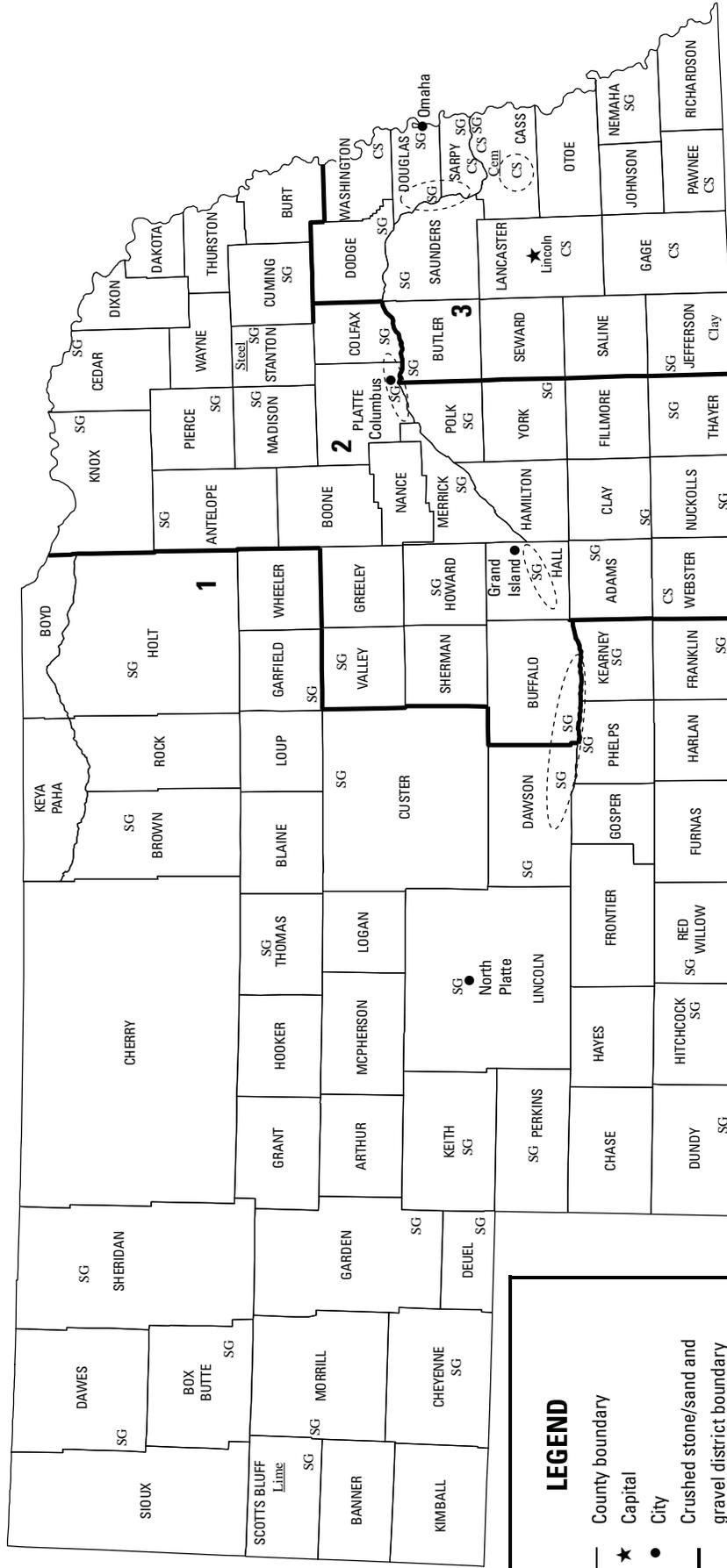




2007 Minerals Yearbook

NEBRASKA [ADVANCE RELEASE]

NEBRASKA

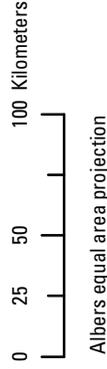


LEGEND

- County boundary
- ★ Capital
- City
- Crushed stone/sand and gravel district boundary

MINERAL SYMBOLS
(Major producing areas)

- Cem Cement plant and quarry
- Clay Common clay
- CS Crushed stone
- Lime Lime plant
- SG Construction sand and gravel
- Steel Steel plant
- Concentration of mineral operations



THE MINERAL INDUSTRY OF NEBRASKA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the University of Nebraska-Lincoln, Nebraska Geological Survey, for collecting information on all nonfuel minerals.

In 2007, Nebraska's nonfuel raw mineral production¹ was valued at \$147 million, based upon annual U.S. Geological Survey (USGS) data. This was a \$17 million, or 13.1%, increase compared with that of 2006, which increased by \$15 million, or 13%, from 2005 to 2006. (The State's actual total nonfuel mineral values for 2005–07 were substantially higher than those reported in table 1; data for masonry and portland cement 2005–07, common clays (2005–06), and lime (2007) have been withheld so as to not disclose company proprietary data.)

In 2007, Nebraska's leading nonfuel mineral commodities were, in descending order of value, cement (portland and masonry), crushed stone, and construction sand and gravel. In terms of value increases, crushed stone led the State's mineral commodities with the largest increase in value followed by construction sand and gravel, each of those mineral commodities having increased by about 14%. A 3% increase in the production of crushed stone led to a rise of slightly more than \$9 million in its value and a 2% increase in construction sand and gravel production resulted in an \$8.6 million increase in that mineral commodity's value (table 1). Although the unit value of cement increased somewhat, small decreases took place both in its production and total production value.

Nebraska continued to be a producer of significant quantities of construction sand and gravel and portland cement in 2007 in comparison with other producing States. Metals that were produced in the State—mostly raw steel—were processed from materials acquired from other domestic and foreign sources.

The following narrative information was provided by the Nebraska Geological Survey²—the Conservation and Survey Division of the University of Nebraska-Lincoln.

Commodity Review

Industrial Minerals

Aggregates.—The worldwide assets of Australian company Rinker Group Ltd. (the parent company of Ft. Calhoun Stone in Ft. Calhoun, north of Omaha) were purchased by CEMEX, S.A. de C.V. Fort Calhoun Stone supplied limestone rock for the construction of a large ethanol plant in Columbus, NE. Throughout 2007, Ft. Calhoun Stone also continued to

¹The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon the mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 2007 USGS mineral production data published in this chapter are those available as of June 2009. All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—can be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals>.

²R.M. Joeckel, Ph.D., Research Geologist and Associate Professor with the University of Nebraska-Lincoln and the Nebraska Geological Survey (NGS), authored the text of the State mineral industry information provided by the NGS.

supply large quantities of riprap for habitat improvement along the Missouri River. With regard to safety at the company's operation, Ft. Calhoun Stone had not registered an injury for three consecutive years by yearend 2007.

Clay and Shale.—Endicott Clay Products Co., based in Fairbury in southeastern Nebraska, supplied major out-of-State contracts for the Metropolitan State Mental Hospital in Norwalk, CA; the Four Seasons Center for the Performing Arts in Toronto, Ontario, Canada; and seven school buildings in the Leander School District of Austin, TX. The company also received the 2007 "Safe Mine Achievement Award" from the U.S. Department of Labor's Mine Safety and Health Administration, Rocky Mountain District.

Cement.—Ash Grove Cement Co., located in Louisville and the State's only cement producer, hired a local contractor to strip 1.5 million metric tons (Mt) (1.65 million short tons) of overburden from its nearby property west of Weeping Water, thereby gaining access to about 1.9 Mt (2.1 million short tons) of limestone in the Pennsylvanian Shawnee Group for use in cement manufacturing. In October, the Nebraska Department of Environmental Quality (NDEQ) determined that Ash Grove had met all regulatory requirements pertaining to the use of up to 30% discarded tires in the fuel mixture for its #2 kiln. Minor changes regarding more frequent monitoring were stipulated in a modification of an existing operating permit affected by this change in fuel supply.

Sand, Industrial.—Following discussions in 2006 and public hearings, Harwest Industrial Minerals Corp. (a subsidiary of Harrison Western Group of Lakewood, CO) signed an agreement to purchase nearly 110 Mt (about 120 million short tons) of sand dredged from the Loup River Power District's settling basin west of Genoa, Nance County, with the intention of processing approximately 90% of it during a period perhaps as long as 50 years (Freeman, 2007). Preferred Rocks of Genoa, LLC subsequently purchased the Harwest Industrial Minerals plant in late December and continued with the production of proppant or hyfrac (frac) sand at the site on a limited scale, with plans to improve facilities and increase production in 2008. Frac sands are industrial sands used in the hydraulic fracturing (fracing) process to increase natural gas development from tight shales. Fracing fluids (mixtures of water, sand, and chemicals) are injected under high pressure into the shale to intersect with natural fractures, thereby releasing methane gas trapped in the natural fractures or pores while also creating a long fracture sand pack flow channel network to the wellbore. The sands being mined at the plant were alluvial deposits of the Loup River, which drains the Nebraska Sand Hills. Sands in the Loup River system can be distinguished in texture and chemical/mineralogical composition from those of the Platte River system, along which much of the Nebraska's sand and gravel production is concentrated.

Plans by a separate industrial concern for the development of a new sand-producing operation in the vicinity of the North Loup River at Elba, Howard County, were also formulated in 2007. This operation, scheduled for opening in 2009, was planned to produce wet sand products, such as golf course sand, well-pack sand, and sports-field construction sand, as well as frac sand for the oil and gas industry.

Fly Ash.—Nebraska Ash (a division of NEBCO, Inc.) based in Lincoln, Lancaster County, had operations in Fremont, Nebraska City, and Omaha. In 2007, Nebraska Ash utilized 277,000 metric tons (t) (305,000 short tons) of fly ash, or 76.3% of the fly ash output from source powerplants and more than 55,200 t (60,900 short tons) of bottom ash, or 70.0% of output from source powerplants. As previously developed by NEBCO engineers, the uses for recovered fly ash and bottom ash remained the same. Approximately two-thirds of the fly ash was used as a raw material in the production of portland cement and concrete and the remaining one-third as a soil stabilization material, while bottom ash was utilized as a fill material and road aggregate. About 70% bottom ash was used as aggregate on county and farm roads and about 30% was used as aggregate in asphaltic concrete. Cooperative research among the Nebraska Department of Roads, public utilities, and the University of Nebraska continued to determine the suitable ash content for concrete used in the construction of roadways.

Metals

Nucor Steel-Nebraska of Nucor Corp. continued to employ more than 400 workers at its Norfolk plant, which was the producer of more than 400 grades of steel with a 97% recycled content. In 2007, approximately 1.03 Mt (1.13 million short tons) of scrap steel was recycled by Nucor Steel-Nebraska (Norfolk), and the company's annual Earth Day scrap drive yielded nearly 25.5 t of scrap steel, about 2,770 kilograms (kg) (6,100 pounds) of aluminum cans, and 15.6 t of computers, televisions, and other electronics.

Nucor Steel-Nebraska was an International Organization for Standardization (ISO) registered facility for ISO 9000 and ISO 14000 international management standards. ISO 9000 registration addresses issues and standards of quality management and ISO 14000 addresses the same regarding environmental management (International Organization for Standardization, 2009c). The ISO, a network of the national standards institutes of 159 countries, is the world's largest developer and publisher of international standards in the classification of materials, the manufacture of products, the provision of services, and the environmental performance of the manufacturer or provider (International Organization for Standardization, 2009a). Adherence to ISO standards contributes to making the development, manufacturing, and supply of products and services more efficient, safer, and cleaner with continued improvement to company or organization environmental performance (International Organization for Standardization, 2009b, p. 1). Although it is a nongovernmental organization, the ISO includes members from various governments in addition to those from private industry and private sector organizations, thereby receiving input from the

public sector as it does from the private sector (International Organization for Standardization, 2009b, p. 2).

Nucor Steel-Nebraska is also a member of the U.S. Department of Labor's Occupational Safety and Health Administration's (OSHA) Voluntary Protection Programs (VPP) in which management, labor, and OSHA establish cooperative relationships at workplaces and implemented a comprehensive safety and health management system. Approval into VPP is OSHA's official recognition of the outstanding efforts of employers and employees who have achieved exemplary occupational safety and health standards (U.S. Department of Labor, Occupational Safety and Health Administration, 2009).

Mineral Fuels and Related Materials

Nebraska's groundwater resource is a key ingredient in the State's ethanol production. Groundwater is another important mineral resource in Nebraska because it is used as a water source for making the alcohol for ethanol—all water used in ethanol production in the State is groundwater. According to the State of Nebraska, ethanol production increased to nearly 3.25 billion liters (about 858 million gallons) in 2007, up from nearly 2.36 billion liters (about 623 million gallons) in 2006. This recent overall increase in the rate of ethanol production that began around 2003 also increased the demand for fertilizer minerals and materials needed to grow corn for ethanol manufacturing.

Public interest in ethanol continued to rise because of its potential benefits to local economies, but concerns about the industry's demand for groundwater, as well as other environmental issues, also have been voiced in the State. Nonetheless, groundwater use by ethanol plants in Nebraska remains a mere fraction of the total volume of groundwater pumped annually from the State's aquifers.

Uranium.—In March, Crow Butte Resources, Inc. (a subsidiary of Cameco, Inc. of Saskatoon, Saskatchewan, Canada) submitted a request for a minor permit modification to the NDEQ in order to increase the company's well field production flow at its mine operation, which is located southwest of Crawford and is Nebraska's only uranium mine. The NDEQ granted the permit modification at the end of August. As uranium prices continued to rise worldwide, Cameco, Inc. announced in June its desire to significantly expand its uranium extraction operations in northwestern Nebraska by increasing yellowcake production by more than 180,000 kg (400,000 pounds) per year, eventually reaching a production goal of about 545,000 kg (1.2 million pounds) per year (Mullin, 2007). The move eventually would add about 25 people to its workforce. Furthermore, Crow Butte Resources submitted an aquifer exemption petition prior to submitting a Nebraska Class III Injection Permit application on the company's North Trend property, which lies northwest of its present operations. The NDEQ denied this application in November, but the company planned to reapply in 2008.

Environmental Issues

U.S. Environmental Protection Agency (EPA) officials announced that, on the basis of soil testing, lead contamination resulting from emissions at the former Asarco smelting plant in Omaha had affected a significantly larger area than the one originally outlined by the agency in 2001 (Gaarder, 2007). The EPA lead cleanup in Omaha is now ranked as the largest residential Superfund site in the Nation. Approximately 90,000 residents live within the affected area. Lead poisoning in children, both from soil contaminated by smelter-derived fallout and from the unrelated use of lead-based paint in homes built before 1978, is a major concern in the affected residential area.

At last count, 38% of the residential yards tested in Omaha for soil contamination already exceeded EPA's threshold of concern for lead, and perhaps as many as 16,000 properties may require remediation. Omaha Healthy Kids Alliance (<http://www.omahahealthykids.org/>), a nonprofit organization, was formed in 2006 to coordinate lead cleanup at the local level. The number of residential yards tested for lead by the beginning of 2007 was tallied at 31,874, and some \$95 million had been expended on cleanup efforts by April 2007 (Gaarder, 2007). By November, cleanup had been completed in 1,000 lead-contaminated yards during 2007, making a grand total of 3,000 yards remediated since 2005 (U.S. Environmental Protection Agency, 2007).

Government Programs

The Conservation and Survey Division (CSD) of the Nebraska School of Natural Resources, Nebraska's State Geological Survey, continued as an active participant in the STATEMAP program in 2007. STATEMAP is a component of the congressionally mandated National Cooperative Geologic Mapping Program (NCGMP), through which the USGS distributes Federal funds to support geologic mapping efforts through a competitive funding process. The NCGMP has three primary components: (1) FEDMAP, which funds Federal geologic mapping projects, (2) STATEMAP, which

is a matching-funds grant program with State geological surveys, and (3) EDMAP, a matching-funds grant program with universities that has a goal to train the next generation of geologic mappers. In October, the CSD completed and delivered geologic maps of the Cortland, Firth, Columbus, Columbus SW 7.5 minute quadrangles. These maps encompass areas of sand and gravel deposits and extensive aquifers. These and other completed maps are available online at the University of Nebraska-Lincoln Web site (University of Nebraska-Lincoln, 2010).

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TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN NEBRASKA^{1,2}

(Thousand metric tons and thousand dollars)

Mineral	2005		2006		2007	
	Quantity	Value	Quantity	Value	Quantity	Value
Cement:						
Masonry	W	W	W	W	W	W
Portland	W	W	W	W	W	W
Clays, common	160 ^e	W	158 ^e	W	135 ^e	W
Gemstones, natural	NA	4	NA	4	NA	4
Lime	12	625	13	700	W	W
Sand and gravel, construction	14,300	60,200	13,100	62,000	13,400	70,600
Stone, crushed	6,950	54,100	7,480 ^f	67,100 ^f	7,720	76,200
Total	XX	115,000	XX	130,000 ^f	XX	147,000

^eEstimated. ^fRevised. NA Not available. W Withheld to avoid disclosing company proprietary data, value excluded in Total. XX Not applicable.

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

²Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 2
NEBRASKA: CRUSHED STONE SOLD OR USED, BY TYPE¹

Type	2006			2007		
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Number of quarries	Quantity (thousand metric tons)	Value (thousands)
Limestone	9	7,390	\$66,300	8	7,670	\$75,700
Miscellaneous stone	1	91	871	1	48	481
Total	XX	7,480 ^r	67,100 ^r	XX	7,720	76,200

^rRevised. XX Not applicable.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 3
NEBRASKA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2007, BY USE¹

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
Construction:		
Coarse aggregate (+1½ inch), riprap and jetty stone	W	W
Coarse aggregate, graded:		
Concrete aggregate, coarse	W	W
Bituminous aggregate, coarse	W	W
Fine aggregate (-¾ inch), screening (undesignated)	W	W
Coarse and fine aggregates:		
Graded road base or subbase	W	W
Unpaved road surfacing	W	W
Crusher run or fill or waste	W	W
Roofing granules	W	W
Agricultural:		
Limestone	W	W
Other agricultural uses	58	429
Chemical and metallurgical:		
Cement manufacture	W	W
Dead-burned dolomite manufacture	W	W
Special, asphalt fillers or extenders	W	W
Unspecified: ²		
Reported	3,010	29,300
Estimated	1,400	13,000
Total	7,720	76,200

W Withheld to avoid disclosing company proprietary data; included in "Total."

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Reported and estimated production without a breakdown by end use.

TABLE 4
NEBRASKA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2007,
BY MAJOR USE CATEGORY¹

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	1,080	\$4,590	\$4.25
Concrete products (blocks, bricks, pipe, decorative, etc.) ²	64	226	3.53
Asphaltic concrete aggregates and other bituminous mixtures	799	5,900	7.39
Road base and coverings ³	1,780	9,960	5.60
Fill	405	1,040	2.57
Snow and ice control	45	218	4.84
Filtration	3	26	8.67
Other miscellaneous uses	16	299	18.69
Unspecified: ⁴			
Reported	1,140	5,960	5.23
Estimated	8,000	42,000	5.27
Total or average	13,400	70,600	5.28

¹Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

²Includes plaster and gunite sands.

³Includes road and other stabilization (cement).

⁴Reported and estimated production without a breakdown by end use.

TABLE 5
NEBRASKA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2007, BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate (including concrete sand)	W	W	606	2,660	W	W
Concrete products (blocks, bricks, pipe, decorative, etc.) ²	W	W	21	77	W	W
Asphaltic concrete aggregates and other bituminous mixtures	W	W	376	3,280	W	W
Road base and coverings ³	525	2,430	1,150	6,450	107	1,080
Fill	62	138	246	669	96	232
Snow and ice control	22	96	20	101	3	21
Other miscellaneous uses	610	3,200	7	191	344	1,640
Unspecified: ⁴						
Reported	42	211	21	406	1,080	5,340
Estimated	2,200	12,000	3,000	16,000	2,900	15,000
Total	3,440	17,500	5,400	29,400	4,540	23,700

W Withheld to avoid disclosing company proprietary data; included in "Other miscellaneous uses."

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes plaster and gunite sands.

³Includes road and other stabilization (cement).

⁴Reported and estimated production without a breakdown by end use.