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 for collecting information on all nonfuel minerals.

In 2000, the estimated value[1] of nonfuel mineral production for Vermont was $74.6 million, based upon preliminary U.S. Geological Survey (USGS) data. This was an 11% increase compared with that of 1999[2] and followed a 9.4% decrease from 1998 to 1999. Because data for talc have been withheld to protect company proprietary data, the actual total values for 1998-2000 are higher than those reported in table 1.

Dimension stone, Vermont's leading nonfuel mineral commodity in 2000, led the State's other nonfuel minerals with the largest increase in production value from that of 1999. The production of dimension stone accounted for about 42% of Vermont's reportable nonfuel mineral value, while crushed stone and construction sand and gravel made up about 35% and 23% of the same, respectively. In 1999, although dimension stone production and value were up, decreases in crushed stone and construction sand and gravel were significantly larger, resulting in the State's decrease in total value for the year (table 1). Although more specific information about talc has been withheld, during both 2000 and 1999 small decreases occurred in the production and associated value of talc.

Compared with USGS estimates of the quantities produced in the United States during 2000, Vermont remained second among the States that produced dimension stone and third among those producing talc.

The Vermont Geological Survey (VGS) provided the following narrative information,[3] which includes information from the VGS and responses by Luzenac America, Inc., and Rock of Ages Corp. to the annual VGS request for information on the State's quarry and mine operations.

In the talc industry, Luzenac America, based in Ludlow, Windsor County, reported that although sales and production declined approximately 16% in 2000, employment levels remained the same as those of 1999. Luzenac marketed talc globally for use in many products including paper, paint, plastics, and roofing. The company received an Act 250 (Vermont's Land Use and Development Law) amendment permit for a small addition to the crusher building in Ludlow allowing for the installation of a rock hammer and improved design of the ore hopper.

Luzenac commenced the backfilling of its Blackbear talc mine in the spring in keeping with the company's concept for reclamation as outlined in the long range plan for the Argonaut Mine. Although initially planning to backfill the Blackbear Mine in 2010, the company accelerated the schedule to 2000.

Rock of Ages Corp., already known around the world for its granites, has accelerated activities during the past 10 years to increase the amount of stone it exports throughout the world. The company changed the product distribution system from a distributor-agent system to direct sales to its customers. As a result of this change, Rock of Ages professed to be more flexible and able to make marketplace decisions more quickly.

In 2000, Rock of Ages introduced new technology at its quarry operations in order to maintain efficient productivity and to hold costs down. The company installed a water jet for channel cutting in the company's Barre, VT, operation. The water jet, along with other channeling methods such as the diamond wire saw and slot drills, completely replaced the liquid oxygen/fuel oil jet torch in Barre in 2000. According to Rock of Ages, while noise was significantly reduced and productivity improved, the company was continuing to look for the best equipment and technology for all aspects of its operations to keep its quarries producing at the highest possible levels.

Rock of Ages reported that, in 2000, it experienced a decline in demand for its Barre Gray granite. Demand for the stone overall has decreased for about 10 years owing to a transition in the marketplace to more colored granites such as blacks, reds, and pinks and also as a result of the high amount of finished imported monuments coming to this country from India and China. On the other hand, worldwide demand has increased for the Bethel White granite quarried in Bethel. According to Rock of Ages, Bethel White is the best white granite in the world and is the high standard to which all other white granites are compared.

In other industry news, the Barney Marble Co. received an Act 250 permit for the reopening of a marble dimension stone quarry on Quarry Rd. in Swanton, and the Barre Granite Quarries LLC received an Act 250 permit revision to reactivate and expand abandoned granite quarries in Sheffield. Both permits were granted in August 2000.

Mine Reclamation

The Elizabeth Mine, an abandoned copper mine in Strafford, has been the focus of the Elizabeth Mine Study Group (432 Ulman Rd., Thetford Center, VT 05075)

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[1]The 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 2000 USGS mineral production data published in this chapter are preliminary estimates as of July 2001 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 of 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.

[2]Values, percentage calculations, and rankings for 1999 may vary from the Minerals Yearbook, Area Reports: Domestic 1999, Volume II, owing to the revision of preliminary 1999 to final 1999 data. Data for 2000 are preliminary and are expected to change; related rankings may also change.

[3]Marjorie Gale, Geologist, with the Vermont Geological Survey, authored the text of minerals industry information submitted by that agency.

for about 5 years. The mine operated from the early 1800s until 1958. Several copper smelters were built on the 570-hectare (1,400-acre) property. Between 1830 and 1958, approximately 46,000 metric tons (100 million pounds) of copper were produced. The tailings on the property were rich in metals and sulfides, from which acid mine drainage contributed an elevated load of metals to Copperas Brook and the West Branch Ompompanoosuc River. The Elizabeth Mine Study Group continued to work with Federal and State governments on remediation and restoration projects at the site in 2000. The Norwich Public Library and the Full Moon Café in South Strafford are the two public repositories for the project documents. The Elizabeth Mine was added to the U.S. Environmental Protection Agency's (EPA) National Prioirties List (NPL) of Superfund sites in 2001. Additional information is on the EPA's web site at URL http://www.epa.gov/superfund/sites/npl/nar1612.htm.

Government Programs

The VGS, which is 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. Although its recent emphasis has been on completion of the bedrock map of Vermont and new surficial mapping by quadrangle and watershed, the VGS began a hazard map program in 2000. Mapping projects addressed societal issues such as landslide hazard, riverine erosion, and naturally occurring radionuclides in bedrock and ground water. Digital surficial and bedrock data were also used to customize HAZUS, an earthquake hazard computer program, to make it realistically simulate local Vermont conditions.

The State Geologist manages interdisciplinary studies with strong geologic components, especially those focused on surface waters, ground water resources, and geologic hazards. 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, providing geologic aid and advice to the public as required by State statute.

The VGS also provides advice concerning the developing and working of rock and mineral deposits suitable for building, roadmaking, 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 VGS provides geologic services for Vermont's Natural Gas and Oil Resources Board. Additional information about the VGS is at URL http://www.anr.state.vt.us/geology/vgshmpg.htm.

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

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral		1998		1999		2000 p/	
		Quantity	Value	Quantity	Value	Quantity	Value
Gemstones		NA	1	NA	1	NA	1
Sand and gravel, construction		4,940	21,200	4,430	18,800	3,840	17,000
Stone:							
Crushed		5,590	28,500	5,400	22,800	6,000	26,000
Dimension	metric tons	93,300	24,500	98,600	25,600	105,000	31,600
Talc	do.	W	(3/)	W	(3/)	W	(3/)
Total		XX	74,200	XX	67,200	XX	74,600

p/ Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data. XX Not applicable.
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/ Value excluded to avoid disclosing company proprietary data.

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

Kind	1998				1999			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	8	2,580	$11,400	$4.43	8	2,440	$10,400	$4.27
Dolomite	4 r/	W	W	W	3	W	W	W
Granite	2	W	W	W	2	W	W	W
Marble	3	1,540	6,610	4.28	3	1,680	7,390	4.41
Quartzite	2 r/	W	W	W	2	W	W	W
Slate	1	W	W	W	1	W	W	W
Total or average	XX	5,590	28,500	5.10	XX	5,400	22,800	4.22

r/ Revised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
1/ Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 3
VERMONT: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1999, BY USE 1/ 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:			
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	12	$55	$4.58
Filter stone	6	22	3.67
Coarse aggregate, graded:			
Concrete aggregate, coarse	92	367	3.99
Bituminous aggregate, coarse	95	377	3.97
Bituminous surface-treatment aggregate	64	253	3.95
Railroad ballast	61	241	3.95
Other graded coarse aggregate	90	305	3.39
Fine aggregate (-3/8 inch):			
Stone sand, concrete	33	117	3.55
Stone sand, bituminous mix or seal	87	311	3.57
Screening, undesignated	W	W	W
Other fine aggregate	60	204	3.40
Coarse and fine aggregates:			
Graded road base or subbase	201	721	3.59
Unpaved road surfacing	120	457	3.81
Crusher run or fill or waste	W	W	W
Other coarse and fine aggregates	95	321	3.38
Unspecified: 3/			
Reported	766	3,600	4.70
Estimated	3,600	16,000	4.28
Total or average	5,400	22,800	4.22

W Withheld to avoid disclosing company proprietary data; included with "Other."
1/ Data are rounded to no more than three significant digits; may not add to totals shown.
2/ Includes dolomite, granite, limestone, marble, quartzite, and slate.
3/ Reported and estimated production without a breakdown by end use.

TABLE 4
VERMONT: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1999,
BY MAJOR USE CATEGORY 1/ 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	341	$1,790	$5.24
Plaster and gunite sands	5	50	10.00
Asphaltic concrete aggregates and other bituminous mixtures	149	1,250	8.37
Road base and coverings 3/	1,010	4,910	4.86
Fill	240	534	2.23
Snow and ice control	181	694	3.83
Other miscellaneous uses 4/	102	744	7.29
Unspecified: 5/			
Reported	182	964	5.30
Estimated	2,200	7,900	3.59
Total or average	4,430	18,800	4.24

1/ To avoid disclosing company proprietary data, no district tables were produced for 1999.
2/ Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.
3/ Includes road and other stabilization (cement).
4/ Includes filtration.
5/ Reported and estimated production without a breakdown by end use.