OIL AND GAS CONSERVATION COMMISSION

OF THE STATE OF MONTANA

● HELENA ●

ANNUAL REVIEW FOR THE YEAR 1960
Volume 5

Relating To

OIL AND GAS

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THE OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA

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ANNUAL REVIEW FOR THE YEAR 1960
Volume 5

INTRODUCTION

This is the Fifth Annual Review of drilling and producing operations in Montana oil fields. A review for the year 1959 was not published: however, most of the drilling and producing statistics for the year 1959 are included within the review. It is the Commission's intention to continue this publication on an annual basis.

A comparison of previously published reserve data has been omitted because much of the basic data has been revised. The primary recovery factor for many fields has been revised downward to conform more closely with actual production trends. The initiation of secondary recovery operations will eventually result in a higher ultimate recovery from many fields. Therefore, the 255 million barrels of remaining primary reserves does not reflect the additional recovery that can be expected by secondary recovery operations. It is planned that subsequent annual reviews will tabulate both primary and secondary reserves. Secondary recovery reserves will not be added until secondary recovery is in actual operation.

Annual production for the year 1960 was approximately 30.2 million barrels. This again established another all time high. It is believed that new field discoveries, field extensions, and initiation of new secondary recovery projects has more than offset production. Several very interesting secondary recovery projects are now in the pilot stage of operation and several others are at an advanced stage of planning. It is believed that total State recoverable reserves will be increased substantialiy during the next few years as a result of secondary recovery operations.

The exploration outlook for 1961 appears very promising at the present time. The discovery of production from the Devonian formation at Tule Creek in Roosevelt County has created new interest in northeastern Montana. Exploration activity in Sheridan County, adjacent to the newly discovered Dwyer Field is expected to continue throughout the year. Completion of the new pipeline into northern Montana should provide a stimulus for increased exploration activity in that area for several years to come. Central Montana should continue to be fairly active during 1961, and recent interest in the Northern Powder River Basin may increase.

The basic information contained in this report has been obtained from information contained in the Commission files. It is planned to enlarge and modify the report year by year using the best available data.

SUMMARY

	1955	1956	1957	1958	1959	1960
Production, Northern Montana—Bbls.	5,214,926	5,083,953	5,632,616	4,348,256	4,307,739	4,332,218
South Central—Bbls.	1,896,630	2,585,437	2,867,658	3,590,554	4,514,034	3,087,871
Central—Bbls.	2,160,479	2,610,047	2,301,145	3,201,003	4,515,489	5,780,420
Williston Basin—Bbls.	6,382,391	11,480,124	16,320,543	16,816,816	16,497,964	17,039,406
TOTAL	15,654,426	21,759,561	27,121,962	27,956,629	29,857,226	30,239,915
No. of Producing Wells, Northern Montana	2,950	2,969	3,130	3,120	3,067	2,811
South Central	94	96	103	102	100	96
Central	176	213	214	248	266	303
Williston Basin	194	306	376	446	455	497
TOTAL	3,414	3,584	3,823	3,916	3,888	3,707
Average Daily Production/Well—BOPD,						
Northern Montana	4.8	4.7	4.9	3.8	3.8	4.2
South Central	55.3	73.5	76.3	96.4	123.7	88.1
Central	33.6	33.4	29.5	35.4	46.5	52.3
Williston Basin	90.1	102.5	118.9	103.3	99.3	93.9
STATE AVERAGE	12.6	16.5	19.4	19.6	21.1	22.3
Development Wells Drilled, Oil Wells	158	229	182	159	156	114
Gas Wells	21	6	17	7	12	4
Dry Holes	69	75	57	46	71	58
TOTAL	248	310	256	212	239	176
Exploratory Wells Drilled, Oil Wells	11	12	12	12	7	14
Gas Wells	4	0	2	2	6	3
Dry Holes	145	171	162	109	101	150
TOTAL	160	183	176	123	114	167
TOTAL WELLS DRILLED	408	493	432	335	353	343
TOTAL FOOTAGE DRILLED	1,873,835	2,465,821	2,108,462	1,700,404	1,627,574	1,655,172
AVERAGE DEPTH ALL WELLS	4,590	5,000	4,880	5,106	4,611	6,811

OIL AND GAS DISCOVERIES IN 1959

County	Field	Operator—Well Name and Location	Total Depth Ft.	Producing Formation	Initial Production Oil (B/D)	Gas (MCF)
Chouteau	Unnamed	Northern Nat., Federal 1-C, 8-25N-17E	1,957	Eagle	....	2,520
Glacier	Unnamed	Kullberg Drlg., Tribal 3S-1, 36-36N-7W	3,665	Sun River	70	.....
Teton	Unnamed	Cardinal Petr., Campbell 1, 4-27N-5W	2,496	Sun River	15	.....
Toole	Unnamed	Cardinal Petr., Turan Morris 1, 13-36N-3E	2,817	Bow Island	....	1,200
Toole	Gold Butte	Cardinal Petr., Gordon Christian 1, 13-35N-2E	2,780	Swift	....	7,900

OIL AND GAS DISCOVERIES IN 1960

Custer	Unnamed	Thos. F. Wheatley, Mont. Fed. 1, 34-2N-45E	2,892	Shannon	.....	1,300
Musselshell	Keg Coulee	American Climax, DeJaegher 1, 31-11N-31E	4,635	Tyler "A"	177	.....
Roosevelt	Tule Creek	Murphy Corp., E. O. Sletvold 1, 18-30N-48E	8,478	Nisku	476	.....
Rosebud	Hibbard	Sinclair, V. E. Kesterson 1, 34-10N-33E	5,240	Amsden	240	.....
Sheridan	Dwyer	Mobil, Aloys Muller F-44-20-P, 20-32N-59E	12,033	Mission Canyon	51	.....
Stillwater	Mackay	Northern Natural, Mackay 1-A, 14-6S-17E	4,116	Greybull	103	.....
Stillwater	Rapelje	Shoreline, C. F. Kirchner 1, 4-2N-20E	4,064	Eagle	.....	840
Toole	Unnamed	Big West Oil, State 1, 36-33N-4W	2,241	Sawtooth	.....	650

MONTANA

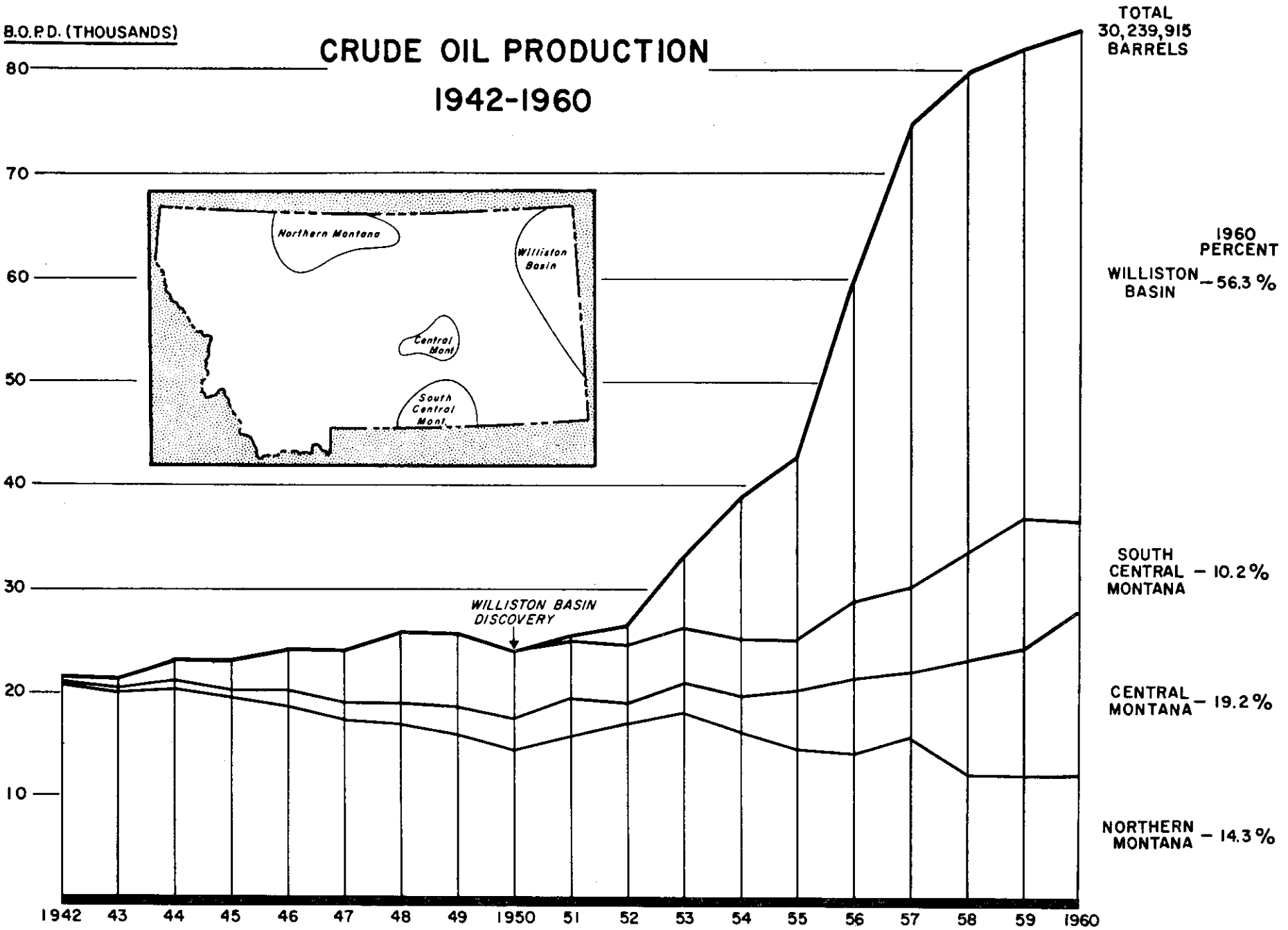
GAS PRODUCTION DATA

Field	County	Producing Formation	1959 Production MCF	1960 Production MCF
Bears Den	Liberty	Kootenai	61,299	72,429
Big Coulee	Golden Valley	Lakota-Morrison	851,730	889,161
Bowdoin	Phillips & Valley	Colorado	3,618,401	5,075,532
Bowes	Blaine	Eagle	897,011	1,432,364
Box Elder	Blaine & Hill	Eagle	0	67,852
Cabin Creek	Fallon	Siluro-Ordovician	970,766	1,094,251
Cedar Creek	Fallon & Wibaux	Judith River & Eagle	5,058,820	4,572,964
Clarks Fork	Carbon	Lakota & Dakota	821,135	640,677
Cut Bank & Reagan	Glacier & Toole	Kootenai	10,167,463	11,231,488
Devon	Toole	Colorado	87,216	97,801
Dry Creek	Carbon	Cretaceous	1,488,715	1,700,909
Elk Basin	Carbon	Tensleep	814,540	762,145
Flat Coulee	Liberty	Kootenai	232,192	100,210
Golden Dome	Carbon	Greybull	33,439	13,534
Grandview	Liberty		278,904	361,794
Hardin	Big Horn	Frontier	41,819	45,289
Keith Block	Liberty	Sawtooth-Madison	1,249,426	1,391,779
Kevin-Sunburst	Toole	Kootenai	1,034,964	1,169,557
Pine	Dawson, Prairie, Fallon, Wibaux	Siluro-Ordovician	933,266	1,022,681
Plevna	Fallon	Judith River	211,657	201,676
Utopia	Liberty	Sawtooth-Ellis	1,231,099	543,487
Whitlash	Liberty	Colorado	887,554	1,180,833
Miscellaneous			778,844	1,017,537
TOTAL all Fields			31,740,260	34,685,950

REFINING

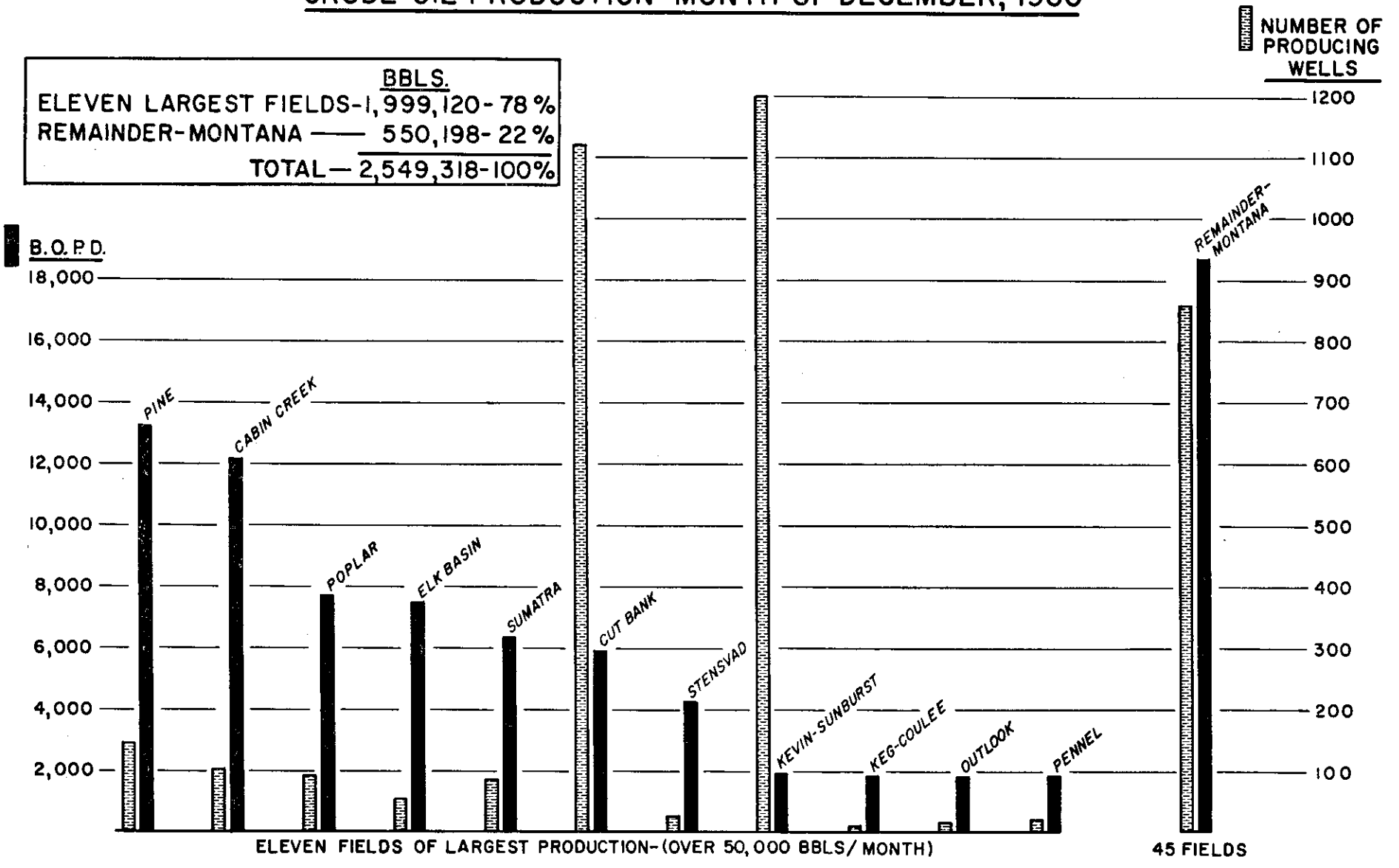
	Year 1960 Total Bbls.
Big West Oil Company	775,189
Continental Oil Company	4,150,810
Diamond Asphalt Company	217,754
Farmers Union Central Exchange, Inc.	6,793,872
Humble Oil & Refining Company	9,808,467
Jet Fuel Refinery	116,453
Phillips Petroleum Company	1,297,563
Texstar Corporation, Lodge Grass	17,303
Texaco, Inc.	595,133
Union Oil Company	1,162,473
TOTAL Bbls. Oil Refined in Montana (1960)	24,935,017

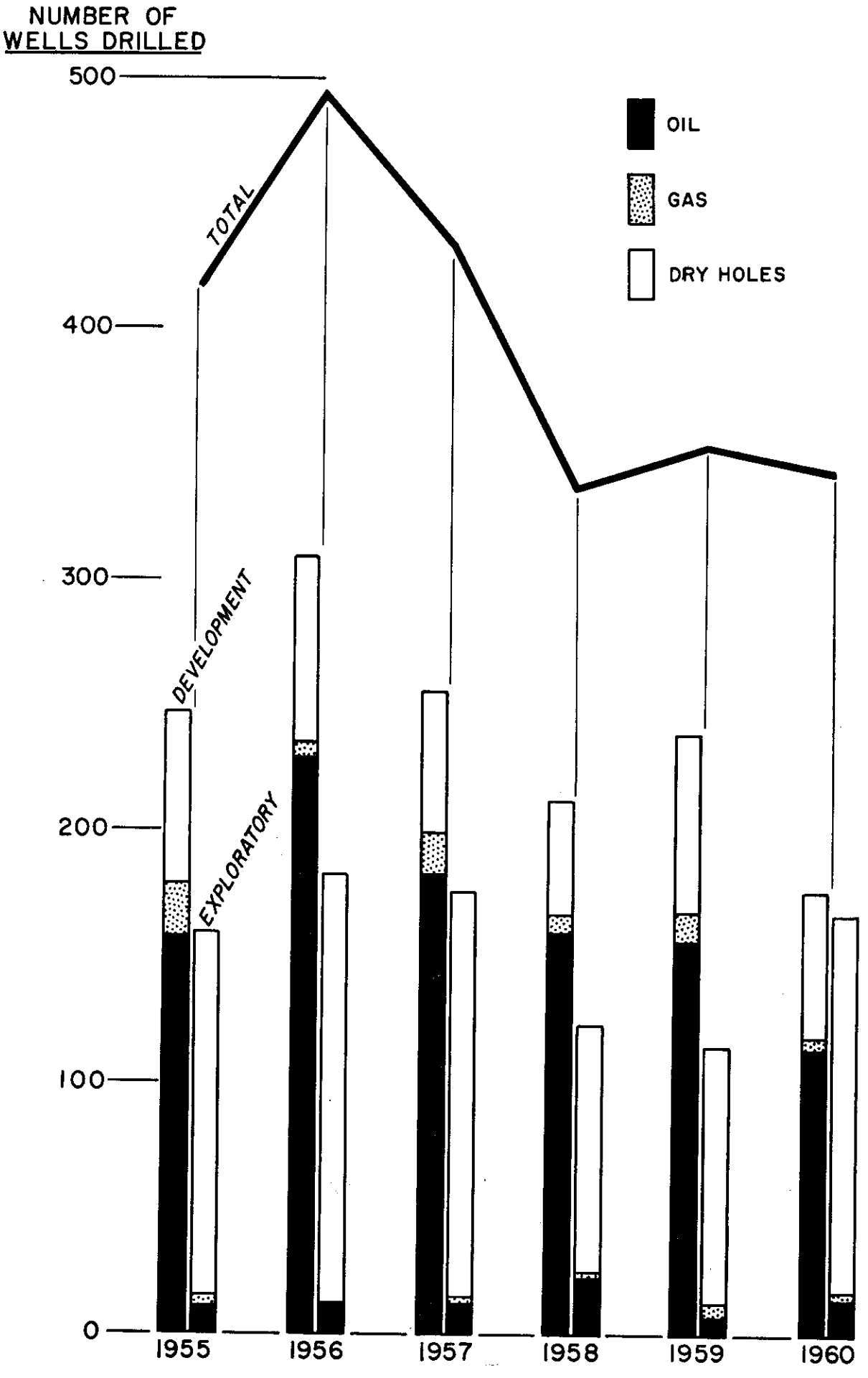
CRUDE OIL PRODUCTION
1942-1960

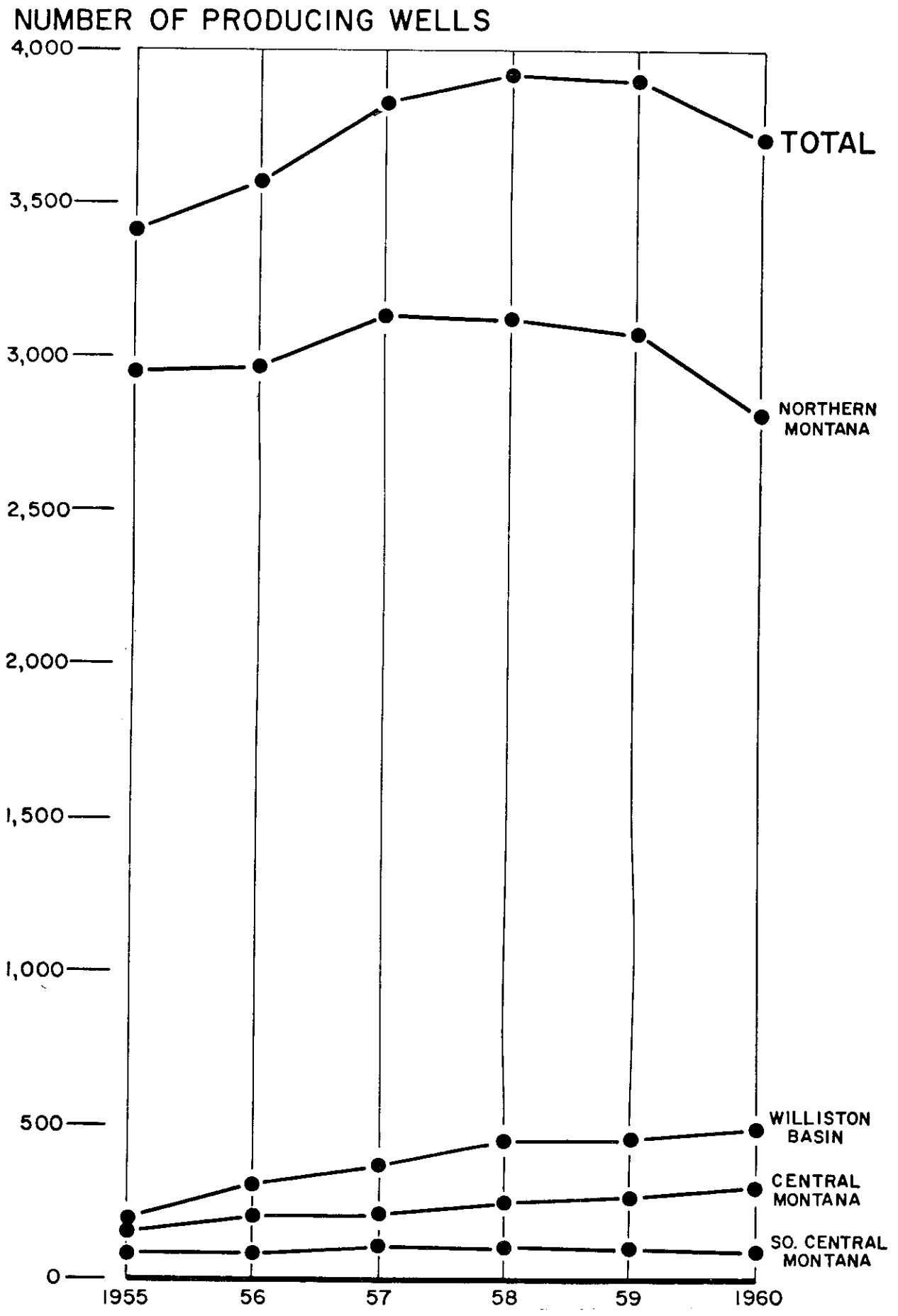


CRUDE OIL PRODUCTION-MONTH OF DECEMBER, 1960

	BBLS.
ELEVEN LARGEST FIELDS-	1,999,120 - 78 %
REMAINDER-MONTANA ——	550,198 - 22 %
TOTAL —	2,549,318 - 100%

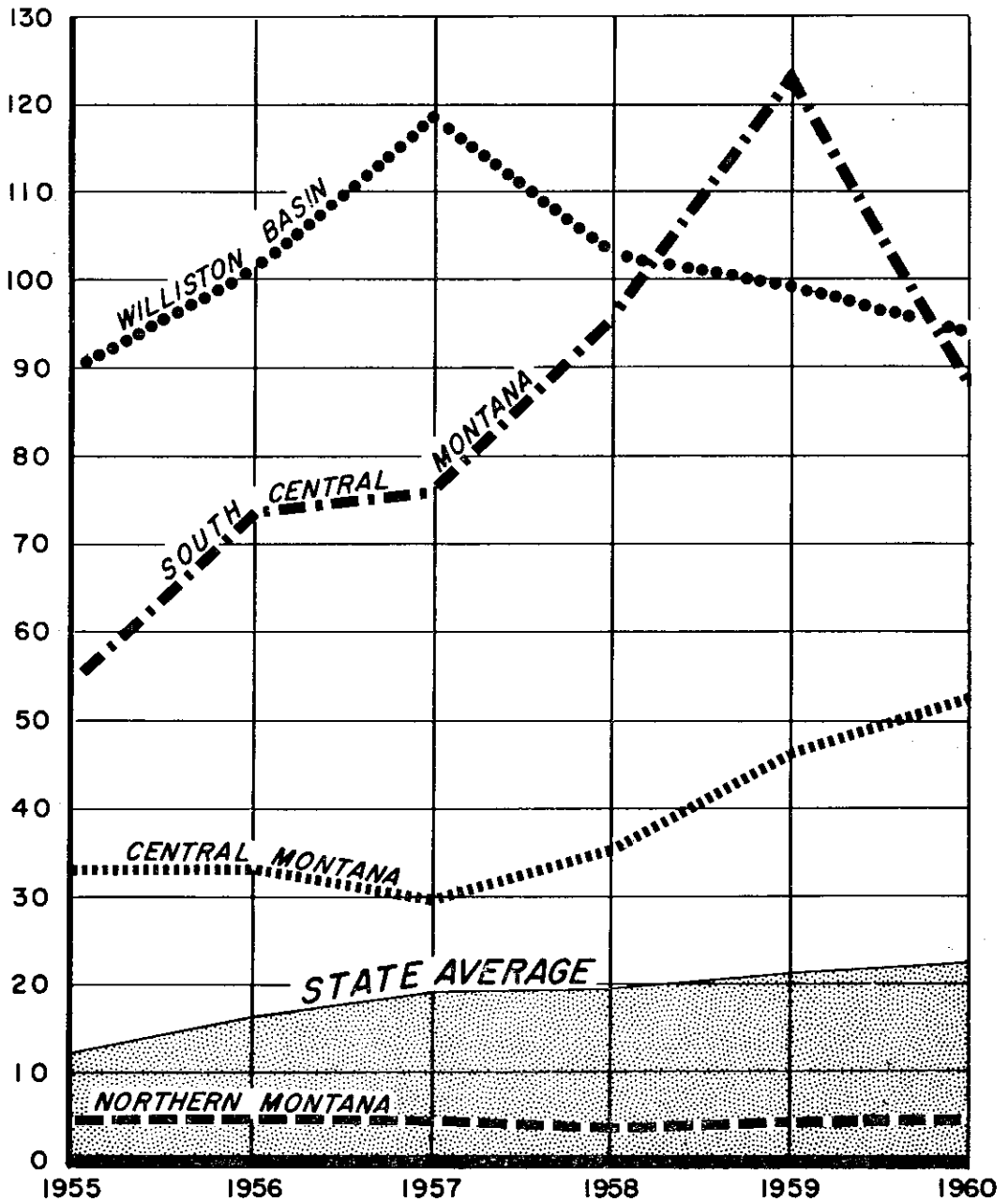



NUMBER OF
WELLS DRILLED
500
400
300
200
100
0
TOTAL
DEVELOPMENT
EXPLORATORY
OIL
GAS
DRY HOLES
1955
1956
1957
1958
1959
1960


NUMBER OF PRODUCING WELLS
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
1955
56
57
58
59
1960
TOTAL
NORTHERN MONTANA
WILLISTON BASIN
CENTRAL MONTANA
SO. CENTRAL MONTANA

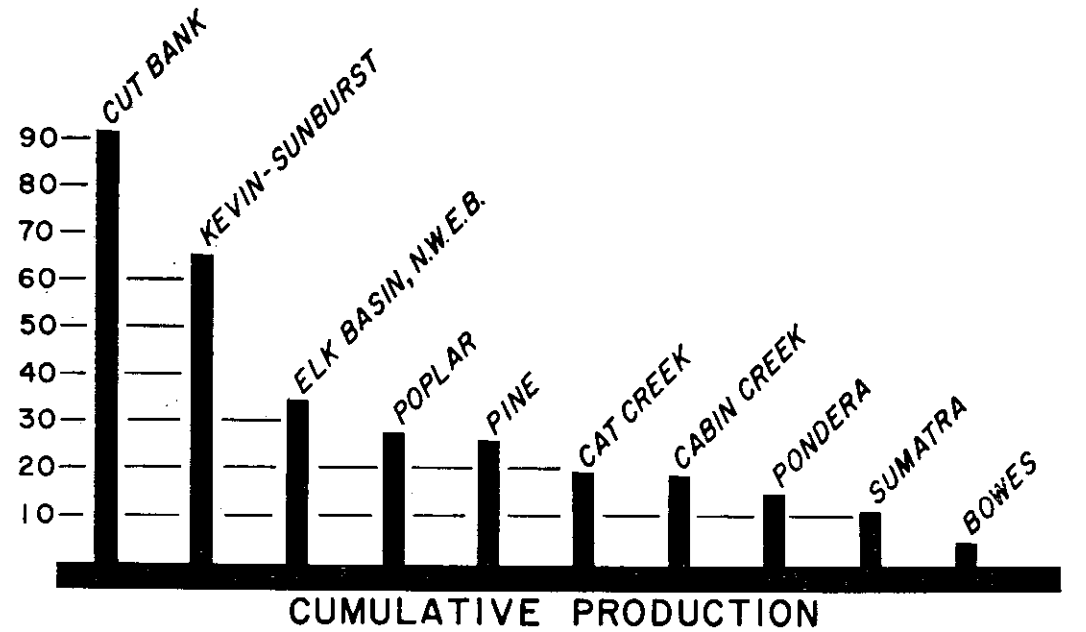
AVERAGE DAILY PRODUCING RATE

B.O.P.D. / WELL

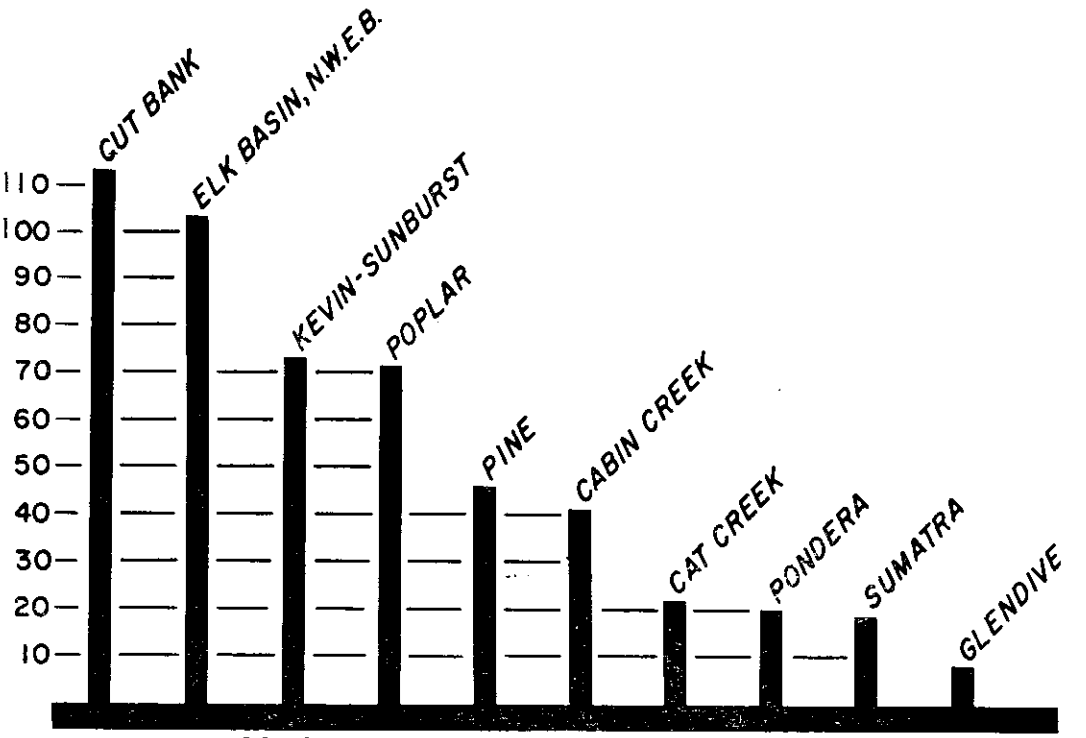


TEN TOP FIELDS

MILLIONS OF BARRELS



CUMULATIVE PRODUCTION



ORIGINAL PRIMARY RESERVES

ASH CREEK

County: Big Horn

Discovery Well:

Name: McDermott-Shell, Elsie Berry No. 1

Location: NW SW Sec. 24, T. 58N., R. 85W., Sheridan County, Wyo.
Date Completed: April 26, 1952
Total Depth: 4799′
Initial Potential: 180 BOPD, 20 BWPD

Spacing Regulations:
330′ from boundary of quarter-quarter section, and 1320′ between wells. 75′ tolerance for topographical conditions. The field boundaries are not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 4

Type of Trap: Anticline

Productive Formations: Shannon sandstone of Upper Cretaceous age.

Probable Drive Mechanism: Partial water drive and depletion drive.

BANNATYNE

County: Teton

Discovery Well:

Name: Genou Oil & Gas, Speer No. 1

Location: NW NW Sec. 8, T. 25 N., R. 1E.
Date Completed: July 21, 1927
Total Depth: 1580′
Initial Potential: 30 BOPD.

Deepest Well: Thomas Carney, Speer No. 2, T.D. 3115′

Spacing Regulations:
Center of 10 acre tracts, 50′ tolerance for topographic conditions, delineated by Commission Order No. 20-58.

Special Field Rules:
State-wide rules.

No. Producing Wells: 9

Type of Trap: Anticline

Productive Formations: Swift (Jurassic)

Probable Drive Mechanism: Water drive.

Secondary Recovery:
In-situ combustion or other forms of secondary recovery are approved. Majority of field has recently undergone a change of ownership. The new owners have not announced any definite plans.

BEARS DEN

County: Liberty

Discovery Well:

Name: Kenneth Frazier, Ritter-Govt. No. 1-X

Location: SW SE Sec. 12, T. 36N., R. 5E.
Completed: July 6, 1924
Total Depth: 3290′
Initial Potential: 5,000 MCFGPD

Deepest Well: Above well

Spacing Regulations:
330′ from boundary of quarter-quarter section, and 1320′ between wells. Tolerance of 75′ for topographic reasons. Field is not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 4

Type of Trap: Anticline

Productive Formations: Kootenai (Lower Cretaceous)

Probable Drive Mechanism: Depletion and gas cap drive.

BELFRY

County: Carbon

Discovery Well:

Name: Carter, Wheatley-Govt. No. 1

Location: NW NW Sec. 7, T. 9S., R. 22E.
Date Completed: March 22, 1958
Total Depth: 12,185′
Initial Potential: 196 BOPD, 1,121 MCFGPD

Deepest Well: Above well

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 1

Type of Trap: Stratigraphic

Productive Formations: Fuson (Lower Cretaceous)

Probable Drive Mechanism: Depletion and solution gas drive.

BIG COULEE

County: Stillwater and Golden Valley

Discovery Well:

Name: Texaco, NP Well No. D-1

Location: SW SW Sec. 31, T. 5N., R. 20E.
Date Completed: November 24, 1948
Total Depth: 4581′
Initial Potential: 24 MCFGPD

Deepest Well: Above well (Cambrian)

Spacing Regulations:
1320′ from lease line, 3700′ between wells, 75′ tolerance for topographic reasons, not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 4

Type of Trap: Anticline

Productive Formations: Lakota (Lower Cretaceous). Morrison (Jurassic).

Probable Drive Mechanism: Water Drive

BIG WALL

County: Musselshell

Discovery Well:

Name: Texaco, NP No. 1

Location: SE NE NW Sec. 19, T. 10N., R. 27E.
Date Completed: July 1, 1948
Total Depth: 3139′
Initial Potential: 9 BOPD

Deepest Well: Texaco, Zoerb No. 1, Section 18, T. 10 N., R. 27 E.
Kibbey (Mississippian). T.D. 3617′

Spacing Regulations:
330′ from lease line, 990′ between wells, 75′ tolerance for topographic reasons. Delineated by Order 12-54.

Special Field Rules:
State-wide rules.

No. Producing Wells: 25

Type of Trap: Structural

Productive Formations: Amsden (Pennsylvanian); Tyler (Mississippian).

Probable Drive Mechanism: Amsden, water drive; Tyler, depletion.

Water Disposal: A total of about 2,880,000 barrels of produced water has been injected into the Tyler "A" sand to December 31, 1960. Approximately 2520 BWPD was injected in December, 1960 at an average pressure of 1275 psig.

BLACKFOOT

County: Glacier

Discovery Well:

Name: Union Oil Co., Muntzing No. 1

Location: NE NW Section 11, T. 37N., R. 6W.
Date Completed: October, 1956
Total Depth: 3542′
Initial Potential: 15 BOPD

Deepest Well: Mobil, F-34-3-1. Madison (Mississippian). T.D. 3687′.

Spacing Regulations:
Center of 40 acres, 300′ tolerance for topographic reasons, delineated by Order No. 3-57.

Special Field Rules:
Dual completions permitted upon approval by Petroleum Engineer.

No. Producing Wells: 16

Type of Trap: Structural and stratigraphic

Productive Formations: Cut Bank Sand (Cretaceous); Madison (Mississippian)

Probable Drive Mechanism: Partial water drive and depletion drive.

BLACKLEAF CANYON

County: Teton

Discovery Well:

Name: Northern Natural Gas, Blackleaf-Federal "A" No. 1

Location: NW SE NE Section 13, T. 26N., R. 9W.
Date Completed: May 22, 1958
Total Depth: 6323′
Initial Potential: 6 BOPD

Deepest Well: Above well

Spacing Regulations:
1320′ from lease line, 3700′ between wells, 75′ tolerance for topographic reasons; not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: Shut-in

Type of Trap: Stratigraphic

Productive Formation: Madison (Mississippian).

Probable Drive Mechanism: Unknown

BORDER

County: Toole

Discovery Well:

Name: Vanalta Oil Co., Ltd. No. 1

Location: L.S.D. 3, Sec. 4, T. 1N., R. 16W., Alberta, Canada.
Date Completed: September 25, 1929
Total Depth: 2477′
Initial Potential: 85 BOPD

Deepest Well: Empire State, Iowa Holding Co. No. 2. Jefferson (Devonian). T.D. 4920′.

Spacing Regulations:
220′ from quarter-quarter section line and 430′ between wells, 75′ tolerance for topographic reasons. Field is delineated by Order No. 7-54.

Special Field Rules:
State-wide rules, except Rules no. 207, 219, 211, 223 and 224, which do not apply.

Type of Trap: Stratigraphic and structural.

Productive Formations: Cut Bank (Lower Cretaceous).

Probable Drive Mechanism: Water drive.

BOWDOIN

County: Phillips and Valley

Discovery Well:

Name: Martin well

Location: Section 18, T. 31 N., R. 35E.
Date Completed: 1913
Total Depth: 740′
Initial Potential: Unknown

Deepest Well: Texaco, Dupont No. 1 Sec. 8, T. 32N., R. 32E. Cambrian. T.D. 5855′.

Spacing Regulations:
One well to each quarter-section; at least 1000′ from any lease boundary and 2000′ between wells; field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 364

Type of Trap: Structural

Productive Formations: Bowdoin and Phillips sands in upper part of Colorado shale (Cretaceous)

Probable Drive Mechanism: Volumetric.

BOWES

County: Blaine

Discovery Well:

Name: California, Johnson & Hobson No. 1

Location: NE NE NE Sec. 9, T. 31N., R. 19E.
Date Completed: October 17, 1926
Total Depth: 4700′
Initial Potential: Show oil

Deepest Well: Northern Ordnance, Guertzgen No. 5, Sec. 1, T. 31N., R. 19E. Devonian. T.D. 5082′.

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons; field delineated by Order No. 13-54.

Special Field Rules:
State-wide rules.

No. Producing Wells: 78

Type of Trap: Structural

Productive Formations: Gas—Eagle (Upper Cretaceous); Oil—Sawtooth (Jurassic).

Probable Drive Mechanism: Eagle, volumetric; Sawtooth, water drive.

Secondary Recovery: The operators are in the process of unitizing the Sawtooth formation for the purpose of initiating a water flood secondary recovery project.

BOX ELDER

County: Blaine

Discovery Well:

Name: Perkins, Stranahan No. 1

Location: NW NW NE Sec. 14, T. 32N., R. 17E.
Date Completed: June 17, 1931
Total Depth: 1276′
Initial Potential: 8000 MCFGPD

Deepest Well: Northern Ordnance, Morphey No. 1, Sec. 14, T. 32N., R. 17E. Madison (Mississippian). T.D. 4212′.

Spacing Regulations:
Not applicable.

Special Field Rules:
Not applicable.

Type of Trap: Structural

Productive Formations: Eagle (Upper Cretaceous)
The Eagle sandstone is presently being used by The Montana Power Company for a gas storage reservoir.

BREDETTE

County: Roosevelt

Discovery Well:

Name: California Company, Elizabeth Grimm No. 1

Location: NE SE Sec. 13, T. 32N., R. 49E.
Date Completed: May 19, 1955
Total Depth: 9671'
Initial Potential: 140 BOPD, 31 BWPD, 1/8" ck.

Deepest Well: Above well. Winnipeg (Ordovician). T.D. 9671'.

Spacing Regulations:
80-acre spacing, permitted wells in the NE¼ and SW¼ of each quarter section, 75' tolerance for topographic reasons. Field delineated by Orders No. 2-56 and 23-56.

Special Field Rules:
State-wide rules.

No. Producing Wells: Field abandoned.

Type of Trap: Structural

Productive Formations: Charles (Mississippian)

Probable Drive Mechanism: Water drive.

BREDETTE — NORTH

County: Daniels and Roosevelt

Discovery Well:

Name: California Company, Paulson No. 1

Location: NW SW Sec. 34, T. 33N., R. 49E.
Date Completed: May 27, 1956
Total Depth: 7475'
Initial Potential: 114 BOPD, 7/64" ck.

Deepest Well: Above well. Madison (Mississippian).

Spacing Regulations:
80-acre spacing, permitted wells in the NW¼ and SE¼ of each quarter section, 75' tolerance for topographic reasons. Field delineated by Order No. 20-56.

Special Field Rules:
State-wide rules.

No. Producing Wells: 2

Type of Trap: Structural

Productive Formations: Charles (Mississippian)

Probable Drive Mechanism: Water drive.

BRORSON

County: Richland

Discovery Well:

Name: Sun-Phillips, Carl Dynneson No. 1

Location: SW NE Sec. 32, T. 24 N., R. 58E.
Date Completed: August 9, 1953
Total Depth: 12,671′
Initial Potential: 745 BOPD, 21 BWPD, 20/64″ ck., from Red River formation.

Deepest Well: Sun-Phillips, Dennis Dynneson No. 1, Sec. 30, T. 24N., R. 58E. Red River (Ordovician). T.D. 13,050′.

Spacing Regulations:
160-acre spacing, permitted well in the SW¼ of each quarter section, 75′ tolerance for topographic reasons; field delineated by Order No. 20-55.

Special Field Rules:
State-wide rules.

No. Producing Wells: 4

Type of Trap: Probable combination of structural and stratigraphic

Productive Formations: Mission Canyon (Mississippian)

Probable Drive Mechanism: Combination water drive and depletion drive.

CABIN CREEK

County: Fallon

Discovery Well:

Name: Shell, No. 22-33

Location: NE SE NW Sec. 33, T. 10N., R. 58E.
Date Completed: June 9, 1953
Total Depth: 9412′
Initial Potential: 1248 BOPD, 32 BWPD, flow into open line

Deepest Well: Shell, 21-17, Sec. 17, T. 10 N., R. 58E. Pre-Cambrian. T.D. 10,573′.

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons; field limits considered same as unit area.

Special Field Rules:
State-wide rules.

No. Producing Wells: 104

Type of Trap: Structural

Productive Formations: Mission Canyon (Mississippian). Silurian-Ordovician.

Probable Drive Mechanism: Mission Canyon, water drive; Siluro-Ordovician, depletion drive.

Secondary Recovery: Pressure maintenance by water injection project is being expanded to include a larger portion of the field. An average of 134 BWPD was injected during June, 1960 at an average pressure of 2150 psig. Accumulative injections to December 1, 1960 were 148,923 barrels of water.

Water Disposal: Produced water has been injected into the Dakota formation since 1957. In November, 1960 an average of 5,110 BWPD was injected. A total of about 3,043,000 barrels have been injected up to December 1, 1960.

CAT CREEK

County: Garfield and Petroleum

Discovery Well:

Name: Frantz Corp., No. 1

Location: SW SE NW Sec. 21, T. 15N., R. 30E.
Date Completed: February, 1920
Total Depth: 998′
Initial Potential: 10 BOPD

Deepest Well: Arro-California, Charles No. 4, Sec. 21, T. 15N., R. 30E. Cambrian. T.D. 5705′

Spacing Regulations:
220′ from lease line, 440′ between wells; field delineated by Orders No. 14-54 and 17-55.

Special Field Rules:
State-wide rules.

No. Producing Wells: 96

Type of Trap: Structural

Productive Formations: Kootenai, Morrison, Swift

Probable Drive Mechanism: Depletion drive

Secondary Recovery: A portion of the field has been unitized and a water flood secondary recovery program is in progress. About 870,000 barrels have been injected into the First Cat Creek sand and 570,000 barrels injected into the Second Cat Creek sand since December, 1959. Production from the flood area has increased from 687 barrels of oil and 2,660 barrels of water in December, 1959 to 10,848 barrels of oil and 90,550 barrels of water in December, 1960.

CEDAR CREEK

County: Fallon and Wibaux

Discovery Well:

Name: Eastern Montana Oil & Gas Co.

Location: NE NE Sec. 20, T. 14N., R. 55E.
Date Completed: November, 1912
Total Depth: 2710′
Initial Potential: 2,500 MCFGPD (est.)

Spacing Regulations:
1200′ from quarter section line and 2400′ between wells, 75′ tolerance for topographic reasons. Field delineated by Order No. 33-54.

Special Field Rules:
State-wide rules.

No. Producing Wells: 232

Type of Trap: Structural

Productive Formations: Judith River (Upper Cretaceous). Eagle (Upper Cretaceous).

Probable Drive Mechanism: Volumetric

CLARKS FORK

County: Carbon

Discovery Well:

Name: General Petroleum & Julius Peters, Govt.-McClellan No. 1

Location: NW NW Sec. 25, T. 9S., R. 22E.
Date Completed: December 16, 1944
Total Depth: 6531′
Initial Potential: 124 BOPD, 30% water

Deepest Well: British-American, Govt.-McClellan No. 1. Madison (Mississippian). T.D. 9446′

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells; 75′ tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 1

Type of Trap: Structural and stratigraphic

Productive Formations: Frontier (Upper Cretaceous)

Probable Drive Mechanism: Gas cap or depletion drive.

CLARKS FORK — NORTH

County: Carbon

Discovery Well:

Name: British-American, Montana State No. 1

Location: NE SE Sec. 16, T. 9S., R. 22E.
Date Completed: January 30, 1956
Total Depth: 10,877′
Initial Potential: 338 BOPD, 1681 MCFGPD, 18/64″ ck.

Deepest Well: Above well. Madison (Mississippian)

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons; not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 3

Type of Trap: Structural and stratigraphic

Productive Formations: Dakota (Lower Cretaceous), Lakota (Lower Cretaceous)

Probable Drive Mechanism: Gas cap and water drive.

CUPTON

County: Fallon

Discovery Well:

Name: Rothschild, Northwest Improvement No. 44-15

Location: SE SE Sec. 15, T. 9N., R. 59E.
Date Completed: August 30, 1955
Total Depth: 9785′
Initial Potential: 306 BOPD, 165 BWPD

Deepest Well: Above well. Red River (Ordovician)

Spacing Regulations:
80-acre spacing permitted wells in the SE¼ and NW¼ of each quarter section, 75′ tolerance for topographic reasons. Delineated by Order No. 31-55.

Special Field Rules:
State-wide rules.

No. Producing Wells: 2

Type of Trap: Structural

Productive Formations: Red River (Ordovician)

Probable Drive Mechanism: Water drive.

CUT BANK

County: Glacier and Toole

Discovery Well:

Name: Sand Point, Berger No. 1 (Gas well)

Location: SE SE NW Sec. 1, T. 35N., R. 5W.
Date Completed: 1926
Total Depth: 2978′
Initial Potential: 8,000 MCFGPD

Deepest Well: Union, Stufft 418-7. Cambrian. T.D. 5500′

Spacing Regulations:
320′ from quarter-quarter section line, 650′ between wells, fifth well in center of 40 permitted, 75′ tolerance for topographic reasons. Field delineated by Orders No. 10-54 and 21-59.

Special Field Rules:
State-wide rules except Rules 207, 211, 219, 221, 223 and 224 do not apply.

No. Producing Wells: 1114

Type of Trap: Stratigraphic

Productive Formations: Kootenai (Lower Cretaceous); Madison (Mississippian)

Probable Drive Mechanism: Depletion drive

Secondary Recovery: Several pilot water floods have shown encouraging results. Field operators are in the process of forming several partial field units so that water flood projects can be expanded.

DEER CREEK

County: Dawson

Discovery Well:

Name: Texaco, No. 1 NP "G" (NCT-4)

Location: SW SW Sec. 23, T. 17 N., R. 53E.
Date Completed: August 29, 1952
Total Depth: 10,128′
Initial Potential: 191 BOPD

Deepest Well: Texaco, Ekland No. 1, Sec. 26, T. 17N., R. 53E. Red River (Ordovician). T.D. 10,228′

Spacing Regulations:
80-acre spacing permitted well in the NE¼ and SW¼ of each quarter section 75′ tolerance for topographic reasons. Delineated by Order No. 23-55.

Special Field Rules:
State-wide rules.

No. Producing Wells: 6

Type of Trap: Structural

Productive Formations: Red River (Ordovician); Interlake (Silurian)

Probable Drive Mechanism: Water drive

Water Disposal: An average of 665 BWPD at a pressure of 243 psig. was injected during the last quarter of 1960. Approximately 374,000 barrels of water have been disposed of into the Dakota formation since March, 1957 when the project started.

DELPHIA

County: Musselshell

Discovery Well:

Name: Texota, Goffena No. 1

Location: NW NE Sec. 26, T. 9N., R. 27E.
Date Completed: December 20, 1956
Total Depth: 6311′
Initial Potential: 124 BOPD

Deepest Well: Texota-Bradley, Goffena No. A-1. Charles (Mississippian). T.D. 6811′

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 2

Type of Trap: Structural

Productive Formations: Amsden (Pennsylvanian)

Probable Drive Mechanism: Water drive.

DEVILS BASIN

County: Musselshell

Discovery Well:

Name: Van Duzen Oil, No. 1

Location: NE SW NW Sec. 24, T. 11N., R. 24E.
Date Completed: December, 1919
Total Depth: 2110′
Initial Potential: 12 BOPD

Deepest Well: Clark Drilling Company, NP No. 1. Cambrian. T.D. 4081′

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons; field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 4

Type of Trap: Structural

Productive Formations: Heath (Upper Mississippian)

Probable Drive Mechanism: Depletion drive.

DEVON

County: Toole

Discovery Well:

Name: Minot, Shelby Holding Co. No. 1

Location: SW NE Sec. 18, T. 33N., R. 2E.
Date Completed: 1926
Total Depth: 1795′

Initial Potential: 3500 MCFGPD

Deepest Well: Above well. Madison (Mississippian)

Spacing Regulations:
1320′ from lease line, 3700′ between wells, 75′ tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 21

Type of Trap: Stratigraphic

Productive Formations: Blackleaf (Colorado Shale), (Lower Cretaceous)

Probable Drive Mechanism: Volumetric

DRY CREEK

County: Carbon

Discovery Well:

Name: Ohio Oil Company, NP No. 1

Location: 1940′ N/S, 2900′ W/E, Sec. 11, T. 7S., R. 21E.
Date Completed: March 31, 1929
Total Depth: 5772′
Initial Potential: 6500 MCFGPD (Frontier)

Deepest Well: Ohio Oil Company, NP No. 18, Sec. 3, T. 7S., R. 21E. Cambrian. T.D. 8882′

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons; field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 4

Type of Trap: Structural

Productive Formations: Eagle (Upper Cretaceous) gas; Frontier (Upper Cretaceous) gas; Greybull (Lower Cretaceous) oil; Prior (Lower Cretaceous) oil

Probable Drive Mechanism: Gas sands, volumetric; Oil sands, combination water and depletion drive.

DWYER

County: Sheridan

Discovery Well:

Name: Mobil, Muller No. F-44-20-P

Location: SE SE Sec. 20, T. 32 N., R. 59E.
Date Completed: January 8, 1960
Total Depth: 12,033′
Initial Potential: 51 BOPD, 49 BWPD

Deepest Well: Above well. Red River (Ordovician)

Spacing Regulations:
160 acre spacing, permitted well in the SE¼ of each quarter section (temporary rules), 175′ tolerance for topographic reasons, field delineated by Order No. 25-60.

Special Field Rules:
State-wide rules.

No. Producing Wells: 4

Type of Trap: Probably combination structural and stratigraphic

Productive Formations: Mission Canyon (Mississippian)

Probable Drive Mechanism: Water drive.

ELK BASIN

County: Carbon

Discovery Well:

Name: Hurst No. 1

Location: Sec. 30, T. 58N., R. 99 W., Park County, Wyoming
Date Completed: 1915
Total Depth: 1402′
Initial Potential: 1000 BOPD (Frontier)

Spacing Regulations:
330′ from quarter-quarter section, 1320′ between wells, 75′ tolerance for topographic conditions. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 55

Type of Trap: Structural

Productive Formations: Frontier (Upper Cretaceous); Dakota (Lower Cretaceous); Embar (Permian); Tensleep (Pennsylvanian); Madison (Mississippian)

Probable Drive Mechanism: Frontier, gravity drainage; Embar-Tensleep, gravity drainage; Madison, water drive

Secondary Recovery: Frontier, crestal gas injection with sweet gas; Embar-Tensleep, full pressure maintenance by crestal injection of inert gas.

ELK BASIN, NORTHWEST

County: Carbon

Discovery Well:

Name: Sinclair Wyoming Oil Co., NW EB Unit No. 1

Location: SW NW Sec. 28, T. 9S., R. 23E.
Date Completed: July 22, 1947
Total Depth: 6795′
Initial Potential: 494 BOPD

Deepest Well: Pan American, B. L. Zaerr B-1. Madison (Mississippian). T.D. 6957′

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons; field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 11

Type of Trap: Structural

Productive Formations: Frontier (Upper Cretaceous). Madison (Mississippian)

Probable Drive Mechanism: Frontier, depletion drive; Madison,

Secondary Recovery: Water flood operations are being conducted in the Frontier formation. Approximately 450,000 barrels of water has been injected since October, 1957, date of first injection. The project has recently been enlarged and December, 1960 injections averaged about 1670 BWPD. The first increase in oil production was observed in December, 1960.

FERTILE PRAIRIE

County: Fallon

Discovery Well:

Name: Mon-O-Co, Ferguson-Goldin No. 1

Location: SE SW Sec. 18, T. 7N., R. 61E.
Date Completed: November 8, 1954
Total Depth: 9286'
Initial Potential: 132 BOPD

Deepest Well: McAlester Fuel, NP No. A-1. Winnipeg (Ordovician). T.D. 9684'

Spacing Regulations:
80-acre spacing, permitted wells in the NW¼ and SE¼ of each quarter section, 75' tolerance for topographic reasons; field delineated by Order No. 3-56.

Special Field Rules:
State-wide rules.

No. Producing Wells: 1

Type of Trap: Structural

Productive Formations: Red River (Ordovician)

Probable Drive Mechanism: Water drive

FRANNIE

County: Carbon

Discovery Well:

Name: Pan American, Rosenberg C-1

Location: NW NE NW Sec. 25, T. 58 N., R. 98 W., Park County, Wyoming
Date Completed: February 28, 1928
Total Depth: 2612'
Initial Potential: 9 BOPD

Spacing Regulations:
330' from quarter-quarter section line, 1320' between wells, 75' tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 2

Type of Trap: Structural

Productive Formations: Tensleep (Pennsylvanian)

Probable Drive Mechanism: Combination water drive and gravity drainage.

GAGE

County: Musselshell

Discovery Well:

Name: Northern Ordnance, Morris No. 1

Location: SW SW Sec. 15, T. 9N., R. 26E.
Date Completed: September 9, 1943
Total Depth: 7495′
Initial Potential: 120 BOPD

Deepest Well: Above well. Madison (Mississippian)

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 2

Type of Trap: Combination structural and stratigraphic

Productive Formations: Amsden (Pennsylvanian)

Probable Drive Mechanism: Water drive.

GAS CITY

County: Dawson

Discovery Well:

Name: Shell, No. 33X-21

Location: NE NW SE Sec. 21, T. 14N., R. 55E.
Date Completed: June 4, 1955
Total Depth: 9596′
Initial Potential: 202 BOPD, 5 BWPD, 22/64″ ck.

Deepest Well: Above well. Winnipeg (Ordovician)

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 10

Type of Trap: Structural

Productive Formations: Red River (Ordovician)

Probable Drive Mechanism: Water drive.

GLENDIVE

County: Dawson

Discovery Well:

Name: Texaco, NP "G" (NCT-1) No. 1

Location: NE NE Sec. 35, T. 15 N., R. 54E.
Date Completed: January 10, 1952
Total Depth: 9079′
Initial Potential: 254 BOPD

Deepest Well: Texaco, NP "G" (NCT-1) No. 2. Winnipeg (Ordovician). T.D. 10,537′

Spacing Regulations:
80-acre spacing, permitted well in the NE¼ and SW¼ of each quarter section, 75′ tolerance for topographic reasons. Field delineated by Order No. 27-55.

Special Field Rules:
State-wide rules.

No. Producing Wells: 11

Type of Trap: Stratigraphic and structural

Productive Formations: Stony Mountain-Red River (Ordovician)

Probable Drive Mechanism: Water drive

Water Disposal: Water disposal started March 25, 1956. About 595,000 barrels have been injected into the Dakota formation since that time. Approximately 785 BWPD were injected during the last quarter of 1960, at an average pressure of 868 psig.

GYPSY BASIN

County: Teton and Pondera

Discovery Well:

Name: Western Oils, Bills No. 1

Location: SW SE SW Sec. 31, T. 28N., R. 6W.
Date Completed: July 8, 1951
Total Depth: 3410′
Initial Potential: 50 BOPD

Deepest Well: Above Well. Madison (Mississippian)

Spacing Regulations:
Center of 40 acres, 150′ tolerance for topographic reasons. Field delineated by Order No. 13-59.

Special Field Rules:
State-wide rules.

No. Producing Wells: 4

Type of Trap: Combination structural and stratigraphic

Productive Formations: Madison (Mississippian)

Probable Drive Mechanism: Combination water drive and depletion drive.

HARDIN

County: Big Horn

Discovery Well:

Name: Yellowstone Oil & Gas, Blair No. 1

Location: Sec. 10, T. 1S., R. 33E.
Date Completed: 1913
Total Depth: Unknown
Initial Potential: Unknown

Deepest Well: Daniels Petroleum Co., No. 1 Sec. 13, T. 1S., R. 33E. Madison (Mississippian). T.D. 4195′

Spacing Regulations:
1320′ from lease line, 3700′ between wells, 75′ tolerance for topographic reasons, not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 41

Type of Trap: Stratigraphic

Productive Formations: Frontier (Cretaceous)

Probable Drive Mechanism: Volumetric.

HIBBARD

County: Rosebud

Discovery Well:

Name: Sinclair, Kesterson No. 1

Location: SE NW Sec. 34, T. 10N., R. 33E.
Date Completed: February 29, 1960
Total Depth: 5240′
Initial Potential: 240 BOPD

Deepest Well: Above well. Heath (Mississippian)

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 1

Type of Trap: Unknown

Productive Formations: Amsden (Pennsylvanian)

Probable Drive Mechanism: Water drive.

IVANHOE

County: Musselshell

Discovery Well:

Name: Chicago-Republic, No. 1

Location: SW SE NE Sec. 17, T. 11N., R. 31E.
Date Completed: September 15, 1953
Total Depth: 5210′
Initial Potential: 92 BOPD (Morrison)

Deepest Well: Above well. Charles (Mississippian)

Spacing Regulations:
Center of 40-acre, 200′ tolreance for topographic reasons. Delineated by Orders No. 13-56 and 7-60.

Special Field Rules:
State-wide rules.

No. Producing Wells: 22

Type of Trap: Structural and stratigraphic

Productive Formations: Morrison (Jurassic). Amsden (Pennsylvanian). Tyler (Mississippian)

Probable Drive Mechanism: Morrison and Tyler, depletion drive; Amsden, water drive.

KEG COULEE

County: Musselshell

Discovery Well:

Name: American-Climax Petr. Corp., DeJaegher No. 1

Location: SE NE Sec. 31, T. 11N., R. 31E.
Date Completed: April 1, 1960
Total Depth: 4635′
Initial Potential: 177 BOPD

Spacing Regulations:
80-acre spacing, pattern varies; 100′ tolerance for topographic reasons. Field delineated by Order No. 11-60.

Special Field Rules:
State-wide rules.

No. Producing Wells: 6

Type of Trap: Stratigraphic

Productive Formations: Tyler (Mississippian)

Probable Drive Mechanism: Depletion drive.

KEITH

County: Liberty

Discovery Well:

Name: Texaco, Cicon No. 1

Location: NE NW SW Sec. 29, T. 36N., R. 6E.
Date Completed: December 17, 1944
Total Depth: 3221′
Initial Potential: 3000 MCFGPD

Deepest Well: Montana Power, Sorrel-Govt. No. 1. Cambrian. T.D. 5015′

Spacing Regulations:
1320′ from lease line and 3700′ between wells, 75′ tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 6

Type of Trap: Structural

Productive Formations: Bow Island (Cretaceous); Sawtooth-Madison (Jurassic-Mississippian)

Probable Drive Mechanism: Water drive.

KEVIN-SUNBURST

County: Toole

Discovery Well:

Name: Gordon Campbell-Kevin Syndicate, Goeddertz No. 1

Location: NE NE NE Sec. 16, T. 35N., R. 3W.
Date Completed: March 14, 1922
Total Depth: 2540′
Initial Potential: 10 BOPD

Deepest Well: Lee Edwards, Inland Empire No. 1. Pre-Cambrian. T.D. 4916′

Spacing Regulations:
9 wells per 40-acre tract, only 3 wells on any side of tract set back at least 220′ from line, 75′ tolerance for topographic reasons. Field delineated by Orders No. 8-54 and 28-55.

Special Field Rules:
State-wide rules, except Rules No. 207, 211, 219, 221, 223 and 224 do not apply.

No. Producing Wells: 1193

Type of Trap: Stratigraphic

Productive Formations: Madison (Mississippian); Sawtooth (Jurassic); Sunburst (Cretaceous)

Probable Drive Mechanism: Depletion drive

Secondary Recovery: Two small pilot water floods are now in operation. Results of these floods are yet inconclusive.

LAKE BASIN — NORTH

County: Stillwater

Discovery Well:

Name: Holland-American, Castle No. 1

Location: NW SE Sec. 22, T. 2N., R. 21E.
Date Completed: January 11, 1958
Total Depth: 4179′
Initial Potential: 480 MCFGPD, Eagle; 4500 MCFGPD, Frontier

Deepest Well: Superior, Copulos 71-22. Pre-Cambrian. T.D. 7929′

Spacing Regulations:
640-acre spacing, permitted well in the NW SE of each section, 75′ tolerance for topographic reasons. Delineated by Order No. 6-58.

Special Field Rules:
State-wide rules. Frontier and Eagle may be dually completed without provisions of Rule 219.

No. Producing Wells: Shut-in

Type of Trap: Structural

Productive Formations: Eagle (Cretaceous); Frontier (Cretaceous)

Probable Drive Mechanism: Unknown.

LITTLE BEAVER

County: Fallon

Discovery Well:

Name: Shell, Unit No. 23-13

Location: NE SW Sec. 13, T. 4N., R. 61E.
Date Completed: July 30, 1952
Total Depth: 8553′
Initial Potential: 313 BOPD, 33 BWPD

Deepest Well: Carter, NP No. 1, Sec. 19, T. 4N., R. 62E. Pre-Cambrian. T.D. 9676′

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 15

Type of Trap: Structural

Productive Formations: Red River (Ordovician)

Probable Drive Mechanism: Water drive.

LITTLE BEAVER — EAST

County: Fallon

Discovery Well:

Name: Montana-Dakota Utilities, NP No. 1

Location: Sec. 17, T. 4N., R. 62E.
Date Completed: October, 1952
Total Depth: 8186′
Initial Potential: 25 BOPD

Deepest Well: Shell, No. 14-34, Sec. 34, T. 5N., R. 61E. Red River (Ordovician). T.D. 8471′

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 11

Type of Trap: Structural

Productive Formations: Red River (Ordovician)

Probable Drive Mechanism: Water

Water Disposal: Commission has granted approval for water injection; however, the project is not yet in operation.

MACKAY

County: Carbon and Stillwater

Discovery Well:

Name: Northern Natural Gas, Mackay No. 1-A

Location: NW SE Sec. 14, T. 6S., R. 17E.
Date Completed: May 20, 1960

Total Depth: 4116′
Initial Potential: 103 BOPD

Deepest Well: Above well. Morrison (Jurassic)

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 2

Type of Trap: Structural

Productive Formations: Greybull (Lower Cretaceous)

Probable Drive Mechanism: Unknown.

MELSTONE

County: Musselshell

Discovery Well:

Name: Amerada, Hougen No. 1

Location: SE SE Sec. 23, T. 10N., R. 29E.
Date Completed: October 18, 1948
Total Depth: 4228′
Initial Potential: 655 BOPD, ¾″ ck.

Deepest Well: Amerada, Hougen No. 2. Sec. 23, T. 10N., R. 29E. Cambrian. T.D. 7626′

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 8

Type of Trap: Structural and stratigraphic

Productive Formations: Tyler (Mississippian)

Probable Drive Mechanism: Depletion drive.

Water Disposal: Produced water was injected into the Tyler "B" zone from February, 1954 to May, 1958. A total of 1,056,000 barrels were injected before the injection well plugged.

MONARCH

County: Fallon

Discovery Well:

Name: Shell, NP 12-23

Location: Sec. 23, T. 9N., R. 58E.
Date Completed: November 18, 1958
Total Depth: 9175′
Initial Potential: 218 BOPD, 13 BWPD

Deepest Well: Above well. Red River (Ordovician)

Spacing Regulations:
160-acre spacing, SW¼ of each quarter section, 175′ tolerance for topographic reasons. Delineated by Order No. 12-59.

Special Field Rules:
State-wide rules.

No. Producing Wells: 13

Type of Trap: Structural and stratigraphic

Productive Formations: Red River (Ordovician); Interlake (Silurian)

Probable Drive Mechanism: Depletion drive with partial water drive.

MOSSER

County: Yellowstone

Discovery Well:

Name: Tarrant, Mosser No. 2

Location: SW SW NE Sec. 26, T. 3S., R. 24E.
Date Completed: January 25, 1937
Total Depth: 1027′
Initial Potential: 60 BOPD

Deepest Well: Tarrant, Mosser No. 1, Sec. 26, T. 3S., R. 24E. Madison (Mississippian). T.D. 2568′

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons. Order No. 21-56 establishes some exceptions.

Special Field Rules:
State-wide rules.

No. Producing Wells: 5

Type of Trap: Structural

Productive Formations: Dakota (Lower Cretaceous)

Probable Drive Mechanism: Water drive.

OUTLOOK

County: Sheridan

Discovery Well:

Name: Amerada, Tange No. 1

Location: Sec. 20, T. 36N., R. 53E.
Date Completed: December 22, 1956
Total Depth: 9950′
Initial Potential: 2742 BOPD

Deepest Well: Amerada, A. Johnson No. 1, Sec. 33, T. 36N., R. 53E. Pre-Cambrian. T.D. 11,074′

Spacing Regulations:
160 acre spacing, permitted wells can be in either SW¼ or NE¼ of each quarter section, 175′ tolerance for topographic reasons. Delineated by Order No. 19-59A.

Special Field Rules:
State-wide rules.

No. Producing Wells: 11

Type of Trap: Stratigraphic and structural

Productive Formations: Silurian-Devonian. Red River (Ordovician)

Probable Drive Mechanism: Water drive

Water Disposal: Produced water disposal began January 12, 1960 into the Dakota formation. An average of 1030 BWPD was injected at an average pressure of 775 psig. during December, 1960. Accumulative water injections to January 1, 1961 were about 248,000 barrels.

PENNEL

County: Fallon

Discovery Well:

Name: Shell, State No. 22X-36

Location: SE NW Sec. 36, T. 8N., R. 59E.
Date Completed: September 8, 1955
Total Depth: 9242′
Initial Potential: 205 BOPD, 39 BWPD

Deepest Well: Above well. Winnipeg (Ordovician)

Spacing Regulations:
80 acre, permitted wells in the NW¼ and SE¼ of each quarter section, 150′ tolerance for topographic reasons. Delineated by Order No. 1-56.

Special Field Rules:
State-wide rules.

No. Producing Wells: 20

Type of Trap: Structural

Productive Formations: Lodgepole (Mississippian); Mission Canyon (Mississippian); Siluro-Ordovician.

Probable Drive Mechanism: Combination depletion drive and water drive

Water Disposal: Commission has granted approval to dispose of produced water by injection; however, the project is not yet in operation.

PINE

County: Fallon, Wibaux, Prairie and Dawson

Discovery Well:

Name: Shell, Pine Unit No. 32-30

Location: SW SW NE Sec. 30, T. 12N., R. 57E.
Date Completed: January 28, 1952
Total Depth: 9746′
Initial Potential: 467 BOPD, 148 BWPD

Deepest Well: Shell, 43-22A. Sec. 22, T. 11N., R. 57E. Pre-Cambrian. T.D. 10,414′

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells; 75′ tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 143

Type of Trap: Structural

Productive Formations: Silurian-Ordovician

Probable Drive Mechanism: Water drive.

Secondary Recovery: A partial pressure maintenance program was initiated March 10, 1959 by injecting water into the producing horizon. Commission has given approval to expand the project. A total of about 540,000 barrels of water have been injected into the Siluro-Ordovician reservoir.

Water Disposal: Produced water has been disposed of by injecting into the Dakota formation since October, 1958. A total of about 2,910,000 barrels had been injected to December 1, 1960. Average November, 1960 injection rates were 3770 BWPD.

PLEVNA

County: Fallon

Discovery Well:

Name: F. H. Becker No. 1

Location: NE NE SE Sec. 28, T. 5N., R. 60E.
Date Completed: January 18, 1946
Total Depth: 1053′
Initial Potential: 300 MCFGPD

Deepest Well: Fallon, NP No. 7, Sec. 3, T. 5N., R. 59E. Judith River (Upper Cretaceous). T.D. 2240′

Spacing Regulations:
1200′ from quarter section line, 2400′ between wells, 75′ tolerance for topographic reasons. Field delineated by Orders No. 34-54 and 4-57.

Special Field Rules:
State-wide rules.

No. Producing Wells: 25

Type of Trap: Structural

Productive Formations: Judith River (Upper Cretaceous)

Probable Drive Mechanism: Water drive.

PONDERA

County: Teton

Discovery Well:

Name: Midwest Refining, Haber No. 1

Location: SE SE Sec. 17, T. 27N., R. 4W.
Date Completed: June, 1927
Total Depth: 2072′
Initial Potential: 3 BOPD, 3500 MCFGPD

Deepest Well: Wasatch Oil, Hirshberg No. 1. Sec. 23, T. 27 N., R. 4W. Pre-Cambrian. T.D. 5233′.

Spacing Regulations:
220′ from quarter-quarter section line, 430′ between wells, 75′ tolerance for topographic reasons. Delineated by Order No. 9-54.

Special Field Rules:
State-wide rules, except Rules No. 207, 211, 219, 221, 223, 224 do not apply.

No. Producing Wells: 326

Type of Trap: Structural and stratigraphic

Productive Formations: Madison (Mississippian)

Probable Drive Mechanism: Combination depletion drive with limited water drive.

POPLAR

County: Roosevelt

Discovery Well:

Name: East Poplar Unit No. 1. Murphy Corp.

Location: SW NE Sec. 2, T. 28N., R. 51E.
Date Completed: March 10, 1952
Total Depth: 9163'
Initial Potential: 233 BOPD

Deepest Well: Above well. Winnipeg (Ordovician)

Spacing Regulations:
330' from quarter-quarter section line, 1320' between wells, 75' tolerance for topographic reasons. Delineated by Order No. 7-55.

Special Field Rules:
State-wide rules.

No. Producing Wells: 93

Type of Trap: Structural

Productive Formations: Charles-Mission Canyon (Mississippian)

Probable Drive Mechanism: Water drive

Secondary Recovery: Partial pressure maintenance by water injection was started in September, 1956. The project has since been expanded. Total water injections to January 1, 1961 were about 6,545,000 barrels. December, 1960 injections averaged about 6,450 BWPD.

Water Disposal: Excess produced water has been injected into the Dakota formation since September, 1957. A total of about 7,723,000 barrels have been injected to January 1, 1961. Average daily injections during December, 1960 were 3,260 BWPD.

POPLAR — NORTHWEST

County: Roosevelt

Discovery Well:

Name: Ajax Oil, McGowan No. 1

Location: SE SW Sec. 10, T. 29N., R. 50E.
Date Completed: May 12, 1952
Total Depth: 6274'
Initial Potential: 75 BOPD, 25 BWPD

Deepest Well: Carter, Harry Mason No. 1. Interlake (Silurian). T.D. 8392'

Spacing Regulations:
80-acre spacing; permitted wells in the NW¼ and SE¼ of each quarter section, 75' tolerance for topographic reasons. Field delineated by Order No. 18-55.

Special Field Rules:
State-wide rules. Order No. 18-55 lists special well completion practices to be followed.

No. Producing Wells: 4

Type of Trap: Structural

Productive Formations: Charles-Mission Canyon (Mississippian)

Probable Drive Mechanism: Water drive.

RAGGED POINT

County: Musselshell

Discovery Well:

Name: Texas, Manion No. 1

Location: SE SW Sec. 5, T. 11N., R. 30E.
Date Completed: January 4, 1948
Total Depth: 6312′
Initial Potential: 236 BOPD, 5% water.

Deepest Well: Above well. Cambrian

Spacing Regulations:
Center of 40 acres, 75′ tolerance for topographic reasons. Delineated by Orders No. 15-54 and 8-59.

Special Field Rules:
State-wide rules.

No. Producing Wells: 10

Type of Trap: Structural and stratigraphic

Productive Formations: Kibbey and Tyler (Mississippian)

Probable Drive Mechanism: Kibbey, water drive; Tyler, depletion drive.

REAGAN

County: Glacier

Discovery Well:

Name: Reagan Associates, Tribal 194-1

Location: SE NE Sec. 22, T. 37N., R. 7W.
Date Completed: March 29, 1941
Total Depth: 3869′
Initial Potential: 6000 MCFGPD

Deepest Well: Union Oil, Blackfeet Tribal 194-12. Cambrian. T.D. 6258′

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons.

Special Field Rules:
State-wide rules.

No. Producing Wells: 50

Type of Trap: Structural

Productive Formations: Madison (Mississippian)

Probable Drive Mechanism: Combination gas cap and water drive

Secondary Recovery: Operators have commission approval to cycle produced gas for partial pressure maintenance. Project is not yet in operation.

RED CREEK

County: Glacier

Discovery Well:

Name: G. S. Frary, Isabel Moberly No. 1

Location: SW SW Sec. 1, T. 37N., R. 5W.
Date Completed: January 16, 1958
Total Depth: 2656'
Initial Potential: 1500 MCFGPD

Deepest Well: Pardee-Inland Empire, McAlpine No. 1. Madison (Mississippian). T.D. 2990'

Spacing Regulations:
Center of 40 acres, 75' tolerance for topographic reasons. Delineated by Order No. 16-58.

Special Field Rules:
State-wide rules. Rule 219 waived.

No. Producing Wells: 15

Type of Trap: Structural and stratigraphic

Productive Formations: Cut Bank (Lower Cretaceous), Madison (Mississippian).

RAPELJE

County: Stillwater

Discovery Well:

Name: Shoreline Petroleum, C. F. Kirchner No. 1

Location: NE SW Sec. 4, T. 2N., R. 20E.
Date Completed: November 18, 1960
Total Depth: 4064'
Initial Potential: 840 MCFGPD

Deepest Well: Above well. Morrison (Jurassic)

Spacing Regulations:
1320' from lease line, 3700' between wells, 75' tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: Shut-in

Type of Trap: Unknown

Productive Formations: Eagle (Cretaceous)

Probable Drive Mechanism: Unknown

RED STONE

County: Sheridan

Discovery Well:

Name: H. L. Hunt, Hagen No. 1

Location: NE NW Sec. 7, T. 34 N., R. 52E.
Date Completed: November 1, 1958
Total Depth: 10,700′
Initial Potential: 100 BOPD

Deepest Well: Above well. Cambrian.

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 1

Type of Trap: Unknown

Productive Formations: Devonian

Probable Drive Mechanism: Water drive.

REPEAT

County: Carter

Discovery Well:

Name: Ohio Oil, Govt. No. 1

Location: Lot 4, Sec. 4, T. 1S., R. 62E.
Date Completed: March 27, 1956
Total Depth: 9362′
Initial Potential: 186 BOPD, 2% water

Deepest Well: Above well. Winnipeg (Ordovician)

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 1

Type of Trap: Unknown

Productive Formations: Red River (Ordovician)

Probable Drive Mechanism: Water drive.

RICHEY

County: Dawson and McCone

Discovery Well:

Name: Shell, NP No. 11-9

Location: SE NW NW Sec. 19, T. 23N., R. 50E.
Date Completed: November 29, 1951
Total Depth: 10,518'
Initial Potential: 1656 BOPD, 408 BWPD, 32/64" ck.

Deepest Well: Above well. Ordovician.

Spacing Regulations:
80 acre spacing, permitted wells in the NW¼ and SE¼ of each quarter section, 75' tolerance for topographic reasons. Field delineated by Order No. 21-55.

Special Field Rules:
State-wide rules

No. Producing Wells: 12

Type of Trap: Structural

Productive Formations: Charles (Mississippian)

Probable Drive Mechanism: Water drive

Water Disposal: Part of the produced water in this field is being injected into the Dakota formation. Cumulative injections to October 1, 1960 were about 2,075,000 barrels. An average of 725 BWPD was injected during the month of September, 1960.

RICHEY — SOUTHWEST

County: McCone

Discovery Well:

Name: Shell, NP No. 22-25B

Locaton: SE NW Sec. 25, T. 22N., R. 48E.
Date Completed: 1952
Total Depth: 10,188'
Initial Potential: 51 BOPD

Deepest Well: Above well. Winnipeg (Ordovician)

Spacing Regulations:
80 acre spacing permitted wells in the NE¼ and SW¼ of each quarter section, 75' tolerance for topographic reasons. Field delineated by Order No. 22-55.

Special Field Rules:
State-wide rules.

No. Producing Wells: 2

Type of Trap: Structural

Productive Formations: Interlake (Silurian); Dawson Bay (Devonian)

Probable Drive Mechanism: Depletion drive.

RUDYARD

County: Hill

Discovery Well:

Name: Texaco, Anderson No. 1

Location: SE SW Sec. 27, T. 34N., R. 9E.
Date Completed: December 9, 1955
Total Depth: 3435′
Initial Potential: 3500 MCFGPD

Deepest Well: Texaco, R. E. Blair No. 1, NW SE Sec. 28, T. 34N., R. 9E. Pre-Cambrian. T.D. 6550′

Spacing Regulations:
640 acre spacing, permitted well in C NW¼, 150′ tolerance for topographic reasons. Field delineated by Order No. 2-58.

Special Field Rules:
State-wide rules.

No. Producing Wells: Shut-in

Type of Trap: Structural

Productive Formations: Sawtooth (Jurassic)

Probable Drive Mechanism: Volumetric.

SAND CREEK

County: Dawson

Discovery Well:

Name: Texaco, Guelff No. 1

Location: SE NE Sec. 4, T. 15N., R. 54E.
Date Completed: March 8, 1959
Total Depth: 9684′
Initial Potential: 408 BOPD

Deepest Well: Above well. Red River (Ordovician)

Spacing Regulations:
80 acre spacing, permitted wells in the NW¼ and SE¼ of each quarter section, 150′ tolerance for topographic reasons. Field delineated by Order No. 16-59.

Special Field Rules:
State-wide rules.

No. Producing Wells: 6

Type of Trap: Structural

Productive Formations: Interlake (Silurian); Red River (Devonian)

Probable Drive Mechanism: Water drive.

SIDNEY

County: Richland

Discovery Well:

Name: Wendell C. Flynn, Beagle Land & Livestock Co. No. 1

Location: SW SW Sec. 17, T. 23N., R. 59E.
Date Completed: September 11, 1958
Total Depth: 13,135′
Initial Potential: 50 BOPD

Deepest Well: Above well. Winnipeg (Devonian)

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 2

Type of Trap: Unknown

Productive Formations: Mission Canyon (Mississippian)

Probable Drive Mechanism: Water drive.

SNYDER

County: Big Horn

Discovery Well:

Name: George Greer, Kendrick No. 2

Location: NE NW NW Sec. 6, T. 1S., R. 35E.
Date Completed: October 4, 1952
Total Depth: 4588′
Initial Potential: 150 BOPD

Deepest Well: George Greer, Kendrick No. 3. Sec. 6, T. 1S., R. 35E. Winnipeg (Ordovician). T.D. 6808′

Spacing Regulations:
330′ from quarter-quarter section line, 1320′ between wells, 75′ tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 4

Type of Trap: Structural

Productive Formations: Tensleep (Pennsylvanian)

Probable Drive Mechanism: Water drive.

SOAP CREEK

County: Big Horn

Discovery Well:

Name: Western States Oil & Gas Co., Tribal No. 1

Location: Approx. center Section 34, T. 6S., R. 32E.
Date Completed: February 11, 1921
Total Depth: 1966′
Initial Potential: 200 BOPD

Deepest Well: Inland Empire, Tribal 52-34. Sec. 34, T. 6S., R. 32E. Pre-Cambrian. T.D. 4470′

Spacing Regulations:
Center of 10 acres, 100′ tolerance for topographic reasons. Delineated by Order No. 26-60.

Special Field Rules:
State-wide rules.

No. Producing Wells: 17

Type of Trap: Structural

Productive Formations: Tensleep, Amsden (Pennsylvanian); Madison (Mississippian)

Probable Drive Mechanism: Water drive.

STENSVAD

County: Musselshell and Rosebud

Discovery Well:

Name: Honolulu, Stensvad No. 11-9

Location: NE SE Sec. 11, T. 11N., R. 31E.
Date Completed: December 20, 1958
Total Depth: 5516′
Initial Potential: 448 BOPD

Spacing Regulations:
Center of 40 acres, 200′ tolerance for topographic reasons. Delineated by Orders No. 2-59, 22-59, 7-60.

Special Field Rules:
State-wide rules.

No. Producing Wells: 24

Type of Trap: Stratigraphic

Productive Formations: Tyler (Mississippian)

Probable Drive Mechanism: Depletion drive

Secondary Recovery: The operators in this field are in the process of forming a unit in order to initiate water flood operations.

SUMATRA

County: Rosebud

Discovery Well:

Name: Farmers Union, Sawyer No. 1

Location: NE SW Sec. 26, T. 11N., R. 32E.
Date Completed: October 8, 1950
Total Depth: 5277′
Initial Potential: 50 BOPD

Deepest Well: Texas, Horgen No. 1. Sec. 13, T. 11N., R. 32E. Kibbey (Mississippian). T.D. 5657′

Spacing Regulations:
Center of 40 acres, tolerance at Commission's discretion. Delineated by Order No. 14-58.

Special Field Rules:
State-wide rules.

No. Producing Wells: 88

Type of Trap: Stratigraphic

Productive Formations: Amsden (Pennsylvanian); Tyler (Mississippian)

Probable Drive Mechanism: Depletion drive

Water Disposal: A part of the produced water is injected into the Amsden formation. A total of about 161,000 barrels had been injected to October 1, 1960. Average September, 1960 injections were 428 BWPD at 600 psig.

TULE CREEK

County: Roosevelt

Discovery Well:

Name: Murphy, Sletvold No. 1

Location: SE SE Sec. 18, T. 30 N., R. 48E.
Date Completed: October 27, 1960
Total Depth: 8478′
Initial Potential: 476 BOPD, 14/64″ ck.

Deepest Well: Above well. Dawson Bay (Devonian)

Spacing Regulations:
330′ from boundary of quarter-quarter section, and 1320′ between wells. 75′ tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 2

Type of Trap: Unknown

Productive Formations: Nisku (Devonian)

Probable Drive Mechanism: Unknown.

UTOPIA

County: Liberty

Discovery Well:

Name: Texaco, State M-1094

Location: NW SE SE Sec. 16, T. 33N., R. 4E.
Date Completed: October 5, 1943
Total Depth: 2579'
Initial Potential: 15 BOPD (Field produces gas)

Deepest Well: Texaco, Laas No. 2. Sec. 14, T. 33N., R. 4E. Cambrian. T.D. 4593'

Spacing Regulations:
1320' from lease line, 3700' between wells, 75' tolerance for topographic reasons. Field not delineated.

Special Field Rules:
State-wide rules.

No. Producing Wells: 7

Type of Trap: Structural

Productive Formations: Sawtooth (Jurassic); Madison (Mississippian); Jefferson (Devonian)

Probable Drive Mechanism: Unknown.

WHITLASH

County: Toole and Liberty

Discovery Well:

Name: Montana-Canadian Oil, E. Brown No. 1

Location: SE NE NW Sec. 19, T. 37N., R. 4E.
Date Completed: November, 1918
Total Depth: 2730'
Initial Potential: 15,000 MCFGPD

Deepest Well: Union Oil, Mahoney No. 1. Sec. 22, T. 37N., R. 4E. Cambrian. T.D. 4068'

Spacing Regulations:
330' from quarter-quarter section line, 650' between wells, 75' tolerance for topographic reasons. Field delineated by Order No. 16-54.

Special Field Rules:
State-wide rules.

No. Producing Wells: 42 Gas; 27 Oil

Type of Trap: Combination stratigraphic and structural

Productive Formations: Blackleaf and Bow Island (Cretaceous); Kootenai-Sunburst-Swift-Sawtooth (Cretaceous); Madison (Mississippian)

Probable Drive Mechanism: Volumetric.

WILLS CREEK

County: Fallon and Wibaux

Wills Creek is a non-unitized extension of the Cabin Creek Field lying on the east flank of the Cedar Creek Anticline.

WOLF SPRINGS

County: Yellowstone

Discovery Well:

Name: Atlantic, C. S. Horton No. 18-1

Location: SE SW Sec. 18, T. 7N., R. 32E.
Date Completed: July 31, 1955
Total Depth: 8442'
Initial Potential: 370 BOPD

Deepest Well: Above well. Cambrian.

Spacing Regulations:
80 acre spacing, permitted wells in the NW and SE¼, 75' tolerance for topographic reasons. Delineated by Order No. 9-59.

Special Field Rules:
State-wide rules.

No. Producing Wells: 19

Type of Trap: Structural

Productive Formations: Amsden (Pennsylvanian)

Probable Drive Mechanism: Water drive.

WOODROW

County: Dawson

Discovery Well:

Name: Texaco, NP "G" (NCT-8) No. 1

Location: NE NE Sec. 7, T. 16 N., R. 54E.
Date Completed: August 25, 1952
Total Depth: 8124'
Initial Potential: 114 BOPD, 20% water

Deepest Well: Texaco, Elpel No. 1. Winnipeg (Ordovician). T.D. 10,370'

Spacing Regulations:
160 acre spacing, permitted well in the SW¼ in Red River, and the NE¼ in Charles, 75' tolerance for topographic reasons. Delineated by Orders No. 25-55 and 24-55.

Special Field Rules:
State-wide rules.

No. Producing Wells: 2

Type of Trap: Structural

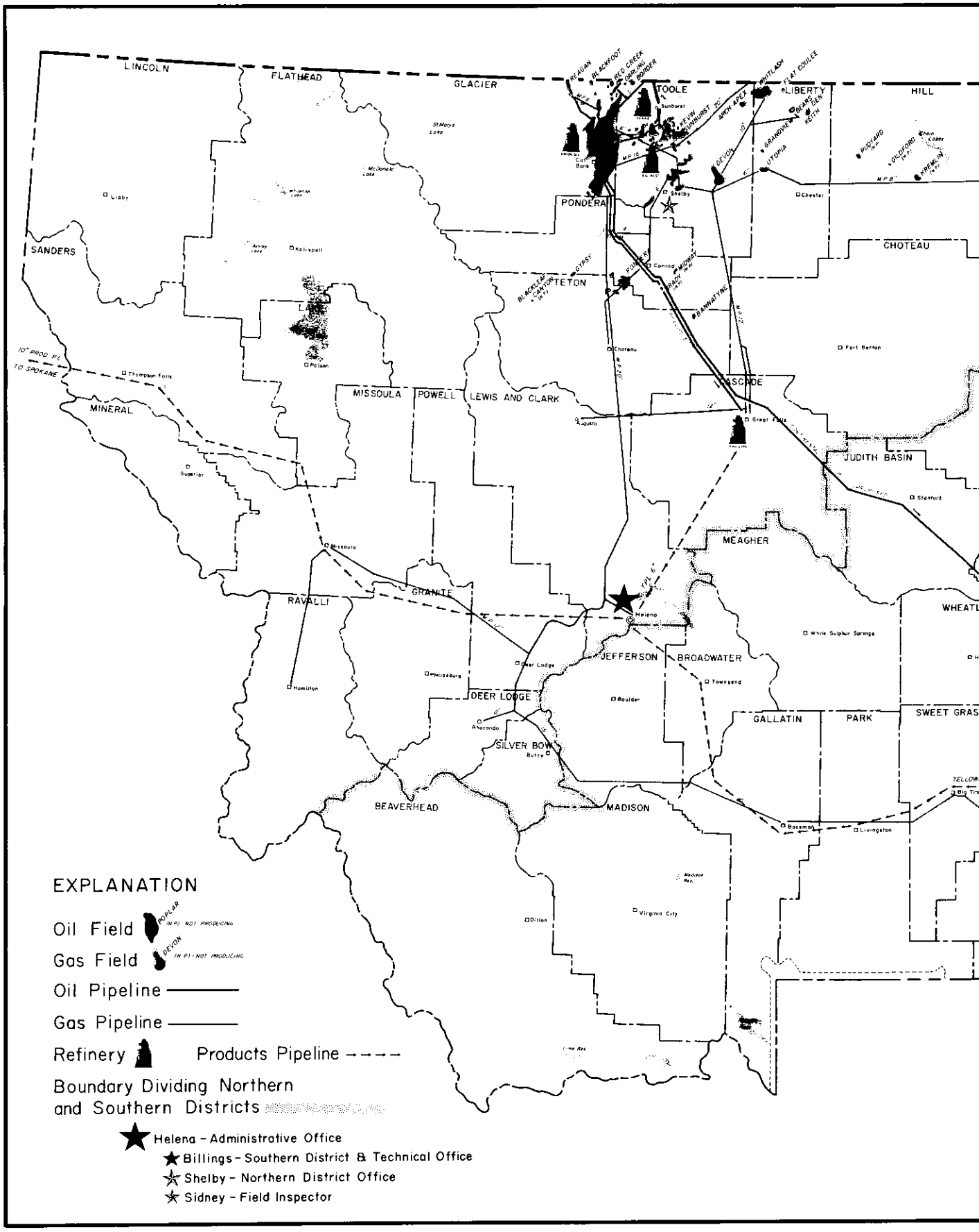
Productive Formations: Charles (Mississippian)

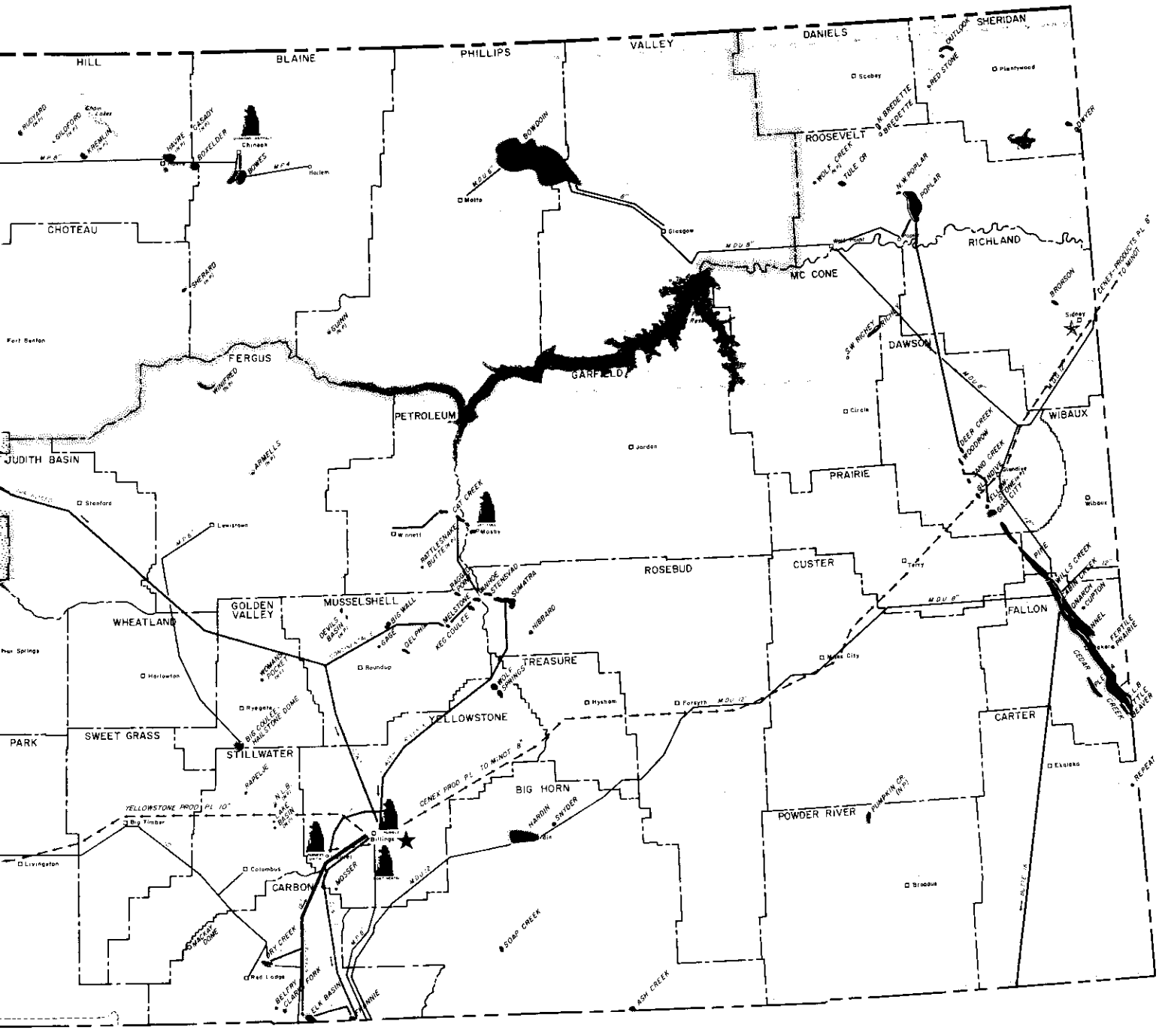
Probable Drive Mechanism: Water drive.

Line No.	Field (or Pool)	County	Year Discovered	Production Formation	Approx. Depth	A.P.I. Gravity	Volume Factor	Avg. Net Pay Ft.	Avg. Porosity %
1	Ash Creek	Big Horn	1952	Shannon (U. Cret.)	4500	34	1.045	14	22
2	Bannatyne	Teton	1927	Swift (U. Jur.)	1450	27	1.05	39	15
3	Bears Den	Liberty	1924	Sunburst (L. Cret.)	2300	39	1.08	20	12
4	Belfry	Carbon	1958	Fuson (L. Cret.)	9844	38	1.60	20	11.25
5	Big Wall	Musselshell	1948	Tyler (U. Miss.)	3000	31	1.02	22	17
6	Big Wall	Musselshell	1953	Amsden (L. Penn.)	2500	19	1.005	17	16
7	Blackfoot	Glacier	1955	Madison (Miss.)	3550	25	1.15	8	14
8	Blackfoot	Glacier	1955	Cut Bank (L. Cret.)	3500	30	1.11	15	15
9	Border	Toole	1929	Cut Bank (L. Cret.)	2400	31	1.08	22	15
10	Bowes	Blaine	1949	Sawtooth (M. Jur.)	3250	19	1.02	37	11.7
11	Bredette-North	Roosevelt, Daniels	1956	Charles (Miss.)	6720	38	1.24	24	6
12	Brorson	Richland	1954	Mission Canyon (Miss.)	9744	32	1.50	92	4
13	Cabin Creek	Fallon	1953	Siluro-Ordovician	8400	33	1.20	50	13
14	Cabin Creek	Fallon	1956	Mission Canyon (Miss.)	7300	33	1.13	25	11
15	Cat Creek (Antelope-Mosby)	Petroleum-Garfield	1920	Kootenai (L. Cret.)	1225	52	1.10	10	21
16	Cat Creek (West Dome)	Petroleum-Garfield	1920	Kootenai (L. Cret.)	1100	52	1.10	51	21
17	Cat Creek	Petroleum-Garfield	1945	Morrison (U. Jur.)	1600	52	1.10	6	22
18	Cat Creek	Petroleum-Garfield	1945	Swift (U. Jur.)	1750	52	1.10	25	18
19	Clarks Fork	Carbon	1954	Frontier (U. Cret.)	6730	43	1.16	28	14
20	Clarks Fork-North	Carbon	1956	Lakota (L. Cret.)	8940	50	1.92	19	19
21	Clarks Fork-North	Carbon	1957	Dakota (L. Cret.)	8750	56	1.92	11	20
22	Cupton	Fallon	1955	Red River (U. Ord.)	9800	33	1.50	33	13
23	Cut Bank	Glacier-Toole	1932	Kootenai (L. Cret.)	2900	38	1.148	16	15
24	Cut Bank	Glacier-Toole	1945	Madison (Miss.)	3000	39	1.10	10	14
25	Deer Creek	Dawson	1952	Red River (U. Ord.)	9850	42	1.21	112	6.7
26	Deer Creek	Dawson	1952	Interlake (Sil.)	9440	42	1.22	71	7
27	Delphia	Musselshell	1957	Amsden (L. Penn.)	6290	35	1.15	12	6.5
28	Devils Basin	Musselshell	1919	Heath (U. Miss.)	1200	24	1.02	11	17
29	Dry Creek	Carbon	1930	Greybull (L. Cret.)	5600	52	1.60	12	12
30	Dry Creek	Carbon	1932	Pryor (L. Cret.)	5800	52	1.20	30	12
31	Dwyer	Sheridan	1960	Mission Canyon (Miss.)	8000	33	1.12	30	11.8
32	Elk Basin	Carbon	1915	Frontier (U. Cret.)	1200	45	1.16	30	21
33	Elk Basin	Carbon	1942	Embar-Tensleep (Perm.-Penn.)	5000	29	1.1566	124	10.5
34	Elk Basin	Carbon	1946	Madison (Miss.)	5300	28	1.123	224	12
35	Elk Basin-Northwest	Carbon	1947	Frontier (U. Cret.)	3375	47	1.287	28	19
36	Elk Basin-Northwest	Carbon	1947	Madison (Miss.)	6215	35	1.075	124	11.6
37	Fertile Prairie	Fallon	1954	Red River (Ord.)	9200	33	1.25	30	5.6
38	Frannie	Carbon	1928	Tensleep (Penn.)	2700	27	1.018	29	19
39	Gage	Musselshell	1943	Amsden (L. Penn.)	6000	34	1.07	18	10
40	Gas City	Dawson	1955	Red River (U. Ord.)	8700	38	1.284	25	9
41	Glendive	Dawson	1952	Stony Mtn.-Red River (U. Ord.)	8700	38	1.25	147	6.5
42	Gypsy Basin	Pondera	1958	Madison (Miss.)	3150	--	--	--	--
43	Hibbard	Rosebud	1960	Amsden (Perm.)	4810	31	1.05	12	15
44	Ivanhoe	Musselshell	1960	Amsden (Perm.)	3600	32	1.08	9	17
45	Ivanhoe	Musselshell	1953	Morrison (U. Jur.)	2800	30	1.08	10	15
46	Ivanhoe	Musselshell	1956	Tyler (U. Miss.)	4050	33	1.08	29	15
47	Keg Coulee	Musselshell	1960	Tyler (U. Miss.)	4550	32	1.15	30	15
48	Kevin-Sunburst	Toole	1922	Madison (Miss.)	1500	32	1.083	6.5	20
49	Little Beaver	Fallon	1952	Red River (U. Ord.)	8300	29	1.16	37	12
50	Little Beaver-East	Fallon	1954	Red River (U. Ord.)	8300	30	1.20	29	12.5
51	Mackay Dome	Carbon-Stillwater	1960	Greybull (L. Cret.)	3650	10	1.00	56	10
52	Melstone	Musselshell	1948	Tyler (U. Miss.)	4250	34	1.09	25	12
53	Monarch	Fallon	1958	Interlake-Red River (Sil.-U.Ord.)	8400	32	1.1	31	7
54	Mosser	Yellowstone	1936	Dakota (L. Cret.)	1000	22	1.01	15.4	23.6
55	Outlook	Sheridan	1956	Siluro-Devonian	9000	38	1.12	20	8
56	Outlook	Sheridan	1957	Red River (U. Ord.)	9900	33	1.21	35	8
57	Pennel	Fallon	1955	Siluro-Ordovician	8800	33	1.135	40	11
58	Pennel	Fallon	1957	Mission Canyon (Miss.)	7000	31	1.10	38	3.4
59	Pennel	Fallon	1960	Lodgepole (Miss.)	7500	36	1.13	30	8
60	Pine	Dawson, Wibaux, Fallon, Prairie	1952	Siluro-Ordovician	8400	34	1.17	32	11.5
61	Pondera	Pondera-Teton	1927	Madison (Miss.)	2100	34	1.20	15	16
62	Poplar-East	Roosevelt	1952	Charles-Mission Canyon (Miss.)	5550	40	1.10	25	11
63	Poplar-Northwest	Roosevelt	1952	Charles-Mission Canyon (Miss.)	6260	40	1.10	16	10.3
64	Ragged Point	Musselshell	1947	Kibbey (U. Miss.)	4400	33	1.09	28	11
65	Ragged Point	Musselshell	1956	Tyler (U. Miss.)	3580	32	1.10	14	14.5
66	Reagan	Glacier	1947	Madison (Miss.)	3700	38	1.10	11	12
67	Red Creek	Glacier	1958	Kootenai (L. Cret.)	2600	33	1.17	20	19.2
68	Red Creek	Glacier	1958	Madison (Miss.)	2750	28	1.10	18	13
69	Red Stone	Sheridan	1958	Winnipegosis (Dev.)	9400	39	1.10	10	7
70	Repeat	Carter	1956	Red River (U. Ord.)	8610	23	1.024	25	10
71	Richey	Dawson-McCone	1951	Charles (Miss.)	7000	39	1.203	25	8
72	Richey-Southwest	McCone	1952	Interlake (Sil.)	9200	48	1.37	21	9
73	Richey-Southwest	McCone	1952	Dawson Bay (Dev.)	9130	48	1.37	6	9
74	Sand Creek	Dawson	1959	Interlake (Sil.)	8950	39	1.30	20	10
75	Sand Creek	Dawson	1959	Red River (U. Ord.)	9400	39	1.30	15	10
76	Sidney	Richland	1958	Mission Canyon (Miss.)	9000	32	1.50	30	4
77	Snyder	Big Horn	1952	Tensleep (Penn.)	4550	21	1.16	12	20
78	Soap Creek	Big Horn	1920	Tensleep-Amsden-Madison	1900	20	1.045	20	15
79	Stensvad	Musselshell-Rosebud	1958	Tyler (U. Miss.)	5500	33	1.171	26.25	14
80	Sumatra	Rosebud	1949	Tyler (U. Miss.)	4500	32	1.16	30	18.5
81	Sumatra	Rosebud	1955	Amsden (L. Penn.)	4000	29	1.10	8	20
82	Tule Creek	Roosevelt	1960	Nisku (Dev.)	7700	45	1.30	30	25
83	Whitlash	Liberty	1927	(L. Cret.)	1400	38	1.13	15	16
84	Wills Creek	Fallon	1957	Sil-Ordovician	8500	32	1.20	70	12
85	Wolf Springs	Yellowstone	1955	Amsden (L. Penn.)	6200	30	1.0745	10.5	5.75
86	Woodrow	Dawson	1952	Charles (Miss.)	7800	32	1.45	19	17.3
	TOTALS								
	Average								31.7

JA — SUMMARY OF OIL FIELDS

me or	Avg. Net Pay Ft.	Avg. Poro-sity %	Avg. Connate Water %	Original Oil In Place Bbls/Acre	Productive Area 12-31-60 Acres	Original Oil In Place 1000 Bbls.	Estimated Primary Recovery Factor %	Original Primary Reserves 1000 Bbls.	Cumulative Production 12-31-60 1000 Bbls.	Remaining Primary Reserves 12-31-60 1000 Bbls.	1960 Production Total Bbls.	1960 Production Avg. Daily BOPD.	Original Recoverable Reserves Bbls./ Acre	Original Recoverable Reserves Bbls./ Acre Ft.	Line No.
45	14	22	35	14,855	160	2,377	26	618	311	307	30,507	83	3,865	276	1
5	39	15	43	24,635	170	4,188	5	209	114	95	15,568	42	1,230	32	2
8	20	12	35	11,205	160	1,793	10	179	104	75	11,184	31	1,120	56	3
0	20	11.25	17	9,049	411	3,719	20	744	57	687	49,622	135	1,810	91	4
2	22	17	40	17,066	900	15,359	30	4,608	3,668	1,972	263,556	720	5,120	233	5
05	17	16	35	13,647	280	3,821	27	1,032					3,685	217	6
5	8	14	40	4,533	480	2,176	20	435	415	429	122,105	334	906	113	7
1	15	15	35	10,221	160	1,635	25	409					2,556	170	8
8	22	15	30	16,593	300	4,978	23	1,145	1,087	58	6,132	17	3,816	173	9
2	37	11.7	31	22,719	5,282	120,000	5.75	6,900	5,636	1,264	279,909	765	1,306	35	10
4	24	6	53	4,234	640	2,710	20	542	464	78	28,700	78	847	35	11
0	92	4	40	11,419	320	3,654	15	548	312	236	25,920	71	1,712	19	12
0	50	13	30	29,415	6,660	195,904	18	35,263	19,397	21,625	4,469,974	12,213	5,294	106	13
3	25	11	30	13,215	2,179	28,795	20	5,759					2,642	106	14
0	10	21	19	11,997	200	2,399	22	528					2,640	264	15
0	51	21	19	61,186	920	56,291	30	16,887	19,569	3,087	180,760	493	18,351	360	16
0	6	22	40	5,586	120	670	32	214					1,783	297	17
0	25	18	40	19,043	880	16,758	30	5,027					5,713	229	18
6	28	14	43	14,941	40	598	12	72	64	8	634	2	1,800	64	19
2	19	19	39	8,896	400	3,558	35	1,245	968	402	145,857	398	3,112	165	20
2	11	20	30	6,222	80	498	25	125					1,563	142	21
0	33	13	35	14,421	160	2,307	5	115	111	4	11,403	31	718	22	22
48	16	15	35	10,542	53,050	559,253	19	106,258	91,287	22,455	2,077,933	5,677	2,003	125	23
0	10	14	30	6,912	4,010	27,717	27	7,484					1,866	187	24
1	112	6.7	35	31,270	480	15,010	8	1,201					2,502	22	25
2	71	7	35	20,543	400	8,217	9.4	772	1,366	607	168,257	460	1,930	27	26
5	12	6.5	30	3,683	440	1,621	20	324	209	115	34,658	95	736	61	27
2	11	17	64	5,120	120	614	10	61	36	25	0	0	508	46	28
0	12	12	22	5,445	1,700	9,257	20	1,851					1,089	91	29
0	30	12	25	17,455	1,000	17,455	20	3,491	3,913	1,429	33,403	91	3,491	116	30
2	30	11.8	55	11,033	640	7,061	15	1,059	92	967	91,890	256	1,654	55	31
6	30	21	20	33,702	120	4,044	54	2,184					1,820	61	32
566	124	10.5	10	78,593	1,376	108,144	57	61,642					44,798	361	33
23	224	12	9	168,975	920	155,474	21.5	33,427	34,902	69,052	2,718,419	7,427	36,333	162	34
87	28	19	30	22,448	120	2,694	25	674					5,616	200	35
75	124	11.6	20	83,036	382	31,720	19	6,027					15,777	70	36
5	30	5.6	40	6,255	320	2,002	7.5	150	130	20	1,039	3	468	16	37
18	29	19	16	35,272	80	2,822	25	706	462	244	21,862	60	8,830	305	38
7	18	10	48	6,786	320	2,172	25	543	503	40	14,250	39	1,696	94	39
84	25	9	35	8,836	1,305	11,531	18	2,076	1,411	665	186,250	510	1,590	64	40
5	147	6.5	35	38,544	1,040	40,086	20	8,017	4,786	3,231	455,762	1,248	7,708	52	41
	--	--	--	--	160	300	25	75	19	56	8,283	23	469	--	42
5	12	15	35	8,644	40	346	25	87	47	40	47,201	154	2,175	181	43
8	9	17	40	6,594	110	725	35	254					2,309	265	44
8	10	15	35	7,004	80	560	18	100	1,581	1,585	353,062	965	1,250	125	45
8	29	15	20	24,997	450	11,249	25	2,812					6,249	215	46
5	30	15	25	23,071	560	12,920	20	2,584	233	2,351	232,871	843	4,614	154	47
83	6.5	20	35	6,053	40,205	243,361	30	73,008	65,523	7,485	743,936	2,033	1,816	280	48
6	37	12	35	19,299	1,910	36,861	10	3,686	1,327	2,359	258,149	605	1,949	53	49
0	29	12.5	35	15,233	728	11,090	10	1,109	532	577	271,207	740	1,520	52	50
0	56	10	20	34,755	80	2,780	5	139	3	136	2,596	7	1,738	31	51
9	25	12	30	14,945	360	5,380	23.4	1,259	1,195	64	36,121	99	3,497	140	52
	31	7	35	9,946	2,080	20,688	15	3,103	512	2,591	395,352	1,080	1,492	48	53
1	15.4	23.6	30	19,540	96	1,876	18	338	158	180	6,181	17	3,521	229	54
2	20	8	30	7,758	1,760	13,652	21	2,867	1,953	1,072	606,410	1,651	1,629	81	55
1	35	8	45	9,875	80	790	20	158					1,975	56	56
35	40	11	35	19,548	2,640	51,606	10	5,161					1,954	49	57
0	38	3.4	30	6,378	80	510	15	77	2,808	3,629	585,666	1,600	963	25	58
3	30	8	35	10,709	560	5,997	20	1,199					2,141	71	59
7	32	11.5	30	17,078	13,488	230,348	20	46,070	26,271	19,799	5,112,014	13,932	3,415	107	60
0	15	16	31	10,706	5,520	59,097	35	20,684	15,102	5,582	504,829	1,379	3,747	250	61
0	25	11	30	13,576	17,909	243,133	30	72,940	27,205	45,735	3,207,394	8,763	4,073	163	62
0	16	10.3	45	6,393	400	2,557	15	384	241	143	24,748	67	960	60	63
9	28	11	40	13,152	140	1,841	27	497	966	480	154,373	412	3,550	128	64
0	14	14.5	35	9,307	340	3,164	30	949					2,785	199	65
0	11	12	30	6,517	3,010	19,616	30	5,885	2,592	3,293	190,334	522	1,950	178	66
7	20	19.2	25	19,094	760	14,511	25	3,628	539	4,836	343,971	940	4,780	242	67
0	18	13	30	11,553	840	9,705	18	1,747					2,080	115	68
0	10	7	45	2,715	80	217	15	33	16	17	8,305	23	412	41	69
24	25	10	30	13,258	160	2,122	16	340	169	171	38,985	106	4,250	85	70
03	25	8	30	9,028	940	8,486	23	1,952	1,453	499	195,463	534	2,080	83	71
7	21	9	35	6,955	300	2,087	35	730	599	356	79,206	216	2,435	116	72
7	6	9	30	2,140	300	642	35	225					750	125	73
0	20	10	40	7,160	680	4,869	15	730	488	371	330,009	901	1,075	54	74
0	15	10	40	5,370	240	1,289	10	129					538	36	75
0	30	4	40	3,724	160	596	20	119	39	80	18,436	50	744	25	76
6	12	20	35	10,431	149	1,554	20	311	266	45	20,926	57	2,085	174	77
45	20	15	35	14,488	410	5,940	22	1,307	1,004	303	64,045	175	3,185	159	78
71	26.25	14	20	19,465	1,382	26,900	25	6,725	3,046	3,679	1,941,645	5,305	4,860	185	79
6	30	18.5	35	24,123	3,160	76,244	25	19,061	11,337	8,091	2,144,939	5,860	6,030	201	80
0	8	20	35	7,335	200	1,467	25	367					1,835	229	81
0	30	25	25	33,565	320	10,741	30	3,222	31	3,191	31,312	482	10,100	336	82
3	15	16	20	13,180	1,100	14,498	15	2,175	1,174	1,001	25,698	70	1,980	132	83
0	70	12	25	40,730	800	32,584	20	6,517	1,003	5,514	408,242	1,115	8,150	116	84
745	10.5	5.75	23	3,356	4,330	14,531	20	2,906	2,492	414	370,236	1,011	670	64	85
5	19	17.3	35	11,433	160	1,829	10	183	139	44	23,562	64	1,143	60	86
					197,982	2,662,341		618,383	363,437	254,946	30,231,760				
	31.7						23.22					82,665	3,123	98.5	


LINCOLN
FLATHEAD
GLACIER
TOOLE
LIBERTY
HILL
PONDERA
CHOTEAU
SANDERS
TETON
MISSOULA
POWELL
LEWIS AND CLARK
CASCADE
JUDITH BASIN
MINERAL
MEAGHER
RAVALLI
GRANITE
JEFFERSON
BROADWATER
DEER LODGE
GALLATIN
PARK
SILVER BOW
BEAVERHEAD
MADISON
EXPLANATION
Oil Field
Gas Field
Oil Pipeline
Gas Pipeline
Refinery
Products Pipeline
Boundary Dividing Northern and Southern Districts
Helena - Administrative Office
Billings - Southern District & Technical Office
Shelby - Northern District Office
Sidney - Field Inspector



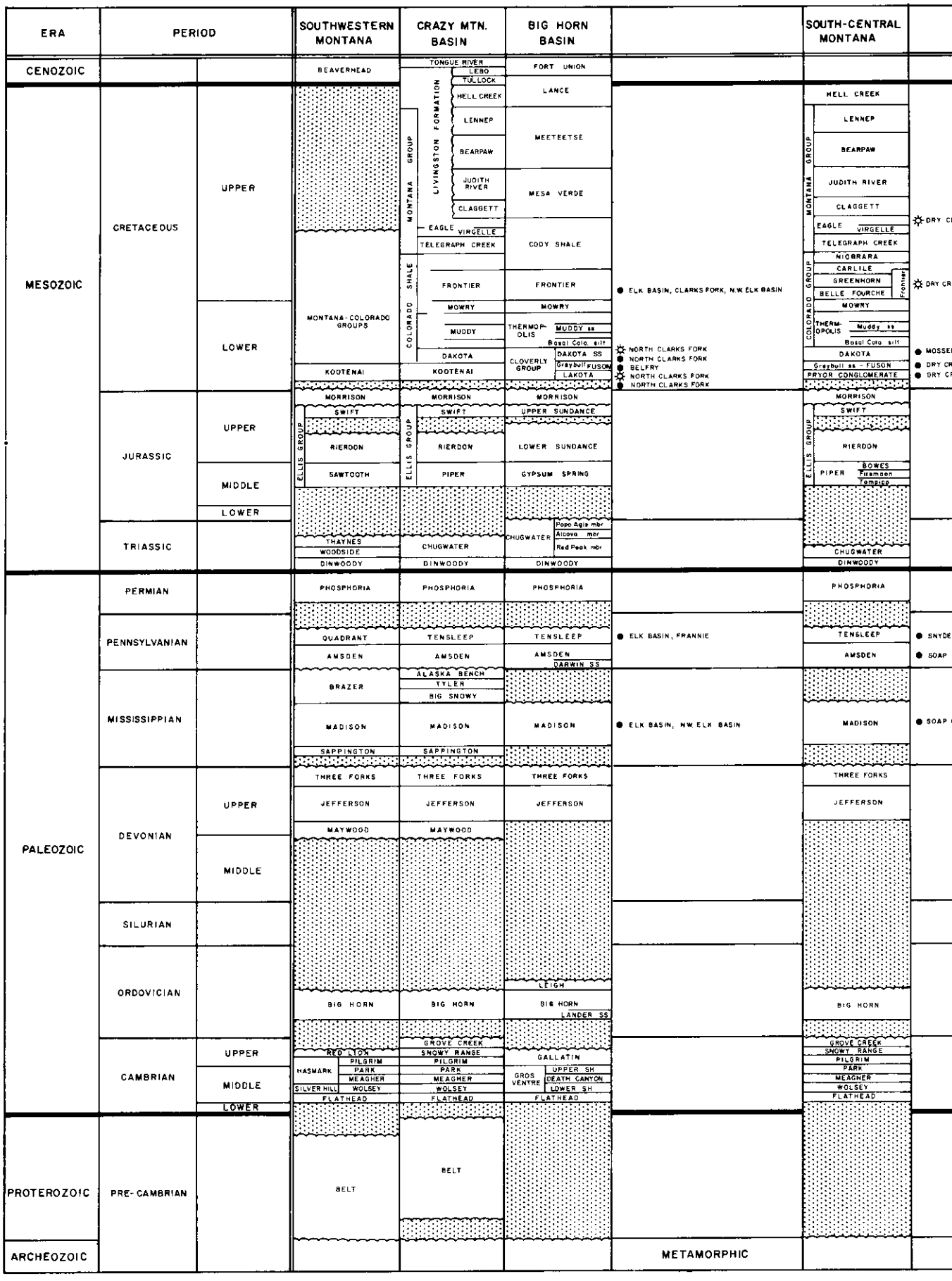
MONTANA

OIL AND GAS FIELDS, PIPELINES AND REFINERIES

1960

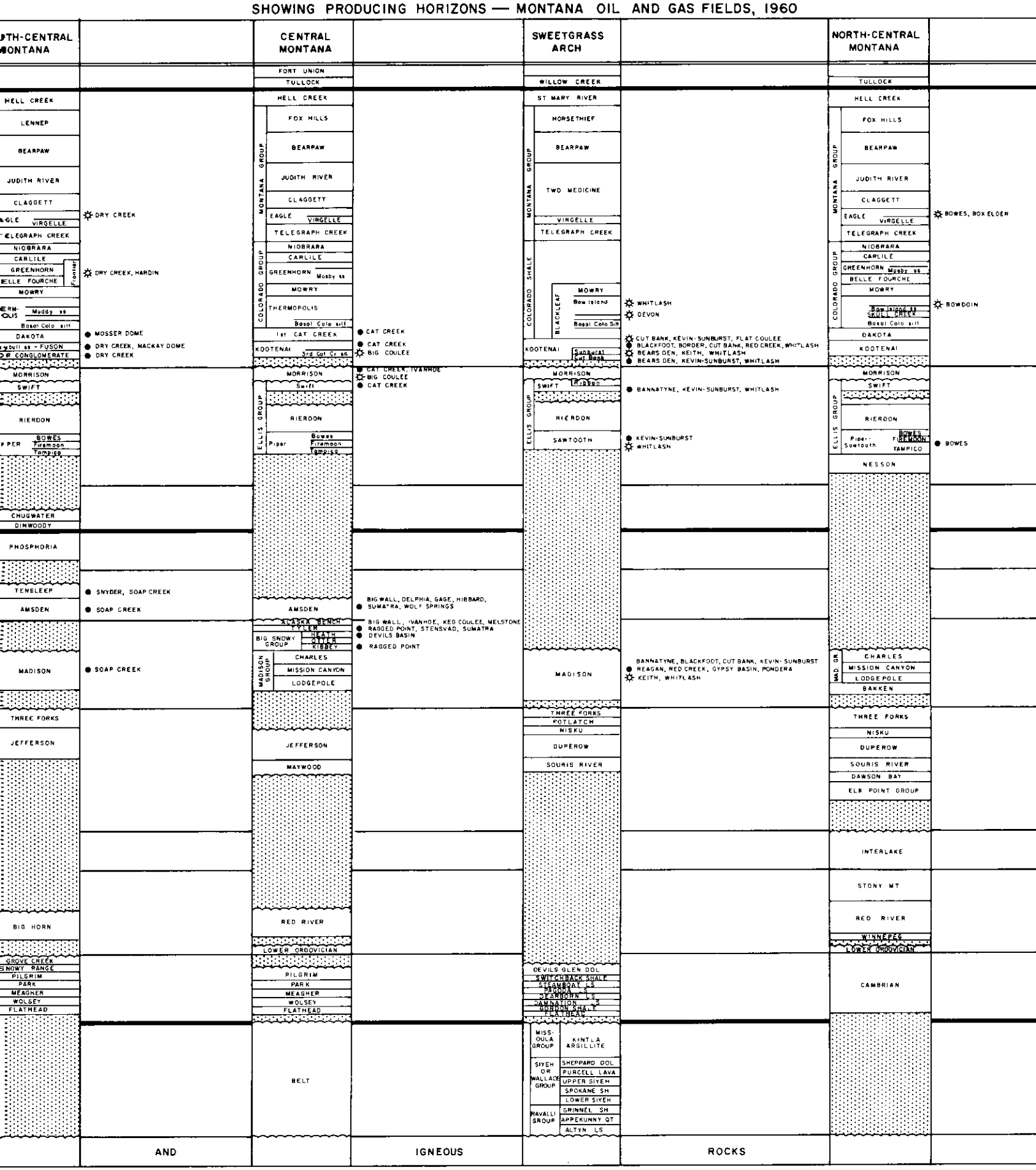
THE OIL AND GAS CONSERVATION COMMISSION
OF THE STATE OF MONTANA

Compilation and Drafting GEORGE S. SORLIE


ERA
PERIOD
SOUTHWESTERN MONTANA
CRAZY MTN. BASIN
BIG HORN BASIN
SOUTH-CENTRAL MONTANA
CENOZOIC
MESOZOIC
PALEOZOIC
PROTEROZOIC
ARCHEOZOIC
CRETACEOUS
JURASSIC
TRIASSIC
PERMIAN
PENNSYLVANIAN
MISSISSIPPIAN
DEVONIAN
SILURIAN
ORDOVICIAN
CAMBRIAN
PRE-CAMBRIAN
UPPER
MIDDLE
LOWER
BEAVERHEAD
TONGUE RIVER
LEBO
TULLOCK
HELL CREEK
LENNEP
BEARPAW
JUDITH RIVER
CLAGGETT
EAGLE
VIRGELLE
TELEGRAPH CREEK
LIVINGSTON FORMATION
MONTANA GROUP
COLORADO SHALE
FRONTIER
MOWRY
MUDDY
DAKOTA
KOOTENAI
MONTANA-COLORADO GROUPS
FORT UNION
LANCE
MEETEETSE
MESA VERDE
CODY SHALE
FRONTIER
MOWRY
THERMOPOLIS
MUDDY ss
Basal Colo. silt
CLOVERLY GROUP
DAKOTA SS
Greybull FUSON
LAKOTA
KOOTENAI
MORRISON
SWIFT
RIERDON
SAWTOOTH
ELLIS GROUP
PIPER
UPPER SUNDANCE
LOWER SUNDANCE
GYPSUM SPRING
CHUGWATER
Popo Agie mbr
Alcova mbr
Red Peak mbr
THAYNES
WOODSIDE
DINWOODY
PHOSPHORIA
TENSLEEP
AMSDEN
DARWIN SS
QUADRANT
ALASKA BENCH
TYLER
BIG SNOWY
BRAZER
MADISON
SAPPINGTON
THREE FORKS
JEFFERSON
MAYWOOD
LEIGH
BIG HORN
LANDER SS
GROVE CREEK
SNOWY RANGE
RED LION
PILGRIM
HASMARK
PARK
MEAGHER
SILVER HILL
WOLSEY
FLATHEAD
GALLATIN
GROS VENTRE
UPPER SH
DEATH CANYON
LOWER SH
BELT
METAMORPHIC
ELK BASIN, CLARKS FORK, N.W. ELK BASIN
NORTH CLARKS FORK
BELFRY
NORTH CLARKS FORK
NORTH CLARKS FORK
ELK BASIN, FRANNIE
ELK BASIN, NW. ELK BASIN
HELL CREEK
LENNEP
BEARPAW
JUDITH RIVER
CLAGGETT
EAGLE
VIRGELLE
TELEGRAPH CREEK
NIOBRARA
CARLILE
GREENHORN
BELLE FOURCHE
Frontier
MOWRY
THERMOPOLIS
Muddy ss
Basal Colo. silt
DAKOTA
Greybull ss. - FUSON
PRYOR CONGLOMERATE
MORRISON
SWIFT
RIERDON
PIPER
BOWES
Firamoo
Tampico
CHUGWATER
DINWOODY
PHOSPHORIA
TENSLEEP
AMSDEN
MADISON
THREE FORKS
JEFFERSON
BIG HORN
GROVE CREEK
SNOWY RANGE
PILGRIM
PARK
MEAGHER
WOLSEY
FLATHEAD
DRY
MOSSE
SNYDE
SOAP

GENERALIZED STRATIGRAPHIC CORRELATION CHART

SHOWING PRODUCING HORIZONS — MONTANA OIL AND GAS FIELDS, 1960



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