quantities of production from each become less important. There are cases where important facts of nature are different for different sands, even though the sands are not far separated vertically, and, of course, in such cases segregation of quantities is important. The many probable uses for your data will justify your reporting as completely as possible.

Nature of trap:

Our readers will appreciate special care in presenting information relative to the nature of the trap. The trap-forming factors should be sufficiently clearly stated that each reservoir may be assigned to the appropriate place in any good classification, published or unpublished. It is suggested that you read "Classification of Petroleum Reservoirs" by O. Wilhelm, A. A. P. G. Vol. 29, pp. 1537-1580, and check to see that you have presented data which will enable a reader to correctly place the reservoir in that classification.

Change in field name:

If the field has been known by another name, and particularly if such other name has been used in publications, make appropriate entry under some such heading as above.

Acknowledgment of source of data:

It is our belief that our authors will secure their data from reliable sources and that the readers will be satisfied with the authenticity without citing sources. We think it better that the usual form of acknowledgment be omitted. We believe that most employers would prefer only such acknowledgment as indicated on the first page of each of the following papers. Of course, if any operator who supplies data or contributes services desires specific acknowledgment, then the author should enter appropriate acknowledgment. The footnote form used in recent A. A. P. G. bulletins is favored.

Items to be excluded:

Following is a list of items commonly included in field papers but which generally should be excluded from papers for this project:

Estimates of reserves
Prospects for deeper production
Cost data
Outlets (Market)
Railroad Commission allowables and rules
Drilling practices
Completion practices
Casing records
Description of physical equipment
Supply of fresh water
Drill-stem tests
Initial production tests
Daily average production

Design for specific use by specific readers:-

"Occurrence of Oil and Gas in Texas" is compiled for use by exploration geologists, exploitation geologists and petroleum engineers and is designed primarily to afford them a source of data for basic research. All problems in the preparation of your paper should be resolved in view of such usage by this group.

Delievery of completed paper:

Your completed paper should be delivered to a member of the geological society committee in charge of the project for the region in which your field is located.

BUREAU OF ECONOMIC GEOLOGY
University Station, Box B
Austin, Texas

CHECK-LIST FOR FIELD PAPERS

FIELD NAME, County, State. By (Name of Author, with customary footnote)

LOCATION

METHODS OF EXPLORATION LEADING TO DISCOVERY of field (First reservoir only)

DISCOVERIES of reservoirs:
Name of reservoir; Date of completion of discovery well; Well designation

Elevation of surface: Maximum and minimum at well locations

Stratigraphic section, with names of era, system, series, group, formation, member. Generally, the papers will contain no word descriptions of rocks other than indicated below relative to reservoir rocks. The preferable manner of presentation of the stratigraphic section in the vicinity of productive zones is by a combination electric and graphic log. Generally, a tabulation will best serve for presenting the section from the surface to the deepest horizon penetrated within the field. (Various other items on this check-list will be entered on the same sheet with the graphic log or in the tabulation, or perhaps occasionally in both if both are used.)

Surface formation (Name of formation, or formations, at surface within area of field)

Oldest stratigraphic horizon penetrated within area of field

Stratigraphic positions of occurrences of oil and gas

Important variations in thicknesses of formations or members (cross section or text, or both)

Areal distribution of oil and gas, by reservoirs (Generally on the same map as contours)

Structure (Preferable presentation: structural contour map and cross section)

NATURE OF TRAP (Trap-forming factors) (Each reservoir)

PRODUCTIVE AREA, in acres (Each reservoir and field total)

THICKNESS OF RESERVOIR ROCKS (Each reservoir)

LITHOLOGY OF RESERVOIR ROCKS (Each reservoir)

CONTINUITY OF RESERVOIR ROCKS (Each reservoir)

ELEVATION AND RELIEF OF PRODUCTIVE ZONE (Each reservoir)

CHARACTER OF OIL (Each reservoir)

CHARACTER OF GAS (Each important gas reservoir)

WATER PRODUCTION, brief statement

ACID TREATMENT

SELECTED REFERENCES

PRODUCTION HISTORY (For field as a whole, then by reservoirs)
Number of wells producing at end of each year (Columns: Each fluid and each manner of operation)
Number of wells injecting into reservoir, by years (Column for each fluid)
Oil production, by years
Gas production, by years
Liquid products of gas processing plants, by years

CAPITALIZATION indicates headings anticipated in text. Items without capitalization generally will be presented on log, map, cross section or in tabulation of stratigraphic section.

Names used in titles of papers are in CAPITAL type. Other names for fields and names for parts of fields are in lower case type.

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