MISSOURI RIVER BASIN

BOARD OF REVIEW'S REPORT TO THE COMMISSIONER

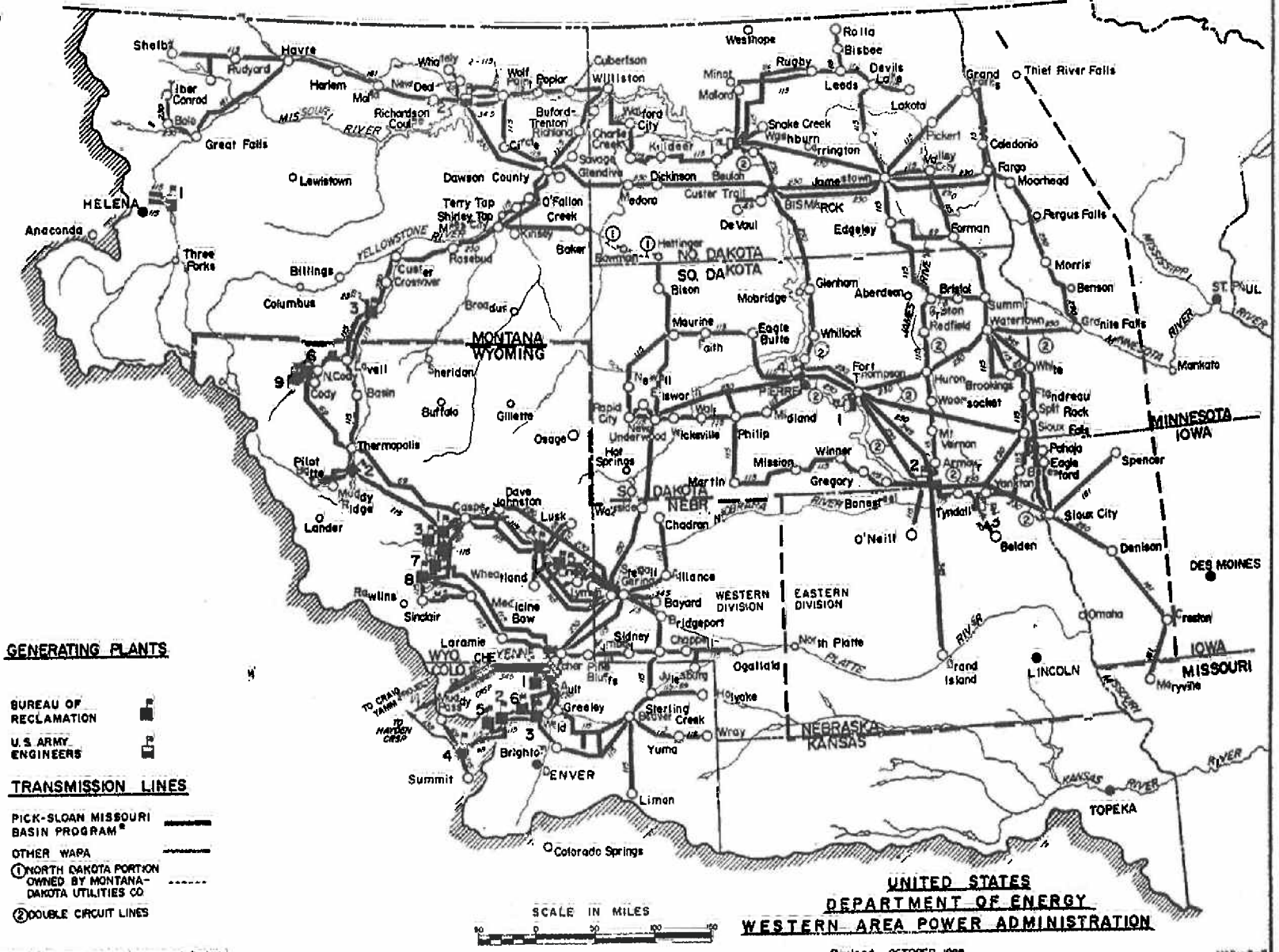
United States Department Of The Interior
Bureau of Reclamation
Denver 2, Colorado, April 14, 1944

From Board of Review
To Commissioner

Subject: Report on Conservation, Control, and Use of Water Resources of the Missouri River Basin.

2. The water of the Missouri River system is a primary national resource which, up to the present time, has been inadequately controlled and developed. The two major problems of the basin are the control of devastating floods along the lower river and the stabilization of agriculture in the Dakotas and in eastern Montana.

MISSOURI RIVER BASIN POWER SYSTEM



EXISTING GENERATING PLANTS, FEDERALLY OWNED

NAME PLATE RATING IN MW

MONTANA
1. Canyon Ferry
2. Ft Peck
3. Yellowtail

WYOMING
1. Alcova
2. Boysen
3. Fremont Canyon
4. Glendo
5. Guernsey
6. Heart Mountain
7. Kortes
8. Seminoe
9. Buffalo Bill

COLORADO
1. Big Thompson
2. Estes
3. Flatiron
4. Green Mountain
5. Marys Lake
6. Polehill

NORTH DAKOTA
1. Garrison

SOUTH DAKOTA
1. Big Bend
2. Fort Randall
3. Gavins Point
4. Oahe

GENERATING PLANTS
- BUREAU OF RECLAMATION
- U.S. ARMY ENGINEERS

TRANSMISSION LINES
- PICK-SLOAN MISSOURI BASIN PROGRAM*
- OTHER WAPA
- (1) NORTH DAKOTA PORTION OWNED BY MONTANA-DAKOTA UTILITIES CO.
- (2) DOUBLE CIRCUIT LINES

SCALE IN MILES

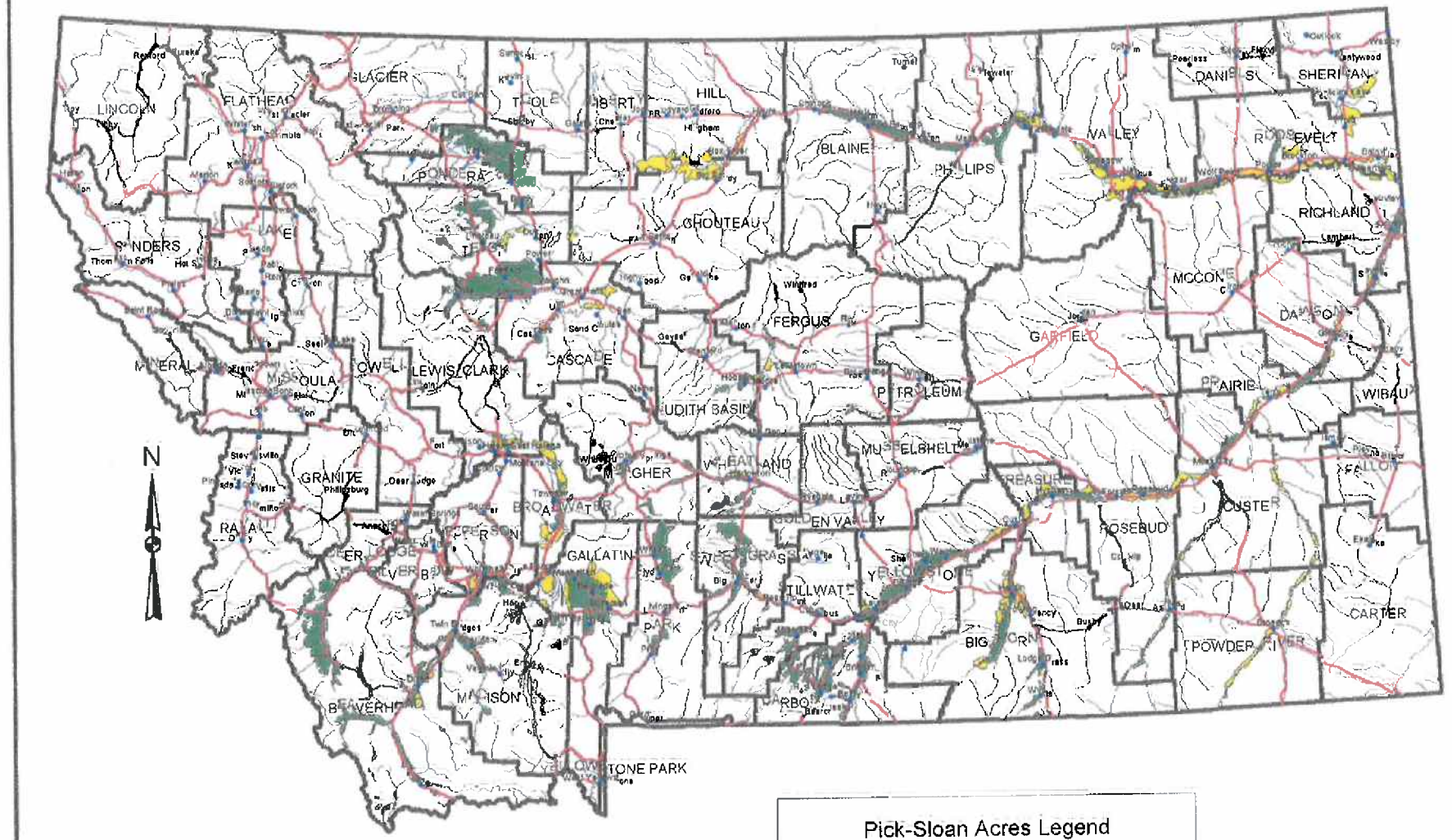
UNITED STATES
DEPARTMENT OF ENERGY
WESTERN AREA POWER ADMINISTRATION

Revised OCTOBER, 1968

* Includes Facilities of the Pick-Sloan Missouri Basin Program and the Integrated Projects (Ft. Peck, Colorado - Big Thompson, Kendrick, North Platte and Shoshone)

Figure 1

1944 Pick-Sloan Acres of Irrigated and Future Irrigation in Montana



GARRISON DIVERSION

THE PICK-SLOAN POWER REVENUES. WHO GETS WHAT?

Since 1955, dams on the Missouri River have been generating hydroelectric power. In 1944, the Flood Control Act authorized these dams primarily as flood control dams to keep water levels in Missouri, Kansas, Nebraska, Iowa and other states along the Missouri River at reasonable levels. The water would be stored in upstream states like North Dakota to keep downstream states from flooding. The power generated by these dams would be used to fund the project and to keep a government promise: states that store water would benefit from the project as well.

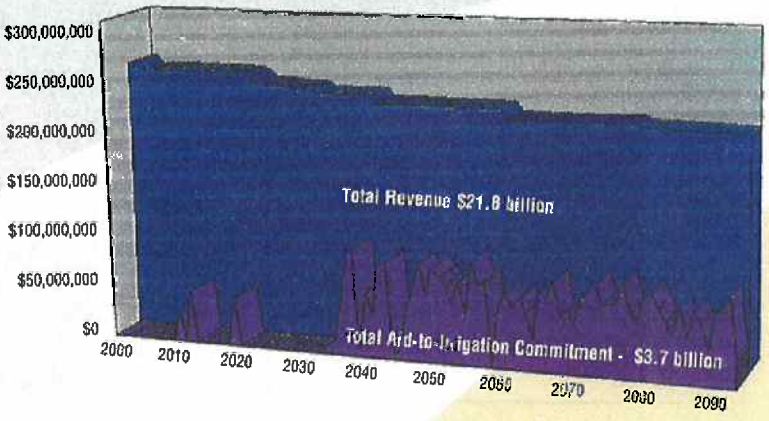
PROMISES WERE MADE TO NORTH DAKOTA.

One of the dams built on the Missouri River was the Garrison Dam in North Dakota, a massive earthen dam that, together with water behind Oahe Dam, would flood 550,000 acres. In exchange for the loss of prime farm land and rural communities, the federal government made promises to North Dakota aimed at helping the state grow and develop.

- North Dakota could use some of the water behind Garrison Dam to irrigate one million acres.
- The power generated by the dams would be made available at cost for development in the Upper Midwest where long distances and difficult weather made electricity an expensive service to offer.
- North Dakota could use some of the power revenues to pay for irrigation costs and part of the power generated by the dams for pumping irrigation water.

The two largest factors contributing to the development of North Dakota, water and electricity, were to be addressed in a single, straightforward plan. The plan anticipated revenues of more than $21.8 billion by 2095, most of which was to be used for operating and maintaining the Pick-Sloan program and repaying debt.

Aid-to-Irrigation Commitment 2000-2095
Pick-Sloan Missouri Basin Program



$3.7 billion of the revenue from the Pick-Sloan Dams were to be used to help repay irrigation costs in the Pick-Sloan Missouri Basin Program.

BUT THE WATER KEPT GOING THROUGH THE TURBINES AND MAKING MONEY

To date, the dams have generated almost $4 billion in power revenues, but, almost none of the power or water set aside for irrigation was ever delivered and, in all likelihood, never will be.

Meanwhile:

- Much of the construction that was to supply water for irrigation, municipal, rural and industrial use remains incomplete and unused.

- Almost all of the water set aside for irrigation continues to generate electricity and is sold to power customers across the region.

The extra water and power created over the past 20 years by the failure to complete the Garrison irrigation program is conservatively valued at over $150 million. An additional $800 million in federal commitments were scheduled to be paid in 40 equal installments as soon as the first Garrison irrigation water was delivered.

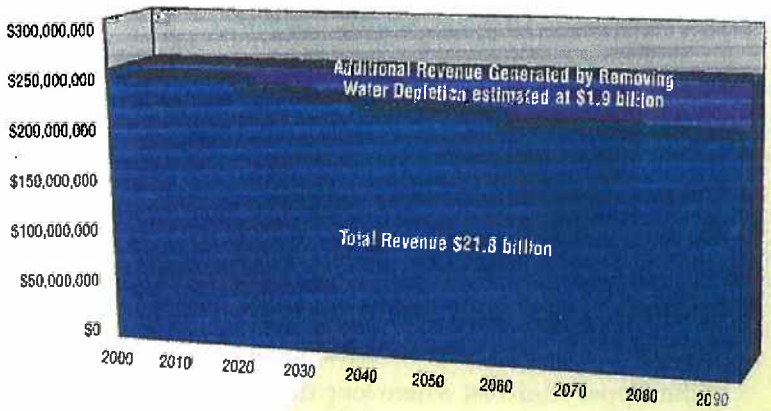
The entire Pick-Sloan program will generate an estimated $1.9 billion in extra electricity using water that was intended to irrigate five million acres of farmland.

WHAT DOES GARRISON DIVERSION PROPOSE?

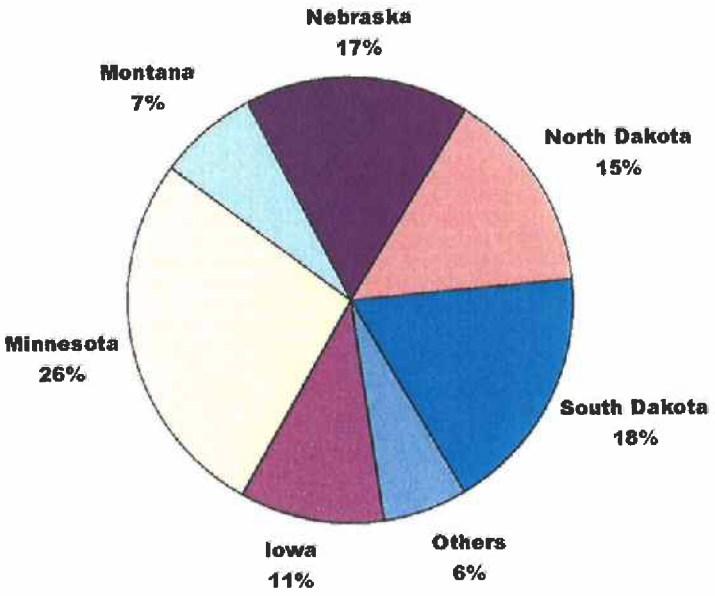
By using some of these revenues to complete the promised water delivery projects, the federal government can honor at least some of the commitments it made to North Dakota years ago. And it can do it without huge government grants and without raising the cost of power. In return for relieving the federal government of its obligation to support irrigation projects in North Dakota, Garrison Diversion proposes that the federal government use a portion of these power revenues to establish a rural economic development fund. North Dakota would use the fund to meet a portion of the highest priority water system needs in the state. Because the plan would freeze cost allocated to power, the wholesale rates at which Pick-Sloan power is sold would remain the same as under the existing arrangement.

Garrison Diversion remains dedicated to bringing Missouri River water to the people of North Dakota. An important key to making this happen is the revenue generated from the sale of hydroelectric power. Garrison Diversion is working to get North Dakota its share.

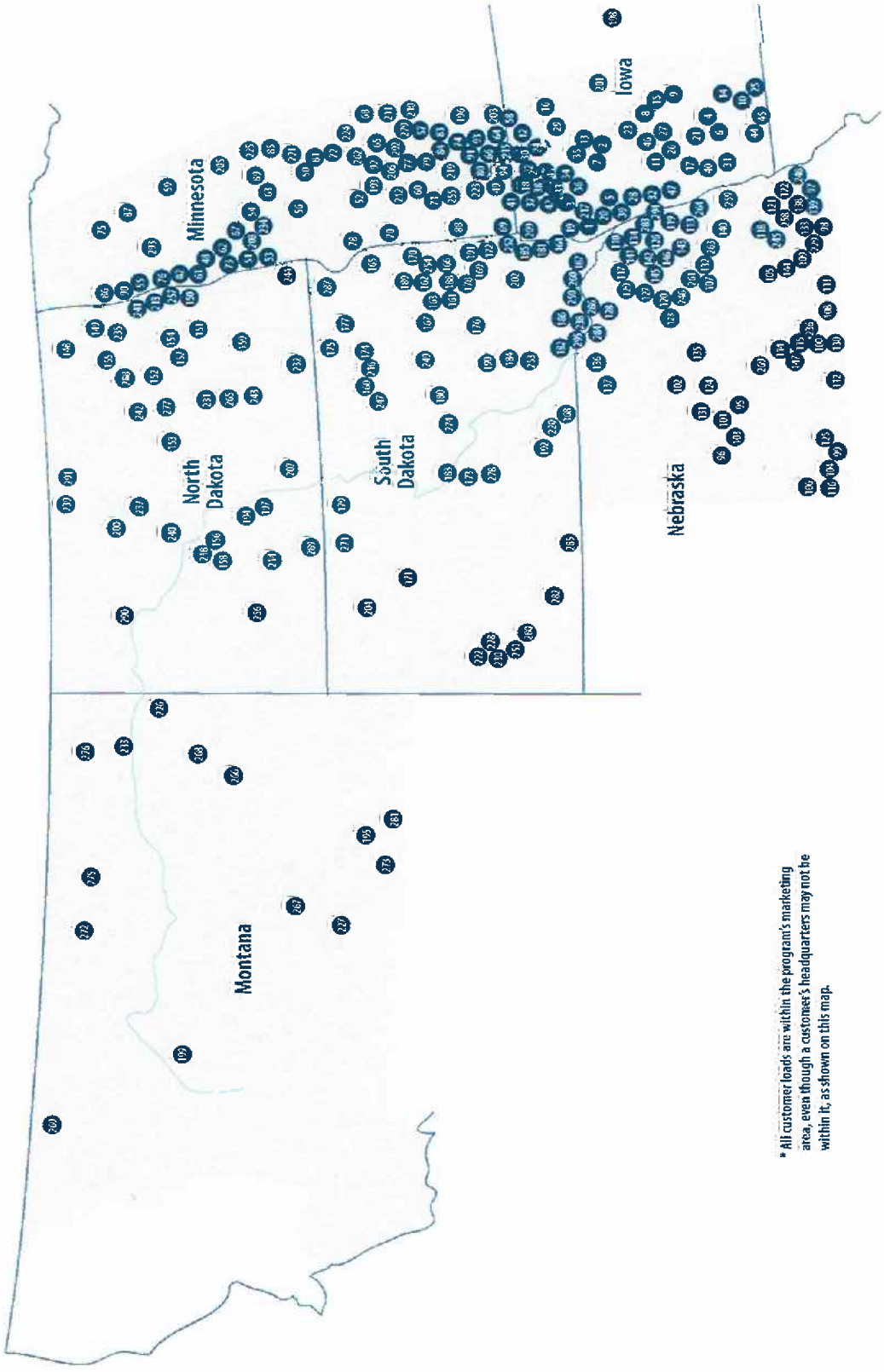
Changes in Generated Revenue 2000-2095
Pick-Sloan Missouri Basin Program



Firm Power Pick-Sloan marketed by Western Area Power Administration 2004



Others	6.20%
Iowa	10.50%
Minnesota	26.90%
Montana	7.10%
Nebraska	16.60%
North Dakota	14.60%
South Dakota	18.10%



* All customer loads are within the program's marketing area, even though a customer's headquarters may not be within it, as shown on this map.

Municipalities

Iowa

1 Akron
2 Alta
3 Alton
4 Anita
5 Anthon
6 Atlantic
7 Aurelia
8 Breda
9 Coon Rapids
10 Corning
11 Denison
12 Estherville
13 Fonda
14 Fontanelle
15 Glidden
16 Graettinger
17 Harlan
18 Hartley
19 Hawarden
20 Hinton
21 Kimballton
22 Lake Park
23 Lake View
24 Laurens
25 Lenox
26 Manilla
27 Manning
28 Mapleton
29 Marathon
30 Milford
31 Neola
32 Onawa
62 Hawley
63 Henning
64 Jackson
65 Kandiyohi
66 Lakefield
67 Lake Park
67 Litchfield
69 Luverne
70 Madison
71 Marshall
72 Melrose
73 Moorhead
74 Mountain Lake
75 Newfolden
76 Nielsville
77 Olivia
78 Ortonville
79 Redwood Falls
80 St. James
81 Sauk Centre
82 Shelly
83 Sleepy Eye
84 Springfield
85 Staples
86 Stephen
87 Thief River Falls
88 Tyler
89 Wadena
90 Warren
91 Westbrook
92 Willmar
93 Windom
94 Worthington

Nebraska

124 Ord
125 Oxford
126 Pender
127 Pierce
128 Plainview
129 Randolph
130 Red Cloud
131 Sargent
132 Schuyler
133 Shickley
134 South Sioux City
135 Spalding
136 Spencer
137 Stuart
138 Syracuse
139 Tecumseh
140 Wahoo
141 Wakefield
142 Wayne
143 West Point
144 Wilber
145 Winside
146 Wisner
147 Wood River

North Dakota

148 Cavalier
149 Grafton
150 Hillsboro
151 Hope
152 Lakota
153 Maddock
154 Northwood
155 Park River
156 Riverdale
186 Tyndall
187 Vermillion
188 Volga
189 Watertown
190 Wessington Springs
191 White
192 Winner

Rural electric cooperatives

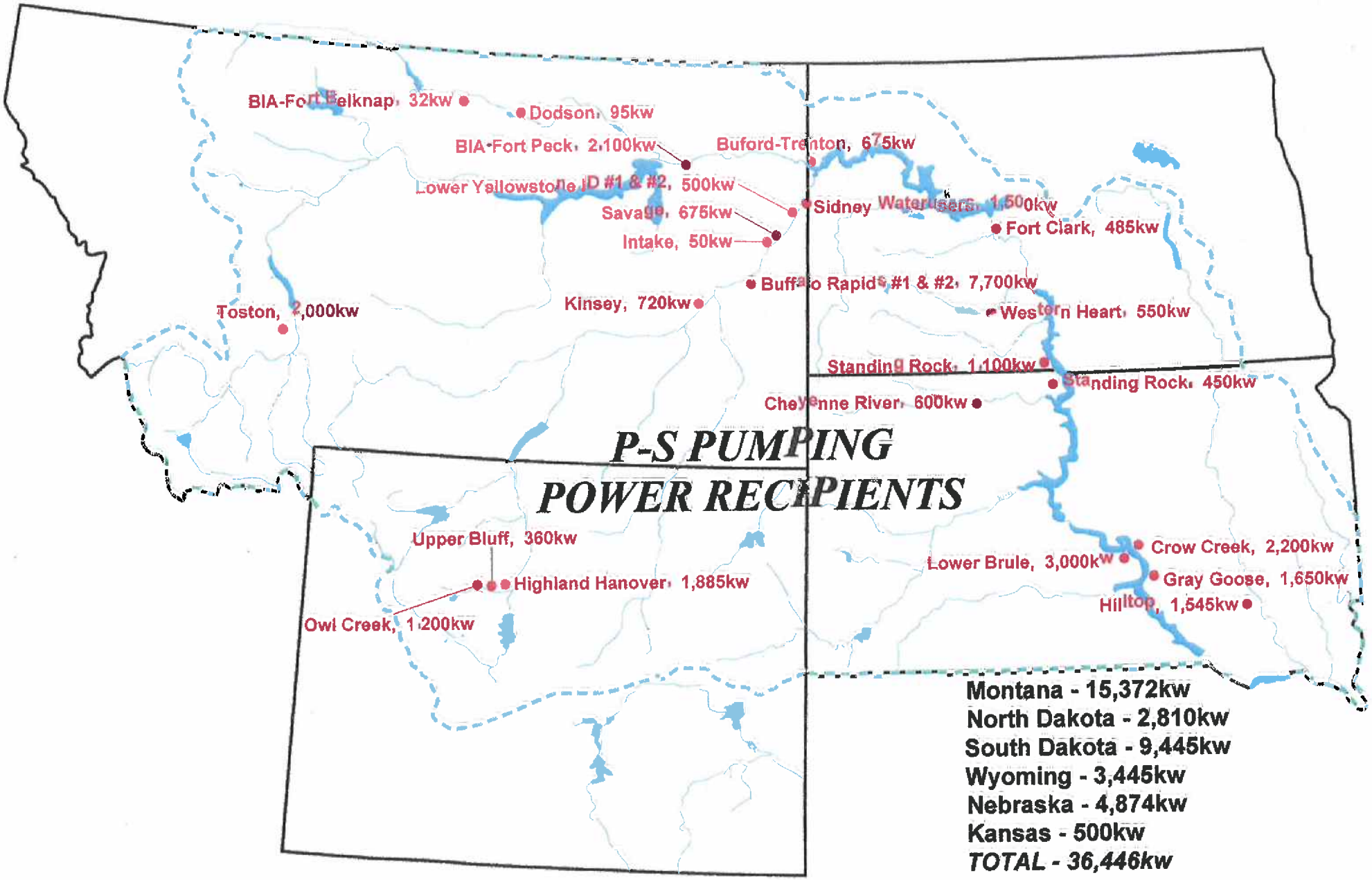
193 Agralite Electric Co-op.
194 Basin Electric Power Co-op.
195 Big Horn County Electric Co-op.
196 Brown County Rural Electric
197 Capital Electric Co-op.
198 Central Iowa Power Co-op.
199 Central Montana Electric Power Co-op.
200 Central Power Electric Co-op.
201 Corn Belt Power Co-op.
202 East River Electric Power Co-op.
203 Federated Rural Electric Assn.
204 Grand Electric Co-op.
205 Itasca-Mantrap Co-op. Electric Assn.
206 Kandiyohi Co-op. Elec. Power Assn.
207 KEM Electric Co-op.
208 Lake Region Co-op. Elec. Assn.
209 L&O Power Co-op.
210 McLeod Co-op. Power
211 Meeker Co-op. Light and Power
212 Minnesota Valley Co-op.
213 Minnkota Power Co-op.
214 Mor-Gran-Sou Electric Co-op.
215 Nobles Cooperative Electric
216 Northern Electric Co-op.
242 ND State School for the Deaf
243 ND State Hospital–Jamestown
244 ND State School of Science–Wahpeton
245 Nebraska State Penitentiary
246 Norfolk Regional Center
247 Northern State University–Aberdeen
248 Peru State College
249 SD Developmental Center
250 SD Human Services Center–Yankton
251 SD School of Mines & Tech
252 SD State Penitentiary–Sioux Falls
253 SD State Training School– Plankinton
254 SD State University--Brookings
255 Southwest Minnesota State University
256 Southwest Water Authority
257 Univ. of ND--Grand Forks
258 Univ. of Nebraska–Lincoln
259 Univ. of Nebraska–Omaha
260 Univ. of SD–Vermillion
261 Wayne State College
262 Willmar Regional Treatment Center

Public utility districts

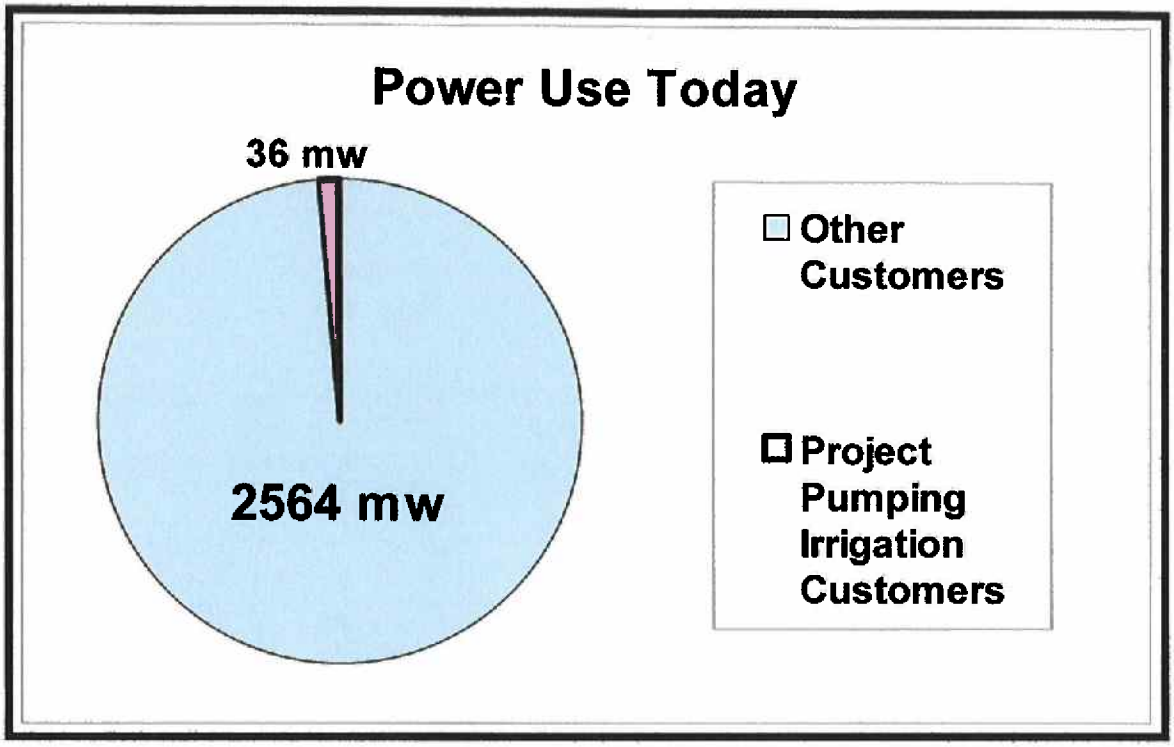
263 Nebraska Public Power District
264 Omaha Public Power District

Irrigation districts

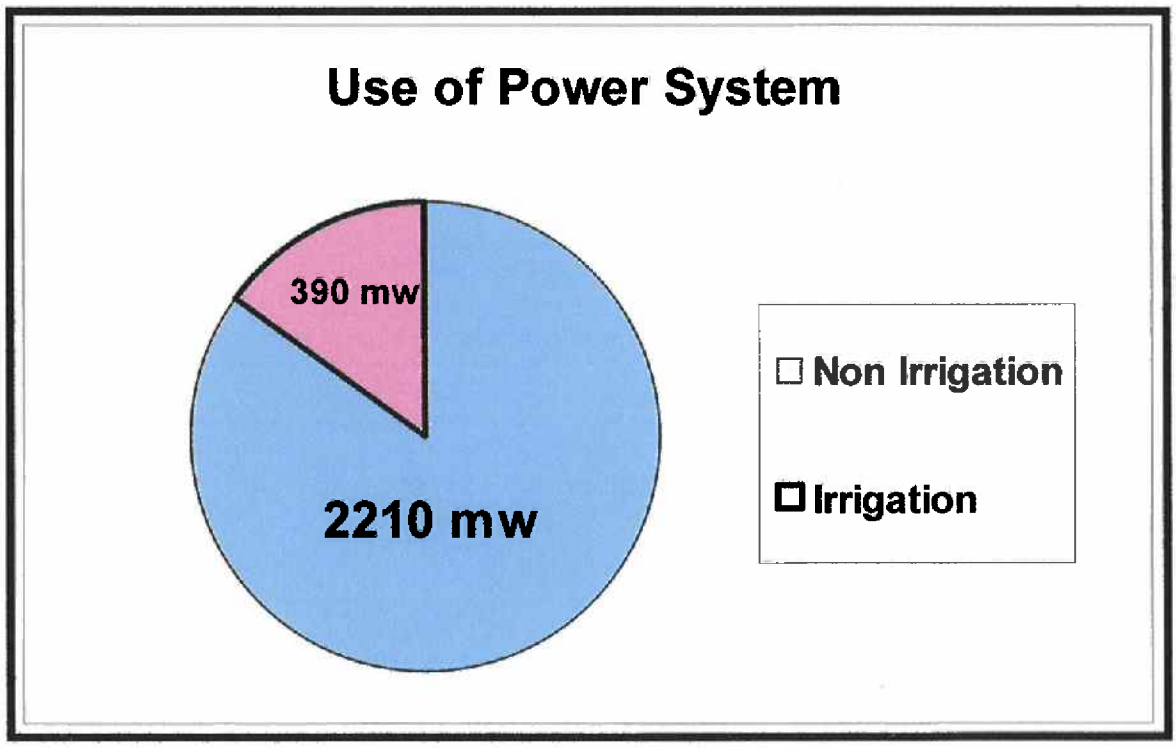
265 Garrison Diversion
266 Hammond Pump
267 Hysham ID
268 Prairie County Water & Sewer Dist. No. 2
269 Loup Basin Reclamation District


BIA-Fort Belknap, 32kw
Dodson, 95kw
BIA-Fort Peck, 2,100kw
Buford-Trenton, 675kw
Lower Yellowstone ID #1 & #2, 500kw
Sidney Waterusers, 1,500kw
Savage, 675kw
Fort Clark, 485kw
Intake, 50kw
Buffalo Rapids #1 & #2, 7,700kw
Toston, 2,000kw
Kinsey, 720kw
Western Heart, 550kw
Standing Rock, 1,100kw
Standing Rock, 450kw
Cheyenne River, 600kw
P-S PUMPING
POWER RECIPIENTS
Upper Bluff, 360kw
Crow Creek, 2,200kw
Lower Brule, 3,000kw
Highland Hanover, 1,885kw
Gray Goose, 1,650kw
Hilltop, 1,545kw
Owl Creek, 1,200kw
Montana - 15,372kw
North Dakota - 2,810kw
South Dakota - 9,445kw
Wyoming - 3,445kw
Nebraska - 4,874kw
Kansas - 500kw
TOTAL - 36,446kw

PSMBP



15.8% of total power investment or $500 million is charged to future irrigation.



1944 Pick-Sloan Acres of Irrigated and Future Irrigation in Montana

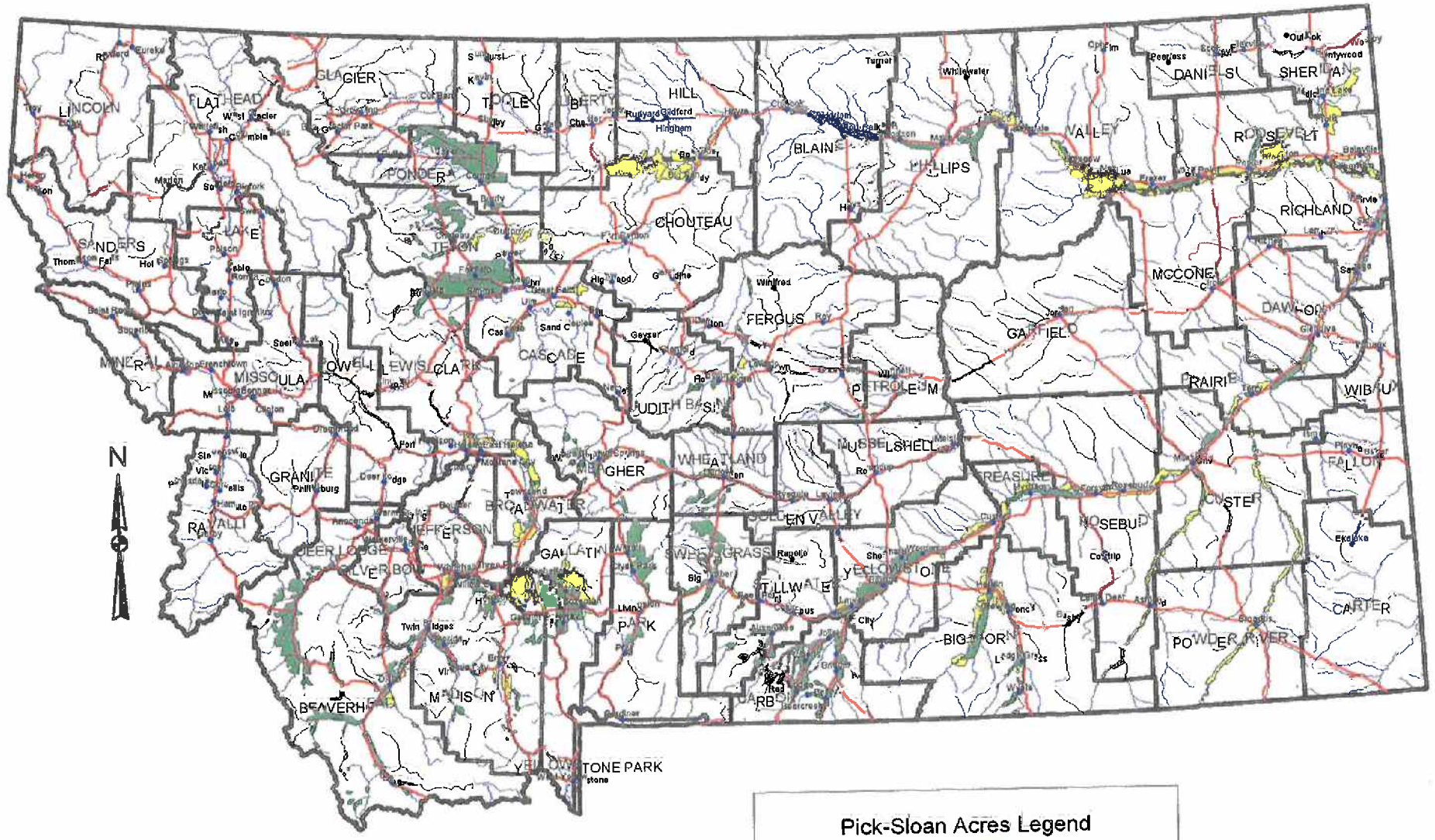


Table 3. Population, Housing Units, Land Area, and Density: 2000; and Percent Change: 1970 to 2000

[For information concerning historical counts, see "User Notes." Density computed using land area. For information on nonsampling error and definitions, see text]

State County	Population	Housing units	Land area in square miles	Average per square mile: Population	Average per square mile: Housing units	Percent change: Population: 1990 to 2000	Population: 1980 to 1990	Population: 1970 to 1980	Housing units: 1990 to 2000	Housing units: 1980 to 1990	Housing units: 1970 to 1980
The State	**902 195**	**412 633**	**145 552.43**	**6.2**	**2.8**	**12.9**	**1.8**	**13.3**	**14.3**	**10.0**	**33.2**
COUNTY											
Beaverhead County	9 202	4 571	5 542.31	1.7	0.8	9.2	2.9	–	10.7	10.3	16.5
Big Horn County	12 671	4 655	4 994.81	2.5	0.9	11.8	2.2	10.3	8.2	11.3	33.3
Blaine County	7 009	2 947	4 226.18	1.7	0.7	4.2	-3.9	4.0	0.6	13.4	8.4
Broadwater County	4 385	2 002	1 191.35	3.7	1.7	32.2	1.6	29.3	25.7	9.9	56.6
Carbon County	9 552	5 494	2 047.99	4.7	2.7	18.2	-0.2	14.4	13.8	10.7	29.4
Carter County	1 360	811	3 339.57	0.4	0.2	-9.5	-16.5	-8.0	-0.6	2.6	4.5
Cascade County	80 357	35 225	2 697.90	29.8	13.1	3.4	-3.7	-1.4	6.5	2.7	18.4
Chouteau County	5 970	2 776	3 973.24	1.5	0.7	9.5	-10.5	-5.9	4.0	-0.8	2.4
Custer County	11 696	5 380	3 783.13	3.1	1.4	–	-10.8	7.7	-0.8	-1.2	25.6
Daniels County	2 017	1 154	1 426.09	1.4	0.8	-11.0	-20.1	-8.0	-5.4	-6.4	1.7
Dawson County	9 059	4 168	2 373.14	3.8	1.8	-4.7	-19.5	4.8	-7.1	-3.2	23.5
Deer Lodge County	9 417	4 958	736.98	12.8	6.7	-8.4	-17.9	-20.0	2.7	-7.1	1.0
Fallon County	2 837	1 410	1 620.33	1.8	0.9	-8.6	-17.5	-7.1	-7.5	0.4	11.9
Fergus County	11 893	5 558	4 339.17	2.7	1.3	-1.6	-7.6	3.7	-3.0	6.3	13.8
Flathead County	74 471	34 773	5 098.34	14.6	6.8	25.8	14.0	31.7	28.9	20.0	59.5
Gallatin County	67 831	29 489	2 605.84	26.0	11.3	34.4	17.7	31.9	38.1	24.3	59.6
Garfield County	1 279	961	4 668.06	0.3	0.2	-19.5	-4.0	-7.8	4.0	6.5	18.6
Glacier County	13 247	5 243	2 994.72	4.4	1.8	9.3	14.0	-1.4	9.3	19.9	15.7
Golden Valley County	1 042	450	1 175.30	0.9	0.4	14.3	-11.1	10.2	4.2	-8.5	29.0
Granite County	2 830	2 074	1 727.44	1.6	1.2	11.1	-5.6	-1.4	7.8	17.7	21.6
Hill County	16 673	7 453	2 896.36	5.8	2.6	-5.6	-1.8	3.5	1.5	2.1	23.1
Jefferson County	10 049	4 199	1 656.64	6.1	2.5	26.6	12.9	34.2	27.2	15.2	83.1
Judith Basin County	2 329	1 325	1 669.85	1.2	0.7	2.1	-13.8	-0.8	-1.6	-1.0	22.0
Lake County	26 507	13 605	1 493.77	17.7	9.1	26.0	10.4	31.9	24.0	21.4	52.5
Lewis and Clark County	55 716	25 672	3 460.96	16.1	7.4	17.3	10.4	29.3	19.9	15.3	50.3
Liberty County	2 158	1 070	1 429.76	1.5	0.7	-6.0	-1.5	-1.3	6.3	-12.7	45.7
Lincoln County	18 837	9 319	3 612.67	5.2	2.6	7.8	-1.5	-1.7	16.5	14.0	18.8
McCone County	1 977	1 087	2 642.53	0.7	0.4	-13.1	-15.8	-6.0	-6.4	3.6	6.3
Madison County	6 851	4 671	3 586.54	1.9	1.3	14.4	9.9	8.7	19.7	42.4	28.0
Meagher County	1 932	1 363	2 391.82	0.8	0.6	6.2	-15.6	1.5	8.3	4.8	15.1
Mineral County	3 884	1 961	1 219.82	3.2	1.6	17.2	-9.8	24.2	19.9	-0.7	52.0
Missoula County	95 802	41 319	2 597.97	36.9	15.9	21.6	3.5	30.5	23.5	9.6	61.6
Musselshell County	4 497	2 317	1 867.15	2.4	1.2	9.5	-7.3	18.6	6.1	7.1	29.3
Park County	15 694	8 247	2 602.41	5.6	2.9	8.4	12.5	14.9	19.1	14.0	30.7
Petroleum County	493	292	1 653.90	0.3	0.2	-5.0	-20.8	-3.0	-0.3	-4.2	13.8
Phillips County	4 601	2 502	5 139.57	0.9	0.5	-10.9	-3.8	-0.4	-9.5	10.0	16.8
Pondera County	6 424	2 834	1 624.70	4.0	1.7	-0.1	-4.4	1.8	8.3	-3.1	19.2
Powder River County	1 858	1 007	3 297.18	0.6	0.3	-11.1	-17.1	-11.9	-8.1	-2.4	16.7
Powell County	7 180	2 930	2 325.94	3.1	1.3	8.5	-4.9	4.5	3.4	0.2	15.4
Prairie County	1 199	716	1 736.55	0.7	0.4	-13.3	-24.7	4.8	-4.1	-7.3	14.4
Ravalli County	36 070	15 946	2 394.21	15.1	6.7	44.2	11.2	56.1	43.7	21.5	71.3
Richland County	9 667	4 557	2 084.09	4.6	2.2	-9.8	-12.5	24.5	-5.6	2.9	33.5
Roosevelt County	10 620	4 044	2 355.60	4.5	1.7	-3.4	5.1	1.0	-5.2	12.0	12.5
Rosebud County	9 383	3 912	5 012.37	1.9	0.8	-10.7	6.1	64.1	-8.0	12.3	84.3
Sanders County	10 227	5 271	2 762.17	3.7	1.9	18.0	-0.1	22.3	21.6	12.8	35.7
Sheridan County	4 105	2 167	1 676.58	2.4	1.3	-13.3	-12.6	-6.3	-10.3	–	15.8
Silver Bow County	34 606	16 176	718.31	48.2	22.5	2.0	-10.9	-9.3	4.5	-3.7	2.8
Stillwater County	8 195	3 947	1 795.09	4.6	2.2	25.4	16.8	20.9	19.9	22.8	36.9
Sweet Grass County	3 609	1 860	1 855.08	1.9	1.0	14.4	-1.9	7.9	13.6	10.8	6.6
Teton County	6 445	2 910	2 272.61	2.8	1.3	2.8	-3.4	6.1	6.8	-0.8	21.3
Toole County	5 267	2 300	1 910.95	2.8	1.2	4.4	-9.2	-4.8	-2.3	-3.2	12.4
Treasure County	861	422	978.86	0.9	0.4	-1.5	-10.9	-8.2	-5.8	-3.0	3.1
Valley County	7 675	4 847	4 921.00	1.6	1.0	-6.8	-19.6	-10.6	-8.6	-5.5	6.1
Wheatland County	2 259	1 154	1 423.09	1.6	0.8	0.6	-4.8	-6.7	2.2	-1.0	13.0
Wibaux County	1 068	587	889.31	1.2	0.7	-10.3	-19.3	0.8	4.3	-17.2	26.9
Yellowstone County	129 352	54 563	2 635.15	49.1	20.7	14.0	5.0	23.7	11.9	14.1	46.6

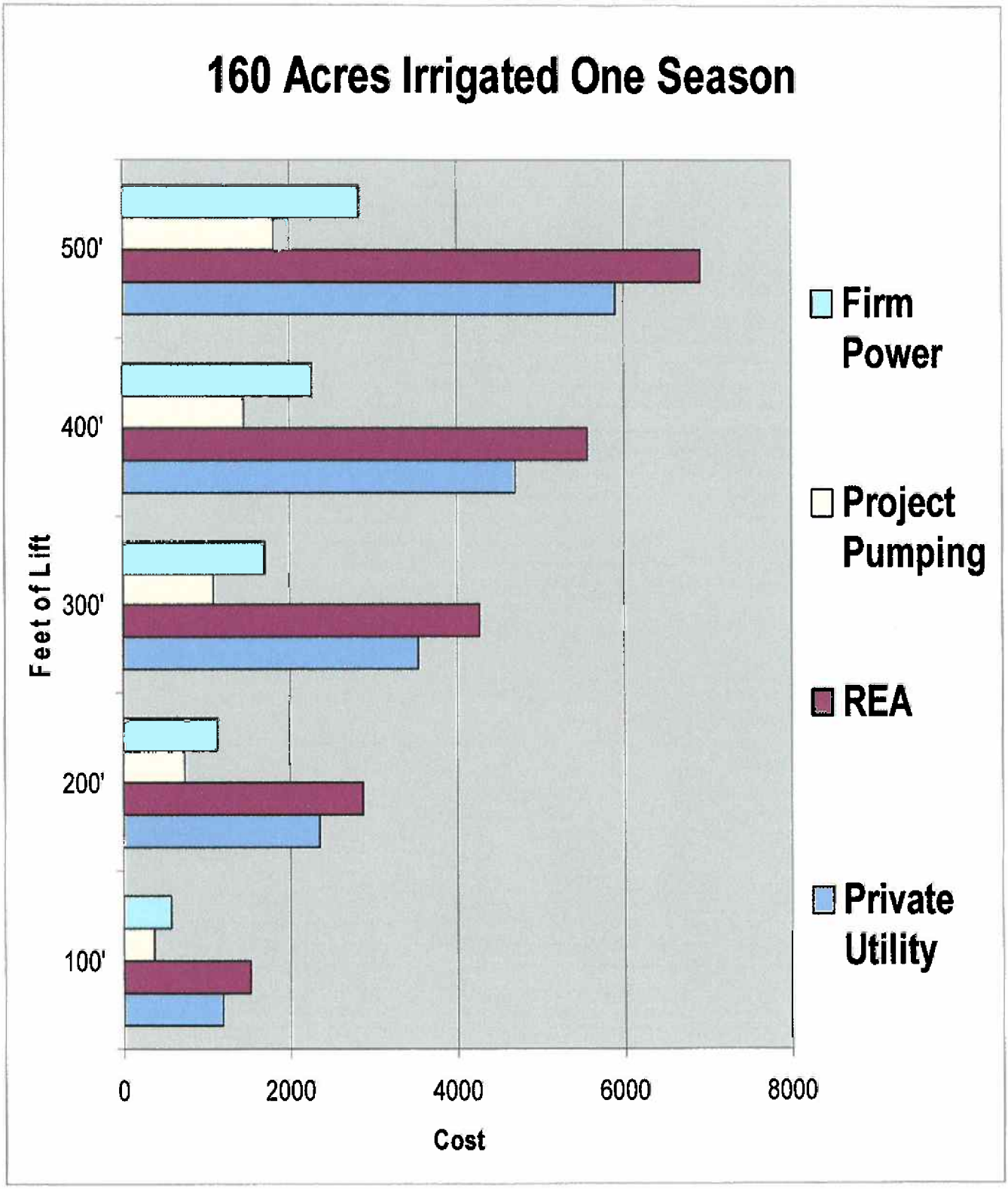
Assumptions: 160 acres Irrigation
7.5 GPM per Acre
Lifts of 100- 500 feet at 100' increments
Assuming system is 85 % efficient
Assuming 1.5 acre-feet per acre per yr required

Power rates of : Firm Federal Hydro blended rate 19.54 mills per KWH (+delivery)

Project Pumping w/out ability to pay 12.55 mills per KWH (Delivery included)

Randomly selected Rural Electric Coop
(Taken from their Web site)
.0425 per KWH next 20,000
.0375 all KWH additional
25.00 base
7.50 per KW

Private Utility
(taken off their website)
.0368 per KWH
15.00 base charge
3.00 per KW


160 Acres Irrigated One Season
Feet of Lift
500'
400'
300'
200'
100'
0
2000
4000
6000
8000
Cost
Firm Power
Project Pumping
REA
Private Utility