

# THE MINERAL INDUSTRY OF NORTH DAKOTA

**This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the North Dakota Geological Survey for collecting information on all nonfuel minerals.**

In 1997, for the third consecutive year, North Dakota ranked 48th in the Nation in total nonfuel mineral production value,<sup>1</sup> according to the U.S. Geological Survey (USGS). The estimated value for 1997 was \$31.6 million, a 2.6% increase from that of 1996. This followed a marginal decrease of a little more than 1% from 1995 to 1996 (based on final 1996 data). The State accounted for about one-tenth of 1% of the U.S. total nonfuel mineral production value.

North Dakota's leading nonfuel mineral by value was construction sand and gravel. This high-volume, low-value commodity accounted for 77% of the State's nonfuel mineral production value. In 1997, except for a slight increase in the values of construction and industrial sand and gravel, all mineral commodity values remained virtually the same. In 1996, the magnitudes of change were similar with slight decreases occurring in construction and industrial sand and gravel and lime.

The following narrative information was provided by the North Dakota Geological Survey<sup>2</sup> (NDGS). During 1997, 18 surface mining operations were operational, as reported to the State Soil Conservation Service. Based on these reports, 117 hectares were affected. The quantity of minerals mined included 1,480,000 cubic meters of sand and gravel, 60,800 cubic meters of clay, and 77,600 cubic meters of crushed stone, totaling 1,620,000 cubic meters of mineral material. From 51 pits ranging in size for 0.3 to 24 hectares, a total of 252,000 cubic meters of overburden were disturbed. Hebron Brick Co. in Morton County continued to lead the State in clay products production, and accounted for 57% of the clay mined in the State.

In the fall of 1997, American Colloidal Co. submitted a permit to conduct surface mining operations for leonardite in Bowman County. Leonardite, associated with lignite, is an oxidized lignite. It is processed and used as a dispersant and for viscosity control in oilwell drilling muds, as a stabilizer for ion-exchange resins in water treatment, and as a soil conditioner. Currently, GeoResources, Inc. of Williston, Williams County, is the only

leonardite mining and processing operation in North Dakota besides American Colloidal. The two companies produced a combined total of 59,500 metric tons of leonardite in 1997. American Colloidal anticipates 36,000 to 72,500 metric tons of leonardite per year to be processed, depending on market demands. The company hopes to begin production at the new site in the summer of 1998. The life of the mine is expected to be 6 years.

During the 1997 legislative session, two bills passed that directly affect the nonfuel minerals industry. The State Soil Conservation Committee (SSCC) was designated by the Legislature to administer the Surface Mining Reports Law (SMRL). The SMRL requires the reporting of all activities by any person conducting surface mining operations for minerals other than coal, who, within one calendar year, removes 7,650 cubic meters (10,000 cubic yards) or more of earthen materials or products, including overburden, affecting 0.2 hectare (0.5 acre) or more in combined mining operations. Detailed reporting requirements are described in North Dakota Century Code (NDCC) Chapter 38-16. At the same time, funding for the SSCC was cut by 75%, staff decreased to essentially one person, and some of their duties assigned to other State agencies. Mineral commodities included are cement rock, clay, gravel, limestone, manganese, molybdenum, peat, potash, pumicite, salt, sand, scoria, stone, sodium sulfate, zeolite, or other minerals, excluding coal. The SSCC has the regulatory authority to administer the reporting requirement, while actual regulatory authority for most of these mining activities rests with the NDGS. According to the NDGS, the law as written is somewhat ambiguous at best.

Also passed during the 1997 legislative session was an amendment clarifying the definition of "subsurface minerals." The definition of subsurface minerals as it now appears in the NDCC Chapter 38-12, Regulation, Development, and Production of Subsurface Minerals, and in NDCC Chapter 38-15, Resolution of Conflicts in Subsurface Mineral Production is as follows: "Subsurface minerals means all naturally occurring elements and their compounds, volcanic ash, precious metals, carbonates, and natural mineral salts of boron, bromine, calcium, chlorine, helium, iodine, lithium, magnesium, nitrogen, phosphorous, potassium, sodium, thorium, uranium, and sulfur, and their compounds, but does not include sand and gravel and rock crushed for sand and gravel" (NDCC Ch. 38-12-01.07). The definition still uses very broad language, but the addition of specific minerals and elements limits some of the confusion regarding the inclusion of sand and gravel in the subsurface mineral law. Sand and gravel mining activities are subject to the requirement mentioned in the previous paragraph (NDCC Ch. 38-16, SMRL).

The summary of surface mining statistics presented here by the NDGS in cooperation with the SSCC is a good faith, yet

<sup>1</sup>The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or 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 1997 USGS mineral production data published in this chapter are estimates as of January 1998. Construction sand and gravel estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset, and request Document # 1000 for a telephone listing of all mineral commodity specialists, or call USGS information at (703) 648-4000 for the specialist's name and number. This telephone listing may also be retrieved over the Internet at <http://minerals.er.usgs.gov/minerals/contacts/comdir.html>. All Mineral Industry Surveys—mineral commodity, State, and country—also may be retrieved by way of MINES FaxBack or over the Internet at <http://minerals.er.usgs.gov/minerals/>.

<sup>2</sup>Ann Fritz, Geologist, authored the text of State mineral industry information submitted by the North Dakota Geological Survey.

conservative, estimate of the amount of nonfuel minerals mined in North Dakota during 1997. Although mining operators of the minimum size and above were still required to submit reports, smaller operations needed to be estimated by the SSCC staff. Helpful in this effort were some operators who voluntarily submitted reports to the SSCC, even though they are not required by law to report a summary of surface mining activities.

The coal gasification plant located near Beulah brought its anhydrous ammonia plant fully on-line in the spring of 1997. The plant has the capacity to produce 1,040 tons of anhydrous ammonia per day, but currently is producing 952 tons because of nitric oxide emission limits. Total production of anhydrous

ammonia in 1997 was about 188,000 tons. In 1997, the gasification plant also produced 3,620,000 liters of krypton and xenon, 2,070,000 liters of liquid nitrogen, and about nearly 745,000 liters of methanol. Ammonium sulfate production from the stack gas scrubber was 90,900 tons in 1997. Production of ammonium sulfate will be limited in 1998 because of the use of low-sulfur coal.

The NDGS continued the process of entering all of the geologic information from its subsurface mineral program into a computerized spreadsheet. This information will be used for a number of purposes, including redefining the State's uranium deposits.

TABLE 1  
NONFUEL RAW MINERAL PRODUCTION IN NORTH DAKOTA 1/ 2/

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	1995		1996		1997 p/	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays, common	59	W	59	W	59	W
Gemstones	NA	W	NA	3	NA	3
Sand and gravel, construction	8,420	23,900	8,320	23,800	8,320	24,400
Combined value of lime, peat, sand and gravel (industrial), and values indicated by symbol W	XX	7,300	XX	7,060	XX	7,160
Total	XX	31,200	XX	30,800	XX	31,600

p/ Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable

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

2/ Data are rounded to three significant digits; may not add to totals shown.

TABLE 2  
NORTH DAKOTA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1996,  
BY MAJOR USE CATEGORY 1/

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate and concrete products	58	\$403	\$6.95
Asphaltic concrete aggregates and other bituminous mixtures	203	477	2.35
Road base and coverings 2/	2,140	4,990	2.33
Fill	103	206	2.00
Other miscellaneous uses 3/	27	99	3.67
Unspecified: 4/			
Actual	1	3	3.00
Estimated	5,780	17,600	3.04
Total or average	8,320	23,800	2.86

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes road and other stabilization (cement).

3/ Includes railroad ballast and snow and ice control.

4/ Includes production reported without a breakdown by end use and with estimates for nonrespondents.