

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 1999, the preliminary estimated value¹ of nonfuel mineral production for North Dakota was \$37.7 million, according to the U.S. Geological Survey (USGS). This was about a 2% decrease from that of 1998,² and followed a 13.6% increase in 1998 from 1997.

North Dakota's leading nonfuel mineral by value was construction sand and gravel. This high-volume, low-value commodity accounted for nearly 79% of the State's nonfuel mineral production value. In 1999, all nonfuel minerals showed slight increases in value, except for construction sand and gravel, which had a small decrease, and gemstones, which was unchanged (table 1). In 1998, only construction sand and gravel, up \$3.6 million, showed any significant change, the increase of which accounted for most of the State's increase in value. All other nonfuel minerals increased slightly, except for common clay, which had a small decrease.

The following narrative information was provided by the North Dakota Geological Survey³ (NDGS). During 1999, 17 surface mining operations were operational, as reported to the State Soil Conservation Committee (SSCC). (The SSCC collects production data by volume, unlike the USGS, which collects data by mass or metric tons produced.) Based on these reports, 125 hectares (ha) were affected. The quantity of minerals mined included more than 2.7 million cubic meters (Mm³) of sand and gravel, 67,800 cubic meters (m³) of clay, and about 108,000 m³ of crushed stone, 1,680 m³ of scoria, totaling about 2.88 Mm³ of mineral material. From 61 pits ranging in size from more than 0.1 ha to 16 ha, a total of approximately 572,000 m³ of overburden were disturbed.

Leonardite is an oxidized lignite. Currently, Georesources,

¹The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon 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 1999 USGS mineral production data published in this chapter are preliminary estimates as of May 2000, and are expected to change. For some mineral commodities, such as, construction sand and gravel and crushed stone, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. A telephone listing for the specialists may be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals/contacts/comdir.html>, by using MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset (request Document #1000 for a telephone listing of all mineral commodity specialists), or by calling USGS information at (703) 648-4000 for the specialist's name and number. All Mineral Industry Surveys—mineral commodity, State, and country—also may be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals>; facsimile copies may be obtained from MINES FaxBack.

²Values, percentage calculations, and rankings for 1998 may vary from the Minerals Yearbook, Area Reports: Domestic 1998, Volume II, owing to the revision of preliminary 1998 to final 1998 data. Data for 1999 are preliminary and are expected to change; related rankings may also be subject to change.

³Edward C. Murphy, Geologist, authored the text of State mineral industry information submitted by the North Dakota Geological Survey.

Inc. of Williston and American Colloid Co. of Scranton operate the only Leonardite mines in North Dakota. The two companies produced a combined total of approximately 32,000 metric tons (t) of Leonardite in 1999. Leonardite is processed and used as a dispersant and viscosity control in oil well drilling muds, as a stabilizer for ion-exchange resins in water treatment, and as a soil conditioner.

The SSCC, as designated by the State legislature, continues to administer the Surface Mining Report Law, which requires any person conducting surface mining operations for minerals other than coal to comply with the reporting requirements of North Dakota Century Code Chapter 38-16. Minerals included under the law are cement rock, clay, gravel, limestone, manganese, molybdenum, peat, potash, pumicite, salt, sand, scoria, stone, sodium sulfate, zeolite, and other minerals (except coal). The SSCC has the regulatory authority to administer the reporting requirement, while the actual regulatory authority for most of these mining activities rests with the NDGS. The law requires that any person or company that within one calendar year removes 7,650 m³ (10,000 cubic yards) or more of earthen materials or products (including overburden) affecting 0.2 ha (0.5 acre) or more in combined mining operations must report the particulars of its surface mining activities. Some operators of smaller operations cooperate by voluntarily submitting summary reports to the SSCC, although not required by law. Nevertheless, because not all operations report, the summary of surface mining statistics presented above is a conservative estimate of the amount of nonfuel minerals mined in North Dakota in 1999.

The coal gasification plant near Beulah continued to operate an anhydrous ammonia plant. The plant, in operation since spring 1997, has the capacity to produce 1,180 metric tons per day (t/d) of anhydrous ammonia. The plant averaged 663 t/d during 1999 due to several extended power outages at the plant. Total production of anhydrous ammonia in 1999 was 242,000 t. In 1999, the gasification plant also produced more than 3.6 million liters (ML) of krypton and xenon; over 8,100 t (16.3 million pounds) of phenol; over 13,600 t (27.3 million pounds) of cresylic acid; over 32 ML (8.5 million gallons) of naphtha; almost 4.2 ML (1.1 million gallons) of methanol; and about 243,000 liters (64,300 gallons) of liquid nitrogen. Ammonium sulfate production from the stack gas scrubber was 149,000 t in 1999.

The NDGS continued entering all geologic information from its subsurface mineral program into a computerized data base. This information will be used for a number of purposes, including redefining the State's fuel minerals (lignite, uranium, and coalbed methane) and generating useful information on the State's nonfuel minerals, especially sand and gravel, claystone, and Leonardite.

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

(Thousand metric tons and thousand dollars)

Mineral	1997		1998		1999 p/	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays: Common	56	W	42	W	44	W
Gemstones	NA	3	NA	3	NA	3
Sand and gravel: Construction	9,360	26,800	10,700	30,400	10,200	29,600
Stone: Crushed	--	--	71 3/	232 3/	80 3/	268 3/
Combine values of lime, peat (1998), sand and gravel (industrial), stone [crushed volcanic cinder (1998-99)], and values indicated by symbol W	XX	6,890	XX	7,630	XX	7,850
Total	XX	33,700	XX	38,300	XX	37,700

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

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

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

3/ Excludes certain stones; kind and values included with "Combined values" data.

TABLE 2
NORTH DAKOTA: CRUSHED STONE SOLD OR USED, BY KIND 1/

Kind	1997				1998			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Volcanic cinder and scoria	--	--	--	--	1	W	W	W
Miscellaneous stone	--	--	--	--	5	71	232	\$3.27
Total or average	XX	--	--	--	XX	71	232	3.27

W Withheld to avoid disclosing company proprietary data; not included in "Total." XX Not applicable. -- Zero.

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

TABLE 3
NORTH DAKOTA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1998,
BY MAJOR USE CATEGORY 1/ 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate	228	\$1,400	\$6.16
Asphaltic concrete aggregates and other bituminous mixtures	679	1,530	2.25
Road base and coverings	2,250	4,750	2.11
Fill	212	377	1.78
Other miscellaneous uses 3/	11	62	5.64
Unspecified: 4/			
Actual	2,350	8,580	3.65
Estimated	4,980	13,700	2.76
Total or average	10,700	30,400	2.84

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

2/ To avoid disclosing company proprietary data, no district tables were produced in 1998.

3/ Includes railroad ballast and snow and ice control.

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