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Annual Report of Nebraska-1990

Karl E. Starch

Raymond R. Burchett
University of Nebraska-Lincoln

ANNUAL REPORT

NEBRASKA

By Karl E. Starch and Raymond R. Burchett

1990

U.S. DEPARTMENT OF THE INTERIOR

BUREAU OF MINES

NEBRASKA

U.S.
DEPARTMENT
OF THE
INTERIOR

Manuel Lujan, Jr.
Secretary

BUREAU
OF
MINES

T S Ary
Director

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COVER PHOTO:
The Nebraska Capitol Building in Lincoln symbolizes the cooperative working relationship between the U.S. Bureau of Mines and the mineral agencies of the State.

For comments or further information, please contact

Regional Office of State Activities
U.S. Bureau of Mines
Bldg. 20, Denver Federal Center
Denver, CO 80225
(303) 236-0435

THE MINERAL INDUSTRY OF NEBRASKA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Conservation and Survey Division of the University of Nebraska (Nebraska Geological Survey) for collecting information on all nonfuel minerals.

By Karl Starch[1] and Raymond R. Burchett[2]

The value of nonfuel mineral production in Nebraska fell approximately 13% from 1989's record production level. The $90.3 million of production is about average for the past 9 years and does not indicate a trend in any direction. Of the six industrial minerals produced in Nebraska in 1990, three experienced an increase in value over the preceding year and three a reduction. Three commodities, cement, sand and gravel, and crushed stone, accounted for all but a very small portion of production. Of these, stone production increased very slightly while cement production declined moderately and sand and gravel production declined substantially. No metals were reported mined in Nebraska in 1990.

Nebraska ranked 44th among the 50 states in nonfuel mineral production with just over one-fourth of 1% of the national total.

TRENDS AND DEVELOPMENTS

Nearly all of the decrease in value of nonfuel mineral output can be ascribed to lower production of sand and gravel. Paradoxically, the number of private and public residential units authorized for construction during the year rose almost 12%, to 6,750, while the value of nonresidential construction awards for offices, stores, industrial plants, etc., rose more than 23%, to $357 million. The value of State road contract awards rose more than 16%, to $330 million, which included bridge and highway construction on I-80, I-480, and I-680 in the Omaha area.

Ferret Exploration Co. of Nebraska continued its progress toward operation of an in situ leach uranium mine near Crawford in northwestern Nebraska. The company has operated a pilot mine on 7.7 acres near Crow Butte southeast of Crawford for 5 years. On December 29, 1989, the U.S. Nuclear Regulatory Commission issued the company a license to operate a commercial mine on 3,000 acres. The Nebraska Department of Environmental Control gave its tentative approval to the commercial operation contingent upon the State attorney general's review of a question raised about ownership of Ferret. A Nebraska law prohibits foreign ownership of real estate outside of towns. A citizen watchdog committee concerned with potential water aquifer contamination, Western Nebraska Resources Council, had filed a complaint that Ferret was more than 50% owned by German, Canadian, and Korean interests. In January 1990, the Nebraska attorney general issued an opinion that Ferret had complied with requirements that a majority of its stock be owned by U.S. citizens and that they form a majority of the company's board of directors. In April, the Nebraska Department of Environmental Control issued a commercial mining permit to Ferret. According to the permit, Ferret planned to use an in situ process in which a

TABLE 1
NONFUEL MINERAL PRODUCTION IN NEBRASKA[1]

Mineral		1988 Quantity	1988 Value (thousands)	1989 Quantity	1989 Value (thousands)	1990 Quantity	1990 Value (thousands)
Clays	metric tons	215,419	$786	224,624	$880	227,292	$1,685
Gemstones		NA	10	NA	2	NA	7
Sand and gravel (construction)	thousand short tons	11,229	28,928	e15,200	e41,800	11,453	30,056
Stone (crushed)	do.	e4,900	e22,000	3,978	20,050	e4,000	e21,200
Combined value of cement, lime, and sand and gravel (industrial)		XX	39,468	XX	41,085	XX	37,381
Total		XX	91,192	XX	103,817	XX	90,329

eEstimated. NA Not available. XX Not applicable.
[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

solution of water, oxygen, and sodium carbonate is injected into wells 400 feet to 800 feet deep. The solution dissolves uranium, which is pumped to the surface through recovery wells and extracted from the recovered solution by ion exchange. The operation was expected to yield about 1 million pounds of uranium yellowcake annually beginning in about April 1991.

The permit is for 20 years and requires review every 5 years and extensive ground water monitoring, restricts activities at the well site, and requires restoration of the aquifer after mining is completed. The Nuclear Regulatory Commission will supervise mining operations. However, before Ferret can actually start mining, it must find a place to store its radioactive waste. The Nuclear Regulatory Commission refused permission to continue to store wastes on the mining site; a Utah waste storage site with which Ferret would like to contract does not have the proper license. The Western Nebraska Resources Council continues to claim Ferret is still foreign owned.

All of the 40,000 pounds of yellowcake recovered to date by the pilot plant was processed into fuel for use by the Nebraska Public Power District. Ferret has drilled more than 3,000 exploratory holes on 210,000 leased acres in several Nebraska panhandle counties.

EMPLOYMENT

Mining employment in the State increased about 11% to almost 1,650 workers, compared with a 3.3% growth in the total labor force in Nebraska. Of these mining workers, about 50 worked in the underground limestone quarries at Weeping Water, 700 worked in surface operations, mostly sand and gravel, and about 240 worked in mills or preparation plants. The balance worked in the oil and gas industry. Average annual pay in mining was about $22,000, which was above the State average annual pay of $18,000, but grew more slowly during the year, approximately 2.3% compared with a 4.6% increase in overall industry average pay, and was considerably less than mining pay in neighboring States.

REGULATORY ISSUES

A plan to establish a low-level radioactive waste facility in Boyd County in northeastern Nebraska continued to draw controversy. In 1987, Nebraska was designated as host State for the facility as a member of the five-State Central Interstate Low-Level Radioactive Waste Compact, which included Arkansas, Kansas, Louisiana, and Oklahoma as well as Nebraska. The compact was formed in response to the 1985 Low-Level Radioactive Waste Policy that requires all States to provide the facilities to dispose of their own low-level radioactive waste by January 1, 1993. U.S. Ecology was selected as the company to develop and operate a facility for the compact States. U.S. Ecology selected a site in Boyd County, 5 miles from the South Dakota border, as the most suitable geologically for the aboveground, reinforced concrete vault system facility that would accept low-level waste such as contaminated gloves and equipment from nuclear power plants and hospitals in the five States of the compact for 30 years. No high-level radioactive waste would be stored in the facility. On July 27, 1990, U.S. Ecology submitted a formal application to the Nebraska Department of Environmental Control for a permit to construct and operate the proposed $60 million to $70 million facility. A $275,000 application fee and 13 volumes, 4,000 pages, of environmental reports and safety analysis accompanied the permit application. The State began what was expected to be a yearlong review of the license application. Submittal of the license application won the Central Interstate Compact an $850,000 award from the U.S. Department of Energy for meeting a 1990 deadline for doing so.

Residents of the State and particularly those in the vicinity of the proposed construction site have differing opinions as to the desirability of the facility in Nebraska. Opposition and support groups have formed. South Dakota's Governor and congressional delegation have expressed their opposition. At midyear, one of Nebraska's Senators who was Governor in 1984 when Nebraska joined the five-State compact, called for a moratorium on construction of the facility. In November, the newly elected Governor of Nebraska stated that he would impose a moratorium on development of the site. A delay in construction of the facility could leave Nebraska and other compact States and all the organizations that would use the facilities in violation of the Federal law requiring that such a facility be in place by January 1, 1993. An act of Congress would be required to change the requirement. State officials are questioning why Nebraska and California appear to be the only sites that have a scheduled completion date for this type of facility.

A University of Nebraska report, "Occurrence of Pesticides and Nitrates in Nebraska's Ground Water, 1990," concluded that nitrate-nitrogen contamination from commercial fertilizers, manure, and other sources was increasing and contaminating large areas of ground water in Nebraska. The report estimated that 755,000 tons of nitrogen fertilizer is applied to Nebraska farmlands annually, in addition to 235,000 tons of nitrogen from cattle and hog manure and 16,500 tons of pesticides. More than 90% of the people in Nebraska rely on ground water for drinking water.

Serious ground water contamination problems were found at three of five solid waste landfills investigated by the State Department of Environmental Control. The five sites were part of 106 landfills out of 290 unlicensed landfills investigated that were felt to have the potential for ground water contamination. The investigation was undertaken under authority of Legislative Bill 639 passed in 1987, which required the department to conduct a comprehensive study of all garbage dumps in Nebraska to determine whether they met State and Federal standards.

Ash Grove Cement Co. studied the feasibility of using part of its quarry along the Platte River near Louisville as a place to bury trash and garbage. It was questionable whether the local area produces enough refuse to make such an operation profitable. An alternative would be to burn the trash and garbage in Ash Grove's cement kilns along with the hazardous waste already being burned as fuel in the company's kilns.

LEGISLATION AND GOVERNMENT PROGRAMS

No mineral-related legislation was introduced into Nebraska's unicameral legislature in 1990. There were, however, a number of bills introduced relating to low-level radioactive waste disposal. In February, the legislature's Natural Resources Committee heard testimony on seven bills designed to strengthen the State's low-level radioactive waste laws but took no action on them. The focus of this legislative interest was strengthening the role of local monitoring committees, assuring the other compact States would share liability cost with Nebraska, or, in one case, withdrawing Nebraska from the Central Interstate Low-Level Radioactive Waste Compact. At yearend, legislation to hold up licensing of a Nebraska radioactive waste facility pending progress on similar facilities in other States was being proposed for introduction in the next year's legislative session.

The Conservation and Survey Division, Institute of Agriculture and Natural Resources, The University of Nebraska-Lincoln, has issued several dozen Nebraska Geonotes in its series of nontechnical, information booklets on mineral deposits in Nebraska. It also published a series of updated test-hole logbooks on exploration drilling in the State.

FUELS

The number of producing oil wells in Nebraska increased from 1,702 in 1989 to 1,742 in 1990, although production fell from 6.3 million barrels to 5.9 million barrels. The number of natural gas wells decreased from 15 in 1989 to 11 in 1990, and gas production fell from 285 million cubic feet in 1989 to 114 million cubic feet in 1990. Of the 140 oil and gas wells drilled, 75 were for exploration, 63 for development, and 2 for tests.

Petroleum production in Nebraska was mostly located in a dozen southwestern and panhandle counties. Output has been in a slightly declining trend since the mid-1970's because of reduced exploration and depletion of existing wells. Two natural gas processing plants are located in the panhandle in Cheyenne and Kimball Counties. Two underground natural gas storage terminals are associated with these plants. Three underground liquid propane gas storage areas are located in the Lincoln-Omaha area.

REVIEW BY NONFUEL MINERAL COMMODITIES

Industrial Minerals

Nonfuel mineral production in Nebraska consisted entirely of industrial minerals. In 1990, the Nebraska Geological Survey, Conservation and Survey Division, noted 726 active mining operations in the State, 29 limestone quarries, 667 sand and gravel pits, 8 clay or shale pits, and 22 sandstone pits. These operations disturbed 660 acres during the year but restored 248 acres. The Nebraska Geological Survey estimated that in the 90 years or more that mining has taken place in Nebraska, more than 43,000 acres has been disturbed, of which more than one-half has been reclaimed. Of the estimated 3,600 quarries, pits, and mines that have been active over the years, 84% have been sand and gravel pits and 10% limestone quarries. The remainder included 99 sandstone pits, 30 volcanic ash pits, 11 quartzite pits, 26 clay or shale pits, 14 coal mines, 5 peat pits, 3 flint quarries, and 1 chalk mine.

Cement.—In terms of total value of output, cement was the leading nonfuel mineral produced in Nebraska. The Ash Grove Cement Co. with a single plant near Louisville in Cass County south of Omaha remained Nebraska's sole producer of portland and masonry cement. Although production of portland cement started out strong with deliveries in the first quarter of the year up almost 80%, production for the year was down about 9%. Sales of masonry cement, which were only about 1.5% as large as portland cement, were up almost 10%. Nebraska ranked 28th of the 38 States in which portland cement was produced. Limestone, shale, and gypsum were the chief raw materials used in cement manufacture.

Clays.—Output of clay was little changed from the preceding year. Most of the clay produced was used in the manufacture of common and face bricks at three brick companies, Endicott Clay Products Co. near Endicott in Jefferson County, Yankee Hill Brick Manufacturing Co. near Lincoln in Lancaster County, and Omaha Brick Works near Ralston in Douglas County.

Lime.—Lime was produced by Western Sugar Co. primarily for use in refining sugar from sugar beets. Limekilns at Scottsbluff and Mitchell in Scotts Bluff County in western Nebraska utilized lime from a Wyoming quarry. Output of lime was down about 12% and value of that output was down about 9%.

Sand and Gravel.—Construction.—Construction sand and gravel production is surveyed by the U.S. Bureau of Mines for even-numbered years only; data for odd-numbered years are based on annual company estimates. This chapter contains actual data for 1988 and 1990 and estimates for 1989.

Construction sand and gravel was the second most important nonfuel mineral commodity produced in Nebraska in terms of value and the largest in terms of distribution of activity and number of companies and people involved.

A total of 108 companies mined sand and gravel at 192 pits located in all but 8 of Nebraska's 93 counties. Output and value of sand and gravel declined

significantly in 1990. The four largest producers, Lyman-Richey Sand and Gravel Corp., Western Sand and Gravel Co., Hartford Sand and Gravel Co., and Central Paving Sand and Gravel Co., produced more than one-third of the total output. All four companies operated in the east-central area of the State with ready access to the State's largest cities, Omaha and Lincoln. More than one-third of the State's total output came from Cass, Douglas, Sarpy, and Saunders Counties in the Omaha area. Nebraska ranked 30th of 50 States producing construction sand and gravel.

About one-third of the material produced was utilized as road stabilization and base material, 16% as concrete aggregate, and lesser amounts in asphaltic concrete, fill, concrete products, plaster/gunite, ice control, railroad ballast, roofing granules, and other uses. Unit values ranged from $1.91 per ton to $4.44 per ton, with an average value of about $2.92 per ton. Most material was transported by truck to the point of use.

The Platte River, which runs the entire east-west length of Nebraska, is a particularly suitable source of both sand and gravel, which washes down to Nebraska from the Rocky Mountains. The easy accessibility and general high quality and abundance of sand and gravel along the Platte River make sand and gravel a viable industry the length of Nebraska wherever sufficient demand is present. An interesting feature across west-central Nebraska where interstate highway I-80 parallels the Platte River is a series of small lakes located at each intersection of the highway. The borrow pits from which sand and gravel was mined to build the intersections have been developed into water recreation and wildlife refuge sites providing a pleasant contrast to the semiarid nature of that part of Nebraska.

Industrial.—The amount of industrial sand produced in the State remained unchanged at a very small level of output.

***Stone.*—Crushed.**—Stone production is surveyed by the U.S. Bureau of Mines for odd-numbered years only; data for even-numbered years are based on annual company estimates. This chapter contains estimates for 1988 and 1990 and actual data for 1989.

Crushed stone was the third of the industrial minerals that comprised the bulk of Nebraska's nonfuel mineral output and the only one that showed an increase, although small, during the year. Limestone was the principal type of stone produced. There were 17 limestone plants in eastern Nebraska, 5 of them at Weeping Water in Cass County south of Omaha. The quarries at Weeping Water, which touts itself as the Limestone Capital of the World, are somewhat unusual in that they are underground operations. Principal producers of crushed limestone were Fort Calhoun Stone Co., Kerford Limestone Co., and Martin Marietta Aggregates. Cass County south of Omaha and Washington County north of Omaha were leaders in production. Crushed limestone is used for aggregate in concrete, cement manufacture, road base, rip rap, agricultural lime, wallstone, and mineral fillers.

Three firms in Nebraska produced finely ground limestone (calcium carbonate) for feed supplements and fillers for cement, paint, and rubber. Kerford Limestone Co. and Iowa Limestone Co. are west of Weeping Water in Cass County, and Texasgulf is southeast of Weeping Water. Three firms produce agricultural lime exclusively. They are located near the towns of Garland, Seward County; Nelson, Nuckolls County; and Ponca, Dixon County. Most crushed limestone plants in southeast Nebraska produce some agricultural lime. One plant near Weeping Water made patented limestone pellets for agricultural and lawn and garden use.

Although no dimension stone was reported quarried in Nebraska, 10 Nebraska firms cut stone brought in from other States.

Other Industrial Minerals.—Ammonia, ammonium-nitrate, or urea fertilizers were produced by Arcadia Corp. at LaPlatte, Sarpy County; Farmland Industries Inc. at Fremont, Dodge County, and at Hastings, Adams County; and Cominco American Inc. at Beatrice, Gage County. Many small firms around the State cut and polished gems and ornamental stones such as agate, chalcedony, chert, jasper, petrified wood, and quartz. The Zonolite Division of W. R. Grace & Co. was the sole manufacturer of expanded perlite in Nebraska. Zonolite's plant near Omaha, Douglas County, expanded crude perlite brought in from other States and sold the expanded product as filler material, as aggregate for plaster and concrete, and as a horticultural product.

Cyprus Mines Corp., United Sierra Division's plant near Grand Island, Hall County, was 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. The Construction Products Division of W. R. Grace & Co. exfoliated vermiculite at a plant near Omaha using crude vermiculite from Montana. The exfoliated product was used principally for insulation, concrete aggregate, and fireproofing.

Metals

No metals were mined in Nebraska. ASARCO Incorporated continued to operate a lead refinery in Omaha that was established about 1870. The recently upgraded plant recovers gold, silver, and zinc, as well as lead from the lead bullion brought in from other States and processed at the Omaha plant. Most of the lead produced goes into the manufacture of storage batteries.

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[1]Chief, Branch of State Activities, U.S. Bureau of Mines, Denver, CO. He has 20 years experience with the Bureau of Mines and has covered the mineral activities in Nebraska for 4 years. Assistance in the preparation of the chapter was provided by Pat La Tour and Wanda West, editorial assistants.

[2]Research geologist, Conservation and Survey Division of the University of Nebraska (Nebraska Geological Survey), Lincoln, NE.

TABLE 2
NEBRASKA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1990, BY MAJOR USE CATEGORY

Use	Quantity (thousand short tons)	Value (thousands)	Value per ton
Concrete aggregates (including concrete sand)	1,869	$5,213	$2.79
Plaster and gunite sands	162	310	1.91
Concrete products (blocks, bricks, pipe, decorative, etc.)	206	469	2.28
Asphaltic concrete aggregates and other bituminous mixtures	755	1,949	2.58
Road base and coverings[1]	3,865	10,078	2.61
Fill	477	919	1.93
Snow and ice control	84	190	2.26
Railroad ballast	3	6	2
Other[2]	115	418	3.64
Unspecified:[3]			
Actual	1,291	3,791	2.94
Estimated	2,626	6,713	2.56
Total or average	11,453	30,056	2.62

[1]Includes road and other stabilization (cement and lime)
[2]Includes roofing granules.
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3
NEBRASKA: SAND AND GRAVEL SOLD OR USED BY PRODUCERS IN 1990, BY DISTRICT AND USE

(Thousand short tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregates (including concrete sand)	288	704	744	1,971	837	2,538
Plaster and gunite sands	12	96	26	57	125	158
Concrete products (blocks, bricks, etc.)	W	W	34	49	W	W
Asphaltic concrete aggregates and other bituminous mixtures	425	1,073	162	400	168	476
Road base and coverings[1]	704	1,354	1,279	3,765	1,881	4,959
Fill	30	44	221	449	226	426
Snow and ice control	38	71	33	85	14	35
Railroad ballast	3	6	—	—	—	—
Other miscellaneous[2]	146	343	42	180	99	315
Unspecified:[3]						
Actual	386	1,074	206	570	699	2,146
Estimated	517	1,219	1,051	2,238	1,057	3,256
Total[4]	2,549	5,985	3,797	9,763	5,106	14,308

W Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous."
[1]Includes road and other stabilization (cement and lime).
[2]Includes roofing granules.
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.
[4]Data may not add to totals shown because of independent rounding.

Principal Mineral-Producing Localities

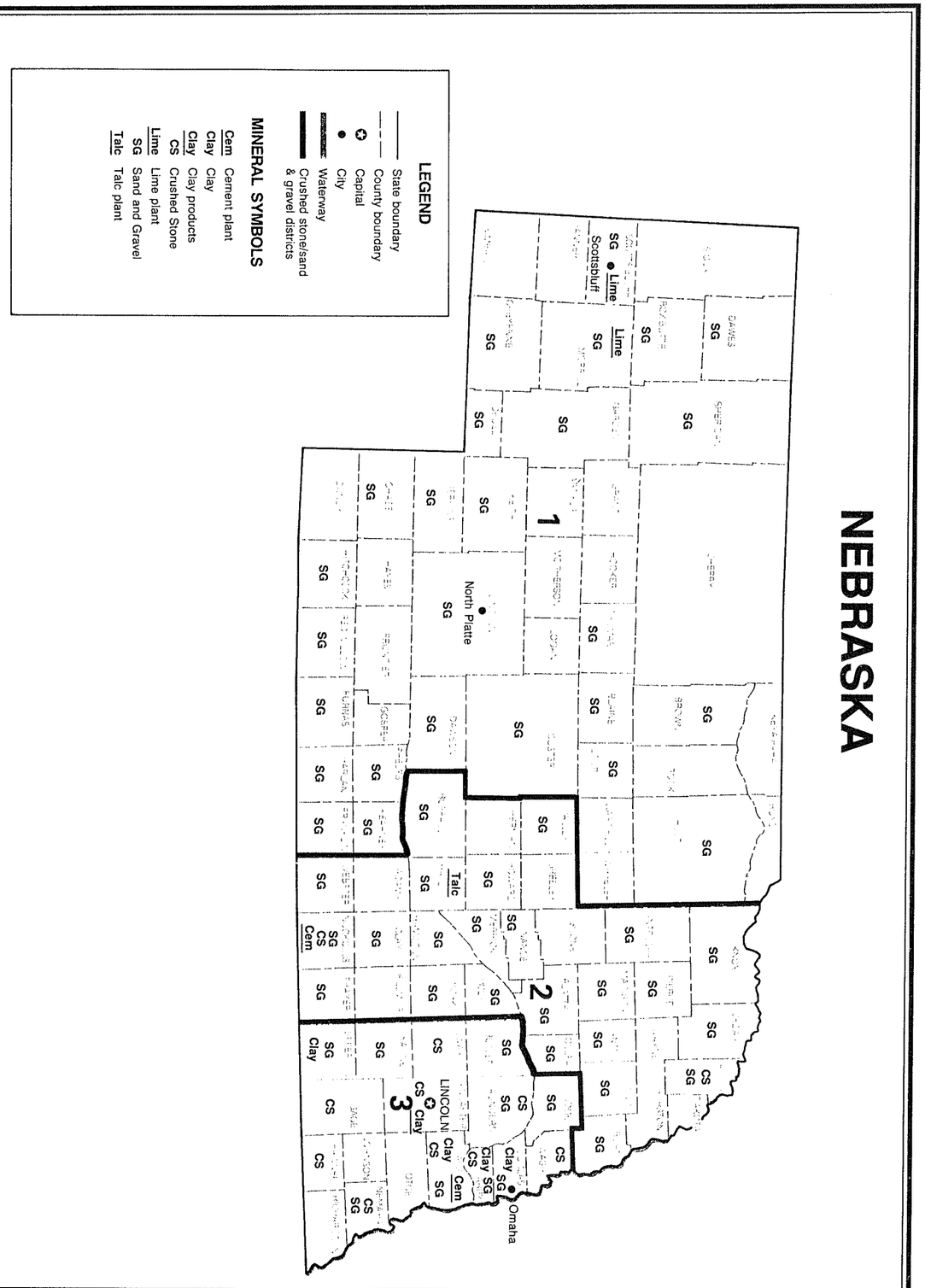

TABLE 4
PRINCIPAL PRODUCERS

Commodity and company	Address	Type of activity	County
Cement:			
Ash Grove Cement Co.[1]	Box 25900 Overland Park, KS 66225	Quarry, clay pit, plant	Cass.
Clays:			
Endicott Clay Products Co.	Box 17 Fairbury, NE 68352	Pit and plant	Jefferson.
Omaha Brick Works	Box 27073 Ralston, NE 68127	do.	Douglas.
Yankee Hill Brick Manufacturing Co.	Route 1 Lincoln, NE 68502	do.	Lancaster.
Lime:			
Western Sugar Co.	Anaconda Towers Suite 1400 555 17th St. Denver, CO 80202	Plants	Morrill and Scotts Bluff.
Sand and gravel (construction):			
Central Sand & Gravel Co. Inc.	Box 626 Columbus, NE 68601	Pits and plants	Butler, Madison, Nance, Platte.
Hartford Sand & Gravel Co.	Box Z Valley, NE 68064	Dredges and pits	Dodge and Douglas.
Lyman-Richey Sand & Gravel Corp.	4315 Cuming St. Omaha, NE 68131	Pits and plants	Cass, Douglas, Platte, Saunders.
Western Sand & Gravel Co.[2]	Box 28 Ashland, NE 68003	Dredges and pits	Cass, Dodge, Saunders.
Stone (crushed):			
Limestone-dolomite:			
Fort Calhoun Stone Co.	1255 South St. Blair, NE 68008	Quarries and plants	Washington.
Kerford Limestone Co.	Box 449 Weeping Water, NE 68463	Quarry and plant	Cass.
Martin-Marietta Aggregates, Central Div.	Box 30013 Raleigh, NC 27622	Quarries and plants	Cass, Nemaha, Nuckolls, Pawnee, Saunders.

[1]Also clays in Cass County.
[2]Also industrial sand in Saunders County.

MINERAL-RELATED GOVERNMENT AGENCIES

FEDERAL

U.S. Department of the Interior
U.S. Bureau of Mines
Denver Regional Office of State Activities
Bldg. 20, Denver Federal Center
Denver, CO 80225
Telephone: (303) 236-0435;
FTS 8-202-236-0435

U.S. Army Corps of Engineers
Colonel Stewart H. Bornhoft, District Engineer
215 North 17th St.
Omaha, NE 68102
Telephone: (402) 221-3900

U.S. Department of Labor
Mine Safety and Health Administration
Rodric M. Brelend, District Manager
Rocky Mountain District Office
Metal and Nonmetal Mine Safety and Health
Box 25367, Denver Federal Center
Denver, CO 80225-0367
Telephone: (303) 231-5465

U.S. Environmental Protection Agency
Morris Kay, Regional Administrator
Region 7
726 Minnesota Ave.
Kansas City, KS 66101
Telephone: (913) 551-7006

U.S. Nuclear Regulatory Commission
Ramon E. Hall, Office Director
Uranium Recovery Field Office
Box 25325
Denver, CO 80225
Telephone: (303) 231-5800

STATE

Nebraska Geological Survey
Conservation and Survey Division
The University of Nebraska
Perry Wigley, Director
113 Nebraska Hall
Lincoln, NE 68588-0517
Telephone: (402) 472-3471

Department of Environmental Control
Randolph Wood, Director
Box 98922
State House Station
Lincoln, NE 68509
Telephone: (402) 471-2186