

1980


Nebraska Mineral Operations Review, 1979

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Burchett, Raymond R. and Eversoll, Duane A., "Nebraska Mineral Operations Review, 1979" (1980). *Conservation and Survey Division*. 14.

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NEBRASKA MINERAL OPERATIONS REVIEW, 1979

R. R. Burchett and D. A. Eversoll



*Institute of Agriculture
and Natural Resources*

May 1980

**Nebraska Geological Survey
Conservation and Survey Division
Institute of Agriculture and Natural Resources
The University of Nebraska-Lincoln**

A total of 3,074 quarries, pits, and mines have been active at various times over approximately the last 80 years in Nebraska (table 1). Of this number, 364 were limestone quarries; 2,542 sand, gravel, and silt pits; 24 clay or shale pits; 81 sandstone pits; 11 quartzite pits; 29 volcanic ash pits; 14 coal mines; 1 chalk mine; 3 flint quarries; and 5 peat pits. These operations have disturbed about 36,362 acres, of which approximately 45 percent have been reclaimed.

During 1979, there were active in Nebraska 36 limestone quarries; 539 sand, gravel, and silt or siltstone pits; 7 clay or shale pits; and 18 sandstone pits. These 600 mining operations disturbed 757 acres and restored 569 acres during the year. The locations of these quarries, pits, and mines are shown in figure 1.

The Nebraska Oil and Gas Conservation Commission reports that 1,551 wells produced 6,068,019 barrels of oil and 20 wells produced 2.6 billion cubic feet of gas during 1979. Locations of the oil and gas fields are shown in figure 2. Of the 577 drilling permits issued by the commission during the year, 320 were for exploration, 255 for development, 2 for water disposal wells. The largest number of exploration and development wells completed occurred in Cheyenne County, followed by Kimball, Red Willow, Hitchcock, Morrill, and Garden counties.

Current information collected by the Conservation and Survey Division (Nebraska Geological Survey), the U.S. Department of Agriculture (Soil Conservation Service), and the Nebraska Department of Roads (Materials Division) has been compiled and placed on open file at the office of the Conservation and Survey Division, 113 Nebraska Hall, 901 North 17th Street, Lincoln, Nebraska 68588.

TABLE 1 - SUMMARY OF NEBRASKA QUARRIES, PITS, AND MINES
JANUARY 1, 1980

COUNTY	No. of Sites	Estim. Acres Mined	No. of Sites	Limestone Acres Mined	No. of Sites	Sand, Gravel Acres Mined	No. of Sites	Clay, Shale Acres Mined	No. of Sites	Sandstone Acres Mined	No. of Sites	Quartzite Acres Mined	No. of Sites	Misc. Acres Mined
ADAMS	19	164	101	0	0	19	164	101	0	0	0	0	0	0
ANTELOPE	25	274	58	0	0	25	274	58	0	0	0	0	0	0
BANNER	17	94	20	0	0	17	94	20	0	0	0	0	0	0
BLAINE	7	22	4	0	0	7	22	4	0	0	0	0	0	0
BODINE	8	98	43	0	0	8	98	43	0	0	0	0	0	0
BOX BUTTE	5	113	18	0	0	1	80	0	0	33	18	0	0	0
BOYD	17	48	8	0	0	17	48	8	0	0	0	0	0	0
BROWN	39	274	113	0	0	38	272	113	0	0	0	0	1	2
BUFFALO	120	1794	1575	0	0	120	1794	1575	0	0	0	0	0	0
BURT	17	46	32	0	0	15	40	32	1	4	0	1	2	0
BUTLER	20	529	275	0	0	20	529	275	0	0	0	0	0	0
CASS	200	3052	686	156	2365	26	650	357	8	25	0	10	10	0
CEDAR	80	341	171	1	1	0	79	340	171	0	0	0	0	0
CHASE	27	134	57	0	0	23	118	49	0	0	0	4	16	8
CHERRY	17	46	7	0	0	13	37	7	0	0	1	7	0	0
CHEYENNE	42	524	292	0	0	42	524	292	0	0	0	0	0	0
CLAY	9	146	8	0	0	9	146	8	0	0	0	0	0	0
COLFAX	26	486	353	0	0	26	486	353	0	0	0	0	0	0
CUMING	15	559	307	0	0	15	559	307	0	0	0	0	0	0
CUSTER	20	246	35	0	0	17	239	35	0	0	0	0	0	0
DAKOTA	19	257	134	6	8	12	247	132	0	0	1	2	2	0
DAWES	28	107	10	0	0	28	107	10	0	0	0	0	0	0
DAWSON	103	1636	791	0	0	103	1636	791	0	0	0	0	0	0
DEUEL	29	228	37	0	0	29	228	37	0	0	0	0	0	0
DIXON	21	91	6	5	24	2	16	67	4	0	0	0	0	0
DODGE	40	1979	1588	0	0	40	1979	1588	0	0	0	0	0	0

TABLE 1 - CONTINUED

COUNTY	No. of Sites	Estim. Acres Mined	No. of Sites	Limestone of Acres Mined	No. of Sites	Sand, Gravel of Acres Mined	No. of Sites	Clay, Shale of Acres Mined	No. of Sites	Sandstone of Acres Mined	No. of Sites	Quartzite of Acres Mined	No. of Sites	Misc. Acres Mined
DOUGLAS	32	1253	574	0	0	32	1253	574	0	0	0	0	0	0
DUNDY	20	75	20	0	0	20	75	20	0	0	0	0	0	0
FILLMORE	8	149	48	0	0	8	149	48	0	0	0	0	0	0
FRANKLIN	29	354	57	0	0	25	287	57	0	0	4	67	0	0
FRONTIER	8	60	26	0	0	4	22	17	0	0	3	34	5	4
FURNAS	33	241	13	5	23	25	216	13	0	0	0	0	0	0
GAGE	74	691	217	15	112	53	563	202	1	2	2	1	0	0
GARDEN	40	74	16	0	0	40	74	16	0	0	0	0	0	0
GARFIELD	5	39	36	0	0	5	39	36	0	0	0	0	0	0
GOSPER	8	123	120	0	0	7	120	120	0	0	0	0	0	0
GREELEY	11	21	6	0	0	10	19	4	0	0	0	0	0	0
HALL	143	1897	718	0	0	143	1897	718	0	0	0	0	0	0
HAMILTON	30	252	111	0	0	30	252	111	0	0	0	0	0	0
HARLAN	10	138	69	0	0	8	112	69	0	0	0	0	0	0
HAYES	11	94	70	0	0	11	94	70	0	0	0	0	0	0
HITCHCOCK	30	181	55	0	0	29	179	53	0	0	1	2	2	0
HOLT	82	644	151	0	0	80	635	151	0	0	2	9	0	0
HOOVER	9	60	41	0	0	9	60	41	0	0	0	0	0	0
HOWARD	17	171	83	0	0	17	171	83	0	0	0	0	0	0
JEFFERSON	44	367	132	11	57	28	286	122	4	23	10	0	0	0
JOHNSON	12	31	6	2	12	1	9	5	0	0	0	0	0	0
KEARNEY	13	213	196	0	0	13	213	196	0	0	0	0	0	0
KEITH	62	940	437	0	0	62	940	437	0	0	0	0	0	0
KEYA PAHA	68	172	49	0	0	40	100	38	0	0	26	72	11	0
KIMBALL	29	258	112	0	0	29	258	112	0	0	0	0	0	0
KNOX	38	514	156	0	0	38	514	196	0	0	0	0	0	0

TABLE 1 - CONTINUED

COUNTY	No. Sites Mined	Estim. Acres Mined	No. Sites Mined	Recl.	No. Limestone of Acres Sites Mined	No. Sand, Gravel of Acres Sites Mined	No. Clay, Shale of Acres Sites Mined	No. Sandstone of Acres Sites Mined	Quartzite of Acres Sites Mined	No. Sites Mined	Misc. Acres Mined									
LANCASTER	62	411	153	11	217	58	35	114	73	4	49	3	12	31	19	0	0	0	0	
LINCOLN	124	1721	899	0	0	0	114	1696	899	0	0	0	0	0	0	0	0	10	25	0
LOGAN	2	3	0	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0
LOUP	15	87	35	0	0	0	15	87	35	0	0	0	0	0	0	0	0	0	0	0
MADISON	24	827	231	0	0	0	23	827	231	0	0	0	0	0	0	0	0	1	0	0
MCPHERSON	2	15	0	0	0	0	2	15	0	0	0	0	0	0	0	0	0	0	0	0
MERRICK	58	613	350	0	0	0	58	613	350	0	0	0	0	0	0	0	0	0	0	0
MORRILL	46	333	67	0	0	0	38	322	65	0	0	0	8	11	2	0	0	0	0	0
NANCE	12	167	50	0	0	0	12	167	50	0	0	0	0	0	0	0	0	0	0	0
NEMAHA	73	606	105	60	572	88	12	34	17	0	0	0	0	0	0	0	0	1	0	0
NUCKOLLS	28	225	20	2	8	0	25	216	20	0	0	0	0	0	0	0	0	1	1	0
OTOE	30	160	92	11	86	31	13	55	54	2	19	7	0	0	0	0	0	4	0	0
PANTEE	33	142	109	14	87	70	14	44	39	1	8	0	0	0	0	0	0	4	3	0
PERKINS	14	72	9	0	0	0	14	72	9	0	0	0	0	0	0	0	0	0	0	0
PHELPS	9	96	31	0	0	0	9	96	31	0	0	0	0	0	0	0	0	0	0	0
PIERCE	14	327	43	0	0	0	14	327	43	0	0	0	0	0	0	0	0	0	0	0
PLATTE	36	1234	679	0	0	0	36	1234	679	0	0	0	0	0	0	0	0	0	0	0
POLK	18	419	201	0	0	0	18	419	201	0	0	0	0	0	0	0	0	0	0	0
RED WILLOW	36	587	284	1	2	2	31	581	278	0	0	0	0	0	0	0	4	4	0	0
RICHARDSON	57	438	187	26	235	68	26	200	119	1	2	0	0	0	0	0	0	4	1	0
ROCK	22	107	57	0	0	0	22	107	57	0	0	0	0	0	0	0	0	0	0	0
SALINE	29	256	52	3	14	0	26	242	52	0	0	0	0	0	0	0	0	0	0	0
SARPY	55	1272	859	18	288	56	31	974	803	2	3	0	4	7	0	0	0	0	0	0
SAUNDERS	71	1073	671	1	5	0	68	1065	671	0	0	0	1	0	0	0	0	1	3	0
SCOTTSBLUFF	125	639	283	0	0	0	125	639	283	0	0	0	0	0	0	0	0	0	0	0
SEWARD	17	59	14	3	23	4	14	36	10	0	0	0	0	0	0	0	0	0	0	0

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TABLE 1 - CONTINUED

COUNTY	No. of Sites Mined	Estim. Acres Mined	No. of Sites	Limestone Acres Mined	No. of Sites	Sand, Gravel Acres Mined	No. of Sites	Clay, Shale Acres Mined	No. of Sites	Sandstone Acres Mined	No. of Sites	Quartzite Acres Mined	No. of Sites	Misc. Acres Mined							
SHERIDAN	26	63	7	0	0	51	7	0	0	12	0	0	0	0							
SHERMAN	7	6	4	0	0	6	4	0	0	0	0	0	0	0							
STOLX	17	36	7	0	0	36	7	0	0	0	0	0	0	0							
STANTON	13	281	154	0	0	281	154	0	0	0	0	0	0	0							
THAYER	50	509	122	3	23	485	122	0	0	0	0	0	0	1							
THOMAS	17	238	68	0	0	238	68	0	0	0	0	0	0	0							
THURSTEN	21	41	3	2	7	34	3	0	0	0	0	0	0	0							
VALLEY	14	156	56	0	0	153	55	0	0	0	0	0	0	3							
WASHINGTON	8	135	45	3	127	39	5	0	0	0	0	0	0	0							
WAYNE	2	4	4	0	0	4	4	0	0	0	0	0	0	0							
WEBSTER	21	236	15	5	7	229	15	0	0	0	0	0	0	0							
WHEELER	2	12	2	0	0	12	2	0	0	0	0	0	0	0							
YORK	28	456	248	0	0	456	248	0	0	0	0	0	0	0							
TOTALS----	3074	36362	16504	364	4303	761	2542	31503	15643	24	135	20	81	216	63	11	105	9	52	98	7

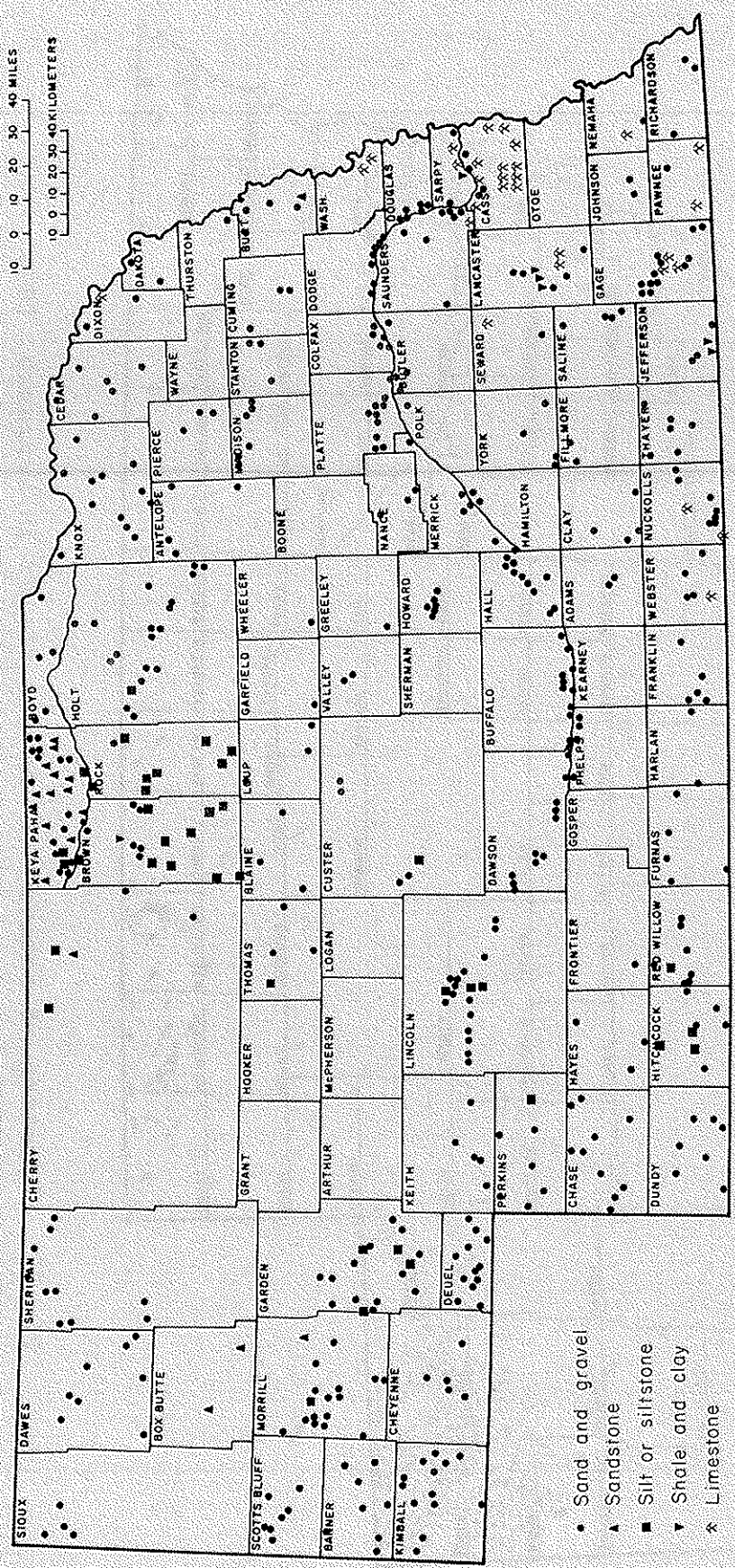


Fig. 1. Location of active quarries, pits, and mines in Nebraska, 1979

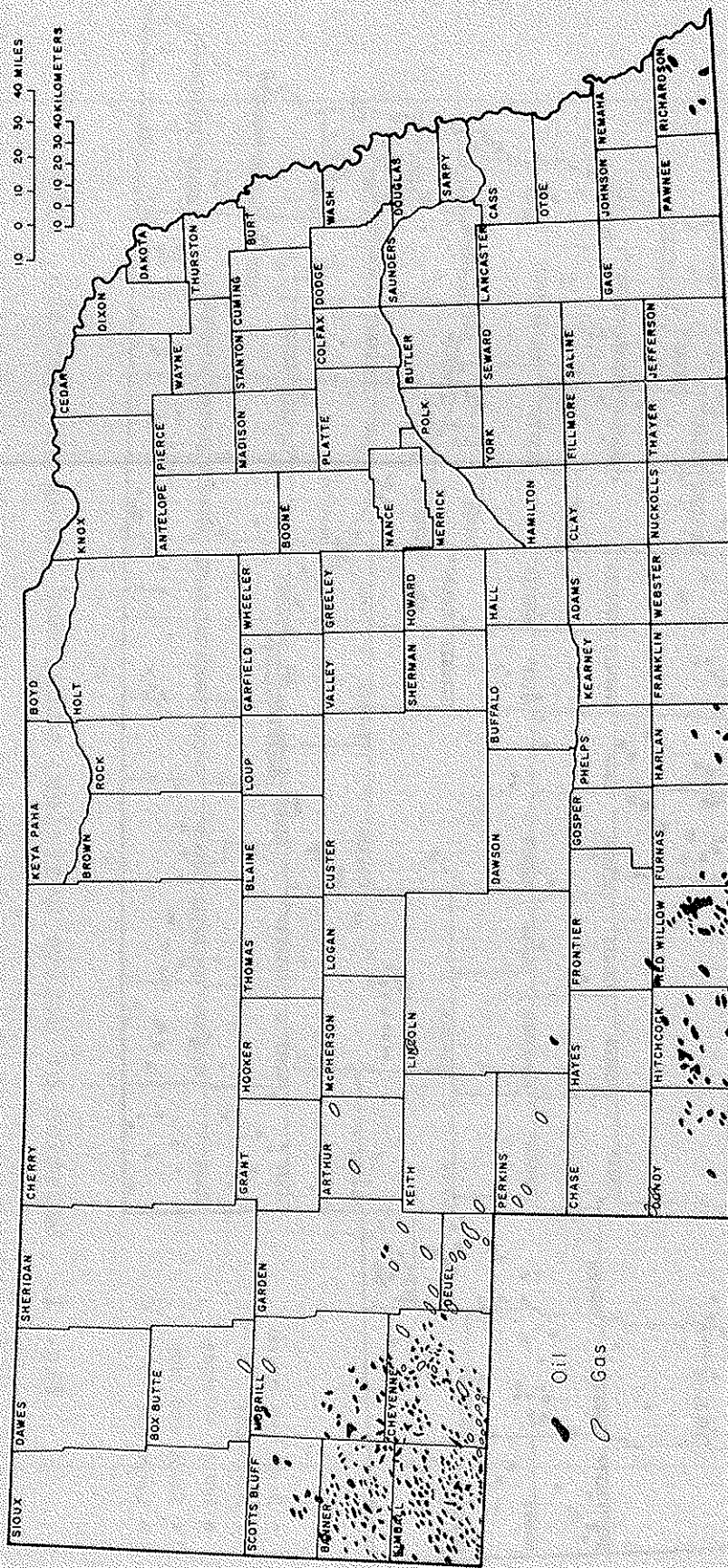


Fig. 2. Location of active oil and gas fields in Nebraska, 1979

Role of Minerals in State Economy

Few Nebraskans live a single day without using raw mineral products or materials manufactured from, processed by, fertilized with, or in some other way affected by minerals or mineral products. Unlike some natural resources, minerals are not renewable.

The value of nonfuel mineral production during 1979--\$203.5 million-- was the highest annual value in Nebraska's history (figure 3). About 1,700 people are employed by the mining industry in Nebraska, the greater number working in the counties with the largest mineral production value. The 1979 mineral production of Nebraska, as reported by the U.S. Bureau of Mines, and the Nebraska Oil and Gas Conservation Commission, follows:

Table 2.--Preliminary data on mineral production^{1/} in Nebraska during 1979

	1979	
	Quantity	Value, thousand dollars
Clays.....thousand short tons..	155 ^P	488 ^P
Natural gas.....million cubic feet..	2,600	100,766
Petroleum.....thousand 42-gallon barrels..	6,068	
Sand and gravel.....thousand short tons..	17,200 ^P	36,000 ^P
Stone, crushed.....do.....	4,420 ^P	17,556 ^P
Combined value of cement (masonry and portland), gemstones, and lime.....	XX	48,651 ^P
Total.....	XX	203,461

^PPreliminary. XX Not applicable.

¹Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

²Combined value of oil and gas sold.

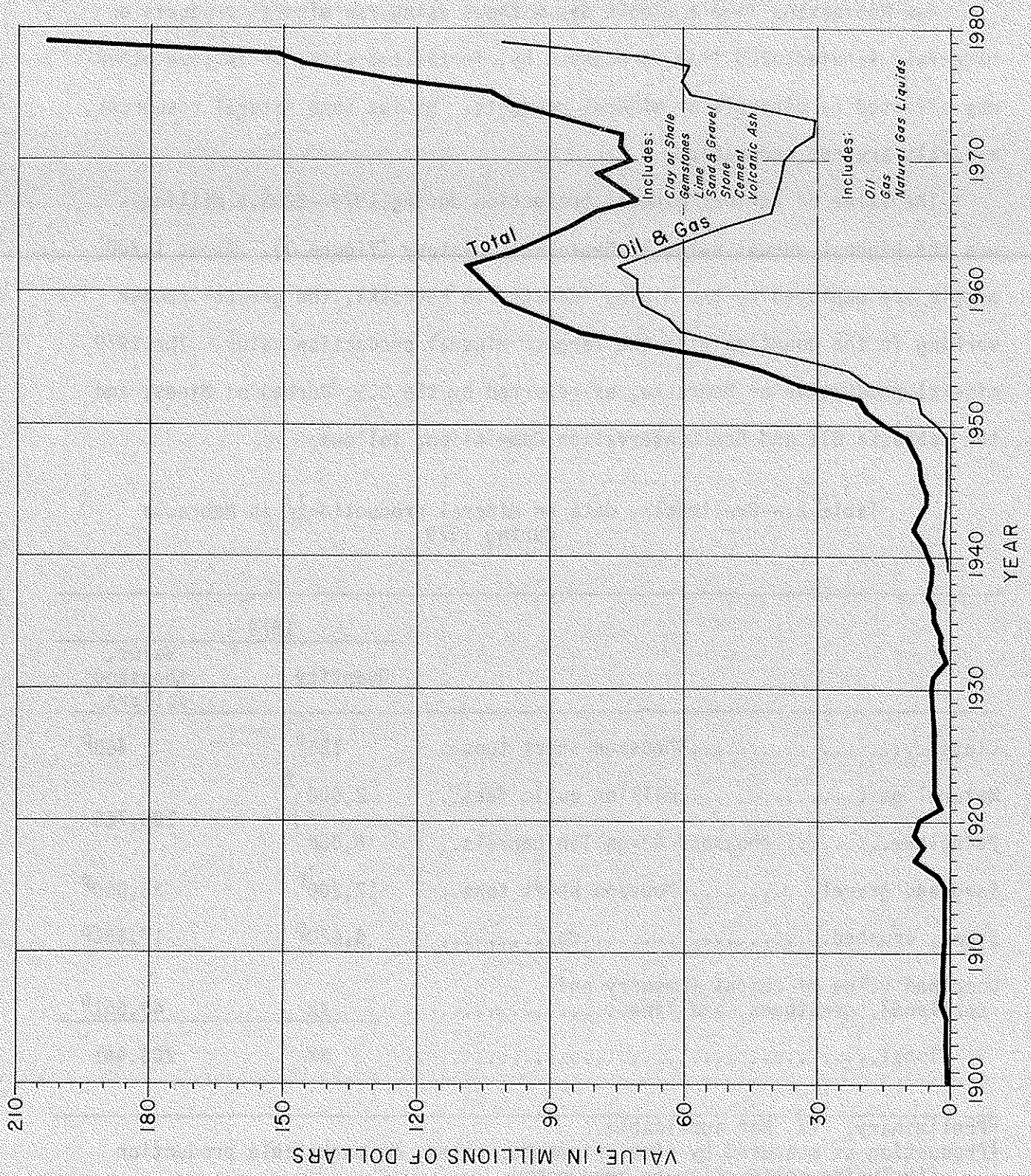


Fig. 3. Value of oil and gas and total mineral production in Nebraska

Mineral Resource Industries

Industrial plants manufacturing products from mineral resources are scattered throughout Nebraska. These plants, whose locations are shown in figure 4, are discussed below:

Agricultural Lime Plants. Four firms produce agricultural lime exclusively. They are located near Garland in Seward County, near Nelson in Nuckolls County, and two near Ponca in Dixon County. Most crushed limestone plants, largely in southeast Nebraska, produce some agricultural lime.

Brick Plants. Three firms produce brick in Nebraska: Endicott Clay Products Company near Endicott in Jefferson County; Yankee Hill Brick Manufacturing Company near Lincoln in Lancaster County; and Omaha Brick Works near Ralston in Douglas County. Common and face brick are the main products of these plants.

Cement Plants. Cement is produced by Ash Grove Cement Company near Louisville in Cass County and by Ideal Cement Company near Superior in Nuckolls County. Limestone, shale, and gypsum are the chief raw materials used in cement manufacture.

Concrete Products Plants. Many plants across the state produce concrete products such as block, brick, precast and prestressed slabs and construction beams, tile, pipe, vaults, septic tanks, steps, feed bunks, and bunker silos.

Crushed Limestone Plants. There are approximately 15 limestone plants in the eastern third of Nebraska. Principal producers are Fort Calhoun Stone Company, Hopper Brothers Quarries, and Kerford Limestone Company. Cass and Washington counties are the leaders in production. Crushed limestone is used for aggregate in concrete, cement manufacture, road base, riprap, agricultural lime, wallstone, and mineral fillers.

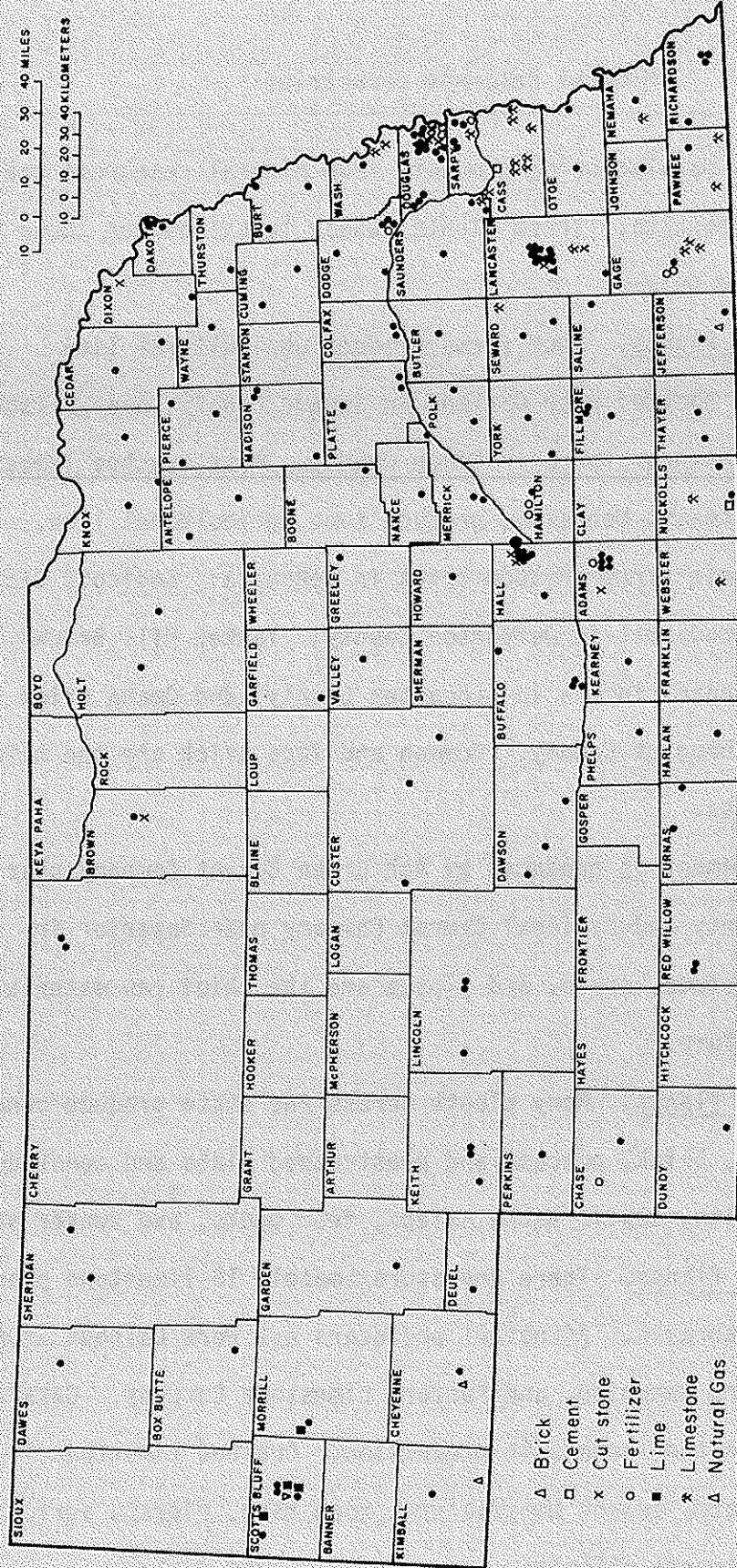


Fig. 4. Location of mineral-resource processing plants in Nebraska, 1979

Cut-Stone Plants. Stone imported from other states is cut by Nebraska firms. Two of these firms are near Grand Island in Hall County, two near Lincoln in Lancaster County, one is near Juniata in Adams County, one near Ainsworth in Brown County, and seven are near Omaha in Douglas County.

Fertilizer Plants. Some of the larger producers of ammonia, urea, and ammonium nitrate include Allied Chemical Company at La Platte in Sarpy County; CF Industries, Inc., at Fremont in Dodge County; and Phillips Chemical Company at Beatrice in Gage County. The Farmland Industries, Inc., plant at Hastings in Adams County produces ammonia. Ammonium nitrate is produced by Cominco-American, Inc., in Beatrice.

Gem and Ornamental Stone Plants. Many small firms around Nebraska cut and polish gems and ornamental stones such as agate, quartz, jasper, chalcedony, chert, and petrified wood.

Glass Plants. Several firms around the state manufacture items from glass produced in other states.

Ground Limestone Plants. Three firms in Nebraska produce finely ground limestone (calcium carbonate) for feed supplements and fillers for cement, paint, and rubber. Kerford Limestone Company and American Cyanamid Company are west of Weeping Water in Cass County, and the United Mineral Products Company is southeast of Weeping Water.

Lime Plants. Great Western Sugar Company produces lime from limestone imported from their quarry in Wyoming. Limekilns are located at Scottsbluff, Gering, and Mitchell in Scotts Bluff County, and at Bayard in Morrill County. The lime is used mainly for sugar refining.

Natural Gas Processing Plants. Two natural gas processing plants are located in Nebraska. One, south of Kimball in Kimball County, is operated by Cities Service Oil Company. The other, west of Sidney in Cheyenne County, is

operated by Marathon Oil Company. Production from these two plants includes natural gasoline, cycle products, liquid petroleum gases, and ethane.

Oil Refineries. Only one refinery remains in Nebraska. It is near Scottsbluff in Scotts Bluff County and is operated by CRA, Inc. Production includes natural gasoline and cycle products.

Perlite Plants. The Zonolite Division of W. R. Grace & Company is the sole manufacturer of expanded perlite in Nebraska. Its plant near Omaha in Douglas County imports crude perlite from other states, expands it, and sells it as filler material, as aggregate for plaster and concrete, and as a horticultural product.

Ready-Mix Concrete Plants. A total of 82 ready-mix concrete plants located throughout the state produce wet concrete for construction purposes. Some of these plants also manufacture cured concrete products.

Sand and Gravel Plants. All but eight of Nebraska's counties produce sand and gravel. Douglas and Saunders counties are the leading producers. Among the largest producers are Central Sand and Gravel Company in Butler, Madison, Pierce, and Platte counties; Hartford Sand and Gravel Company in Douglas and Dodge counties; Lyman-Richey Sand and Gravel Corporation in Cass, Dodge, Douglas, Morrill, Platte, Sarpy, and Saunders counties; and Western Sand and Gravel Company in Cass, Dodge, and Saunders counties.

Talc Plants. Cyprus Mines Corporation, United Sierra Division's plant near Grand Island in Hall County, is the only producer of ground talc in Nebraska. The unground talc is obtained from outside the state. The product is used in paper, ceramics, rubber, paint, insecticides, textiles, and toilet articles.

Vermiculite Plants. The only producer of exfoliated vermiculite is the W. R. Grace & Company, Construction Products Division, near Omaha in Douglas County. Montana is the source of crude vermiculite. The expanded product is used principally for insulation, concrete aggregate, and fireproofing.

