

THE MINERAL INDUSTRY OF VERMONT

This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the Vermont Geological Survey, Office of the State Geologist, for collecting information on all nonfuel minerals.

In 1997, Vermont ranked 45th among the 50 States in total nonfuel mineral production value,¹ according to the U.S. Geological Survey (USGS). The State was 46th in 1996. The estimated value for 1997 was \$68 million, a more than 3% increase from that of 1996. This followed a 9.3% increase from 1995 to 1996 (based on final 1996 data). The State accounted for somewhat less than 0.5% of the U.S. total nonfuel mineral production value.

The increased value of crushed stone provided nearly all of Vermont's increase in value in 1997. Dimension stone had a marginal increase, construction sand and gravel dropped by \$1 million, and gemstones remained unchanged (*table 1*). In 1996, increases in the values of construction sand and gravel and crushed stone accounted for the State's significant increase in value. Dimension stone showed a small drop and gemstones remained unchanged. Although data regarding talc production must be concealed to protect company data, that mineral commodity's value increased in 1997, following a smaller decrease in 1996. Compared with USGS estimates of the quantities produced in the 50 States during 1997, Vermont remained third in rank in the production of both dimension stone and talc.

The following narrative information was provided by the Vermont Geological Survey² (VGS). Rock of Ages Corp., a manufacturer and retailer of dimension granite and granite memorials based in Graniteville, Washington County, completed its initial public offering of Class A Common Stock on October 24, 1997. The company acquired Childs & Childs Granite Co. of Elberton, GA, and the Keith Monument Co. of Elizabethtown, KY. Rock of Ages owns and operates four quarries in the towns of Barre (two), Bethel, and Woodbury in addition to nine other granite quarries in North America.

The owner of Gawet Marble in Windham, Windham County, received an Act 250 (Vermont's Land Use and Development Law) permit in 1996 and began removal of existing blocks of verde

antique marble in 1997. Verde antique marble is a mixture of massive serpentine, a translucent light-to-dark-green-colored rock, and white marble, which together show beautiful variegated coloring. It is often used as an ornamental stone and may be valuable as building material. Quarry operations are scheduled to begin in the spring of 1998.

In 1995, the Vermont Legislature enacted Act 30, adding subsections (j) through (l) to Title 10 of the Vermont Statutes Annotation Section 6081 of the Act 250 statute. Act 30 established a slate quarry registration program whereby quarries which are properly registered are deemed to be active (not abandoned) and exempt from Act 250 for enumerated "ancillary activities" (i.e., "Drilling, crushing, grinding, sizing, washing, drying, sawing and cutting stone, blasting, trimming, punching, splitting and gauging, and use of buildings and the use and construction of equipment exclusively to carry out the above activities"). During 1997, 125 Act 250 Jurisdictional Opinions were issued, thereby accepting the 1996 registration applications for more than 200 slate quarry holes in Vermont.

During the summer of 1997 the VGS in cooperation with the USGS Eastern Mineral Resources Team (EMRT) began the process of updating the mineral resource data of the State. The 2 agencies contracted with F.M. Beck Co. of Maine to review the 700 Vermont listings in the USGS Mineral Resources Data System (MRDS) for accuracy and to make corrections and/or additions where necessary. In addition, a select subset of about 200 MRDS records will be assigned mineral deposit type. The updated assessment will be used in a planning process that focuses on how the VGS can best serve the citizens of the State in regards to mineral-resource issues.

The VGS, also known as the Division of Geology and Mineral Resources in Vermont's Department of Environmental Conservation, conducts surveys and research of the geology, mineral resources, and topography of the State. Of late, emphasis has been on preparation of a bedrock map of Vermont and interim digital map products. A surficial mapping program began in 1996. The State Geologist manages interdisciplinary studies with strong geologic components, especially those focused on surface waters and groundwater resources. Review of projects as they relate to Criteria 9D and 9E of the aforementioned Act 250 is a VGS activity that recognizes the importance of lands with high potential for extraction of mineral and earth resources. The VGS also reviews and makes recommendations regarding mine and quarry reclamation plans in response to current environmental concerns. Published reports are prepared and made available to the public, consultants, industry, and government. The VGS collates and disseminates this practical knowledge in packages ready for the consumer, providing geologic aid and advice to the public as required by State statute.

The VGS also provides advice concerning the development and

¹The 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 and crushed stone 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/>.

²Marjorie Gale, Geologist/Information and Education Officer at the Vermont Geological Survey, submitted the information provided by that agency.

working of rock and mineral deposits suitable for building, road making, and economic purposes. The VGS maintains an archive of old and new information as per State statute. In the event of

any significant discovery of hydrocarbons in the State, the Survey provides geologic services for Vermont's Natural Gas and Oil Resources Board.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN VERMONT 1/ 2/

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	1995		1996		1997 p/	
	Quantity	Value	Quantity	Value	Quantity	Value
Gemstones	NA	1	NA	1	NA	1
Sand and gravel, construction	3,220	11,000	3,870	15,200	3,510	14,100
Stone:						
Crushed	4,420	20,700	4,560	22,800	5,100	26,000
Dimension metric tons	100,000	28,700	99,600	27,900	100,000	28,100
Total 3/	XX	60,400	XX	66,000	XX	68,200

p/ Preliminary. NA Not available. 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.

3/ Partial total, excludes values that must be concealed to avoid disclosing company proprietary data.

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

Kind	1995				1996			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	6 r/	2,080 r/	\$7,610 r/	\$3.65 r/	6	2,260	\$8,440	\$3.74
Dolomite	6	W	W	5.38	2	W	W	9.06
Marble	2	W	W	3.90	3	1,030	4,610	4.46
Granite	2	48	W	W	2	W	W	5.84
Quartzite	3 r/	W	W	W	3	1,120	8,600	7.71
Slate	1	W	W	9.61	1	W	W	9.92
Total	XX	4,420	20,700	4.68	XX	4,560	22,800	5.01

r/ Revised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.

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

TABLE 3
VERMONT: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1996, BY USE 1/ 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	13	\$104	\$8.00
Filter stone	12	93	7.75
Coarse aggregate, graded:			
Concrete aggregate, coarse	129	1,060	8.19
Bituminous aggregate, coarse	263	2,240	8.50
Bituminous surface-treatment aggregate	166	1,350	8.11
Railroad ballast	12	94	7.83
Fine aggregate (-3/8 inch):			
Stone sand, concrete	122	965	7.91
Stone sand, bituminous mix or seal	172	1,250	7.27
Other fine aggregate 3/	9	78	8.67
Coarse and fine aggregates:			
Graded road base or subbase	143	1,150	8.06
Unpaved road surfacing	113	887	7.85
Other construction materials 4/	99	751	7.59
Agricultural, other agricultural uses	W	W	4.38
Unspecified: 5/			
Actual	1,110	4,090	3.69
Estimated	W	W	3.95
Total	4,560	22,800	5.01

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

1/ Includes dolomite, granite, limestone, marble, quartzite, and slate.

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

3/ Includes screening (undesignated).

4/ Includes crusher run (select material or fill).

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

TABLE 4
VERMONT: 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 (including concrete sand)	548	\$3,320	\$6.05
Plaster and gunite sands	7	78	11.14
Asphaltic concrete aggregates and other bituminous mixtures	131	788	6.02
Road base and coverings	1,290	4,880	3.80
Fill	207	444	2.14
Snow and ice control	438	1,350	3.09
Other miscellaneous uses 2/	241	1,410	5.84
Unspecified: 3/			
Actual	97	457	4.71
Estimated	921	2,500	2.72
Total or average	3,870	15,200	3.93

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

2/ Includes filtration.

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