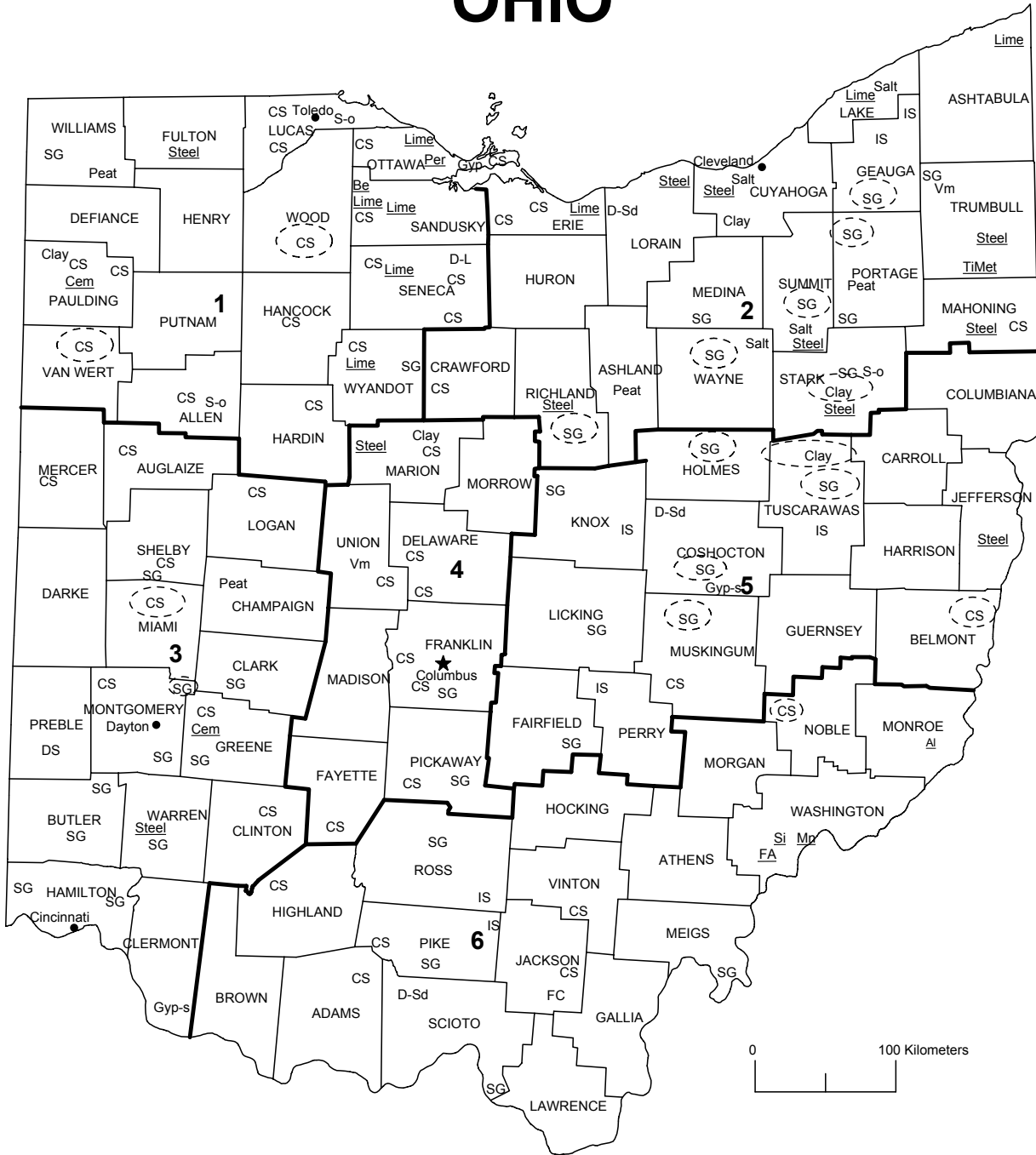


OHIO



LEGEND		MINERAL SYMBOLS (Major Producing areas)			
	County boundary	<u>Al</u>	Aluminum plant	FC	Fire clay
	Capital	<u>Be</u>	Beryllium plant	Gyp	Gypsum
	City	<u>Cem</u>	Cement plant	Gyp-s	Synthetic gypsum
	Crushed stone/sand and gravel districts	Clay	Common clay	IS	Industrial sand
		CS	Crushed stone	<u>Lime</u>	Lime plant
		D-L	Dimension limestone	<u>Mn</u>	Manganese dioxide plant
		D-Sd	Dimension sandstone	Peat	Peat
		DS	Dimension stone	<u>Per</u>	Perlite plant
		<u>FA</u>	Ferroalloys plant	S-o	Sulfur (oil)
				Salt	Salt
				SG	Construction sand and gravel
				<u>Si</u>	Silicon metal plant
				<u>Steel</u>	Steel plant
				<u>TiMet</u>	Titanium metal plant
				Vm	Vermiculite
					Concentration of mineral operations

Source: Ohio Division of Geological Survey/U.S. Geological Survey (2002)

THE MINERAL INDUSTRY OF OHIO

This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the Ohio Department of Natural Resources, Division of Geological Survey, for collecting information on all nonfuel minerals.

In 2002, the estimated value¹ of nonfuel mineral production for Ohio was \$1.06 billion, based upon preliminary U.S. Geological Survey (USGS) data. This was about a 2% increase from that of 2001² and followed a 4.1% increase from 2000 to 2001. The State remained 12th in the Nation in total nonfuel raw mineral production value, of which Ohio accounted for more than 2.5% of the U.S. total.

In 2002, crushed stone by value remained Ohio's leading nonfuel mineral, followed by construction sand and gravel, salt, lime, cement (portland and masonry), and industrial sand and gravel (in descending order of value). Crushed stone and construction sand and gravel accounted for about 58% of the State's total nonfuel raw mineral production value. In 2001, increases in salt, crushed stone, lime, and dimension stone, up about \$30 million, \$12 million, \$8 million, and \$2 million, respectively, led the State's increase in nonfuel mineral value for the year. The largest decreases in value were those of cement, down about \$5 million, and gypsum and industrial sand and gravel, down about \$2 million each (table 1).

Compared with USGS estimates of the quantities produced in the other 49 States during 2002, Ohio remained second (of two producing States) in fire clay, third in lime, fourth in salt, and fifth in construction sand and gravel and common clays. While the State rose to 6th from 7th in crushed stone, it decreased to 10th from 9th in industrial sand and gravel. In addition, Ohio continued to be a significant producer of portland and masonry cements and dimension stone. The State's mines produced exclusively industrial minerals and coal; any metals, especially aluminum and steel, produced in the State were processed from materials received from other domestic and foreign sources. In 2002, Ohio continued to be the Nation's second leading raw-steel-manufacturing State with an estimated output of about

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 2002 USGS mineral production data published in this chapter are preliminary estimates as of July 2003 and are expected to change. For some mineral commodities, such as construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Specialist contact information may be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals/contacts/comdir.html>; alternatively, specialists' names and telephone numbers may be obtained by calling USGS information at (703) 648-4000 or by calling the USGS Earth Science Information Center at 1-888-ASK-USGS (275-8747). All Mineral Industry Surveys—mineral commodity, State, and country—also may be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals>.

²Values, percentage calculations, and rankings for 2001 may differ from the Minerals Yearbook, Area Reports: Domestic 2001, Volume II, owing to the revision of preliminary 2001 to final 2001 data. Data for 2002 are preliminary and are expected to change; related rankings may also change.

13.3 million metric tons (Mt) of raw steel, as reported by the American Iron and Steel Institute. Based upon USGS annual data, the State dropped to third from second in the production of primary aluminum in 2002.

The Ohio Department of Natural Resources, Division of Geological Survey (ODGS) provided the following narrative information.³ The Ohio nonfuel mineral industry employed more than 5,600 people during 2002.

Commodity Review

Industrial Minerals

Clay and Shale.—Ohio's clay and shale industry continued to thrive, although at a slower pace than in recent years. Belden Brick Co. was the largest producer of building brick in the State; its seven plants in Tuscarawas County had a capacity to produce 225 million bricks per year. Significant brick producers were also located in Licking and Marion Counties. Niche-market operators, such as Richland Moulded Brick Co. (historical-style building brick) in Richland County and Dome Minerals, Inc. (pavers) in Columbiana County, enjoyed steady growth. Specialty clays, particularly for a rejuvenated art-pottery industry in southeast Ohio, were in demand. Cement manufacture and lightweight-aggregate applications continued to use large quantities of Ohio clay and shale.

Salt.—Most of the decline in Ohio's salt production could be attributed to a labor dispute during the spring and summer at Cargill Inc.'s large underground rock salt mine in Cleveland.

Sand and Gravel.—The largest sand and gravel operation in 2002 was Olen Corp.'s Columbus Plant, which produced 2.2 Mt of aggregate from glacial outwash and kame terraces in southern Franklin County. One other operation located in Butler County produced nearly 2 Mt in 2002; several pits located throughout the State each produced more than 500,000 metric tons (t) of sand and gravel. Martin Marietta Aggregates led the State in sand and gravel production (8.7 Mt). Most of Ohio's 300 active sand and gravel operations were small to medium in size and served local markets.

Consolidation in the Ohio aggregate industry continued in 2002. Shelly Materials, Inc. (a subsidiary of Oldcastle Materials North America) purchased four central Ohio limestone quarries and two sand and gravel operations from Martin Marietta Aggregates. Shelly also purchased a limestone quarry and a sand and gravel operation from Chesterhill Stone Co. These acquisitions will solidify Shelly Materials' ranking as the second-leading producer of sand and gravel (behind Martin

³Mark Wolfe, Geologist, authored the text of the State mineral industry information provided by the Ohio Division of Geological Survey.

Marietta Aggregates) in Ohio and also make them the third largest producer of limestone and dolomite in the State, trailing only National Lime and Stone Co. and Hanson Aggregates Midwest, Inc.

Sand, Industrial.—Ohio had an abundance of high-silica sandstones that can be used by the glass industry and for other industrial applications. Best Sand Corp. produced 573,000 t of high-purity industrial sand from the Pennsylvanian-age Sharon conglomerate in Geauga County during 2002. Ogleby Norton Industrial Sands, Inc. produced more than 300,000 t of high-silica sand from operations in Knox and Perry Counties. Production came from the Mississippian-age Black Hand sandstone and Pennsylvanian-age Massillon sandstone, respectively.

Stone, Crushed and Dimension.—The State's 121 active quarries produced 68.8 Mt of limestone and dolomite in 2002. Ohio's largest limestone quarry in 2002 was Hanson's Sandusky quarry located in Erie County. This quarry produced 4.0 Mt of aggregate from the Devonian-age Columbus and Delaware limestones. Seven additional quarries produced in excess of 2 Mt of limestone and/or dolomite during 2002. National Lime

and Stone again led the State in limestone and dolomite with a total production of 11.3 Mt from eight plants. The continuing strength in the national dimension-stone market helped Ohio sandstone dimension-stone operators to record a production increase of 16.1% in 2002, which was the highest level since 1986.

Government Programs

The report on Ohio's mineral industries, prepared annually by the ODGS, was available on the Internet at URL <http://www.ohiodnr.com/geosurvey>. The report contained detailed production, employment, and geologic information on each industrial mineral operation in the State. A Web-based GIS version of the Ohio mineral industries map was under development; when completed, it will allow a user to directly access industrial minerals information residing in the database. Many other products were available on the ODGS Web site, including the new page-size Shaded Elevation Map of Ohio, Glacial Geology of Ohio map, and Ohio Karst Areas map.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN OHIO^{1,2}

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	2000		2001		2002 ^P	
	Quantity	Value	Quantity	Value	Quantity	Value
Cement:						
Masonry	92	11,000 ^e	74 ^r	9,000 ^e	70 ^e	9,000 ^e
Portland	1,030	83,300 ^e	1,040	80,400 ^e	990 ^e	77,000 ^e
Clays, common	1,370	7,380	1,320	7,400	1,850	8,200
Gemstones	NA	3	NA	3	NA	4
Lime	1,850	106,000	1,900	114,000	1,850	119,000
Sand and gravel:						
Construction	51,200	256,000	50,400	256,000	48,700	252,000
Industrial	1,200	32,800	1,120	30,700	1,010	29,500
Stone:						
Crushed	73,600	327,000	75,900	339,000	78,800	358,000
Dimension metric tons	34,500	3,050	30,700	5,150	30,000	5,090
Combined values of clay (fire), gypsum (crude), peat, salt	XX	172,000	XX	198,000	XX	198,000
Total	XX	999,000	XX	1,040,000	XX	1,060,000

^eEstimated. ^PPreliminary. NA Not available. XX Not applicable.

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

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

³Grindstones, pulpstones, and sharpening stones; excludes mill liners and grinding pebbles.

TABLE 2
OHIO: CRUSHED STONE SOLD OR USED, BY KIND¹

Kind	2000				2001			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone ²	92	64,000	\$284,000	\$4.44	92	66,500	\$293,000	\$4.41
Dolomite	13	9,130	40,300	4.42	13	8,970	43,700	4.88
Sandstone	7	459	2,210	4.82	6	381	1,610	4.23
Total or average	XX	73,600	327,000	4.44	XX	75,900	339,000	4.46

XX Not applicable.

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

²Includes "limestone-dolomite" reported with no distinction between the two.

TABLE 3
OHIO: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2001, BY USE¹

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:			
Coarse aggregate (+1 1/2 inch):			
Macadam	W	W	\$4.23
Riprap and jetty stone	1,920	\$9,360	4.87
Filter stone	46	236	5.13
Other coarse aggregates	169	679	4.02
Total or average	2,140	10,300	4.80
Coarse aggregate, graded:			
Concrete aggregate, coarse	3,860	17,500	4.52
Bituminous aggregate, coarse	1,610	8,450	5.26
Bituminous surface-treatment aggregate	299	1,530	5.13
Railroad ballast	248	1,050	4.20
Other graded coarse aggregates	1,190	5,360	4.50
Total or average	7,200	33,800	4.70
Fine aggregate (-3/8 inch):			
Stone sand, concrete	172	614	3.57
Stone sand, bituminous mix or seal	419	1,900	4.53
Screening, undesignated	278	1,050	3.76
Other fine aggregates	517	2,010	3.89
Total or average	1,390	5,570	4.02
Coarse and fine aggregates:			
Graded road base or subbase	4,490	18,200	4.06
Unpaved road surfacing	1,880	7,430	3.96
Terrazzo and exposed aggregate	W	W	9.94
Crusher run or fill or waste	822	3,010	3.66
Roofing granules	W	W	5.90
Other coarse and fine aggregates	7,570	29,300	3.87
Total or average	14,800	57,900	3.93
Other construction materials ²	3,450	14,800	4.28
Agricultural:			
Agricultural limestone	(3)	(3)	3.79
Other agricultural uses	(3)	(3)	3.43
Chemical and metallurgical:			
Cement manufacture	(3)	(3)	4.00
Lime manufacture	(3)	(3)	4.41
Glass manufacture	(3)	(3)	4.63
Dead-burned dolomite manufacture	(3)	(3)	3.58
Flux stone	(3)	(3)	4.09
Special:			
Asphalt fillers or extenders	(3)	(3)	4.80
Whiting or whiting substitute	(3)	(3)	12.35
Other fillers or extenders	(3)	(3)	5.84
Other miscellaneous uses and specified uses not listed	(3)	(3)	4.64
Unspecified:⁴			
Reported	26,700	127,000	4.76
Estimated	9,700	42,000	4.32
Total or average	36,400	169,000	4.65
Grand total or average	75,900	339,000	4.46

W Withheld to avoid disclosing company proprietary data; included with "Other."

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

²Includes waste material.

³Withheld to avoid disclosing company proprietary data; included in "Grand total."

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

TABLE 4
OHIO: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2001, BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction:								
Coarse aggregate (+1 1/2 inch) ²	1,690	8,010	W	W	190	1,100	W	W
Coarse aggregate, graded ³	2,980	13,800	872	5,270	1,530	6,820	W	W
Fine aggregate (-3/8 inch) ⁴	526	2,340	W	W	170	696	W	W
Coarse and fine aggregate ⁵	5,480	20,200	W	W	1,510	6,920	W	W
Other construction materials ⁶	1,580	7,510	494	1,740	701	2,890	524	1,940
Agricultural ⁷	W	W	W	W	W	W	W	W
Chemical and metallurgical ⁸	W	W	W	W	W	W	W	W
Special ⁹	W	W	W	W	W	W	--	--
Other miscellaneous uses	W	W	W	W	W	W	W	W
Unspecified: ¹⁰								
Reported	5,770	29,700	3,220	15,300	4,060	18,400	9,250	42,000
Estimated	6,000	26,000	1,400	6,200	950	4,200	--	--
Total	27,500	122,000	12,900	54,600	10,500	47,900	14,600	65,600
Use	District 5		District 6		Unspecified districts			
	Quantity	Value	Quantity	Value	Quantity	Value		
Construction:								
Coarse aggregate (+1 1/2 inch) ²	89	439	W	W	--	--		
Coarse aggregate, graded ³	W	W	196	1,030	142	594		
Fine aggregate (-3/8 inch) ⁴	164	607	158	562	--	--		
Coarse and fine aggregate ⁵	1,840	7,530	1,530	7,290	--	--		
Other construction materials ⁶	106	410	45	275	--	--		
Agricultural ⁷	W	W	W	W	--	--		
Chemical and metallurgical ⁸	--	--	--	--	--	--		
Special ⁹	--	--	--	--	--	--		
Other miscellaneous uses	W	W	--	--	--	--		
Unspecified: ¹⁰								
Reported	90	405	4,340	21,500	--	--		
Estimated	230	1,000	1,100	4,800	--	--		
Total	2,840	11,700	7,490	36,100	142	594		

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

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

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

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

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

⁵Includes crusher run (select material or fill), graded road base or subbase, roofing granules, terrazzo and exposed aggregate, unpaved road surfacing, and other coarse and fine aggregates.

⁶Includes waste material.

⁷Includes agricultural limestone and other agricultural uses.

⁸Includes cement manufacture, dead-burned dolomite manufacture, flux stone, glass manufacture, and lime manufacture.

⁹Includes asphalt fillers or extenders, whiting or whiting substitute, and other fillers and extenders.

¹⁰Reported and estimated production without a breakdown by end use.

TABLE 5
OHIO: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2001, BY MAJOR USE CATEGORY¹

Use	Quantity		Unit value
	(thousand metric tons)	Value (thousands)	
Concrete aggregates (including concrete sand)	8,520	\$42,600	\$5.00
Plaster and gunitite sands	258	1,730	6.72
Concrete products (blocks, bricks, pipe, decorative, etc.)	412	2,400	5.81
Asphalt concrete aggregates and other bituminous mixtures	3,130	15,400	4.92
Road base and coverings	2,720	15,300	5.61
Road stabilization (cement)	75	361	4.81
Road stabilization (lime)	8	41	5.13
Fill	4,470	21,700	4.85
Snow and ice control	53	270	5.09
Roofing granules	6	72	12.00
Filtration	113	714	6.32
Other miscellaneous uses ²	692	4,280	6.18
Unspecified: ³			
Reported	24,300	125,000	5.12
Estimated	5,600	26,000	4.67
Total or average	50,400	256,000	5.07

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

²Includes roofing granules.

³Reported and estimated production without a breakdown by end use.

TABLE 6
OHIO: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2001, BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregates and concrete products ²	363	1,800	2,630	14,900	2,380	11,300
Asphaltic concrete aggregates and other bituminous mixtures	W	W	1,280	6,690	W	W
Road base and coverings ³	W	W	605	3,870	553	3,060
Fill	268	1,230	908	5,240	1,750	6,220
Snow and ice control	--	--	4	26	W	W
Other miscellaneous uses ⁴	190	1,050	286	2,030	729	3,730
Unspecified: ⁵						
Reported	346	1,310	2,900	15,900	10,400	51,900
Estimated	130	590	2,100	10,000	2,000	8,600
Total	1,300	5,990	10,700	58,900	17,900	84,800
Use	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregates and concrete products ²	1,230	6,370	1,710	7,640	877	4,630
Asphaltic concrete aggregates and other bituminous mixtures	W	W	615	2,360	64	321
Road base and coverings ³	W	W	840	4,160	246	1,400
Fill	1,160	7,240	358	1,650	24	103
Snow and ice control	W	W	35	186	W	W
Other miscellaneous uses ⁴	1,060	6,000	238	1,260	51	257
Unspecified: ⁵						
Reported	3,430	18,100	4,160	22,000	3,020	15,300
Estimated	--	--	860	4,300	510	2,600
Total	6,880	37,700	8,820	43,600	4,790	24,600

W Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous uses." -- Zero.

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

²Includes plaster and gunitite sands.

³Includes road and other stabilization (cement and lime).

⁴Includes filtration, railroad ballast, and roofing granules.

⁵Reported and estimated production without a breakdown by end use.