

Oil and Gas Conservation Commission

OF THE STATE OF MONTANA



ANNUAL REVIEW FOR THE YEAR 1968

Relating to

OIL AND GAS

Volume 12

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Annual Review for the Year 1968 Volume 12

INTRODUCTION

This is the twelfth Annual Review of drilling and producing operations in Montana.

Oil production in Montana during 1968 was 48,460,246 barrels. This was a new high for Montana production and represents an increase of approximately 39% compared to 1967. Reserves remaining in Montana fields as of January 1, 1969, are at about the same level as a year ago. This reflects a net increase of some 48,000,000 barrels or enough to offset 1968's record production. Most of the increase in reserves is attributed to secondary oil anticipated from the Bell Creek Field. Reserve increases in other fields were offset by decline and adjustments to reserves in some of the older fields. Average daily production in 1968 increased from 96,549 barrels in 1967 to 132,405 barrels.

There were 940 wells drilled in Montana during 1968. Of these 537 were exploratory and 403 were development wells. Exploratory drilling resulted in 15 oil discoveries, 13 gas discoveries and 509 dry holes. Development drilling resulted in 309 oil wells, 14 gas wells and 89 dry holes.

There were several significant discoveries made during 1968 in Northern Montana. Swift sandstone oil production was found at Laird Creek field; gas production from the Sunburst sandstone at Black Jack field and Sunburst sandstone oil production in the West Butte field. Activity continued in the Tiger Ridge gas field, and at year end there were 33 shut-in gas wells in the field. Considerable activity during 1969 is indicated in the Bearpaw uplift region.

Northeastern Montana was the site of several oil discoveries in the Red River dolomite at depths exceeding 12,000 feet. These include the new fields of South Brorson, Fairview and Rush Mountain. Some Red River wells had initials of 750 barrels per day or higher. Several wildcat locations were staked in this area near the year's end. Greatly increased wildcat and development activity appears assured for 1969.

Exploration and development in Central and South Central Montana continued during 1968 at about the same rate as 1967. Deeper Amsden dolomite oil was found on Mosby Dome of the Cat Creek Anticline in Central Montana.

The Bell Creek Muddy sandstone field in Southeastern Montana continued to expand and 328 wells produced 1,528,444 barrels of oil during December, 1968. A gas extraction plant at Bell Creek is expected to be operating at full capacity of about 31 MMCFG/D early in 1969. The south and southwest edges of this field have not yet been fully delineated.

Seven secondary recovery projects were commenced during 1968. Waterfloods of selected areas in the Cut Bank Field, Northern Montana, have caused a significant increase in production and additional projects are expected to be completed during 1969.

The substantial increase in oil industry interest in Montana during 1968 was dramatically indicated by the footage drilled: 4,538,711 feet, compared to 2,158,964 in 1967.

FIVE YEAR SUMMARY

	1964	1965	1966	1967	1968
Production, Northern Montana—Bbls.....	5,705,948	6,826,261	7,991,302	6,758,280	6,883,493
South Central—Bbls.....	3,699,927	3,597,647	3,392,890	3,181,132	2,885,272
Central—Bbls.....	3,269,768	2,849,923	2,710,194	2,872,604	2,728,357
Williston Basin—Bbls.....	17,971,855	19,504,287	21,285,732	20,475,733	19,390,652
Powder River Basin—Bbls.....				1,671,277	16,572,472
TOTAL	30,647,498	32,778,118	35,380,118	34,959,026	48,460,246
No. of Producing Wells, Northern Montana.....	2,216	2,649	2,308	2,097	1,898
South Central.....	88	101	106	96	99
Central.....	317	306	301	286	282
Williston Basin.....	708	754	792	802	784
Powder River Basin.....				109	328
TOTAL.....	3,329	3,810	3,507	3,390	3,391
Average Daily Production/Well—BOPD,					
Northern Montana.....	7.4	7.1	9.5	8.8	9.9
South Central.....	115.1	97.6	87.7	90.7	79.6
Central.....	28.8	25.5	24.7	27.5	26.4
Williston Basin.....	65.7	70.9	73.6	69.9	67.6
Powder River Basin.....				70.6	138.0
STATE AVERAGE.....	25.2	23.6	27.6	28.2	39.0
Development Wells Drilled, Oil Wells.....	100	177	179	162	300
Gas Wells.....	7	9	9	14	14
Dry Holes.....	109	107	96	104	89
TOTAL.....	216	293	284	280	403
Exploratory Wells Drilled, Oil Wells.....	22	14	10	7	15
Gas Wells.....	3	1	3	5	13
Dry Holes.....	150	199	185	191	509
TOTAL.....	175	214	198	203	537
TOTAL WELLS DRILLED.....	391	507	482	483	940
TOTAL FOOTAGE DRILLED.....	1,863,155	2,328,865	2,211,369	2,158,964	4,547,691
AVERAGE DEPTH OF ALL WELLS.....	4,765	4,593	4,588	4,470	4,839

SUMMARY OF DRILLING BY COUNTIES—1968
STATE OF MONTANA

County	Wildcats			Development		Total Wells		Footage Drilled	Avg. Depth Per Well
	Dry	Oil	Gas	Dry	Oil	Gas	Drilled		
Big Horn	17	0	0	0	1	0	18	112,170	6,232
Blaine	11	1	3	2	1	1	19	59,902	3,152
Carbon	1	0	0	1	6	0	8	49,135	6,142
Carter	98	0	0	1	4	0	103	420,491	4,082
Chouteau	14	0	0	0	0	0	14	29,351	2,096
Custer	51	0	0	0	0	0	51	278,386	5,459
Daniels	0	0	0	0	1	0	1	7,590	7,590
Dawson	3	0	0	0	0	0	3	15,824	5,275
Fallon	3	0	0	1	3	0	7	47,600	6,800
Fergus	2	0	0	0	0	0	2	5,400	2,700
Garfield	2	0	0	1	1	0	4	11,883	2,970
Glacier	1	2	2	5	3	0	13	38,923	2,994
Golden Valley	1	0	0	0	0	0	1	1,705	1,705
Hill	8	0	3	1	0	5	17	33,151	1,950
Judith Basin	3	0	0	0	0	0	3	4,762	1,587
Liberty	13	1	2	8	11	2	37	101,574	2,745
McCone	8	0	0	0	0	0	8	44,381	5,548
Musselshell	10	0	0	6	8	0	24	110,664	4,611
Petroleum	0	0	0	4	1	0	5	14,099	2,820
Phillips	4	0	0	0	0	0	4	14,248	3,562
Pondera	4	1	0	0	10	0	15	43,271	2,885
Powder River	133	2	0	39	225	3	402	2,032,402	5,056
Prairie	16	0	0	1	0	0	17	103,339	6,079
Richland	4	2	0	2	12	0	20	255,086	12,754
Roosevelt	3	0	0	3	0	0	6	46,569	7,762
Rosebud	45	1	0	3	4	0	53	291,511	5,500
Sheridan	7	2	0	7	5	0	21	185,186	8,818
Stillwater	3	0	0	0	0	0	3	9,957	3,319
Teton	4	0	0	0	0	0	4	9,132	2,283
Toole	29	3	3	4	4	3	46	102,149	2,221
Treasure	1	0	0	0	0	0	1	6,394	6,394
Valley	7	0	0	0	0	0	7	35,607	5,087
Wibaux	1	0	0	0	0	0	1	7,432	7,432
Yellowstone	2	0	0	0	0	0	2	9,437	4,718
TOTALS	509	15	13	89	300	14	940	4,538,711	4,828

TOTAL
132,405

PERCENT

SOUTHEASTERN MONT.
(Powder River Basin)

34.2

NORTHEASTERN MONT.
(Williston Basin)

40.0

SOUTH CENTRAL MONT.
(Big Horn Basin)

6.0

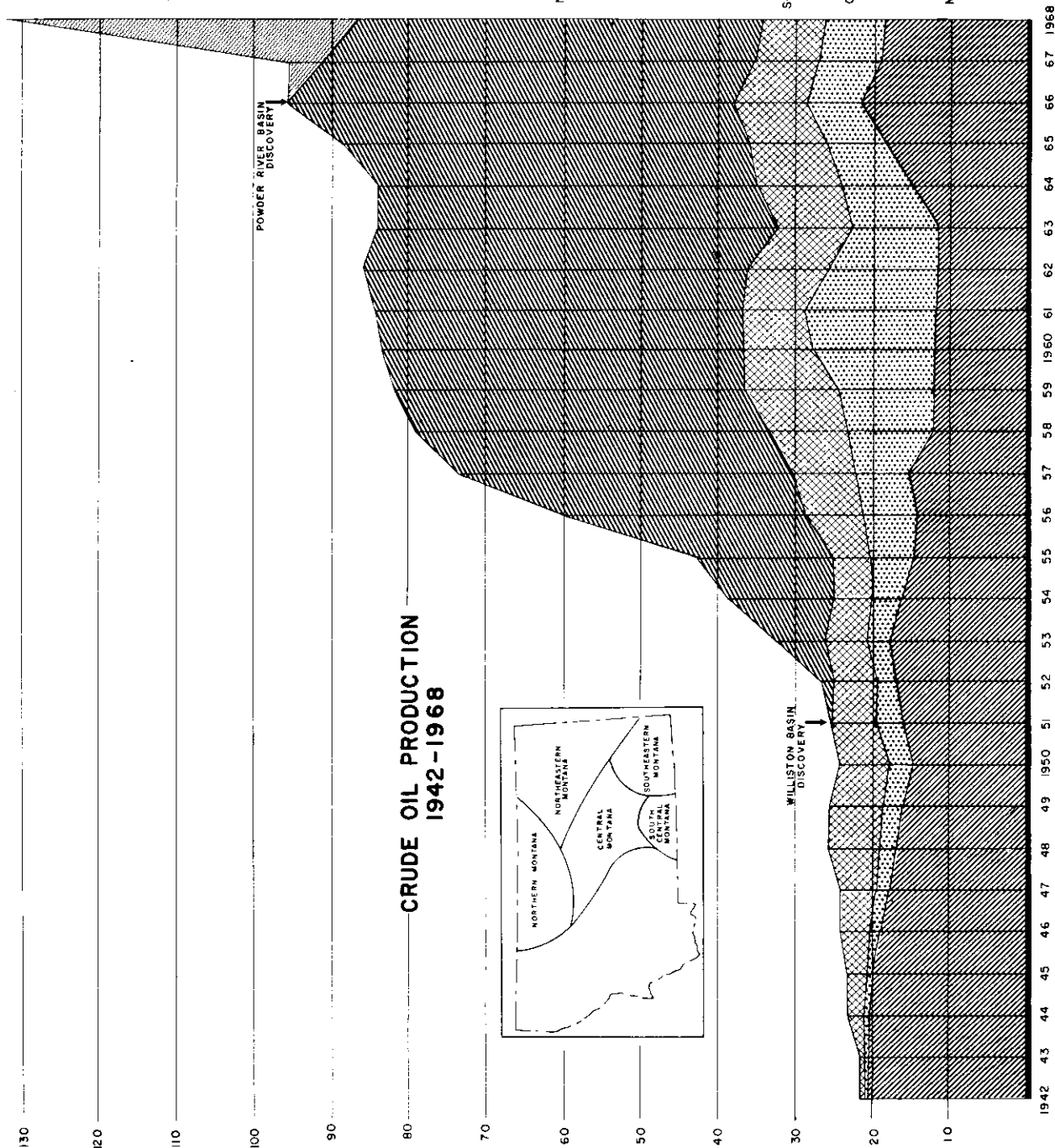
CENTRAL MONTANA
(Big Snowy Uplift)

5.6

NORTHERN MONTANA
(Sweetgrass Arch -
Bearpaw Uplift)

14.2

CRUDE OIL PRODUCTION 1942-1968



B.O.P.D. (THOUSANDS)

GAS PRODUCTION DATA—1968

Field	County	Producing Formations	1968 Production M.C.F.
Big Coulee	Golden Valley & Stillwater	Lakota & Morrison	1,059,012
Bell Creek	Powder River	Muddy	586,214
Bowdoin	Phillips & Valley	Colorado	1,988,908
Bowes	Blaine	Eagle	497,649
Cabin Creek	Fallon	Interlake & Red River	1,261,514
Cedar Creek	Fallon & Wibaux	Judith River & Eagle	4,821,151
Cut Bank & Reagan	Glacier & Toole	Cut Bank & Madison	7,811,914
Dry Creek	Carbon	Eagle & Frontier	359,693
Elk Basin	Carbon	Tensleep	1,149,799
Flat Coulee	Liberty	Blackleaf & Swift	104,520
Gold Butte	Toole	Swift	57,761
Grandview	Liberty	Blackleaf & Kootenai	417,264
Hardin	Big Horn	Frontier	36,068
Keith Block	Liberty	Blackleaf & Sawtooth	3,423,288
Kevin Sunburst	Toole	Kootenai	681,029
Lake Basin	Stillwater	Frontier	1,247,542
Middle Butte	Toole	Blackleaf	34,376
Mt. Lilly	Liberty	Madison	410,577
Pine	Dawson, Prairie, Fallon & Wibaux	Interlake & Red River	840,664
Plevna	Fallon	Judith River	94,433
Utopia	Liberty	Blackleaf, Kootenai & Ellis	1,141,797
Whitlash	Liberty	Blackleaf, Kootenai	1,210,185
Miscellaneous			2,054,382
TOTAL ALL FIELDS			<u>31,289,740</u>

REFINING

	Year 1968 Total Bbls.
Big West Oil Company	1,290,452
Continental Oil Company	13,833,787
Diamond Asphalt Company	173,188
Farmers Union Central Exchange, Inc.	7,796,561
Humble Oil & Refining Company	14,059,738
Jet Fuel Refinery	30,096
Phillips Petroleum Company	1,689,672
Tesoro Petroleum Company	819,517
Union Oil Company	1,258,382
TOTAL Barrels Oil Refined in Montana, 1968	<u>40,951,393</u>

SUMMARY OF ACTIVE SECONDARY RECOVERY PROJECTS (DATE EFFECTIVE TO JANUARY 1, 1969)

Field, Formation	Operator	Type of Project	Injection Pattern	Date Injections Commenced	Cumulative Injections 1000' Bbls. or MCF	Dec. 1968 Avg. Daily Injection Rate	No. of Injection Wells	Source of Injection Media & Remarks
Ash Creek, Shannon	McDermott	Waterflood	Peripherial	10-15-64	552	304	4	Parkman, Date for Montana portion
Big Well, Tyler B	Texaco, Inc.	"	Modified Peripherial	8-20-66	4,253	5,480	2	Produced water from Asuden & Tyler
Bowes, Sawtooth	Texaco, Inc.	"	Dispersed Pilot	5-23-61	2,711	1,220	4	Madison
Cabin Creek, Siluro-Ordovician	Shell Oil	"	Modified Peripherial	6-12-59	30,882	24,491	25	Produced Water & Fox Hills
Cat Creek, 1st & 2nd CC (Unit 1)	Continental Oil	"	Peripherial	10-10-62	6,535	0	4	Third Cat Creek
Cat Creek, 1st & 2nd CC (Unit 2)	Continental Oil	"	Peripherial	12-1-59	15,771	0	4	Third Cat Creek
Corral Creek, Siluro-Ordovician	Shell Oil	"	Modified Peripherial	4-67	3,400	7,764	12	Minnelusa
Cut Bank, NE Unit, Cut Bank	Texaco, Inc.	"	5-Spot	9-2-63	7,817	4,125	31	Madison
Cut Bank, NW Unit, Cut Bank	Humble Oil	"	5-Spot	1-30-62	9,766	3,670	23	Madison
Cut Bank, So. Central, Cut Bank	Union Oil	"	5-Spot	5-63	13,008	6,897	36	Madison
Cut Bank, SE Unit, Cut Bank	Texaco, Inc.	"	5-Spot	4-62	19,866	12,300	51	Madison
Cut Bank, SW Unit, Cut Bank	Phillips Petr.	"	5-Spot	9-62	11,859	22,411	118	Madison
Cut Bank, Tribal, Lander	Humble Oil	"	Dispersed	6-51	4,759	0	2	Eagle
Cut Bank, H. C. Lander, Lander	Humble Oil	"	Dispersed	4-65	762	606	2	Eagle
Cut Bank, Lander Sand, Lander	Texaco, Inc.	"	Dispersed	7-64	2,016	1,709	6	Eagle
Cut Bank, McGuinness-Moulton	Union Oil	"	Dispersed	12-62	1,625	527	1	Madison
Cut Bank, Moulton	Union Oil	"	Dispersed	8-68	516	4,682	6	Madison
Cut Bank, Two Medicine, Cut Bank	Miami Oil	"	5-Spot	12-67	3,237	11,379	63	Madison
Garling, State Unit, Moulton	B.G.G.O. Co.	"	Dispersed	2-67	395	464	1	Madison
Garling, NE Unit, Moulton	Ralph E. Fair	"	Dispersed	2-68	436	1,303	3	Madison
Garling, South, Swenson, Moulton	B.G.G.O. Co.	"	Dispersed	2-67	1,166	2,505	5	Madison
Gower, Ratcliffe	Phillips	"	Pilot	10-68	24	296	1	Produced Water
Elk Basin, Frontier	Pan American	Gas Inj.	Crestal	1926	All injection wells in Wyoming			Purchased Gas
Elk Basin, Embury-Tenaleep	Pan American	Gas Inj.	Crestal	1949	All injection wells in Wyoming			Inert Gas
Elk Basin, Madison	Pan American	Waterflood	Peripherial	1962	21,339	10,889	5	Madison
Elk Basin, NW Unit, Frontier	Sinclair Oil	"	Peripherial	10-57	4,367	1,161	5	Madison
Elk Basin, NW Unit, Tenaleep	Sinclair Oil	"	Modified Peripherial	5-67	349	656	1	Produced Water-Madison
Keg Coulee West, Tyler B	Pan American	"	Modified Peripherial	8-31-66	1,506	2,048	2	Madison
Kevin-Sunburst, Madison	Lon Crumley	"	Dispersed	9-63	435	175	2	Madison
Kevin-Sunburst, Madison	Texaco, Inc.	"	Peripherial	8-64	2,967	2,095	10	Madison
Kevin-Sunburst, Madison	Juniper Oil	"	Dispersed	8-64	795	1,180	8	Madison
Kevin-Sunburst, Madison	Cardinal Petroleum	"	Dispersed	6-65	535	326	7	Madison
Little Beaver, Siluro-Ord.	Shell Oil	"	Semi-Peripherial	8-7-66	5,865	5,514	12	Minnelusa
Little Beaver East, Siluro-Ord.	Shell Oil	"	Semi-Peripherial	4-65	3,211	2,797	5	Minnelusa
Mosby Dome, Swift	Farmers Union	"	Dispersed	7-67	433	957	5	Third Cat Creek
Mosby Dome, 2nd CC	Farmers Union	"	Dispersed	5-68	17	79	5	Third Cat Creek
Moulton, Moulton	Union Oil	"	Dispersed	8-68	516	4,682	6	Madison
Pine, North, Siluro-Ord.	Shell Oil	"	Semi-Peripherial	3-59	43,439	21,187	56	Fox Hills & Produced Water
Pine, South, Siluro-Ord.	Shell Oil	"	Semi-Peripherial	3-68	1,292	4,544	10	Lodgepole
Pondera, Madison	Phillips Petr.	"	Dispersed	8-61	862	65	2	Madison
Ragged Point, Tyler A	Juniper Oil	"	Modified Peripherial	2-3-66	2,026	1,220	4	Third Cat Creek
Reagan, Madison	Union	Gas Inj.	Crestal	8-61	2,485	1,143	2	Produced Gas
Red Creek, Cut Bank	Humble Oil	Waterflood	5-Spot	6-65	3,375	3,403	9	Madison
Richey SW, Dawson Bay-Interlake	Sinclair Oil	"	Dispersed	12-65	1,197	1,267	4	Fox Hills
Stensvad, Tyler B	Pan American	"	Peripherial	2-63	9,998	7,889	5	Mission Canyon
Sumatra, West, Tyler	Conoco	"	Peripherial	10-68	785	4,371	4	Mission Canyon

OIL AND GAS DISCOVERIES IN 1968

County	Operator—Well Name and Location	Field	Total Depth	Initial Potential Oil B/D	Initial Potential Gas MCF	Producing Formation
Blaine	High Crest, Morphey 31-1, NE NE 31-32N-18E	Tiger Ridge	4,113	50		Sawtooth
Blaine	High Crest, State 16-2, SW NE 16-30N-18E	Tiger Ridge	2,042		5,000	Judith River
Blaine	General Crude, Henderson 1, SW SW 27-27N-17E	Unnamed	2,358		1,250	Eagle
Blaine	Gulf Oil Corp., Federal 15-1, NE SW 15-25N-20E	Unnamed	1,987		974	Eagle
Glacier	Montana Power, Thelen 1, NW SE NE 13-37N-9W	Landslide Butte	4,725	25		Sun River
Hill	High Crest, Anderson 30-1, NE SW 30-31N-16E	Tiger Ridge	1,601		1,500	Eagle
Hill	Golden Eagle, Sands 15-1, NE SW 15-32N-15E	Squaw Coulee	1,271		1,300	Eagle
Hill	Oil & Gas Futures, Rocky Boy 1-31, NW SW 31-30N-15E	Unnamed	2,500		500	Judith River
Liberty	NPRR-McGregor, Corcoran-Gray 14-26, SW SW 26-37N-5E	Laird Creek	2,770	108		Swift
Liberty	Rossmiller, Govt. 1, NW NW 2-36N-5E	Black Jack	2,447		1,230	Sunburst
Liberty	NPRR-McGregor, Jensen "C" 32-34, SW NE 34-37N-5E	Black Jack	2,600		2,510	Sunburst
Petroleum	Farmers Union, State 8, SW SW 16-15N-30E	Cat Creek	3,998	50		Amsden
Pondera	Balcon, Tatman 1, NW NE 12-27N-3W	Unnamed	1,707	5		Sunburst
Powder River	Alpine, Federal-Sawtooth 1, SW SE 17-6S-53E	Unnamed	5,050	58		Muddy
Richland	Woods Petr., Dynneson 1, SE NW 7-23N-58E	South Brorson	12,560	744		Red River
Richland	Consolidated, Young Heirs 1, NW NE 31-25N-59E	Fairview	12,850	930		Red River
Rosebud	Cardinal, Federal 11-20, NE SW 20-9S-53E	Bell Creek	4,845	103		Muddy
Rosebud	BGGO Co., Midkiff 1, SW SW 8-9N-32E	Injun Creek	6,035	175		Tyler
Sheridan	Signal, Nordhagen 1, NW NW 36-36N-58E	Goose Lake	6,916	125		Ratcliffe
Sheridan	Sinclair, Hoffelt 1, SE SW 32-32N-59E	Rush Mountain	12,038	316		Red River
Toole	Sumatra Oil, USA 32-11, SE SW NE 11-37N-2E	Fred & George	2,772	11		Sunburst
Toole	Grannell, Clark-Beaudoin 13-5, SE SW 5-37N-2E	Unnamed	2,615	70		Sunburst
Toole	Batts-Balack, Weigen 1-226, SE NW 6-31N-2E	Unnamed	1,658		1,710	Bow Island
Toole	Fulton et al, Berthelate 22-8, SE NW 8-36N-2E	West Butte	2,463	240		Sunburst
Toole	Fulton et al, Federal 31-8, NW NE 8-36N-2E	West Butte	2,706		13,500	Sawtooth-Madison
Toole	A.A. Oil, Fey 15-1, SW SE 1-36N-2E	Arch Apex	1,975		314	Bow Island

UNNAMED OIL AND GAS AREAS

County	Location	Producing Formation	No. Wells	Status
Blaine County	Sec. 15, T. 25N., R. 20E.	Eagle	1	(Shut-in) Gas
Blaine County	Sec. 27, T. 27N., R. 17E.	Eagle	1	(Shut-in) Gas
Carter County	Sections 6 & 7, T. 8S., R. 55E.	Muddy	2	(Shut-in) Gas
Daniels County	Sec. 26, T. 35N., R. 48E.	Ratcliffe	2	Oil
Hill County	Sec. 31, T. 30N., R. 15E.	Judith River	1	(Shut-in) Gas
Pondera County	Sec. 12, T. 27N., R. 3W.	Sunburst	1	Oil
Richland County	Sec. 11, T. 24N., R. 55E.	Red River	1	Oil
Toole County	Sec. 5, T. 37N., R. 2E.	Sunburst	1	Oil
Toole County	Sec. 6, T. 31N., R. 2E.	Bow Island	1	Gas
Toole County	Sec. 14, T. 36N., R. 2E.	Sunburst ?	1	Oil

OIL AND GAS FIELDS

Field, Formation, Age	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations, Field Rules, and Remarks	Secondary Recovery or Water Disposal
ANTELOPE Swift (U. Jur.)	4	Structural	Water Drive	(Listed as part of Cat Creek Field)	None
ARCH APEX Bow Island (L. Cret.) Gas Swift (Jurassic) Gas (Shut-in)	16 1	Strat. Strat.	Volumetric Volumetric	330' from legal subdivision; 2400' from any other drilling or producible gas well producing from the same reservoir; 75' topographic tolerance. (Order 4-60.) (Sometimes called Colorado Blackleaf pool.) (Swift) State-wide.	None
ASH CREEK Shannon (U. Cret.)	3	Structural	Partial Water Drive and Depletion	Spacing waived within unitized portion of field except no well may be drilled closer than 660' from unit boundary. (Order 4-65.)	Waterflood started October, 1964. (Orders 22-64, 15-66.)
BANNATYNE Swift (U. Jur.) Sun River (U. Miss.)	2 2	Structural Structural	Comb. Water Drive and Volumetric	Center of 10-acre tracts, 50' topographic tolerance. Commingling permitted. (Order 20-58.) State-wide. (Order 10-63.)	Pilot waterflood of Swift suspended in 1963.
BASCOM Amsden (Penn.) Tyler (L. Penn.)	1	Strat. Struct.-Strat.	Water Drive Depletion	State-wide. (Order 10-63.)	None
BEARS DEN Sunburst (L. Cret.) Gas Swift (U. Jur.) Oil Sawtooth (Jur.) Gas (Shut-in)	2 3 1	Structural	Depletion and Gas Cap Drive	State-wide.	None
BELL CREEK Muddy (L. Cret.)	328	Strat.	Depletion	40-acre spacing units with location 660' from unit boundary with 150' tolerance for topographic reasons only. 300 barrel per well per day MER. Semi-annual bottom-hole pressure surveys. Quarterly gas-oil ratio tests. (Orders 37-67, 39-67, 50-67, 1-69.) Gas extraction plant.	None

Field, Formation, Age	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations, Field Rules, and Remarks	Secondary Recovery or Water Disposal
BENRUD Nisku (Dev.)	1	Structural	Water Drive	160-acre spacing units with permitted location within a 1320' square in center of quarter section. (Order 6-65.)	Water disposal into Judith River formation. (Order 64-62.)
BENRUD, EAST Nisku (Dev.)	1	Structural	Water Drive	Same as Benrud Field. (Order 6-65.)	Water disposal into Judith River formation. (Order 64-62, 32-66.)
BENRUD, NORTHEAST Nisku (Dev.)	1	Structural	Water Drive	Same as Benrud Field. (Order 6-65.)	Water disposal into Judith River formation. (Order 32-66.)
BERTHELOTE Sunburst (L. Cret.)	1	Strat.	Depletion	40-acre spacing units with well no closer than 330' from lease or property line and not closer than 660' between wells. (Order 18-66.)	None
BIG COULEE 3rd Cat Creek (L. Cret.) Gas Morrison (U. Jur.) Gas	3 3	Structural Structural	Water Drive Water Drive	State-wide.	None
BIG WALL Amsden (Penn.) Tyler (Penn.)	2 18	Structural Struct.-Strat.	Water Drive Depletion	Spaced by old state-wide spacing; 330' from lease or property line, 990' between wells in same reservoir. (Order 12-54.)	Previous disposal into Tyler "A" stopped in 1961. Water-flood of Tyler "B" sand started Aug., 1966. (Order 22-66.)
BLACKFOOT Cut Bank (L. Cret.) Sun River (Miss.)	(Shut-in) 6	Strat. Structural	Depletion Water Drive	One well only per 40-acre spacing unit. 300' tolerance from center of spacing unit. Dual completion in Cut Bank and Madison with administrative approval. (Order 3-57.)	None
BLACK JACK Sunburst (L. Cret.) Gas	3	Strat.	Depletion	One well per 160-acres, no closer than 660' from boundary of each unit. (Order 3-69.)	None

Field, Formation, Age	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations, Field Rules, and Remarks	Secondary Recovery or Water Disposal
BORDER					
Cut Bank (L. Cret.) Oil & Gas	3	Strat.	Depletion	Oil: 220' from boundary of legal subdivision and 430' between wells in same formation; 75' topographic tolerance.	None
Moulton (L. Cret.) Oil & Gas	18	Strat.	Depletion	Gas: 330' from boundary of legal subdivision. 2400' between wells in same formation on same lease. 75' topographic tolerance. (Order 7-54.)	
BOWDOIN					
Bowdoin & Phillips sands in Colorado shale (U. Cret.) Gas	346	Structural	Volumetric	One well per quarter section not less than 1000' from lease boundary or less than 2000' from any gas well in same horizon. (Order 29-55.)	None
BOWES					
Eagle (U. Cret.) Gas	19	Structural	Volumetric	660' from boundary of legal subdivision, 1320' from other wells in same formation. 75' topographic tolerance. (Order 23-54.)	None
Sawtooth (M. Jur.)	58	Structural	Partial Water Drive	330' from lease or property line, 990' between wells in same formation. (Order 13-54.)	Pilot waterflood initiated in 1961 and expanded to field-wide waterflood in 1965. (Order 5-61.) Water from Madison.
BRADLEY					
Sun River (Miss.)	2	Structural	Water Drive	State-wide.	None
BRADY					
Sunburst (L. Cret.)	3	Strat.	Depletion, Partial Water Drive	10-acre spacing units with 75' topographic tolerance from center of spacing unit. (Order 34-62, 55-62.)	None
BRORSON					
Mission Canyon (Miss.) Oil & Gas	1	Structural	Volumetric, Water Drive	One well per 160-acre unit, no closer than 660' from boundary (Mission Canyon); 990' Red River. (Order 21-68, 27-68.)	None
Red River (Ord.)	4				
BRORSON, SOUTH					
Red River (Ord.) Oil & Gas	3	Structural	Volumetric, Water Drive	One well per 160-acre unit, no closer than 660' from unit boundary. (Order 26-68.)	None

Field, Formation, Age	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations, Field Rules, and Remarks	Secondary Recovery or Water Disposal
CABIN CREEK					
Mission Canyon (Miss.)	21	Structural	Water Drive, Depletion	Spacing waived and General Rules No. 213 (Deviation), 218 (Camingling), and 219 (Dual Completion) are suspended until present Unit Agreement becomes operative. (Order 36-62.) Many wells produce from both Interlake & Red River by dual completion.	Waterflood of Siluro-Ordovician reservoir has been expanded to a full scale peripheral flood. (Orders 60-62, 30-63.)
Interlake (Sil.)	7	Structural	Water Drive, Depletion		
Red River (Ord.)	78	Structural	Water Drive, Depletion		
CAT CREEK					
Kootenai (L. Cret.) (3 sands)	42	Structural-Strat.	Water Drive	220' from lease or property line, 440' from every other well in same formation. (Order 17-55.) Five separate producing areas, East, Antelope, Mosby, West and Landheim Domes.	Three Kootenai waterfloods and one Ellis waterflood in progress. (Orders 17-56, 18-59, 13-62, 8-68.) Water from Third Cat Creek sand.
Morrison (U. Jur.)	2	Structural-Strat.	Water Drive		
Ellis (U. Jur.)	27	Structural	Depletion-Water Drive		
(Same as Swift sand)					
Amsden (Penn.)	1	Structural-Strat.	Water Drive	State-wide.	
CEDAR CREEK					
Judith River (U. Cret.) Gas	176	Structural	Volumetric	1200' from legal subdivision line, 2400' from every other well in same formation. (Order 33-54.)	None
Eagle (U. Cret.) Gas	60	Structural	Volumetric	320-acre spacing units. Wells in center of NW $\frac{1}{4}$ and SE $\frac{1}{4}$ of each section with 200' topographic tolerance. (Order 1-61.)	None
CLARKS FORK					
Frontier (U. Cret.)	1	Structural-Strat.	Depletion	330' from quarter-quarter section line, 1320' between wells with 75' topographic tolerance. (Order 17-54.)	None
CONRAD, SOUTH					
Dakota (L. Cret.)	1 (Shut-in)	Strat.	Depletion	10-acre spacing units. Wells in center of each unit with 75' topographic tolerance. (Orders 34-62, 31-63.)	None
CUPTON					
Red River (Ord.)	1	Structural-Strat.	Water Drive	80-acre spacing units consisting of E $\frac{1}{2}$ and W $\frac{1}{2}$ of quarter section; well location in SE $\frac{1}{4}$ and NW $\frac{1}{4}$ of quarter section with 75' topographic tolerance. (Order 31-55.)	None

Field, Formation, Age	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations, Field Rules, and Remarks	Secondary Recovery or Water Disposal
CUT BANK					
Kootenai (L. Cret.) Oil & Gas (Gas Only)	729 170	Strat.	Depletion	(Kootenai formation includes Moulton, Sunburst, and Cut Bank sands.) Oil: 330' from legal subdivision line. 650' between wells in same formation. 5-spot on 40-acre tract permitted. 75' topographic tolerance. (Order 10-54.)	There are 15 waterfloods in progress. Water from Eagle and Madison, or produced.
Madison (Miss.) Oil & Gas (Gas only)	31 2 (?)	Strat.	Water Drive	Gas: 330' from legal subdivision, 2400' between wells in same formation. 75' topographic tolerance. (Order 10-54.)	
DARLING (Included as part of Cut Bank Field)					
DEAN DOME					
Greybull (L. Cret.) Gas Oil	1 1	Structural	Water Drive	State-wide. Oil ring below gas cap. One each shut-in gas and oil well.	None
DEER CREEK					
Interlake (Sil.)	2	Structural	Water Drive	80-acre spacing units consisting of any two adjacent quarter-quarter sections. Well location in NE 1/4 and SW 1/4 of each quarter section with 75' topographic tolerance. (Orders 23-55 & 14-59.) Commingling of production permitted upon approval of Comm. Petr. Engr. (Order 18-63.)	Excess produced water is disposed into Dakota and Lakota formations. (Orders 6-56 & 3-58.) Two Silurian wells shut-in.
Red River (Ord.)	1	Structural	Water Drive		
DELPHIA					
Amsden (Penn.)	1	Structural	Water Drive	State-wide.	None
DEVIL'S BASIN					
Heath (U. Miss.)	(Shut-in) 5	Structural	Depletion	State-wide.	None
DEVON					
Blackleaf, (L. Cret.) Gas	(Shut-in) 12	Strat.	Volumetric Depletion	State-wide.	None
Kootenai (L. Cret.) Oil	Depleted	Strat.	Depletion	State-wide.	None
DRY CREEK					
Eagle (U. Cret.) Gas	1	Structural-Strat.	Volumetric	State-wide.	None.
Frontier (U. Cret.) Gas	6	Structural	Volumetric		Six additional gas storage wells, west end of structure.
Greybull (L. Cret.) Gas, some oil	1	Structural-Strat.	Volumetric-Depletion		

Field, Formation, Age	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations, Field Rules, and Remarks	Secondary Recovery or Water Disposal
DUNCAN CREEK Muddy (L. Cret.)	1	Structural-Strat.	Depletion	State-wide.	None
DWYER Ratliffe (Miss.)	14	Structural-Strat.	Water Drive-Volumetric	160-acre spacing units; well location in SE 1/4 of spacing unit with 75' topographic tolerance. (Orders 25-60, 29-61.)	Produced water disposed into Dakota formation. (Order 26-63.) Waterflood (Order 20-68.)
EAST KEITH & KEITH Bow Island (L. Cret.) Gas Sawtooth-Madison (Jur.-Miss.) Gas	11 2	Structural	Water Drive	State-wide, except unitized portions spaced by (Order 22-62.)	None
ELK BASIN (Mont. Portion) Frontier (U. Cret.) Dakota (L. Cret.) Embar-Tensleep (Perm., Penn.) Madison (Miss.)	7 3 21 20	Structural Structural Structural Structural	Gravity Drainage Gravity Drainage Gravity Drainage Water Drive	Rule No. 203 (Spacing) is waived within Unit Area. (Order 10-61.)	Frontier: Crestal gas injection. Embar - Tensleep: Pressure maintenance by crestal gas in injection. Waterflood approved in 1966. (Order 5-66.) Madison: Water injection.
ELK BASIN, NORTHWEST Frontier (U. Cret.)	6	Structural	Depletion	Spacing waived within unitized portion except that bottom of hole be no closer than 330' from unit boundary and there be at least 1320' surface distance between wells in same formation; 75' topographic tolerance. (Orders 43-63, 28-64.)	Frontier: Waterflood in progress. Embar-Tensleep: Waterflood and gas injection in progress. (Order 3-67.) Madison, produced water.
EMBAR-TENSLEEP (Perm., Penn.) Madison (Miss.)	6 2	Structural Structural	Gravity Drainage Water Drive		
ETHRIDGE Swift (U. Jur.) Gas	6	Strat.	Water Drive	State-wide, except two wells by (Order 28-65).	None
FAIRVIEW Winnipegosis (Dev.) Red River (Ord.)	1 10	Structural Structural	Water Drive Water Drive	160-acre spacing unit. Well location anywhere in spacing unit but no closer than 660' from unit boundary. (Orders 48-65, 1-67, 43-67, 44-67.) Gas used on lease and for drilling.	None
FERTILE PRAIRIE Red River (Ord.)	2	Structural-Strat.	Water Drive	80-acre spacing units consisting of north-south rectangular units. Well location in NW 1/4 and SE 1/4 of quarter section with 75' topographic tolerance. (Orders 3-56, 7-62.)	None

Field, Formation, Age	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations, Field Rules, and Remarks	Secondary Recovery or Water Disposal
FLAT COULEE					
Bow Island (L. Cret.) Gas	1	Structural and Strat.	Depletion	330' from boundary of legal subdivision and 1320' from other wells in same reservoir. (Order 16-55.)	None
Dakota (L. Cret.) Gas	1	Strat.	Depletion	State-wide, exception Order 11-66.	
Swift (Jur.) Gas	Shut-in	Strat.	Depletion	State-wide gas spacing.	
Swift (Jur.) Oil	34	Strat.	Depletion	40-acre spacing units. Well in center of spacing unit with 150' topographic tolerance. Orders 16-62, 19-63.)	
Sawtooth (Jur.) Gas	1	Strat.	Depletion	State-wide.	
FLAT LAKE					
Ratcliffe (Miss.)	57	Structural-Strat.	Partial Water Drive	160-acre spacing units; well location in center of NE¼ of quarter section with 200' topographic tolerance. Wells no closer than 961' to No. Dakota state line and no closer than 1600' to Canadian line. (Orders 10-65 amended, 43-65, 23-66, 33-66.)	Excess salt water disposed into Muddy, Dakota, or Lakota formations. (Orders 39-64, 39-66.)
FLAT LAKE, SOUTH					
Ratcliffe (Miss.)	2	Structural-Strat.	Partial Water Drive	Same as Flat Lake spacing (Order 2-67.)	Excess salt water disposed into Muddy, Dakota, or Lakota. (Order 19-67.)
FRANNIE (Mont. Portion)					
Tensleep (Penn.)	2	Structural	Comb. Water Drive and Gravity Drainage	10-acre spacing units; well location in center of each unit with 100' topographic tolerance. (Order 35-63.)	None
FRED & GEORGE CREEK					
Sunburst (L. Cret.) Oil & Gas	24	Strat.	Depletion	Oil: 40-acre spacing units; well location in center of unit with 250' topographic tolerance. (Orders 29-63, 1-65.)	None
Swift (U. Jur.) Oil & Gas	19	Strat.	Depletion	State-wide.	
GAGE					
Amsden (Penn.)	1	Structural	Water Drive	State-wide.	None
GAGE, SOUTHWEST					
Amsden (Penn.)	(Shut-in)	Unknown	Water Drive	Temporary 160-acre spacing expired. State-wide spacing now applies. (Order 50-65.)	None

Field, Formation, Age	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations, Field Rules, and Remarks	Secondary Recovery or Water Disposal
GAS CITY Red River (Ord.)	22	Structural	Depletion- Water Drive	80-acre spacing units consisting of E½ and W½ of quarter sections; well location in NW¼ and SE¼ of quarter section; 150' topographic tolerance. Spacing waived and state-wide rules 213 (Deviation), 218 (Commingle) and 219 (Dual Completion) are waived in unitized portion of field. (Order 29-62.)	Excess produced water disposed into Judith River formation. (Orders 32-61, 20-64.)
GLENDIVE Red River (Ord.)	15	Structural- Strat.	Depletion- Water Drive	80-acre spacing units consisting of any two adjacent quarter-quarter sections; wells located in center of NE¼ and SW¼ of each quarter section with 75' topographic tolerance. (Orders 27-55, 19-62, 58-62, 20-66.)	Excess produced water disposed into Swift and Dakota formations. (Orders 16-56, 16-63.)
GOLD BUTTE Swift (U. Jur.) Gas	1	Structural	Water Drive ?	640-acre spacing, well location any quarter-quarter section cornering on center of section. (Order 26-59.)	None
GOOSE LAKE Ratcliffe (Miss.)	34	Structural- Strat.	Partial Water Drive	160-acre spacing units; well locations according to areas: Area I center of NW¼ of quarter section; Area II, center of SE¼ of quarter section; Area III, center of NE¼ of quarter section. 200' topographic tolerance. (Orders 42-63, 40-66, 47-67, 16-68.)	Excess produced water disposed into Mission Canyon and Dakota formations. (Orders 12-64, 14-66, 12-68.)
GRABEN COULEE Sunburst (L. Cret.)	1	Structural- Strat.	Depletion	40-acre spacing units; well location no closer than 330' from legal subdivision.	None
Cut Bank (L. Cret.)	20	Structural- Strat.	Depletion	(Cut Bank and Madison) Oil: 330' from boundary of legal subdivision and 650' from other well in same reservoir and on same lease. 75' topographic tolerance. (Order 73-62.)	
Cut Bank-Madison (Dual)	17	Structural- Strat.	Depletion		
Madison (Miss.)	7	Structural- Strat.	Depletion		
GRANDVIEW Bow Island (L. Cret.) Gas (2 Zones)	2	Structural	Unknown	320-acre spacing units aligned in a north-south direction; well locations no closer than 660' to a spacing unit boundary. (Order 49-67.)	None
Madison (Miss.) Gas	1	Structural	Unknown	Oil: State-wide. (3 shut-in wells.)	

Field, Formation, Age	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations, Field Rules, and Remarks	Secondary Recovery or Water Disposal
GYPSY BASIN					
Sunburst (L. Cret.) Oil & Gas	1	Structural-Strat.	Comb. Water Drive and Depletion	330' from lease lines and 660' between wells in same formation. Only two wells per quarter-quarter section. (Order 7-66.)	Order 6-64 permits injection of excessive gas (produced with oil) into the Sunburst gas cap.
Swift (U. Jur.)	1	Structural-Strat.	Comb. Water Drive and Depletion	Same as Sunburst.	
Sawtooth-Madison Oil & Gas (Jur. & Miss.)	2	Structural-Strat.	Comb. Water Drive and Depletion	(Sawtooth-Madison) Oil: 40-acre spacing units; wells no closer than 330' from lease line. (Order 7-66.) (Sawtooth-Madison) Gas: 160-acre spacing units; well locations in center of any quarter-quarter section in each 160-acre unit, 2340' between gas wells. 150' topographic tolerance. (Order 13-59.)	
HARDIN Frontier (U. Cret.) Gas	48	Strat.	Volumetric	State-wide.	None
HIAWATHA Tyler (L. Penn.) (2 Sands)	9	Structural-Strat.	Depletion	State-wide.	None
HIBBARD Amsden (Penn.)	1	Unknown	Water Drive	State-wide.	None
INJUN CREEK Tyler (Penn.)	1	Strat.	Depletion	State-wide.	None
IVANHOE Morrison (U. Jur.)	2	Structural and Strat.	Depletion	40-acre spacing unit for production from any one common formation; well location in center of unit with 200' topographic tolerance. (Order 7-60.)	Waterflood of Tyler B & C discontinued.
Amsden (L. Penn.)	1	Structural and Strat.	Water Drive		
Tyler (L. Penn.)	7	Structural and Strat.	Depletion		

Field, Formation, Age	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations, Field Rules, and Remarks	Secondary Recovery or Water Disposal
KEG COULEE Tyler (Penn.) Oil & Gas	21	Strat.	Depletion	40-acre spacing in southwest portion of field except that spacing is waived in unitized portion. (Orders 3-64, 4-64, 23-64.) 80-acre spacing in remainder of field with variable pattern. (Orders 11-60, 28-62.) Topographic tolerance varies from 100' to 150'. (Orders 11-60, 4-64, 23-64.) Buffer zone waived. (Order 16-65.) Gas to extraction plant in Sumatra field.	A waterflood of Tyler C sand in the unitized northwest portion of the field was commenced in Aug., 1967. (Orders 3-64, 28-66.) Madison water injected.
KEG COULEE, NORTH Tyler (Penn.)	7	Strat.	Depletion	40-acre spacing units; well location in center of spacing unit with 150' topographic tolerance. (Order 46-64.) Buffer zone waived. (Order 16-65.) Gas to extraction plant.	None
KEITH (See East Keith)					
KELLEY Tyler (Penn.)	5	Strat.	Depletion	State-wide, 250' tolerance. (Order 15-67.)	None
KEVIN-SUNBURST Sunburst (L. Cret.) Oil & Gas Sun River (Miss.) Oil & Gas (part above)	600+	Strat.	Depletion	9 wells per 40-acre tract; only 3 wells on any side of tract set back at least 220' from line. Field delineated by Orders 8-54, 28-55. (Estimated 400 wells shut-in.)	There are four waterfloods in operation, using Madison water.
LAIRD CREEK Swift (U. Jur.) Oil & Gas	13	Strat.	Depletion	State-wide. One shut-in gas well.	None
LAKE BASIN, NORTH Eagle, Frontier (U. Cret.) Gas	2	Structural	Unknown	640-acre gas spacing units consisting of one section. Well locations in center of NW $\frac{1}{4}$ or SE $\frac{1}{4}$ of each section with 75' topographic tolerance. (Order 6-58.)	None
LANDSLIDE BUTTE Sun River (Miss.)	2	Unknown	Water Drive	State-wide.	None
LISCOK CREEK Shannon (U. Cret.) Gas (Shut-in)	5	Structural-Strat.	Depletion Water Drive	Spacing, one well per 640 acres within 40-acre square centered SE NW (T. 1 N.,) and SE $\frac{1}{4}$ (T. 2 N.,). (Order 5-67.)	None

Field, Formation, Age	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations, Field Rules, and Remarks	Secondary Recovery or Water Disposal
LITTLE BEAVER (Mont. Portion) Red River (Ord.)	29	Structural	Comb. Depletion and Water Drive	Spacing waived and General Rules No. 213 (Deviation), 218 (Commingling) and 219 (Dual Completion) are suspended until present Unit Agreement becomes inoperative. (Order 41-62.)	Waterflood of the Red River was commenced in August, 1967. (Order 3-66.) Minnesota water.
LITTLE BEAVER, EAST (Mont. Portion) Red River (Ord.)	14	Structural	Comb. Depletion and Water Drive	Same as for Little Beaver. (Order 42-62.)	Waterflood of the Red River was commenced in April, 1965. (Order 33-64.)
LODGE GRASS Tensleep (Penn.)	3	Structural-Strat.	Water Drive	160-acre spacing units; well locations vary according to areas; 250' topographic tolerance. (Orders 26-64, 26-65.)	None
LOOKOUT BUTTE (Includes Coral Creek Unit) Madison (Miss.)	12	Structural	Water Drive	State-wide spacing.	Water disposal into Madison. (Order 68-62.)
Interlake, Red River (Sil.-Ord.)	22	Structural	Comb. Depletion and Water Drive	160-acre spacing; well location in center of SE 1/4 of each quarter section with 150' topographic tolerance. (Order 21-62.) Coral Creek Unit not subject to spacing rules. Re-delineated per Order 7-63.	Waterflood of Silurian-Ordovician approved in 1966. (Order 35-66.) Water from Minnesota.
MACKAY DOME Greybull (L. Cret.) Gas & Oil	2	Structural	Depletion and Water Drive	State-wide.	Bottom-hole heat, (steam).
MASON LAKE Lakota (L. Cret.)	2	Structural	Water Drive	State-wide.	None
MELSTONE Tyler (Penn.)	4	Structural-Strat.	Depletion	State-wide.	None
MIDDLE BUTTE Blackleaf (Cret.) Gas (Bow Island) (Shut-in)	3 2	Structural	Volumetric	320-acre spacing units consisting of E 1/2 & W 1/2 of each section; well location in center of either of the inside quarter-quarter sections located in E 1/2 of each spacing unit. 75' topographic tolerance. (Order 3-60.)	None

Field, Formation, Age	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations, Field Rules, and Remarks	Secondary Recovery or Water Disposal
MINERAL BENCH Duperow (Dev.)	1	Structural	Water Drive	State-wide.	Water disposal into Dakota-Lakota per Order 18-65.
MINERS COULEE Sunburst (L. Cret.)	1	Strat.	Depletion	40-acre spacing units consisting of quarter-quarter sections; well location no closer than 330' from lease or property line and 660' from any other well. (Order 9-66.)	None
Swift (U. Jur.)	3	Strat.	Depletion		
Madison (Miss.)	1	Strat. ?	Water Drive		
MONARCH Mission Canyon (Miss.)	2	Structural-Strat.	Water Drive	80-acre spacing units consisting of east and west halves of quarter section. Well location in SW $\frac{1}{4}$ & NE $\frac{1}{4}$ of quarter section. Location within 660' square at center of quarter-quarter section. (Order 18-61.)	Produced water is disposed into the salt water disposal system for the Pennel Field.
Interlake, Red River (Sil.-Ord.)	14	Structural-Strat.		160-acre spacing units consisting of a quarter section; well location in center of SW $\frac{1}{4}$ of each quarter section with 175' topographic tolerance. (Orders 12-59, 4-63.)	
MOSBY (See Cat Creek)	15	Structural-Strat.	Water Drive	Listed as part of Cat Creek.	Waterflood, 2nd Cat Creek sand. (Order 8-68.)
MOSSEY Greybull (L. Cret.)	4	Structural	Water Drive	Spacing waived. Future development required administrative approval of the Commission. (Order 27-62.)	None
MT. LILLY Madison (Miss.) Gas	2	Structural	Water Drive	640-acre, well location in approximate center of any of the four quarter-quarter sections adjoining center of section; 250' topographic tolerance. (Order 37-63.)	None
NORTH LAKE BASIN (See Lake Basin, North)					
OUTLOOK Mission Canyon (Miss.)	1	Strat.	Water Drive	State-wide spacing.	Produced water is disposed into Dakota and Siluro-Devonian formations. (Orders 16-59, 17-65, 36-66.)
Duperow (Dev.)	2	Strat. and Structural	Water Drive	State-wide spacing.	
Silurian-Devonian	8	Strat. and Structural	Water Drive	160-acre spacing units; well location in center of either SW $\frac{1}{4}$ or NE $\frac{1}{4}$ of each quarter section; 175' topographic tolerance. (Order 19-59A.)	

Field, Formation, Age	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations, Field Rules, and Remarks	Secondary Recovery or Water Disposal
OUTLOOK, SOUTH					
Winnipegosis (Dev.) Interlake (Sil.) (Dual completion with Dev. zone)	1	Structural	Water Drive	160-acre spacing; permitted wells in either SW $\frac{1}{4}$ or NE $\frac{1}{4}$ of quarter section; 175' topographic tolerance. (Order 19-59A.) Commingling permitted. (Order 45-64.)	Produced water disposed into Muddy and Dakota formations. (Orders 19-59, 17-65.)
Red River (Ord.)	1	Structural	Water Drive		
OUTLOOK, WEST					
Winnipegosis (Dev.)	2	Structural	Water Drive	160-acre spacing units consisting of quarter sections; permitted wells in either SW $\frac{1}{4}$ or NE $\frac{1}{4}$ with a tolerance of 175'. (Order 7-67.)	Produced water disposed into Dakota formation. (Order 42-66.)
PENNEL					
Mission Canyon (Miss.)	8	Structural	Water Drive	(Miss.) 80-acre spacing units consisting of east and west half of quarter section; wells located in center of SE $\frac{1}{4}$ and NW $\frac{1}{4}$ of quarter sections with 150' topographic tolerance. (Order 15-61.)	Produced water is being injected into Dakota, Siluro-Ordovician and Madison formations. (Orders 16-60, 46-62, 68-62, 36-63, 13-64.)
Lodgepole (Miss.)		Structural-Strat.			Waterflood approved, Nov. 1968. (Order 24-68.)
Siluro-Ordovician Oil & Gas	130	Structural	Comb. Depletion and Water Drive	80-acre spacing units on west side and 160-acre spacing units on east side of pool. Wells to be located in SE $\frac{1}{4}$ and NW $\frac{1}{4}$ of each quarter section (80 acres) and in SE $\frac{1}{4}$ of each quarter section on 160-acre spacing. (Orders 1-56, 8-56, 15-61, 20-62, 4-63, 7-63.) Commingling approved. (Order 59-62.)	
PINE					
Mission Canyon (Miss.) Oil & Gas	1	Structural	Water Drive	Spacing and General Rules 213, 218 and 219 are waived within the Pine Unit. 80-acre spacing units outside of unit area; well location in NW $\frac{1}{4}$ and SE $\frac{1}{4}$ of quarter section; 150' topographic tolerance. (Order 37-62.) Gas through extraction plant.	A waterflood program for the south area was started in 1959.
Siluro-Ordovician Oil & Gas	118	Structural	Comb. Depletion and Water Drive		A waterflood of the north area was approved in 1967. (Orders 13-68, 1-60, 8-62, 32-67.)
PLEVNA					
Eagle, Judith River (U. Cret.) Gas	29	Structural	Water Drive	1200' from legal subdivision line; 2400' from other wells on same lease or unit; 75' topographic tolerance. (Orders 34-54, 4-57.)	None
POLE CREEK					
Amsden (Penn.)	1	Structural	Water Drive	State-wide.	None

Field, Formation, Age	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations, Field Rules, and Remarks	Secondary Recovery or Water Disposal
PONDERA Sun River (Miss.) Oil & Gas	281	Structural and Strat.	Comb. Depletion and Water Drive	Oil: 220' from legal subdivision, 430' from other wells in same reservoir on same lease; 75' topographic tolerance. Porter Bench Extension: 330' from legal subdivision line; 650' from other wells in same reservoir on same lease or unit; 75' topographic tolerance. (Order 9-54.) Gas: 1320' from legal subdivision line; 3700' from other wells on same lease or unit; 75' topographic tolerance. (Order 9-54.) General Rules 207, 211, 219, 221, 223, and 224 do not apply.	Produced water injected into lower Madison. (Orders 11-56, 15-56, 4-65, 4-66.) A small waterflood project has been in operation since 1959, using Madison water.
PONDERA COULEE Sun River (Miss.) (Shut-in)	4	Structural	Water Drive	330' from legal subdivision lines or upon a 10-acre spacing pattern; 75' topographic tolerance. (Order 5-62.)	None
POPLAR, EAST Madison (Miss.) (Charles & Mission Canyon fms.)	61	Structural	Water Drive	State-wide spacing; field delineated by Order 7-55, 33 shut-in oil wells, 6 shut-in gas wells.	Excess produced water has been injected into the Dakota and Judith River formations. (Orders 1-55, 5-57, 7-57, 14-61, 21-61, 34-61, 10-62, 51-67.)
POPLAR, NORTHWEST Charles (Miss.) ("C" or McGowan Zone)	5	Structural	Water Drive	80-acre spacing units consisting of E $\frac{1}{2}$ and W $\frac{1}{2}$ of each quarter section; permitted wells in NW $\frac{1}{4}$ and SE $\frac{1}{4}$ of quarter section. 75' topographic tolerance. (Order 18-55.)	None
PRAIRIE ELK Charles "C" (Miss.)	1	Unknown	Water Drive	State-wide.	None
PUMPKIN CREEK Shannon (U. Cret.) Gas	7 (Shut-in)	Structural-Strat.	Depletion	State-wide.	None
RAGGED POINT Tyler (Penn.) (2 Sands)	12	Strat.	Depletion	40-acre spacing units; 75' topographic tolerance. (Order 8-59.) Spacing waived for Tyler "A" sand reservoir within Tyler "A" Sand Unit except no well can be closer than 660' to Unit boundary. (Order 35-65.)	A waterflood project of the Tyler "A" sand was commenced in February, 1966, using Third Cat Creek sand water. (Order 35-65.) Water disposal into Kibbey. (Order 19-65.)

Field, Formation, Age	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations, Field Rules, and Remarks	Secondary Recovery or Water Disposal
Kibbey (Miss.)	1	Structural	Water Drive	State-wide spacing. (Order 15-54.) Commingling of production from Tyler and Kibbey permitted in one well per Order 11-65.	
RATTLESNAKE COULEE Sunburst (L. Cret.)	1	Strat.	Depletion	State-wide.	None
REAGAN Sun River (Miss.)	Oil 48 Gas 1	Structural	Comb. Gas Cap and Water Drive	State-wide. Two shut-in oil wells. (Order 17-54.)	A pressure maintenance project utilizing gas injection was started in 1961. (Order 21-60.)
RED CREEK Cut Bank (L. Cret.) Oil & Gas	9	Strat.	Depletion	40-acre spacing units; wells in center of spacing unit with 75' topographic tolerance; spacing waived for unitized portion. (Orders 16-58, 73-62, 31-64.)	Excess produced water injected into Bow Island and Madison. (Orders 22-63, 37-64.) A waterflood project in the Cut Bank sand was initiated in June, 1965, using Madison water.
Sun River (Miss.) Oil & Gas	17	Structural	Water Drive		
RED FOX Nisku (Dev.)	1	Structural	Water Drive	Field consists of one 160-acre spacing unit which straddles the section line. (Order 20-67.)	None
REDSTONE Winnipegosis (Dev.)	1	Unknown	Water Drive	One well per 160-acre unit, but no closer than 660' from unit boundary.	None
REPEAT Red River (Ord.)	1	Unknown	Water Drive	State-wide.	None
RESERVE Winnipegosis (Dev.)	3	Structure-Strat.	Water Drive	160-acre spacing units; permitted well within 1320' square in center of quarter section. Commingling of Red River and Interlake production permitted on individual well basis. (Orders 34-66, 27-67.)	None
Interlake (Sil.)		Structure-Strat.	Water Drive		
Red River (Ord.)	2	Structure-Strat.	Water Drive		

Field, Formation, Age	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations, Field Rules, and Remarks	Secondary Recovery or Water Disposal
RICHEY Charles (Miss.)	1	Structural	Water Drive	80-acre spacing units consisting of any two adjacent quarter-quarter sections; well locations in center of NW¼ and SE¼ of each quarter section; 75' topographic tolerance. (Order 21-55.)	Part of produced water is being injected into the Dakota formation. (Orders 10-58, 19-61.)
RICHEY, SOUTHWEST Interlake, Dawson Bay (Sil.) (Dev.)	6	Structural	Depletion	160-acre spacing units; wells no closer than 900' from boundary of spacing unit. (Order 25-62.)	A waterflood project in the Interlake and Dawson Bay was started in 1965. (Order 34-65.)
ROSCOE Lakota (L. Cret.)	1	Structural	Water Drive	State-wide.	None
RUDYARD Sawtooth (M. Jur.) Gas (Shut-in)	3	Structural	Volumetric	640-acre spacing units consisting of one section; well location in center of NW¼ of section with 75' topographic tolerance. (Order 2-58.)	None
RUSH MOUNTAIN Winnipegosis (M. Dev.) Red River (Ord.)	2	Structural	Volumetric-Water Drive	State-wide. Dual zone completion in discovery well.	None
SAND CREEK Interlake, Red River (Sil.) (Ord.)	8	Structural	Water Drive	80-acre spacing units consisting of any two adjacent quarter-quarter sections. Wells located in center of NW¼ and SE¼ of each quarter section. (Order 16-59.) Commingling of production from Interlake and Red River authorized per Order 49-62.	Excess produced water is injected into the Swift formation. (Order 9-61.)
SHELBY AREA Sunburst (L. Cret.) Gas	51	Structural-Strat.	Depletion	State-wide. Field outline not delineated.	None
SHOTGUN CREEK Ratcliffe (Miss.)	1	Structural	Water Drive	State-wide.	None
SIDNEY-BRORSON (See Brorson and Brorson, South)					
SMOKE CREEK Charles (Miss.)	3	Structural	Water Drive	State-wide.	None

Field, Formation, Age	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations, Field Rules, and Remarks	Secondary Recovery or Water Disposal
SNYDER Tensleep (Penn.)	3	Structural	Water Drive	10-acre spacing units with center 5-spot permitted; 150' topographic tolerance. (Order 45-62.)	None
SOAP CREEK Tensleep, Amsden, Madison (Penn.) (Penn.) (Miss.)	18	Structural	Water Drive	One well per 10-acre spacing unit per production formation; well location in center of spacing unit with 100' topographic tolerance. (Order 26-60.)	None
SPRING LAKE Nisku (Dev.)	1 (Shut-in)	Structural	Depletion	One well per 160-acre spacing unit. Well location anywhere within 840' square in center of spacing unit. (Order 6-63.)	None
Red River (Ord.)	2	Structural	Depletion		
SQUAW COULEE Eagle (U. Cret.) Gas	5	Structural-Strat.	Volumetric	State-wide. In T. 32N., R. 15E., not delineated.	None
STENSVD Tyler (Penn.)	15	Strat.	Depletion	40-acre spacing units; well location in center of spacing unit with 200' tolerance. (Orders 2-59, 7-60.) Wells may be drilled anywhere within waterflood unit boundary, no closer than 660' from unit boundary. (Order 5-65 Amended.)	A waterflood operation has been in progress since 1963, using Madison water. (Orders 53-62, 9-67.)
SUMATRA Tyler (Penn.) Oil & Gas Amsden (Penn.) (Plugged)	88	Strat. Strat. and Structural	Depletion Water Drive	40-acre spacing units; well located in center of unit with 75' tolerance. (Order 14-58.) Gas extraction plant in field.	N.W. Sumatra Unit waterflood approved in 1967, using Madison water. (Order 48-67.)
TIGER RIDGE Judith River (U. Cret.) Gas	1	Structure-Strat.	Depletion- Water Drive	State-wide.	None
Eagle (U. Cret.) Gas (Shut-in)	33	Structure-Strat.	Water Drive- Depletion	One well per section within 2640' square in center of each unit and no closer than 1320' from boundary of unit.	
Sawtooth (Jur.) Oil	1	Structure-Strat.	Water Drive	State-wide.	
TULE CREEK Nisku (Dev.)	6	Structural	Water Drive	160-acre spacing units with permitted well anywhere within 1320' square in center of each unit. (Orders 26-62, 6-65, 11-67.)	Produced water injected into Dakota & Judith River formations. (Orders 12-66, 24-67.)

Field, Formation, Age	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations, Field Rules, and Remarks	Secondary Recovery or Water Disposal
TULE CREEK, EAST Nisku (Dev.)	2	Structural	Water Drive	160-acre spacing units with permitted well anywhere within 1320' square in center of each unit. (Orders 40-64, 6-65.)	Water injected into Judith River formation. (Order 13-68.)
TULE CREEK, SOUTH Nisku (Dev.)	3	Structural	Water Drive	160-acre spacing units with permitted well anywhere within a 1320' square in center of each unit.	Authority given to dispose of produced water into Dakota. (Order 44-64.) Into Judith River formation. (Order 29-67.)
UTOPIA (Under Ethridge Field)					
VIDA Interlake (Sil.)	2	Structural	Water Drive	160-acre spacing units with permitted well anywhere within an 840' square in center of each unit. (Order 39-63.)	Water injected into Lakota formation. (Order 14-68.)
VOLT Nisku (Dev.)	4	Structural	Water Drive	160-acre spacing units with permitted well anywhere within a 1320' square in center of each unit. (Orders 27-64, 6-65, 32-65.) State-wide.	Excess produced water is disposed into Judith River. (Order 3-65.)
Charles "C" (Miss.)	1	Structural	Water Drive		None
WEED CREEK Amsden (L. Penn.)	3	Structural	Water Drive	State-wide.	None
WELDON Kibbey (Miss.)	12	Structural	Partial Water Drive	80-acre spacing unit; each quarter section divided into two separate units running in either a north-south or east-west direction; well location in center of NE 1/4 and SW 1/4 of quarter section with 200' topographic tolerance. (Order 9-65.)	Excess produced water is disposed into the Dakota, Lakota, Morrison, and Charles formations. (Orders 31-65, 47-65, 37-66, 16-67.)
WEST BUTTE Sunburst (L. Cret.) Oil	1	Structural-Strat.	Depletion	Sawtooth-Madison gas commingled, 320-acre unit, no closer than 330' from unit boundary. (Order 29-68.)	None
Sawtooth (Jur.) Gas Madison (Miss.) Gas	2	Structure	Water Drive		

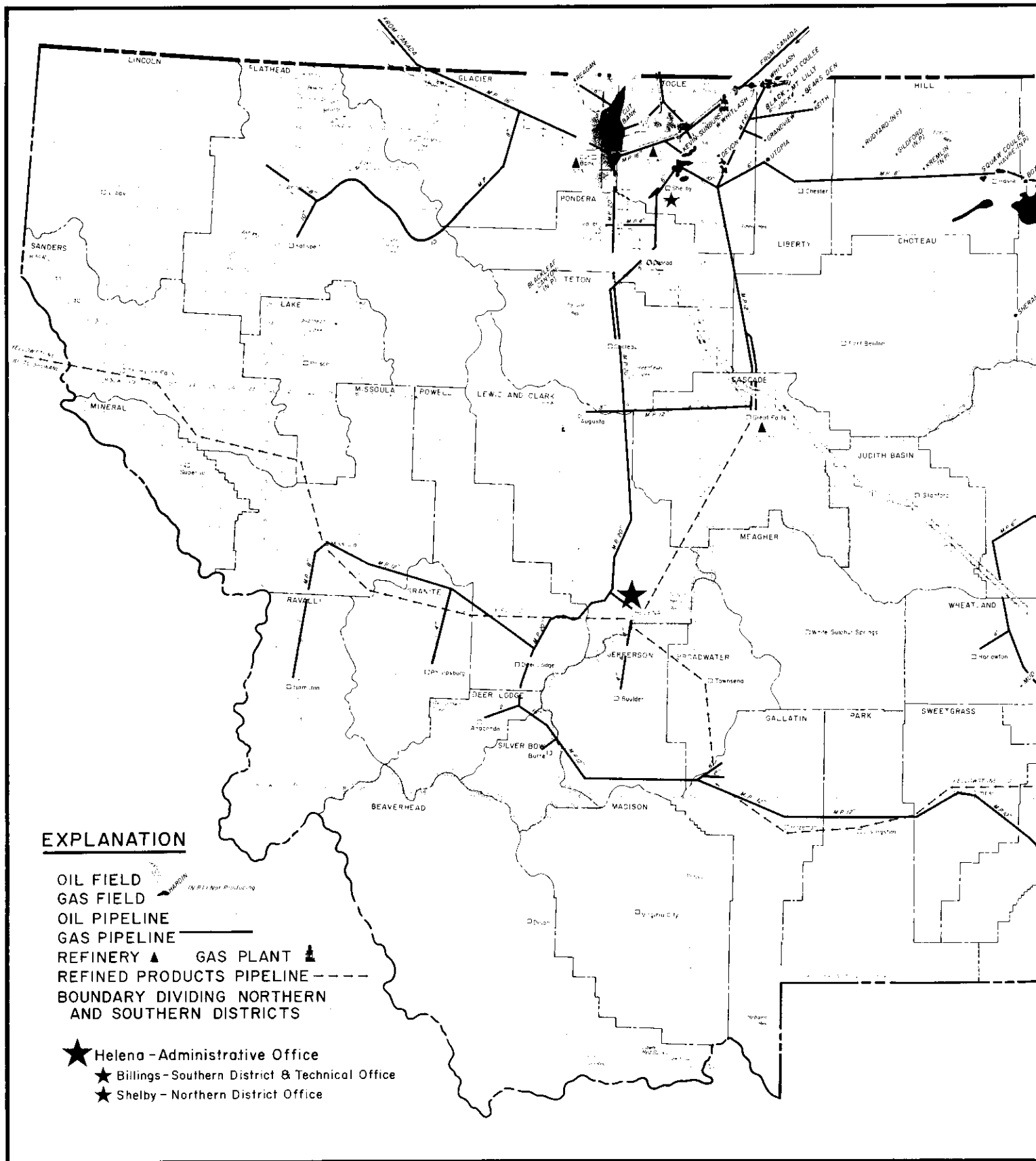
Field, Formation, Age	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations, Field Rules, and Remarks	Secondary Recovery or Water Disposal
WHITLASH					
Bow Island, Kootenai, Swift (Cret.) (Jur.)	Oil 29 Gas 38	Comb. Strat. and Struct.	Volumetric	Gas: 300' from legal subdivision line and 2400' between wells, 75' topographic tolerance. Oil: 330' from legal subdivision line and 650' between wells; 5-spot location at center of 40-acre tract permitted; 75' topographic tolerance. General Rules 207, 211, 219, 221, 223, and 224 suspended. (Order 16-54.)	None
WHITLASH, WEST					
Sunburst, Swift (Cret.) (Jur.)	Oil 1 Gas 9	Structural and Strat.	Volumetric	Gas: 160-acre spacing units consisting of quarter sections; well location anywhere within a 660' square in center of spacing unit. Oil: 330' from legal subdivision line, 650' between wells in same reservoir on same lease; 5-spot location permitted. (Order 61-62.)	None
WILLS CREEK, SOUTH					
Interlake (Sil.)	3	Structural	Partial Water Drive	160-acre spacing units. Well location in center of SE $\frac{1}{4}$ of each unit with 175' topographic tolerance. (Orders 5-64, 30-66.)	None
WOLF SPRINGS					
Amsden (Penn.)	9	Structural	Water Drive	80-acre spacing units consisting of N $\frac{1}{2}$ and S $\frac{1}{2}$ of each quarter section. Well location in center of NW $\frac{1}{4}$ and SE $\frac{1}{4}$ of each quarter section with 75' topographic tolerance. (Orders 4-56, 9-59.)	None
WOODROW					
Charles, Duperow, Interlake Red River (Miss., Dev., Sil., Ord.)	4	Structural	Water Drive	80-acre spacing units consisting of any two adjacent quarter-quarter sections; well locations in center of NE $\frac{1}{4}$ and SW $\frac{1}{4}$ of each quarter section with 200' topographic tolerance. (Order 47-62.) One Charles well; One Interlake well; One commingled Interlake-Duperow well; One Red River well.	Produced water injected into Dakota. (Order 48-62.)

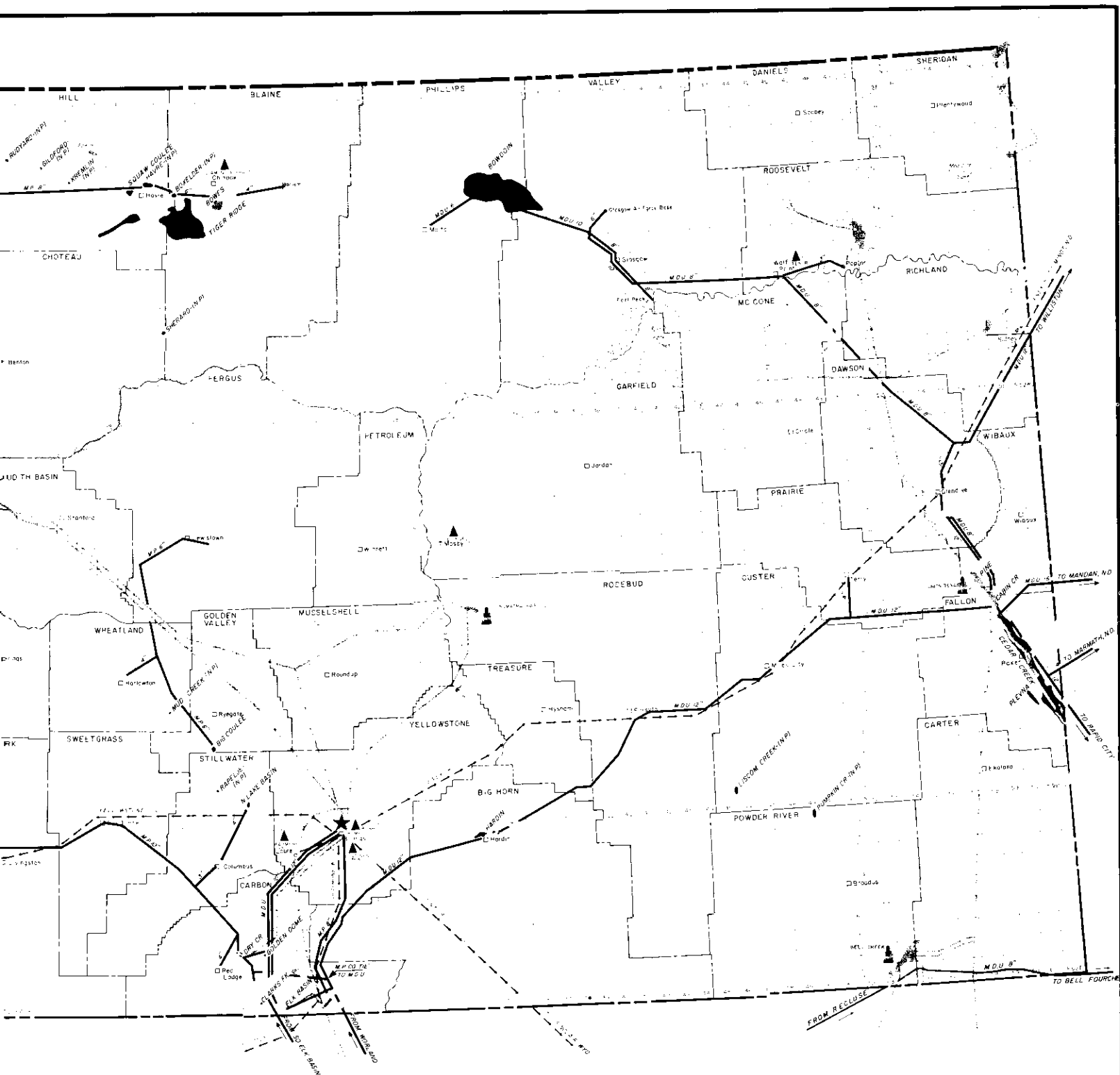
STATE OF MONTANA - SUMMARY OF PRODUCTION

LINE NO.	FIELD (OR POOL)	COUNTY	YEAR DISCOVERED	PRODUCING FORMATION	APPROX. DEPTH	A.P.I. GRAVITY	VOLUME FACTOR	AVG. NET PAY FT.	AVG. POROSITY %	AVG. CONNATE WATER %	ORIGINAL OIL IN PLACE BBL/ACRE	PRODUCTIVE AREA 1-1-59 ACRES	ORIGINAL OIL IN PLACE 1000 BBL
1.	Ash Creek (Montana)	Big Horn	1952	Shannon (U. Cret.)	4,500	34	1.05	14	22	42	13,199	200	2,640
2.	Bears Den	Liberty	1924	Sunburst (L. Cret.)	2,300	39	1.08	20	12	35	11,205	200	2,241
3.	Ball Creek	Powder River	1967	Muddy (Cret.)	4,400	32	1.11	9.5	26.4	23	13,566	13,840	187,755
4.	Benrud	Roosevelt	1961	Nisku (Dev.)	7,650	43	1.41	22	16	30	13,557	80	1,085
5.	Benrud, East	Roosevelt	1962	Nisku (Dev.)	7,500	46	1.27	25	12	30	20,811	150	2,320
6.	Benrud, Northeast	Roosevelt	1964	Nisku (Dev.)	7,500	46	1.27	25	12	30	27,054	160	4,329
7.	Big Well	Musselshell	1948	Tyler (Penn.)	3,000	31	1.02	22	17	40	17,068	1,220	20,821
8.	Big Well	Musselshell	1953	Ansdan (Penn.)	2,500	19	1.61	17	16	35	8,517	280	2,385
9.	Blackfoot	Glacier	1955	Madison (Miss.)	3,550	25	1.15	8	14	40	4,533	480	2,176
10.	Blackfoot	Glacier	1955	Cut Bank (L. Cret.)	3,500	30	1.11	15	15	35	10,221	160	1,635
11.	Bowes	Blaine	1949	Sawtooth (M. Jur.)	3,250	19	1.02	37	11.7	31	22,718	3,760	85,420
12.	Branson-Madison	Richland	1954	Madison (Miss.)	9,600	32	1.40	40	5	40	6,650	960	6,384
13.	Branson-Red River	Richland	1968	Red River (Ord.)	12,600	48	1.77	20	10	35	5,940	960	5,707
14.	Branson-South-Red River	Richland	1968	Red River (Ord.)	12,600	48	1.70	20	12	30	7,667	320	2,453
15.	Cabin Creek	Fallon	1953	Silurian-Ordovician	8,400	33	1.20	50	13	30	29,415	7,520	224,142
16.	Cabin Creek	Fallon	1956	Mission Canyon (Miss.)	7,300	33	1.13	25	11	30	13,215	2,259	29,853
17.	Cat Creek (West Dome)	Petroleum	1920	Kootenai (L. Cret.)	1,100	52	1.10	51	21	19	--	975	59,650
18.	Cat Creek (Antelope-Mosby)	Petroleum, Garfield	1920	Kootenai (L. Cret.)	1,225	52	1.10	10	21	19	11,997	200	2,399
19.	Cat Creek	Petroleum, Garfield	1945	Morrison (U. Jur.)	1,600	52	1.10	6	22	40	5,586	240	1,340
20.	Cat Creek	Petroleum, Garfield	1945	Ellis (U. Jur.)	1,750	52	1.10	25	18	40	19,050	880	16,764
21.	Cat Creek	Petroleum	1957	Ansdan (Penn.)	2,025	52	1.00	10	8	30	4,344	40	174
22.	Cut Bank	Glacier, Toole	1932	Kootenai (L. Cret.)	2,900	38	1.09	18	15	35	12,492	49,000	612,108
23.	Cut Bank	Glacier, Toole	1945	Madison (Miss.)	3,000	39	1.10	10	14	30	6,911	3,200	22,115
24.	Deer Creek	Dawson	1952	Red River (U. Ord.)	9,900	41	1.20	90	7	30	28,530	400	11,412
25.	Deer Creek	Dawson	1956	Interlake (Sil.)	9,440	43	1.20	38	6.7	30	1,514	320	1,684
26.	Dwyer	Sheridan	1961	Mission Canyon (Miss.)	8,000	33	1.12	30	11.8	25	11,034	4,800	52,963
27.	Elk Basin (Montana Portion)	Carbon	1915	Frontier (U. Cret.)	1,100	33	1.16	30	21	20	33,720	120	4,046
28.	Elk Basin (Montana Portion)	Carbon	1942	Ember-Tensleep (Perm.-Penn.)	5,000	29	1.16	124	10.5	10	78,360	1,376	107,834
29.	Elk Basin (Montana Portion)	Carbon	1942	Madison (Miss.)	5,300	28	1.12	224	12	9	169,434	920	155,879
30.	Elk Basin, Northwest	Carbon	1947	Frontier (U. Cret.)	3,375	47	1.29	28	19	30	22,394	120	2,687
31.	Elk Basin, Northwest	Carbon	1947	Madison (Miss.)	6,215	35	1.08	124	12	35	69,477	200	13,895
32.	Elk Basin, Northwest	Carbon	1964	Ember-Tensleep (Perm.-Penn.)	6,000	37	1.15	27	11.5	22	16,338	580	9,476
33.	Fairview	Richland	1967	Winnipegosis (Dev.)	11,350	49	1.10	27	7	30	9,327	160	1,992
34.	Fairview	Richland	1965	Red River (U. Ord.)	12,460	47	1.70	35	11	28	12,650	1,760	22,264
35.	Fairview Prairie	Fallon	1952	Red River (U. Ord.)	9,250	29	1.20	6	14	27	3,364	400	1,586
36.	Flat Coulee	Liberty	1933	Swift (U. Jur.)	2,900	37	1.10	18	21	35	17,329	1,280	22,181
37.	Flat Lake	Sheridan	1964	Ratcliffe (Miss.)	6,500	33	1.26	14	15	45	7,112	8,800	62,586
38.	Flat Lake, South	Sheridan	1966	Ratcliffe (Miss.)	2,600	32	1.26	6	12	45	2,438	320	780
39.	Fred and George Creek	Toole	1963	Sunburst (L. Cret.)	6,000	39	1.20	31	27	30	37,982	880	33,336
40.	Fred and George Creek	Toole	1963	Swift (U. Jur.)	7,100	39	1.10	8	14	30	5,528	800	6,528
41.	Gas City	Dawson	1955	Red River (U. Ord.)	8,700	38	1.28	25	12	35	11,825	2,800	33,110
42.	Glenview	Dawson	1952	Silurian-Ordovician	8,700	38	1.25	147	8	35	47,481	1,800	60,776
43.	Goose Lake	Sheridan	1952	Ratcliffe (Miss.)	7,000	34	1.20	40	16	55	18,620	4,320	80,438
44.	Graben Coulee	Glacier	1961	Sunburst, Cut Bank, Madison	2,940	34	1.10	15	12	30	8,880	760	6,745
45.	Gypsy Basin	Pondera	1958	Madison, Sunburst, Swift	3,150	31	1.10	21	12	32	12,086	260	2,142
46.	Hawthorn	Musselshell	1967	Tyler (L. Penn.)	5,040	33	1.15	34	12	30	19,835	360	7,145
47.	Ivanhoe	Musselshell	1953	Morrison (U. Jur.)	2,800	30	1.08	10	15	35	2,004	700	1,815
48.	Ivanhoe	Musselshell	1960	Ansdan (L. Penn.)	3,600	32	1.08	9	17	40	6,594	160	1,055
49.	Ivanhoe	Musselshell	1955	Tyler (L. Penn.)	4,050	33	1.08	29	15	20	24,975	600	14,989
50.	Keg Coulee (West Portion)	Musselshell	1960	Tyler (L. Penn.)	4,550	32	1.15	22	15	25	16,696	680	11,353
51.	Keg Coulee (East Portion)	Musselshell	1960	Tyler (L. Penn.)	4,550	32	1.15	17	15	25	12,901	440	5,676
52.	Keg Coulee, North	Musselshell	1964	Tyler (L. Penn.)	4,550	33	1.15	14	12	32	7,707	120	7,707
53.	Kelley	Musselshell	1966	Tyler (L. Penn.)	4,350	33	1.15	50	13	30	30,680	200	6,130
54.	Kevin-Sunburst	Toole	1952	Madison-Sunburst (Miss.-L. Cret.)	1,500	32	1.08	6.5	27	35	6,064	40,205	243,803
55.	Leird Creek	Liberty	1968	Swift (U. Jur.)	2,800	39	1.10	14	16	25	11,849	480	5,687
56.	Little Beaver (Montana)	Fallon	1953	Red River (U. Ord.)	8,300	29	1.40	37	12	35	15,991	2,390	38,218
57.	Little Beaver, East (Montana)	Fallon	1954	Red River (U. Ord.)	8,300	30	1.50	24	12.5	35	10,085	1,600	16,136
58.	Lodge Grass	Big Horn	1964	Tensleep (Penn.)	6,520	22	1.16	15	15.4	34	10,200	200	2,040
59.	Lookout Butte	Fallon	1961	Silurian-Ordovician	7,800	33	1.15	15	15	25	11,384	12,320	140,254
60.	Lookout Butte	Fallon	1965	Lodge Pole-Mission Canyon	4,320	26	1.18	26	10	35	11,604	1,920	22,280
61.	Aspen Lake	Musselshell	1964	3rd Cat Creek (L. Cret.)	4,320	36	1.00	16	20	45	13,554	80	1,092
62.	Helstone	Musselshell	1948	Tyler (Penn.)	4,250	34	1.09	25	15	30	18,683	360	6,726
63.	Mineral Bench	Roosevelt	1965	Duperow (Dev.)	8,800	33	1.80	24	11	30	7,965	40	318
64.	Mineral Bench	Roosevelt	1965	Charles "C" (Miss.)	7,120	36	1.10	16	11	30	8,689	160	1,390
65.	Miners Coulee	Toole	1966	Swift (U. Jur.)	2,400	39	1.10	6	14	30	4,147	160	666
66.	Monarch	Fallon	1958	Silurian-Ordovician	8,400	32	1.10	31	7	35	9,957	22,290	22,290
67.	Monarch	Fallon	1961	Mission Canyon (Miss.)	6,110	34	1.08	17	19	30	9,160	340	1,480
68.	Outlook	Sheridan	1956	Silurian-Devonian	9,000	38	1.12	20	8	30	7,750	1,600	12,416
69.	Outlook	Sheridan	1964	Duperow (Dev.)	8,150	39	1.50	15	10	25	8,729	320	2,793
70.	Outlook, South	Sheridan	1957	Red River (U. Ord.)	9,900	33	1.21	35	8	45	9,870	160	1,580
71.	Outlook, South	Sheridan	1957	Winnipegosis (Dev.)	9,100	39	1.12	18	8	30	6,966	240	1,672
72.	Outlook, West	Sheridan	1958	Winnipegosis (Dev.)	9,100	39	1.12	16	8	30	4,206	320	1,986
73.	Pennel	Fallon	1955	Silurian-Ordovician	8,800	33	1.14	25	11	35	12,165	16,160	196,586
74.	Pennel	Fallon	1957	Mission Canyon (Miss.)	7,000	31	1.16	38	3.4	40	6,380	720	7,720
75.	Pennel	Fallon	1960	Lodge Pole (Miss.)	7,500	36	1.13	30	8	35	10,710	320	3,422
76.	Pine	Dawson, Wibaux, Fallon, Prairie	1952	Silurian-Ordovician	8,600	34	1.17	32	11.5	30	17,078	13,320	227,475
77.	Pole Creek	Musselshell	1964	Ansdan (Penn.)	3,560	18	1.05	10	7	30	3,620	320	1,150
78.	Pondera	Pondera, Teton	1927	Madison (Miss.)	2,100	34	1.20	15	16	31	10,706	5,560	59,522
79.	Poplar	Roosevelt	1952	Madison (Miss.)	5,500	40	1.10	25	11	30	13,575	17,900	243,111
80.	Poplar, Northwest	Roosevelt	1952	Madison (Miss.)	6,250	40	1.10	16	11	30	8,689	160	1,390
81.	Ragged Point	Musselshell	1947	RTobey (U. Miss.)	4,400	33	1.09	28	11	40	13,154	160	2,102
82.	Ragged Point	Musselshell	1956	Tyler (Penn.)	3,580	32	1.11	13	14.3	32	8,835	680	6,001
83.	Rattlesnake Coulee	Toole	1966	Sunburst (L. Cret.)	1,850	42	1.10	10	12	30	5,924	40	23
84.	Reagan	Glacier	1947	Madison (Miss.)	3,700	38	1.10	11	12	30	6,516	2,520	16,424
85.	Red Creek	Glacier	1958	Cut Bank (L. Cret.)	2,600	31	1.08	20	19.2	30	19,308	768	14,822
86.	Red Creek	Glacier	1958	Madison (Miss.)	2,750	28	1.10	32	13	30	20,537	640	13,140
87.	Red Fox	Roosevelt	1967	Nisku (Dev.)	7,700	46	1.40	10	18	30	6,928	160	1,101
88.	Redstone	Sheridan	1958	Winnipegosis (Dev.)	9,400	42	1.10	34	8	30	13,427	160	2,144
89.	Reserve	Sheridan	1967	Winnipegosis (Dev.)	11,160	45	1.17	7	8	30	2,599	480	1,244
90.	Reserve	Sheridan	1966	Interlake (Silurian)	10,300	36	1.14	16	2	30	1,525	160	24
91.	Reserve	Sheridan	1958	Red River (Ordovician)	11,100	39	1.30	18	6	30	4,511	480	2,161
92.	Richey	Dawson, McCone	1951	Charles (Miss.)	7,000	39	1.20	25	8	30	9,050	920	8,322
93.	Richey, Southwest	McCone	1952	Silurian-Devonian	9,200	48	1.37	27	9	30	6,634	1,160	11,177
94.	Sand Creek	Dawson	1959	Silurian-Ordovician	8,550	39	1.30	25	10	30	8,953	800	7,873
95.	Shotgun Creek	Roosevelt	1963	Ratcliffe (Miss.)	8,270	37	1.44	14	9	40	4,188	160	567
96.	Snake Creek	Daniels	1967	McGowan (Miss.)	6,900	32	1.25	9	10	25	4,190	320	1,344
97.	Snyder	Big Horn	1952	Tensleep (Penn.)	4,600	21	1.07	25	17	35	21,433	120	2,577
98.	Snope Creek	Big Horn	1952	Tensleep-Ansdan-Madison	1,900	20	1.05	20	15	35	14,408	600	

NA - SUMMARY OF PRODUCING OIL FIELDS

SUMMARY OF PRODUCTION DATA																		
AVG. NET PAY FT.	AVG. POROSITY %	AVG. CONNATE WATER %	ORIGINAL OIL IN PLACE BBL/ACRE	PRODUCTIVE AREA 1-1-69 ACRES	ORIGINAL OIL IN PLACE 1000 BBL.	ESTIMATED RECOVERY FACTOR %		ORIGINAL RESERVES 1000 BBL.		TOTAL ORIGINAL RESERVES 100 BBL.	CUMULATIVE PRODUCTION 1-1-69 1000 BBL.	REMAINING RESERVES 1-1-69 1000 BBL.	1968 PRODUCTION		AVG. DAILY BOED.	ORIGINAL RECOVERABLE RESERVES		LINE NO.
						PRIMARY	SECONDARY	PRIMARY	SECONDARY				TOTAL	BOED.		BBL./ACRE	BBL./ACRE/FT.	
14	22	42	13,199	200	2,640	25	6	660	158	818	619	199	38,747	106	4,090	292	1	
20	12	35	11,705	200	2,241	17	--	381	--	381	326	55	15,551	42	1,905	95	2	
9.5	26	23	13,566	13,840	187,756	31	31	57,969	57,811	115,780	18,283	97,497	16,572,472	45,280	8,366	881	3	
22	16	30	13,557	80	1,085	17	--	187	--	187	167	20	11,967	33	2,337	106	4	
35	15	30	20,811	160	2,320	38	--	1,256	--	1,256	833	423	100,267	274	7,850	224	5	
45	15.5	30	27,054	160	4,329	18	--	780	--	780	651	129	90,016	246	4,869	108	6	
22	17	40	17,068	1,220	20,821	31	5	6,455	1,041	7,496	5,352	2,144	204,148	558	6,144	279	7	
17	16	35	8,517	280	2,385	24	--	625	--	625	546	79	26,092	71	2,232	132	8	
8	14	40	4,533	480	2,178	32	--	696	--	696	--	--	--	--	1,450	181	9	
15	15	35	10,221	160	1,635	20	--	1,227	--	1,227	893	130	33,423	91	2,044	136	10	
37	11.7	31	22,718	3,760	85,420	8	2	6,854	2,021	8,875	7,085	1,770	175,008	478	2,355	64	11	
40	5	40	6,550	960	5,384	10	--	638	--	638	217	421	31,602	86	665	17	12	
20	10	35	5,940	960	5,702	20	--	1,140	--	1,140	337	803	196,658	1,311	1,188	59	13	
20	12	30	7,667	320	2,453	20	--	491	--	491	82	409	82,289	686	1,534	70	14	
50	13	30	29,415	7,620	224,142	22	8	49,311	17,931	67,242	40,604	26,638	2,349,649	6,420	8,824	176	15	
25	11	30	13,215	2,255	29,853	42	--	12,514	--	12,514	7,933	4,581	1,180,659	3,226	5,539	221	16	
51	21	19	--	975	59,650	25	9	14,913	5,369	20,282	16,723	3,559	91,270	249	20,802	408	17	
10	21	19	11,997	200	2,399	22	11	528	264	--	--	--	--	--	1,783	237	18	
6	22	40	5,586	240	1,340	32	--	428	--	428	--	--	95,218	260	5,715	229	20	
25	18	40	19,050	880	16,764	30	--	5,029	--	5,029	--	--	--	--	875	88	21	
10	8	30	4,344	40	174	20	--	35	--	35	11	24	10,240	28	1,288	88	20	
18	15	35	12,492	49,000	612,108	20	11	122,422	67,332	189,754	107,483	82,271	3,673,177	10,036	3,873	215	22	
10	14	30	6,911	3,200	22,115	28	--	6,192	--	6,192	5,736	456	118,313	323	1,935	194	23	
90	7	30	28,530	4,000	11,412	10	--	1,130	--	1,130	1,043	87	24,225	66	2,825	31	24	
38	6.7	30	11,514	320	2,684	24	--	1,253	--	1,253	1,079	174	8,795	24	3,916	103	25	
30	11.8	55	11,614	4,800	52,963	10	--	5,415	--	5,415	3,987	1,428	231,580	633	1,128	38	26	
30	21	30	33,720	3,120	4,046	--	37	--	1,500	1,500	1,316	184	17,282	47	12,500	417	27	
124	10.5	10	78,368	1,375	107,834	--	57	--	61,465	61,465	45,407	16,058	1,758,776	4,805	44,669	360	28	
224	12	9	169,434	920	155,879	--	21	23,382	6,235	29,617	13,109	16,508	835,810	2,284	32,192	144	29	
28	19	30	22,394	120	2,687	25	21	672	564	1,236	1,069	167	19,794	54	10,300	368	30	
124	12	35	69,477	200	13,895	8	--	1,071	--	1,071	865	206	14,417	39	5,350	43	31	
27	11.5	22	16,338	580	9,476	15	13	1,421	1,232	2,653	762	1,891	71,586	196	4,574	169	32	
27	7	30	9,327	160	1,492	13	--	191	--	191	130	61	55,399	151	1,194	44	33	
35	11	28	12,650	1,760	22,264	13	--	2,785	--	2,785	1,405	1,380	868,304	2,372	1,740	50	34	
6	14	27	3,964	400	1,586	25	--	397	--	397	286	111	16,242	53	993	166	35	
18	21	35	17,329	1,280	22,181	12	11	2,662	2,440	5,102	1,916	3,186	154,165	531	3,985	221	36	
14	15	45	7,112	8,800	62,586	12	--	7,700	--	7,700	4,381	3,319	863,558	2,359	875	63	37	
6	12	45	2,438	320	780	15	--	117	--	117	39	78	22,478	61	369	62	38	
31	27	30	37,882	880	33,335	23	20	7,667	6,667	14,334	5,505	8,829	722,833	1,975	16,288	525	39	
25	13	35	11,523	840	4,644	24	--	1,579	--	1,579	763	816	116,860	219	1,880	235	40	
8	14	30	11,825	2,800	33,110	26	3	8,609	993	9,602	6,440	3,162	393,198	1,074	3,429	137	41	
147	8	55	47,481	1,280	60,776	20	--	12,155	--	12,155	8,076	4,079	414,275	1,132	9,496	65	42	
40	16	55	18,620	4,320	80,438	12	--	9,653	--	9,653	3,306	6,347	699,439	1,911	2,234	56	43	
15	12	30	8,880	760	6,749	15	--	1,000	--	1,000	648	352	100,394	274	1,315	88	44	
21	12	32	12,086	260	3,142	10	--	314	--	314	156	158	5,597	15	1,208	58	45	
34	12	30	19,835	360	7,141	17	--	1,200	--	1,200	482	718	379,256	1,036	3,333	98	46	
10	15	35	7,004	160	7,000	24	--	170	--	170	156	14	4,167	11	1,700	170	47	
9	17	40	6,594	100	1,055	34	--	359	--	359	296	63	12,584	34	2,244	249	48	
29	15	20	24,975	600	14,985	25	--	3,746	--	3,746	3,447	298	101,366	275	2,243	215	49	
22	15	25	16,686	680	11,353	23	16	2,611	1,816	4,427	2,401	1,946	194,188	523	6,510	296	50	
17	15	25	12,901	440	5,676	15	--	851	--	851	777	74	30,700	84	1,934	114	51	
14	12	32	7,707	120	925	17	15	157	139	296	141	155	16,333	45	2,467	176	52	
50	13	30	30,690	200	6,138	27	--	1,648	--	1,648	332	1,316	165,007	451	8,240	164	53	
6.5	20	35	6,064	40,205	293,809	30	5	73,141	12,190	85,331	69,474	15,857	390,076	1,066	2,122	326	54	
14	16	25	11,849	480	5,687	15	--	853	--	853	763	105	105,269	288	1,777	127	55	
37	12	35	15,991	2,390	38,218	17	10	6,497	3,822	10,319	4,249	6,070	374,309	1,023	4,318	117	56	
24	12.5	35	10,085	1,600	16,136	24	12	3,873	1,936	5,809	2,748	3,061	226,926	620	3,631	151	57	
15	15.4	34	10,200	200	2,040	10	--	204	--	204	143	61	25,147	69	1,020	68	58	
15	15	25	11,384	12,320	140,251	13	8	18,233	11,220	29,453	10,267	19,186	1,217,389	3,326	2,391	159	59	
26	10	35	11,604	1,320	22,280	25	--	5,520	--	5,520	954	4,616	194,325	535	2,901	112	60	
16	20	45	13,654	80	1,092	15	--	166	--	166	109	57	16,373	45	2,075	130	61	
25	15	30	18,683	360	6,726	25	--	1,682	--	1,682	1,520	162	26,548	73	4,672	187		





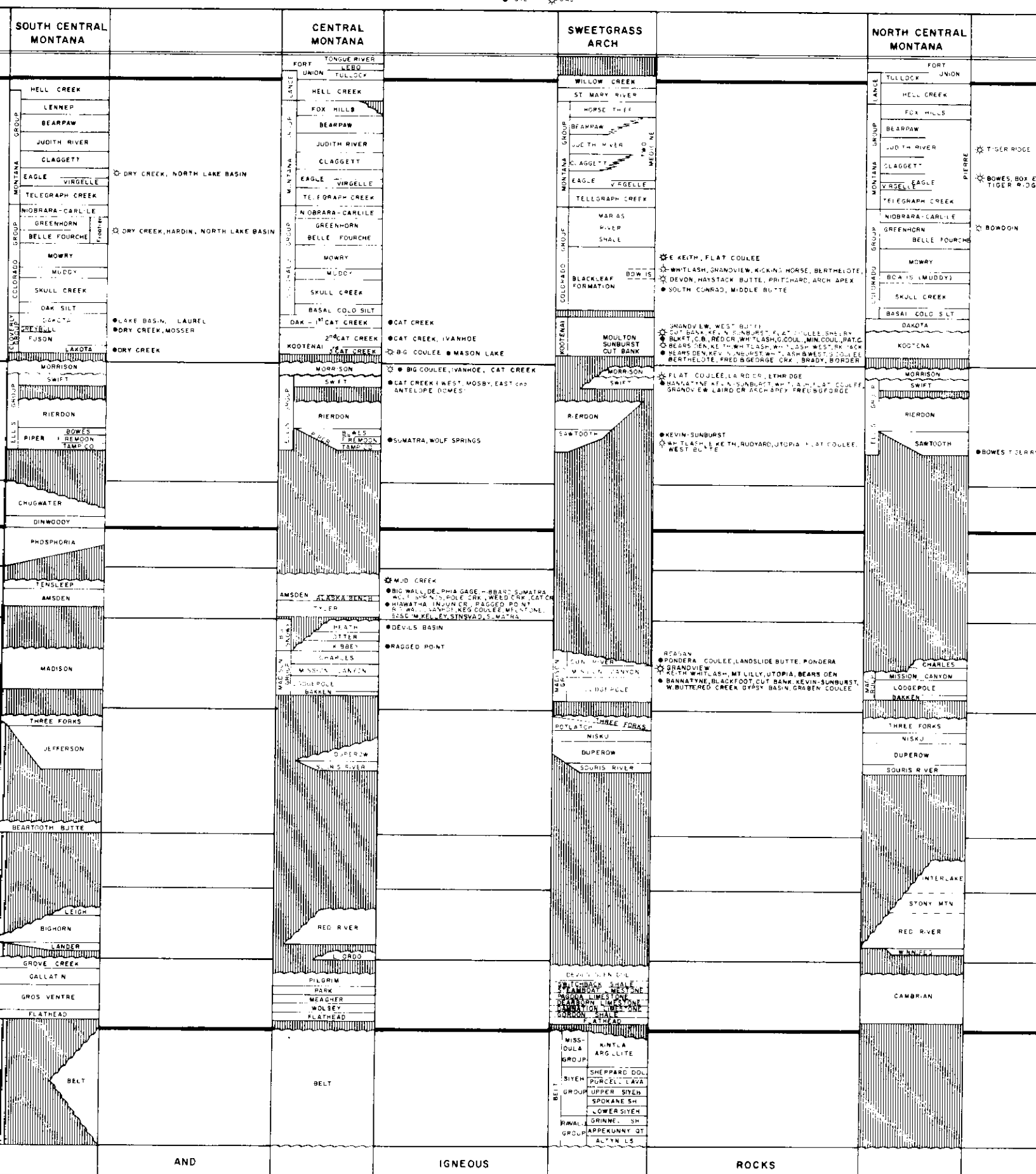
MONTANA **OIL AND GAS FIELDS, PIPELINES AND REFINERIES** **1968**

THE OIL AND GAS CONSERVATION COMMISSION OF THE STATE OF MONTANA

ERA	PERIOD		SOUTHWESTERN MONTANA	CRAZY MTN. BASIN	BIG HORN BASIN		SOUTH CENTRAL MONTANA	
CENOZOIC	TERTIARY		BEAVERHEAD	TONGUE RIVER	FORT UNION			
MESOZOIC	CRETACEOUS	UPPER	MONTANA GROUP	LEBO	LANCE			
				TULLOCK				
				MELL CR.			HELL CREEK	
				LENNEP	MEETEETSE		LENNEP	
				BEARPAW			BEARPAW	
		LOWER	MONTANA GROUP	JUDITH RIVER	MESA VERDE		JUDITH RIVER	
				CLAGGETT			CLAGGETT	
				EAGLE			EAGLE	DRY CREEK, NORTH LAKE
				TELEGRAPH CREEK	CODY SHALE		TELEGRAPH CREEK	
				NUBRARA-CARLILE	FRONTIER	ELK BASIN, NW ELK BASIN, CLARKS FORK	NUBRARA-CARLILE	DRY CREEK, HARDIN, NORTH
	JURASSIC	UPPER	MONTANA GROUP	FRONTIER			FRONTIER	
				MOWRY			MOWRY	
				MOODY	MOODY		MOODY	
		MIDDLE	MONTANA GROUP	SKULL CR.	SKULL CREEK		SKULL CREEK	
				DAK. SILT	DAK. SILT		DAK. SILT	
		LOWER	MONTANA GROUP	DAKOTA	DAKOTA	NORTH CLARKS FORK, ELK BASIN	DAKOTA	LAKE BASIN, LAUREL
				KOOTENAI	KOOTENAI	BELFRY, MCKAY, DEAN	KOOTENAI	DRY CREEK, MOSSER
	TRIASSIC	LOWER ?	MONTANA GROUP	DAKOTA	DAKOTA	CLARKS FORK	DAKOTA	
				DAKOTA	DAKOTA	NORTH CLARKS FORK, ROSCOE	DAKOTA	DRY CREEK
	PERMIAN	UPPER	MONTANA GROUP	MORRISON	MORRISON		MORRISON	
				SWIFT	UPPER SUNDANCE		SWIFT	
		MIDDLE	MONTANA GROUP	RIERDON	LOWER SUNDANCE		RIERDON	
				PIPER	GYPSUM SPRING		PIPER	BOMES
		LOWER ?	MONTANA GROUP	THAYNES	CHUGWATER		THAYNES	CHUGWATER
				WOODSIDE	DINWOODY		WOODSIDE	DINWOODY
	PENNSYLVANIAN	UPPER	MONTANA GROUP	PHOSPHORIA	PHOSPHORIA	ELK BASIN, NW ELK BASIN	PHOSPHORIA	
				QUADRANT	TENSLEEP	ELK BASIN, FRANKIE, NW ELK BASIN	QUADRANT	TENSLEEP
	MISSISSIPPIAN	UPPER	MONTANA GROUP	AMSDEN	AMSDEN	ELK BASIN	AMSDEN	
				BIG SNOWY	BIG SNOWY		BIG SNOWY	
	DEVONIAN	UPPER	MONTANA GROUP	MADISON	MADISON	ELK BASIN, NW ELK BASIN	MADISON	
				SAPPINGTON	SAPPINGTON		SAPPINGTON	
		MIDDLE	MONTANA GROUP	THREE FORKS	THREE FORKS	ELK BASIN	THREE FORKS	
				JEFFERSON	JEFFERSON		JEFFERSON	
		LOWER	MONTANA GROUP	MAYWOOD	MAYWOOD		MAYWOOD	
				BEARTOOTH BUTTE	BEARTOOTH BUTTE		BEARTOOTH BUTTE	
	SILURIAN	UPPER	MONTANA GROUP	BIG HORN	BIG HORN	ELK BASIN	BIG HORN	
				LANDER	LANDER		LANDER	
	ORDOVICIAN	UPPER	MONTANA GROUP	GROVE CREEK	GROVE CREEK		GROVE CREEK	
				GALLATIN	GALLATIN		GALLATIN	
	CAMBRIAN	UPPER	MONTANA GROUP	FLATHEAD	FLATHEAD		FLATHEAD	
				WOLSEY	WOLSEY		WOLSEY	
		MIDDLE	MONTANA GROUP	MEAGHER	MEAGHER		MEAGHER	
				SILVERHILL	SILVERHILL		SILVERHILL	
		LOWER	MONTANA GROUP	FLATHEAD	FLATHEAD		FLATHEAD	
				FLATHEAD	FLATHEAD		FLATHEAD	
	PRE-CAMBRIAN	UPPER	MONTANA GROUP	BELT	BELT		BELT	
				BELT	BELT		BELT	
	PROTEROZOIC	UPPER	MONTANA GROUP	BELT	BELT		BELT	
				BELT	BELT		BELT	
ARCHEOZOIC	PRE-CAMBRIAN		BELT	BELT		METAMORPHIC	BELT	AND

SHOWING PRODUCTIVE FORMATIONS IN MONTANA OIL AND GAS FIELDS

● OIL ☼ GAS



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MONTANA OIL AND GAS CONSERVATION COMMISSION, 1968
HERBERT D HADLEY, GEOLOGIST