# 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 1998, the preliminary estimated value[1] of nonfuel mineral production for North Dakota was $34.7 million, according to the U.S. Geological Survey (USGS). This was a 3% increase from that of 1997,[2] and followed a 9.4% increase in 1997 from that of 1996.

North Dakota's leading nonfuel mineral by value was construction sand and gravel. This high-volume, low-value commodity accounted for nearly 80% of the State's nonfuel mineral production value. In 1998, all nonfuel minerals, led by construction sand and gravel, increased in value, except gemstones, which was unchanged (table 1). Lime and industrial sand and gravel were produced in the State but the data are included in the combined values in table 1 in order to protect company proprietary data. In 1997, only construction sand and gravel showed any significant change, the increase of which accounted for most of the State's increase in value.

The following narrative information was provided by the North Dakota Geological Survey[3] (NDGS). During 1998, 18 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, 115 hectares were affected. The quantity of minerals mined included 1,710,000 cubic meters of sand and gravel, 72,300 cubic meters of clay, and 42,300 cubic meters of crushed stone, 11,100 cubic meters of scoria, totaling 1,830,000 cubic meters of mineral material. From 61 pits ranging in size from more than 0.1 hectare to 16 hectares, a total of 272,000 cubic meters of overburden were disturbed.

Leonardite is an oxidized lignite. Currently, Georesources, Inc. of Williston and American Colloid Co. of Scranton are the only leonardite mining operations in North Dakota. The two companies produced a combined total of more than 34,000 metric tons of leonardite in 1998. 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, or 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 cubic meters (10,000 cubic yards) or more of earthen materials or products (including overburden) affecting 0.2 hectare (one-half acre) or more in combined mining operations must report the particulars of their surface mining activities. Some operators of smaller operations cooperate by voluntarily submitting summary reports to the SSCC, although not required to 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 1998.

The North Dakota legislature, which convenes every other year, was not in session during 1998, therefore no legislative actions in the nonfuel mineral industry occurred. The 56th Legislative Assembly of North Dakota convened on January 5, 1999. House Bill 1390, which would have allowed counties to impose a surcharge on gravel operations, failed to pass by a vote of 35 to 60.

The coal gasification plant located near Beulah continued to operate an anhydrous ammonia plant. The plant, in operation since spring 1997, has the capacity to produce 1,040 tons per day of anhydrous ammonia. The plant averaged 679 tons per day during 1998 due to poor market conditions in North Dakota and the surrounding States. Total production of anhydrous ammonia in 1998 was 248,000 tons. In 1998, the gasification plant also produced more than 3.4 million liters of krypton and xenon; almost 867,000 liters (229,020 gallons) of methanol; and about 518,000 liters (136,838 gallons) of liquid nitrogen. Ammonium sulfate production from the stack gas scrubber was almost 118,000 tons in 1998.

The NDGS continued the process of entering all geologic information from its subsurface mineral program into a computerized database. This information will be used for a

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[1]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 1998 USGS mineral production data published in this chapter are preliminary estimates as of February 1999 and are expected to change. Construction sand and gravel 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 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 http://minerals.usgs.gov/minerals; facsimile copies may be obtained from MINES FaxBack.

[2]Values, percentage calculations, and rankings for 1997 may vary from the *Minerals Yearbook, Area Reports: Domestic 1997, Volume II*, owing to the revision of preliminary 1997 to final 1997 data. Data for 1998 are preliminary and expected to change, while related rankings may also be subject to change.

[3]Ann Fritz, Geologist, authored the text of State mineral industry information submitted by the North Dakota Geological Survey.

number of purposes, including redefining the State's uranium deposits and estimating coalbed methane potential. Using information from the computerized database, Open-File Report 98-1, *The Coalbed Methane Potential of North Dakota Lignites*, was prepared. Copies may be obtained by contacting the NDGS publications clerk at (701) 328-8000.

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

(Thousand metric tons and thousand dollars unless otherwise specified)

| | 1996 | | 1997 | | 1998 p/ | |
|---|---|---|---|---|---|---|
| Mineral | Quantity | Value | Quantity | Value | Quantity | Value |
| Clays: Common | 59 | W | 56 | W | 57 | W |
| Gemstones | NA | 3 | NA | 3 | NA | 3 |
| Sand and gravel: Construction | 8,320 | 23,800 | 9,360 | 26,800 | 9,360 | 27,600 |
| Combine values of other industrial minerals | XX | 7,060 | XX | 6,890 | XX | 7,040 |
| Total | XX | 30,800 | XX | 33,700 | XX | 34,700 |

p/ Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined values" 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 1997, BY MAJOR USE CATEGORY 1/

| Use | Quantity (thousand metric tons) | Value (thousands) | Value per ton |
|---|---|---|---|
| Concrete aggregate (including concrete sand) | 131 | $588 | $4.49 |
| Asphaltic concrete aggregates and other bituminous mixtures | 229 | 595 | 2.60 |
| Road base and coverings 2/ | 2,080 | 4,360 | 2.10 |
| Fill | 185 | 266 | 1.44 |
| Other miscellaneous uses 3/ | 10 | 82 | 8.20 |
| Unspecified: 4/ | | | |
| Actual | 885 | 2,520 | 2.84 |
| Estimated | 5,840 | 18,400 | 3.15 |
| Total or average | 9,360 | 26,800 | 2.87 |

1/ Data are rounded to three significant digits; may not add to totals shown.
2/ Includes road and other stabilization (cement and lime).
3/ Includes railroad ballast and snow and ice control.
4/ Includes reported and estimated production without a breakdown by end use.