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2008 Minerals Yearbook

VIRGINIA

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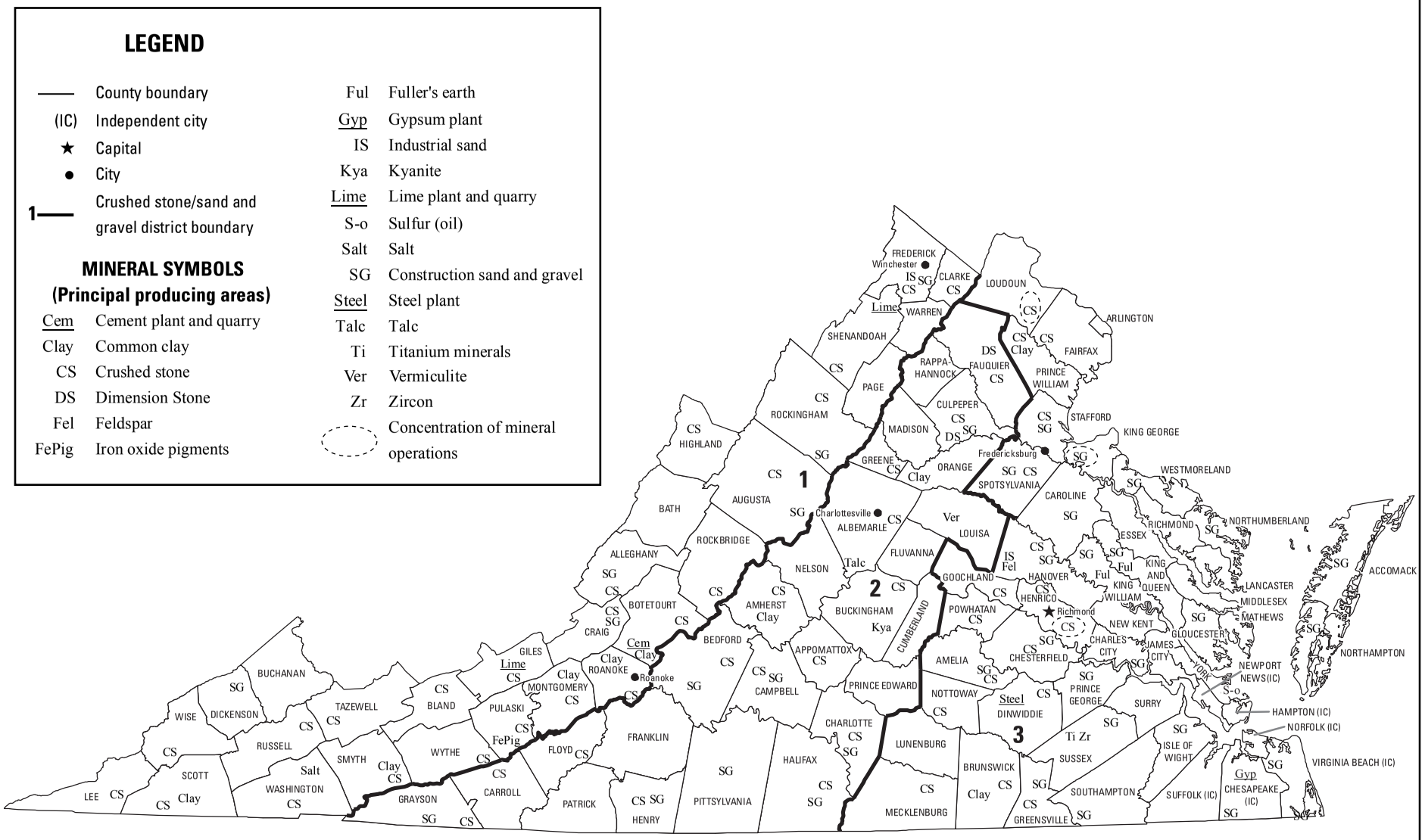
VIRGINIA



Source: Virginia Department of Mines, Minerals, and Energy/U.S. Geological Survey (2008).

The Mineral Industry of Virginia

This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the Virginia Department of Mines, Minerals and Energy for collecting information on all nonfuel minerals.

In 2008, Virginia's nonfuel raw mineral production[1] was valued at $1.13 billion, based upon annual U.S. Geological Survey (USGS) data. This was a decrease of $42 million, or nearly 4%, from the State's total of $1.18 billion in 2007, which was down by $130 million, or nearly 10%, from that of 2006. Virginia rose to 21st in rank (22d in 2007) among the 50 States in total nonfuel raw mineral production value and accounted for 1.6% of the U.S. total.

Crushed stone was, by value, Virginia's leading nonfuel mineral commodity, accounting for 59% of the State's total nonfuel mineral value in 2008 (table 1). From 1990 through 2008, the State produced nearly 1.17 billion metric tons of crushed stone, or an average of 62 million metric tons per year (Mt/yr) during that 19-year period. Construction sand and gravel was the second leading nonfuel mineral commodity by value, followed by portland cement, lime, and zirconium concentrates (data withheld—company proprietary data). These five mineral commodities represented 87% of the State's total nonfuel mineral value.

Despite the decrease in Virginia's total mineral production value, several mineral commodities increased in value, led by increases in salt, titanium (ilmenite), zirconium concentrates, masonry cement, lime, and fuller's earth. The value of salt more than tripled, titanium (ilmenite) and masonry cement rose by 21%, zirconium concentrates and fuller's earth increased by more than 8%, and lime rose by nearly 5% (actual values withheld—company proprietary data). Smaller yet significant increases also took place in common clay and dimension stone. The largest decreases in value took place in crushed stone, down $40 million; portland cement (data withheld—company proprietary data); construction sand and gravel, down $6.4 million; and kyanite, down $3.6 million. Smaller yet significant decreases also occurred in feldspar, industrial sand and gravel, crude vermiculite, and iron oxide pigments (listed in descending order of change).

Virginia continued to be the only U.S. producer of kyanite as well as ranked first of two producers in the production of titanium (ilmenite) and zirconium concentrates. The State rose in rank from 9th to 7th in common clay production, 9th to 8th in crushed stone production, and 13th to 9th in masonry cement production. Virginia remained second in rank behind South Carolina in vermiculite production, second of seven feldspar-producing States, third of three iron oxide pigments-producing States (behind Georgia and Alabama), and fourth in fuller's earth production. The State continued to be a significant producer of lime but ceased production of mica in 2008 and crude talc in 2007.

The following information was provided by the Virginia Division of Geology and Mineral Resources[2] (VDGMR) of the Commonwealth of Virginia's Department of Mines, Minerals and Energy (DMME). Mine production statistics and employment data are based upon annual reports submitted to DMME by mine operators. Data or information pertaining to specific mineral commodities reported by DMME isa based on the Department's own information-gathering processes and may differ from USGS estimates and production figures.

Mine Permitting, Production, and Employment

By yearend 2008, there were 443 permitted nonfuel mineral mines in Virginia, down slightly from 446 permitted mines in 2007. New mining permits were issued to eight operations, 17 permits were transferred to new operators, and seven mines closed during the year. Mine operators reported 66.6 million metric tons (Mt) of nonfuel minerals produced in 2008, which is about 16% less than the total reported in 2007. Mine operators employed 4,656 workers in 2008, including both production and office staff. Independent contractors, although an important component of the mining-related workforce, are not included in the employment number. Total wages paid to mine workers and office staff in 2008 was about $162.2 million.

Commodity Review

Industrial Minerals

Clay and Shale.—In 2008, about 982,000 t of common clay and shale were mined for brick, tile, clay pipe, and other clay products. This represents about a 9% decrease from the production level reported in 2007. There were 35 permitted mine operations during the year. The leading company producing clay and shale materials was General Shale Brick Inc., reporting a total of about 269,000 t from three active mine operations. The largest single shale operation was the Layfield Pit, operated by Branscome Inc., and located in Charles City County, where 187,000 t were reported for the year.

Two operations in Virginia mined fuller's earth (montmorillonite) with combined production reported in 2008 of about 271,000 t. Nestle Purina Petcare Company continued operations from an open pit mine in King William County, and Bennett Mineral Company mined deposits located in King and Queen County. These clay deposits occur in the Tertiary Calvert Formation in Virginia's Coastal Plain region.

[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon the 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 2008 USGS mineral production data published in this chapter are those available as of June 2010. All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—can be retrieved over the Internet at URL http://minerals.usgs.gov/minerals.

[2]William L. Lassetter, Jr., Economic Geology Section Manager with the Virginia Division of Geology and Mineral Resources authored the text of the State mineral industry information provided by that State agency.

Sand and Gravel, Construction.—Construction mine operators reported a total of about 9.0 Mt of sand and gravel construction aggregate produced in 2008 from 245 mines under active mines. Compared with that of 2007, mine output was down by about 29% in 2008. Most of the mines are located in the Coastal Plain physiographic province of the State. Sand and gravel accounted for about 14% of all nonfuel mineral production in Virginia. Vulcan Construction Materials LP was the overall production leader, with about 1.0 Mt reported from two active mines. Vulcan's Puddledock sand and gravel pit, located in Prince George County, was the leading single producing operation, reporting nearly 908,000 metric tons (t). Charles City County led the State in sand and gravel production, with a total of 1.2 Mt from eight operations. Prince George County was the second leading producing county, with 1.1 Mt reported from two active operations.

Stone, Crushed.—Annual reports to DMME from mine operators in Virginia indicated a total of about 52.5 Mt of crushed stone produced in 2008, down 15% from the production level reported in 2007. Production was reported from 130 mine operations with active permits, accounting for about 79% of all nonfuel mineral production in Virginia. About 44% of Virginia's crushed stone came from granite, another 32% from limestone and dolomite, 19% from trap rock, and the remaining 5% from other rock types, including sandstone, marble, quartzite, and so forth.

Vulcan Construction Materials LP remained the leading producer of crushed stone in the State, reporting a total of 12.8 Mt from 20 operations with active permits. Luck Stone Corporation was second in production with 11.1 Mt from 19 active mine permits. Martin Marietta's Doswell quarry located in Hanover County was the largest single producing operation, reporting about 2.2 Mt for 2008. Loudoun County led the State in crushed stone production with a total of 5.2 Mt from five operations.

Mineral Fuels and Related Materials

Uranium.—In early 2008, Virginia Uranium, Inc. completed exploratory drilling (three core and seven rotary holes) on the Coles Hill uranium property located in north-central Pittsylvania County. The drilling was conducted as part of the Uranium Exploration Permit issued in 2007 by the Department of Mines, Minerals and Energy. The permit authorized up to 40 exploration drill holes in two main target areas of the permitted area of about 78 hectares.

The Coles Hill uranium deposit was discovered in the late 1970s by Marline Uranium Corporation while conducting regional scale exploration in central Virginia. From 1979 to 1982, the company completed an extensive drilling program that included 182 rotary percussion and 74 diamond core holes totaling 58,000 meters. In 1982, Marline announced geologic reserves in the South Coles Hill (Swanson) Deposit that included 27 Mt averaging 0.093% U3O8, with about 25,000 t contained U3O8, at the cutoff grade of 0.025%. In 1983, the Virginia General Assembly enacted a moratorium prohibiting the acceptance of mining permit applications until a regulatory program was established. The moratorium remained in effect during 2008.

Government Programs and Activities

As part of the Department of Mines, Minerals and Energy, the Division of Geology and Mineral Resources (VDGMR) serves as the Commonwealth's geological survey. During 2008, VDGMR continued activities that supported the Department's mission to enhance the development and conservation of energy and mineral resources in a safe and environmentally sound manner for a more productive economy. These activities included geologic mapping, compilation and analysis of mineral production statistics, inventorying the locations and geologic characteristics of historic mining activities, and quantitative assessments of mineral and energy resources. The VDGMR has been an active participant in the STATEMAP Program. STATEMAP is a component of the congressionally mandated National Cooperative Geologic Mapping Program (NCGMP), through which the USGS distributes Federal funds to support geologic mapping efforts through a competitive funding process. The NCGMP has three primary components: (1) FEDMAP, which funds Federal geologic mapping projects; (2) STATEMAP, which is a matching-funds grant program with State geological surveys; and (3) EDMAP, a matching-funds grant program with universities that has a goal to train the next generation of geologic mappers. The VDGMR conducted geologic mapping and digital map compilation focused along the Interstate 81 corridor and in the Richmond metropolitan area. Publications and Open File Reports (OFR) that were released in 2008 include: Publication 173, Historical 15- and 30-minute Topographic Maps of Virginia; OFR 08–01, Bedrock geologic map of the Augusta Springs quadrangle, Virginia, 2008, 1:24,000; OFR 08–02, Bedrock geologic map of the Amherst quadrangle, Virginia, 2008, 1:24,000; OFR 08–03, Bedrock geologic map of the Piney River quadrangle, Virginia, 2008, 1:24,000; and OFR–08–04, Virginia Coal Quality Database (Excel spreadsheet), 2008.

VDGMR staff added new records to the Mineral Resources of Virginia (MRV) database, which documents the locations and geologic characteristics of historic and abandoned mineral mine sites. The database serves as a critical resource for analyzing the spatial distribution of a wide variety of mineral resources and the implications for public safety and environmental concerns. VDGMR geologists also compiled location information for abandoned underground coal mines, adding this data to the Departmental Coal Mine Information System that contains scanned, catalogued, and georeferenced mine maps acquired from coal companies, State and Federal agencies, consultants, and the general public. During 2008, VDGMR participated in the USGS National Coal Resources Database System State Cooperative Program. Working with USGS scientists from the Eastern Energy Resources Science Center, coal resource information is recorrelated with the revised stratigraphic framework for the Virginia portion of the Appalachian Basin. For more information on these and other publications of VDGMR, visit the Web site at http://www.dmme.virginia.gov/DMR/.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN VIRGINIA[1, 2]

(Thousand metric tons and thousand dollars)

Mineral	2006		2007		2008	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays, common	762	1,810	725	7,840 r	766	8,540
Kyanite	102 e,r	23,600 r	118 r	29,100 r	97	25,500
Mica, crude	--	--	(3)	1	--	--
Sand and gravel, construction	14,200	110,000	12,300	115,000	10,200	109,000
Stone:						
Crushed	77,800 r	849,000 r	62,600 r	713,000 r	54,500	673,000
Dimension	W	W	W	W	9	1,040
Combined values of cement, clays (fuller's earth), feldspar, gemstones (natural), iron oxide pigments (crude), lime, salt (2007-08), sand and gravel (industrial), talc [crude (2006)], titanium concentrates (ilmenite), vermiculite (crude), zirconium concentrates, and values indicated by symbol W	XX	318,000 r	XX	310,000 r	XX	317,000
Total	XX	1,300,000 r	XX	1,180,000 r	XX	1,130,000

eEstimated. rRevised. W Withheld to avoid disclosing company proprietary data. Withheld values included in "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]Less than ½ unit.

TABLE 2
VIRGINIA: CRUSHED STONE SOLD OR USED, BY TYPE[1]

Type	2007			2008		
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Number of quarries	Quantity (thousand metric tons)	Value (thousands)
Limestone[2]	41 r	18,200 r	$205,000 r	43	18,400	$209,000
Dolomite	4	2,910	19,900 r	3	1,900	18,600
Granite	28 r	25,400 r	315,000 r	30	21,300	290,000
Sandstone and quartzite	6	1,270 r	12,500 r	6	1,100	12,100
Traprock	11	12,800	152,000 r	10	10,100	128,000
Slate	2	591 r	3,130 r	3	454	2,850
Miscellaneous stone	4	1,480	6,140	4	1,280	13,200
Total	XX	62,600 r	713,000 r	XX	54,500	673,000

rRevised. XX Not applicable.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes limestone-dolomite reported with no distinction between the two.

TABLE 3
VIRGINIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2008, BY USE[1]

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
Construction:		
Coarse aggregate (+1½ inch):		
Macadam	W	W
Riprap and jetty stone	238	3,300
Filter stone	266	3,650
Other coarse aggregate	1,370	21,700
Coarse aggregate, graded:		
Concrete aggregate, coarse	3,050	30,000
Bituminous aggregate, coarse	1,800	17,600
Bituminous surface-treatment aggregate	357	3,750
Railroad ballast	506	4,920
Other graded coarse aggregate	8,110	121,000
Fine aggregate (-⅜ inch):		
Stone sand, concrete	669	7,150
Stone sand, bituminous mix or seal	329	4,150
Screening, undesignated	418	4,730
Other fine aggregate	2,350	26,700
Coarse and fine aggregates:		
Graded road base or subbase	1,990	22,800
Unpaved road surfacing	507	4,760
Crusher run or fill or waste	1,990	15,000
Roofing granules	W	W
Other coarse and fine aggregate	6,030	66,600
Other construction materials	1,220	12,200
Agricultural:		
Limestone	692	9,420
Other agricultural uses	132	4,500
Special:		
Mine dusting or acid water treatment	W	W
Other fillers or extenders	W	W
Other miscellaneous uses and specified uses not listed	253	3,190
Unspecified:[2]		
Reported	14,900	190,000
Estimated	7,100	89,000
Total	54,500	673,000

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

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

[2]Reported and estimated production without a breakdown by end use.

TABLE 4
VIRGINIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2008, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch)[2]	1,080	11,700	W	W	W	W
Coarse aggregate, graded[3]	4,410	41,200	W	W	W	W
Fine aggregate (-⅜ inch)[4]	1,800	19,800	W	W	W	W
Coarse and fine aggregate[5]	3,700	31,100	W	W	W	W
Other construction materials	1,210	12,200	2	15	--	--
Agricultural[6]	W	W	W	W	W	W
Special[7]	W	W	--	--	--	--
Other miscellaneous uses	50	646	203	2,540	--	--
Unspecified:[8]						
Reported	--	--	3,680	46,500	11,200	143,000
Estimated	6,400	80,000	629	7,900	138	1,700
Total	19,300	214,000	9,760	113,000	25,500	347,000

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

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

[2]Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregates.

[3]Includes bituminous aggregate (coarse), bituminous surface-treatment aggregate, concrete aggregate (coarse), railroad ballast, and other graded coarse aggregates.

[4]Includes screening (undesignated), stone sand (bituminous mix or seal), stone sand (concrete), and other fine aggregates.

[5]Includes crusher run or fill or waste, graded road base or subbase, roofing granules, unpaved road surfacing, and other coarse and fine aggregates.

[6]Includes limestone and other agricultural uses.

[7]Includes mine dusting or acid water treatment and other fillers or extenders.

[8]Reported and estimated production without a breakdown by end use.

TABLE 5
VIRGINIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2008,
BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	3,880	$50,400	$12.99
Concrete products (blocks, bricks, pipe, decorative, etc.)	19	192	10.11
Asphaltic concrete aggregates and other bituminous mixtures	319	2,470	7.74
Road base and coverings	32	214	6.69
Fill	797	3,860	4.84
Snow and ice control	5	22	4.40
Golf course	16	228	14.25
Other miscellaneous uses	1	5	5.00
Unspecified:[2]			
Reported	1,010	7,370	7.31
Estimated	4,140	43,800	10.58
Total or average	10,200	109,000	10.63

[1]Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

[2]Reported and estimated production without a breakdown by end use.

TABLE 6
VIRGINIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2008,
BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregates and concrete products	W	W	W	W	3,780	48,900
Asphaltic concrete aggregates and road base materials	W	W	W	W	286	2,160
Fill	64	229	(2)	1	733	3,630
Other miscellaneous uses[3]	98	1,100	49	428	18	234
Unspecified:[4]						
Reported	61	548	56	350	890	6,470
Estimated	896	9,530	1,370	14,600	1,870	19,700
Total	1,120	11,400	1,480	15,400	7,580	81,000

Use	Unspecified districts	
	Quantity	Value
Concrete aggregates and concrete products	47	770
Asphaltic concrete aggregates and road base materials	--	--
Fill	--	--
Other miscellaneous uses[3]	--	--
Unspecified:[4]		
Reported	--	--
Estimated	--	--
Total	47	770

W Withheld to avoid disclosing company proprietary data; included in "Other miscellaneous uses." -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Less than ½ unit.
[3]Includes golf course and snow and ice control.
[4]Reported and estimated production without a breakdown by end use.