1989

Mineral Yearbook of Nebraska-1989

Karl Starch

Raymond R. Burchett
University of Nebraska-Lincoln

NEBRASKA

By Karl Starch and Raymond R. Burchett

1989

U.S. DEPARTMENT OF THE INTERIOR

BUREAU OF MINES

NEBRASKA

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DEPARTMENT
OF THE
INTERIOR

Manuel Lujan, Jr.
Secretary

BUREAU
OF
MINES

T S Ary
Director

June 1991

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

For comments or further information, please contact
Regional Office of State Activities
Bureau of Mines
Bldg. 20, Denver Federal Center
Denver, CO 80225
Telephone: (303) 236-0435;
FTS 776-0435

THE MINERAL INDUSTRY OF NEBRASKA

This chapter has been prepared under a Memorandum of Understanding between the 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 rose to $103.8 million in 1989, nearly a 14% increase over that of the preceding year, a record high. Sand and gravel, portland cement, and crushed stone accounted for all but a small portion of this output. No metals were mined in Nebraska. Nebraska ranked 43d among States, with one-third of 1% of the Nation's total nonfuel mineral production.

TRENDS AND DEVELOPMENTS

Nearly all of the increase in value of nonfuel mineral output in Nebraska was in sand and gravel, which also benefited from an increase in average unit price. Portland cement output and value increased only minimally, while output and value of crushed stone decreased moderately. A 3-year bridge rebuilding program in the State continued to benefit the construction industry, the principle user of Nebraska's mineral products. The number of residential units authorized for construction during the year rose more than 5% to about 6,000 units while the value of nonresidential construction fell about 4% to about $289 million. The value of State road contract awards rose nearly 6% to $284 million. The Construction Labor Research Council indicated Nebraska had the fifth lowest construction unemployment rate in the Nation in 1988.

The first commercial mining of uranium in Nebraska was stalled indefinitely by a Nebraska attorney general's ruling in September that Ferret Exploration Co. of Nebraska was a foreign corporation and not eligible to do business in Nebraska. Denver-based Ferret is 25% owned by Uraenertz, a West German corporation; 18.7% by Imperial Metals of Canada; and 10% by Korea Electric Power Corp. Ferret has spent about 10 years and $10 million developing its Crow Butte Project near Crawford in northwest Nebraska, where it believes it has an ore reserve of about 30 million pounds of U_3O_8, or enough for 20 years of operation at the proposed production rate of 500,000 pounds to 1 million pounds of unrefined yellowcake per year. Ferret proposed solution mining the 650-foot-deep deposit and has successfully operated an in situ leach pilot plant on the site for 3 years. The attorney general acted upon a complaint by a citizen's group, The Western Nebraska Resources Council, that was concerned about uranium mining's long-term impact on underground water in Nebraska. His opinion was based on Nebraska statues prohibiting foreigners from owning or leasing real estate 3 miles outside of a city's limits; limiting foreign ownership of capitol stock of a company operating in Nebraska to less than 50%; and the number of foreigners serving on a company's board of directors to less than two-thirds of the entire board. It was unclear whether the 210,000 acres in northwestern Nebraska leased by Ferret for further exploration would be affected by the ruling.

The Nebraska Department of Environmental Control immediately stopped work on a permit that would have allowed Ferret to begin commercial mining. The Nebraska Secretary of State was instructed to start action to dissolve Ferret and its subsidiary, Crow Butte Land Co., and the Dawes County attorney to effect forfeiture of mineral leases the company holds. Ferret officials indicated the company would contest the ruling and particularly any forfeiture or dissolution proceedings.

Petroleum production in Nebraska has been in decline since 1985 and, in 1989, was at the lowest level of the 1980's; natural gas production in Nebraska ended in 1986. With the exception of some production in Richardson County, the

TABLE 1

NONFUEL MINERAL PRODUCTION IN NEBRASKA[1]

Mineral		1987 Quantity	1987 Value (thousands)	1988 Quantity	1988 Value (thousands)	1989 Quantity	1989 Value (thousands)
Clays	metric tons	202,963	$721	215,419	$786	224,624	$880
Gem stones		NA	10	NA	10	NA	2
Sand and gravel (construction)	thousand short tons	e10,300	e26,300	11,229	28,928	e15,200	e41,800
Stone (crushed)	do.	4,316	19,461	e4,900	e22,000	3,978	20,050
Combined value of cement, lime, and sand and gravel (industrial)		XX	43,256	XX	39,468	XX	41,085
Total		XX	89,748	XX	91,192	XX	103,817

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

southeastern most county in Nebraska, all petroleum production in Nebraska has been in southwestern and panhandle counties. Nebraska ranked 20th among the 31 petroleum-producing States with proven reserves of about 50 million barrels of oil.

EMPLOYMENT

Mining employment remained essentially unchanged from that of 1988 at about 1,500 workers. Of these, about two-thirds worked in nonmetal mining and quarrying and about one-third in oil and gas extraction. The $419 average weekly wage in mining was substantially above the $338 average for all industries, and the $542 average weekly wage paid workers in primary metals manufacture (Omaha refinery) was among the highest paid any industrial workers in the State.

Although nonfuel mining employment was only about one-quarter of 1% of total nonagricultural employment in the State, it was the sine qua non of the construction industry and several manufacturing sectors in Nebraska.

REGULATORY ISSUES

Following a year-long study of three potential sites, a 320-acre site in Boyd County was chosen for Nebraska's proposed low-level radioactive waste disposal facility. The State had been designated to host such a facility by the Central Interstate Low-Level Radioactive Waste Compact of which Nebraska was a member along with Arkansas, Kansas, Louisiana, and Oklahoma. U.S. Ecology Inc. and its affiliate, Bechtel National Inc., selected to build and manage the site, had performed extensive geological testing of proposed sites in three counties in Nebraska before settling on the Boyd County location. The facility with a planned January 1, 1993, opening would provide for aboveground storage and would cost about $40 million. More than 95% of the volume of waste to be stored at the site was expected to be category A waste, which is waste that must be contained for 100 years. It is the least dangerous of the three low-level classes of waste. U.S. Ecology and its contractors did extensive drilling and geological research in determining the suitability of alternative sites to ensure containment of possible migration of contaminants into the ground. The proposed establishment of a low-level waste facility in Nebraska spawned a rush of public controversy and legislative proposals (see Legislation and Government Programs section).

With the proposed establishment of a low-level radioactive waste disposal facility and the possibility of uranium mining, environmental concern has run strong in Nebraska in the past several years. However, the Federal Environmental Protection Agency's first National Toxic Release Inventory Report ranked Nebraska near the bottom of a State toxic emissions list. Nebraska was one of only about a dozen States that did not practice deep ground injection of toxic materials. The largest toxic chemical release was into the air, the largest single source of which was ammonia released by three fertilizer manufacturing plants in southeastern Nebraska. Nebraska's air quality remained one of the best in the Nation.

Twenty-five landfills in Nebraska were licensed to accept asbestos. Some accepted asbestos only on a limited basis, while others were accepting it from surrounding States. Demand for such disposal was high, and three new asbestos-only landfills were on the drawing board, according to the State Department of Environmental Waste Recovery Section. Most asbestos that will go into landfills was expected to come from school districts ordered by the Federal Government to remove asbestos from pipes, walls, ceilings, etc. The State Department of Health estimated that about $1/2 billion of asbestos will be removed from Nebraska schools alone. Asbestos disposal in Nebraska was currently much less expensive than in some neighboring States such as Colorado.

Aside from the uranium mining and low-level radioactive waste disposal, the major environmental concerns in the State appeared to be the potential ground water impacts posed by solid waste disposal and nitrate contamination from agricultural fertilizer practices. Controversy remained on the question of who should bear responsibility for ground water contamination that might result from use of agricultural chemicals—the farmer, the agricultural chemical manufacturer, or the agricultural chemical dealer.

EXPLORATION ACTIVITIES

Ferret Exploration of Nebraska, during a several-year time period, leased 210,000 acres in several northwest Nebraska counties to explore for uranium. Further exploration will be related to successful development of the company's Crow Butte uranium project near Crawford.

LEGISLATION AND GOVERNMENT PROGRAMS

In January, the Nebraska Congressional Delegation introduced legislation in both Houses of Congress to designate a 76-mile stretch of the Niobrara River east of Valentine, in north-central Nebraska, a wild and scenic river. If accepted into protected status, Federal assistance could become available to maintain the river and its environment. At yearend, Congressional approval was pending.

Research continued on the manufacture of synthetic diamonds at the Walter Scott Engineering Center at the University of Nebraska—Lincoln. Industrial-grade diamond films were created by using radiowaves instead of the more traditional microwaves. Lower frequency radiowaves resulted in lower production cost and less expensive manufacturing equipment. Thin films of high-temperature superconductive material could speed electrical transmission, thereby improving communication and reducing electrical power losses.

Nebraska received $115,000 as its share of mineral revenue obtained from Federal mineral leases, ranking it 22d among the 26 States that received Federal mineral revenue shares. In Nebraska, this mineral royalty revenue was entirely from oil production.

Of several legislative proposals dealing with the handling of low-level radioactive waste considered by the Nebraska Legislature, only LB 761 was signed by the Governor. This act provided for local site-monitoring committees, required all waste storage to be above ground with zero waste release to the environment, and limited operational life of the site to 30 years or 5 million cubic feet of waste.

REVIEW BY NONFUEL MINERAL COMMODITIES

Industrial Minerals

Nonfuel mineral production in Nebraska consisted entirely of industrial minerals. The Nebraska Geological Survey, Conservation and Survey Division, identified 712 active mining operations in Nebraska in 1989, about one-fifth of all the quarries, pits, and mines that have ever been active in the State during the past 90 years. Of these, 658 were sand and gravel or silt pits, 28 were limestone quarries, 18 sandstone pits, and 8 clay or shale pits. Active operations disturbed about 330 acres and restored about 90 acres. During the years, mining was estimated to have disturbed nearly 43,000 acres with more than 50% of these having been reclaimed.

Cement.—A single plant produced cement in Nebraska in 1989, the Ash Grove Cement Co. plant near Louisville in Cass County. Production and value of portland cement increased just more than 3% in 1989. Output and value of masonry cement increased about 11%, but total output was small. Ideal Basic Industries Inc. closed its Nuckolls County plant in 1986. Nebraska ranked 25th among the 38 States in which portland cement was produced. Numerous plants across the State produced ready-mix concrete or cured concrete products for the construction industry.

Clays.—Output of clay increased moderately in 1989, just more than 4%, and an increase in unit price raised the value of output by nearly 12%. Most of the clay produced was for manufacture of common and face brick. Three plants manufactured brick in Nebraska, all in the southeastern corner of the State—Endicott Clay Products Co. in Jefferson County, Yankee Hill Brick Manufacturing Co. in Lancaster County, and Omaha Brick Works in Douglas County.

Lime.—Lime was produced in western Nebraska by Western Sugar Co. at two limekilns in Scotts Bluff County and one in Morrill County from limestone imported from Wyoming. The lime was used primarily for sugar refining. The reported amount of lime produced increased 60% and more than 44% in value.

Sand and Gravel.—**Construction.**—Construction sand and gravel production is surveyed by the Bureau of Mines for even-numbered years only; data for odd-numbered years are based on annual company estimates. This chapter contains estimates for 1987 and 1989 and actual data for 1988.

Construction sand and gravel was produced in 85 of Nebraska's 93 counties. The Bureau of Mines estimated production of construction sand and gravel increased more than 35% in 1989 and the value of that production by more than 44%. This value comprised 40% of the total value of nonfuel mineral production in the State in 1989. Production served primarily the State's population centers, most notably in the southeast part of the State. Nebraska was 19th of the 50 States producing construction sand and gravel in 1989 and 37th of 38 industrial sand producers.

Industrial.—In contrast to the estimates for construction sand and gravel, industrial sand and gravel output declined by more than one-half during the year. Output by the State's sole producer of industrial sand, in Saunders County, was used in sandblasting and traction enhancement.

Stone.—Stone production is surveyed by the Bureau of Mines for odd-numbered years only; data for even-numbered years are based on annual company estimates. This chapter contains actual data for 1987 and 1989 and estimates for 1988.

Crushed stone was one of the three stalwarts of industrial mineral production in Nebraska. Reported production for 1989 indicated a nearly 19% decline in quantity produced from the previous year and a nearly 9% decline in value. Limestone was the major type of stone quarried. Limestone production was centered in the southeastern corner of the State, with Cass County to the south of Omaha and Washington County on the north of Omaha being the leading producers. There were approximately 17 limestone plants in the eastern third of the State. A limestone deposit near the small town of Weeping Water, Cass County, was the major stone resource utilized in the State. Ash Grove Cement Co.; Texasgulf Inc., a subsidiary of Elf Aquitaine; Kerford Limestone Co.; and Martin Marietta Aggregates were the principal operators at Weeping Water. The crushed limestone was used for aggregates in concrete, cement manufacture, road base, riprap, agricultural lime, wall stone, and mineral fillers. In addition, finely ground limestone was used in the manufacture of feed supplements, paint, and rubber. Although no dimension stone was reportedly quarried in Nebraska, about one dozen plants around the State cut stone brought in from other States.

Talc.—Ground talc was produced by Cyprus Industrial Minerals Inc. at a facility in Grand Island from ores supplied

TABLE 2

NEBRASKA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1989, BY USE

(Thousand short tons and thousand dollars)

Use	Quantity	Value
Coarse aggregate (+1½ inch):		
Riprap and jetty stone	42	279
Other construction materials[2]	2,549	14,267
Agricultural: Agricultural limestone	242	2,131
Other miscellaneous uses[3]	903	2,085
Unspecified:[4]		
Actual	242	1,288
Total	3,978	20,050

[1]Limestone.
[2]Includes stone used in macadam, concrete aggregate, bituminous aggregate, railroad ballast, stone sand (bituminous mix or seal), fine screenings, unpaved road surfacing, and crusher run or fill or waste.
[3]Includes stone used in poultry grit and mineral food and cement manufacture.
[4]Data represents production reported without a breakdown by end use.

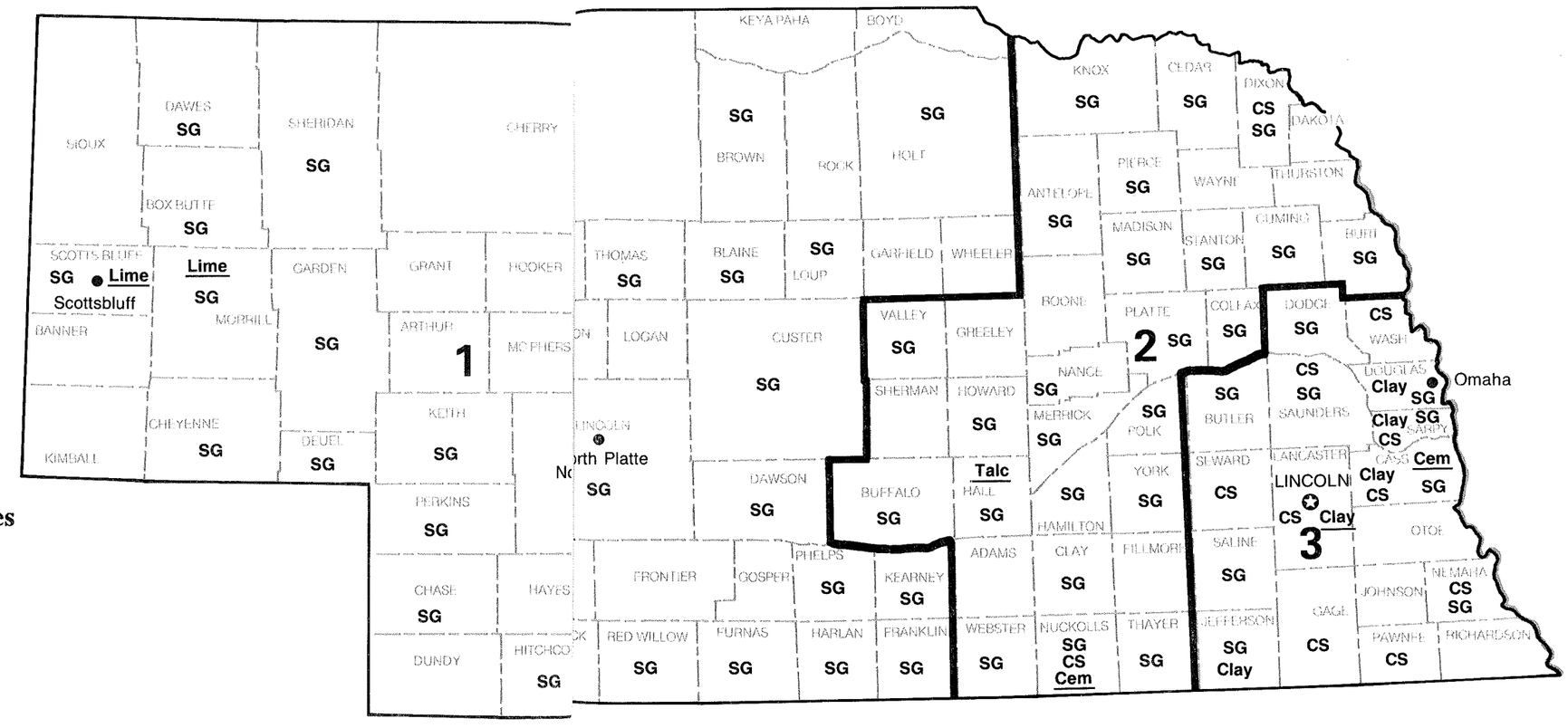
NEBRASKA

LEGEND

- State boundary
- County boundary
- Capital
- City
- Waterway
- Crushed stone/sand & gravel districts

MINERAL SYMBOLS

Cem	Cement plant
Clay	Clay
Clay	Clay products
CS	Crushed Stone
Lime	Lime plant
SG	Sand and Gravel
Talc	Talc plant



Principal Mineral-Producing Localities

by Death Valley (California) and Montana mines.

Vermiculite.—The W. R. Grace & Co. vermiculite exfoliation plant in Douglas County was inactive during the year.

Metals

No metals were mined in Nebraska. ASARCO Incorporated, however, has operated a lead refinery in Omaha since about 1870. A $6.7 million upgrading of this facility was scheduled to be completed in April 1990. When completed, the new state-of-the-art facility was expected to make possible the increased recovery of gold, silver, and zinc from the lead bullion processed at the plant. The gold and silver removed would be further refined at ASARCO's precious-metals refinery in Amarillo, TX, and sold to commercial users. About three-fourths of the purified lead produced was used in the manufacture of storage batteries by various companies. The Omaha plant also refined bismuth, which was used in pharmaceuticals, and antimony oxide, which is used in paint pigments and as a fire retardant. The new facility was planned to reduce handling and energy requirements and provide improved environmental controls.

Nucor Corp., Cold Finish Div., operated a plant at Norfolk that produced cold-finished carbon and alloy steel products used extensively for shafts and machined precision parts. The Norfolk facility was the largest of three such Nucor plants in the United States. Nucor reported cold-finish steel sales growing steadily through the 1980's.

[1]Chief, Branch of State Activities, Bureau of Mines, Denver, CO. He covered the mineral activities in Nebraska in 1989. 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 3

PRINCIPAL PRODUCERS

Commodity and company	Address	Type of activity	County
Cement:			
Ash Grove Cement Co.	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.	Rt. 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, 1988):			
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.[1]	Box 28 Ashland, NE 68003	Dredges and pits	Cass, Dodge, Saunders.
Weverka Sand & Gravel Co.	Box 567 Arapahoe, NE 68922	Pit and plant	Furnas.
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 industrial sand in Saunders County.

☆ U.S. Government Printing Office : 1991 - 281-983/40063

MINERAL-RELATED GOVERNMENT AGENCIES

FEDERAL

U.S. Department of the Interior
Bureau of Mines
Denver Regional Office of State Activities
Bldg. 20, Denver Federal Center
Denver, CO 80225
Telephone: (303) 236-0435;
FTS 776-0435

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

U.S. Department of Labor
Mine Safety and Health Administration
Vernon R. Gomez, District Manager
Rocky Mountain District Office
Metal and Nonmetal Mine Safety and Health
Box 25367, Denver Federal Center
Denver, CO 80225-0367
Telephone: (303) 236-2794

U.S. Environmental Protection Agency
Morris Kay, Administrator
Mary McKee, Nebraska Coordinator
Region 7
726 Minnesota Ave.
Kansas City, KS 66101
Telephone: (913) 236-2800

U.S. Nuclear Regulatory Commission
Ramon E. Hall, Office Director
Uranium Recovery Field Office
Box 25325
Denver, CO 80225
Telephone: (303) 236-2805

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
Dennis Grams, Director
Box 94877
State House Station
Lincoln, NE 68509
Telephone: (402) 471-2186