

CONSTRUCTION SAND AND GRAVEL

By Wallace P. Bolen

Construction sand and gravel is one of the most accessible natural resources and a major basic raw material used mostly by the construction industry. Despite the relative low value of its basic products, the construction sand and gravel industry is a major contributor to and an indicator of the economic well-being of the Nation.

A total of 910 million metric tons of construction sand and gravel was produced in the United States in 1995, a 2.1% increase compared with that of 1994. After a decrease in production in 1991, sand and gravel production has had healthy increases for 4 consecutive years, an indication of continuous strong demand for construction aggregates in the United States. (See table 1 and figure 1.)

Foreign trade of construction sand and gravel remained relatively minor in 1995. Exports increased nearly 25% to 1.3 million tons, and the value increased 22% to \$24.7 million, compared with those of 1994.

Imports decreased about 25% to 1.12 million tons, and the value decreased almost 19% to \$12 million. Because imports and exports are relatively small, domestic apparent consumption of construction sand and gravel is essentially equal to U.S. production of 910 million tons.

Legislation

The National Highway System Designation Act was signed into law on November 28, 1995. In 1996, \$5.6 billion was earmarked for States to use on the 259,000 kilometers of roads and bridges designated as the National Highway System. In 1997, \$6.5 billion will be released for the continuation of these highway projects. Besides releasing funds for highways, the bill also repeals the mandate for crumb rubber use in asphalt as was required by the Intermodal Surface Transportation Efficiency Act and delays the requirement for metrification on Federal Aid Highways until September 30, 2000. The bill also repeals the Federal speed limit and authorizes money for a new Potomac River crossing for the Washington, DC, beltway and work on New York's Pennsylvania Station.

Other major issues of concern to the construction sand and gravel industry are: the implementation of the Clean Air Act Amendments of 1990 and its complex legal and technical provisions; the amended Federal Water Pollution Control Act of 1977, the Clean Water Act, Section 404, dealing with "wetlands" and the associated "no net loss of wetlands" policy; the Storm Water Pollution Prevention Program; the Occupational Safety and Health Administration's (OSHA) Hazard Communication Standards regulating the use of products containing more than 0.1% crystalline silica; and the provisions

of the Federal Endangered Species Act.

Production

U.S. production of construction sand and gravel was 910 million tons in 1995. Of the four major geographic regions, the West again led the Nation in the production of construction sand and gravel with 325 million tons, or 36% of the U.S. total, followed by the Midwest with 289 million tons, or 32% of the total; the South with 200 million tons, or 22%; and the Northeast with 96 million tons, or 11%. Compared with that of 1994, production by major geographic regions increased 3.5% in the West, 3% in the South, and was virtually unchanged in the Northeast and Midwest. (See table 2.)

Of the nine geographic regions, the East North Central led the Nation in the production of construction sand and gravel with 192 million tons, or 21.1% of the U.S. total, followed by the Pacific with 168 million tons, or 18.5%; and the Mountain with 157 million tons, or 17.3% of the total. (See table 2.) Compared with that of 1994, production increased in the following regions: the Mountain, 9.8%; South Atlantic, 8.3%; West South Central, 4.2%; New England, 2.4%; and the West North Central, 1.9%. The regions with decreases were the East South Central, 5.6%; the Middle Atlantic, 2.7%; and the Pacific, 1.8%. The East North Central's production was unchanged from 1994 to 1995.

A review of the production by size of operation indicates that 42.3% of the construction sand and gravel produced in 1995 came from 1,835 operations reporting between 100,000 and 499,999 tons per year; 25% came from 370 operations reporting between 500,000 and 999,999 tons per year; and 20.6% came from 127 operations reporting more than 1,000,000 tons per year. A total of 5,740 operations were active in 1995. (See table 8.)

The estimated production by quarters for 1995 indicates that most of the construction sand and gravel in the United States was produced in the third quarter, followed by the second quarter, and the fourth quarter. (See table 3.) Estimated production by each quarter of 1995 was also available for most of the States. (See table 5.)

Construction sand and gravel was produced in 1995 in every State. The 10 leading States, in descending order of tonnage, were California, Texas, Michigan, Ohio, Arizona, Washington, Illinois, Colorado, Wisconsin, and Minnesota. Their combined production represented 51.7% of the national total. Compared with that in 1994, production increased in 25 States, including 7 of the top 10 States. (See table 4.)

Limited information about the production of construction

sand and gravel in foreign countries may be found in the U.S. Geological Survey's (USGS) "Minerals Yearbook, Volume III, Area Reports: International." For nonreporting countries, estimates of sand and gravel and crushed stone outputs can be based on indirect sources such as the level of cement consumption.

In an industry with thousands of operating companies, status and ownership changes are many. Although it is not possible to review them all, a few noteworthy events will be covered.

On January 4, 1996, Martin Marietta Materials completed its acquisition of Dravo Corp.'s construction aggregate business. The acquisition includes 22 production facilities in nine different States and the Bahamas. With this purchase, Martin Marietta becomes the Nation's second largest aggregate producer and will now expand into the flue gas desulfurization market. Martin Marietta also purchased a 1.2-million-ton-per-year aggregate operation from Lambert Sand and Gravel near Montgomery, AL.

Effective April 1, 1995, Wendling Quarries, Inc., DeWitt, IA, acquired Vulcan Materials Co.'s Iowa operations. The properties include both crushed stone and sand and gravel reserves.

Western Mobile New Mexico acquired Sante Fe-based R&J Crushing on March 1. R&J Crushing mines sand and gravel south of Sante Fe.

Granite Construction Inc. acquired Gibbons Co., a Salt Lake City-based contractor and construction materials maker. Gibbons is a family-owned contractor that also includes a materials business as does Watsonville, CA-based Granite Construction.

In September, Vulcan Materials Co. acquired three sand and gravel operations in western Indiana--Harner Pit, Daugherty Pit, and Barker Pit--between Lafayette and Indianapolis from Fairfield Builders Supply. The acquired reserves complement Vulcan's existing operations in the Lafayette area and allow the company to develop a new customer base south of its existing markets. In a separate transaction, Vulcan Materials divested its sand and gravel operations in northeast Indiana.

In Arizona, RMC Group Plc, London, England, acquired Chandler Materials and Mesa Sand and Rock of Mesa, AZ.

Orem, UT-based Geneva Rock Products acquired Pioneer Sand and Gravel of West Valley City, near Salt Lake City. The deal covers a sand and gravel operation plus leases on more than 81 mineable hectares.

Medusa Aggregates Co., Edinburg, PA, announced plans to close its sand and gravel dredging operations, about 72 kilometers northwest of Pittsburgh.

Consumption

Construction sand and gravel reported by producers to the USGS is actually material that was "sold or used" by the companies and is defined as such. Stockpiled production is not reported until it is sold to a user or consumed by the producer. Because no consumption surveys are conducted by the USGS, the "sold or used" tonnage is assumed to represent the amount

produced for domestic consumption and export. Because some of the construction sand and gravel producers did not report a breakdown by end use, their total production is reported under "Unspecified uses, actual." The estimated production of nonrespondents is reported under "Unspecified uses, estimated."

The USGS surveyed 7,660 construction sand and gravel operations in the United States. Of these, 5,741 were active, 1,405 were idle, and 514 were either reported as or assumed to be permanently shut down. Of the 7,660 surveyed in 1995, 4,753, or 66.5%, responded to the USGS. The 5,741 operations were run by 4,010 companies with 8,274 active sand and gravel pits.

Of the 910 million tons of construction sand and gravel produced in 1995, 376 million tons or 41.3% of the total was unspecified uses. Of the remaining 534 million tons, 42.1% was used as concrete aggregates; 24.6% for road base and coverings and road stabilization; 13% as asphaltic concrete aggregates and other bituminous mixtures; 12.9% as construction fill; 2% for concrete products such as blocks, bricks, pipes, etc.; 1.5% for plaster and gunite sands; and the remainder for snow and ice control, railroad ballast, roofing granules, filtration, and other miscellaneous uses. (See table 6.)

To provide a more accurate estimation of the consumption patterns for construction sand and gravel, the "Unspecified uses" are not included in the aforementioned percentages. It is recommended that in any marketing or use pattern analysis the quantities included in "Unspecified uses" be distributed among the reported uses by applying the previous percentages.

A review of consumption by major geographic regions indicates that most of the sand and gravel for concrete aggregates, including concrete sand, was used in the West, 34.1%; the South, 31.1%; and the Midwest, 25.7%, regions with high levels of construction activity. Most of the sand and gravel for road base and coverings was used in the West, 46.8%, and the Midwest, 36.6%, while most of the sand and gravel used for asphaltic concrete aggregates and other bituminous mixtures was used in the West, 44.1%, and the Midwest, 29.5%. (See table 7.)

Additional information regarding production and/or consumption of construction sand and gravel by major uses in each State and the State districts is published in the USGS Minerals Yearbook State chapters, Volume II of the USGS "Minerals Yearbook."

Transportation

Information regarding the method of transportation of construction sand and gravel from the pit or processing plant to the first point of sale or use is now available for each geographic region as well as the total United States. Reports regarding the method of transportation were provided by the producers for 513 million tons or 56.4% of the total U.S. production of construction sand and gravel. Of this total, 78.6% was transported by truck, 3.4% by waterway, and 1.5% by rail. A significant amount of construction sand and gravel produced, about 16%, was not transported and used at the production site.

(See table 11.) Because most producers either did not keep records or did not report shipping distances or cost per ton per mile, no transportation cost data were available.

Prices

Prices in this chapter are f.o.b. plant, usually at the first point of sale or captive use. This value does not include transportation from the plant or yard to the consumer. It does, however, include all costs of mining, processing, in-plant transportation, overhead costs, and profit.

Compared with that of 1994, the 1995 average unit prices increased nearly 2.4% to \$4.29 per ton. By uses, the unit prices varied from a high of \$7.32 for roofing granules to a low of \$2.70 for fill. The largest increases in unit prices by uses were recorded for concrete products, 11.1%; fill, 6.3%; concrete aggregates, 4.1%; and snow and ice control sand, 3.6%. Average unit prices declined for railroad ballast, 13%; filtration, 10.8%; and roofing granules, 8.7%. (See table 6.)

Foreign Trade

The widespread distribution of domestic sand and gravel deposits and the high cost of transportation limits foreign trade, mostly to local transactions across international boundaries. U.S. imports and exports are small, representing less than 1% of the domestic consumption.

Exports of construction sand increased 51% to 850,000 tons, compared with that of 1994, and the value increased 23.1% to \$19.2 million. Mexico was the major destination, receiving about 49% of the total, followed by Canada with 30%. Exports of construction gravel declined 6% to 453,000 tons, but the value increased 20.4% to \$5.54 million. Canada was the major destination receiving about 81.4% of the total. (See table 12.)

Imports decreased 25% to 1.12 million tons, and the value decreased almost 19% to \$12 million. Canada was the major source of imported construction sand and gravel with 77.3% of the total, followed by The Bahamas with 18.6%. (See table 13.)

Current Research and Technologies

The Finnish National Road Administration is demonstrating a new type of bituminous pavement for low volume gravel roads along a 1.6-kilometer stretch of township road in Otsego, MN. The "emulsion gravel" pavement typically requires a thin mat over a prepared base, potentially cutting cost for labor and materials. An estimated 40% of Scandinavian roads is paved with this material, and many have been in service for several years without failure.

Outlook

The demand for construction sand and gravel in 1996 is expected to be about 945 million tons, or about 4% more than that of 1995. It is estimated that the demand for construction

sand and gravel will stay about 950 million tons in 1997. The projected increases will be influenced by construction activity primarily in the public construction sector.

Construction sand and gravel f.o.b. prices are expected to increase only marginally, due to a slowdown in demand growth compared to the past several years. However, the delivered prices of construction sand and gravel are expected to increase, especially in and near metropolitan areas, mainly because more aggregates are transported from distant sources.

OTHER SOURCES OF INFORMATION

U.S. Geological Survey Publications

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Other Sources

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Concrete Manual, A Water Resources Publication, U.S. Department of the Interior, Bureau of Reclamation, 1975.

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Industrial Minerals and Rocks, Sixth Edition, American Institute of Mining, Metallurgical, and Petroleum Engineers, Inc. 1994.

Aggregates Manager Magazine.

Canadian Aggregates Magazine.

Industrial Minerals Magazine.

Pit & Quarry Magazine.

Quarry Management Magazine.

Rock Products Magazine.

Stone Review Magazine.

TABLE 1
SALIENT U.S. CONSTRUCTION SAND AND GRAVEL STATISTICS 1/

		1991	1992	1993	1994	1995
Sold or used by producers:						
Quantity 2/	thousand metric tons	708,000 e/	834,000 3/	869,000 e/ 3/	891,000	910,000
Value 2/	thousands	\$2,810,000 e/	\$3,340,000 3/	\$3,530,000 e/ 3/	\$3,740,000	\$3,910,000
Exports	value, thousands	\$19,000	\$18,000	\$15,600	\$20,300	\$24,700
Imports	do.	\$16,600	\$15,500	\$15,400	\$14,800	\$12,000

e/ Estimated.

1/ Data are rounded to three significant digits.

2/ Puerto Rico excluded from all sand and gravel statistics.

3/ Excludes Hawaii.

TABLE 2
CONSTRUCTION SAND AND GRAVEL SOLD OR USED BY
PRODUCERS IN THE UNITED STATES, BY GEOGRAPHIC REGION 1/

Geographic region	1994				1995			
	Quantity (thousand metric tons)	Percent of total	Value (thousands)	Percent of total	Quantity (thousand metric tons)	Percent of total	Value (thousands)	Percent of total
Northeast:								
New England	36,900	4.1	\$174,000	4.6	37,800	4.2	\$199,000	5.1
Middle Atlantic	60,000	6.7	327,000	8.7	58,400	6.4	308,000	7.9
Midwest:								
East North Central	192,000	21.5	714,000	19.1	192,000	21.1	717,000	18.3
West North Central	95,200	10.7	306,000	8.2	97,000	10.7	315,000	8.1
South:								
South Atlantic	62,800	7.0	267,000	7.1	68,000	7.5	292,000	7.5
East South Central	42,800	4.8	171,000	4.6	40,400	4.4	171,000	4.4
West South Central	88,100	9.9	361,000	9.7	91,800	10.1	395,000	10.1
West:								
Mountain	143,000	16.1	586,000	15.7	157,000	17.3	678,000	17.3
Pacific	171,000	19.2	832,000	22.3	168,000	18.5	834,000	21.3
Total	891,000	100	3,740,000	100	910,000	100	3,910,000	100

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

TABLE 3
CONSTRUCTION SAND AND GRAVEL SOLD OR USED BY PRODUCERS IN THE UNITED STATES IN 1995,
BY QUARTER AND REGION 1/

Region	Quantity		Quantity		Quantity		Quantity		Total 3/ (thousand metric tons)	Value total (thousands)
	1st quarter (thousand metric tons)	Per- cent change 2/	2d quarter (thousand metric tons)	Per- cent change 2/	3d quarter (thousand metric tons)	Per- cent change 2/	4th quarter (thousand metric tons)	Per- cent change 2/		
Northeast:										
New England	4,100	15.8	8,400	-19.0	10,200	-21.7	7,800	-22.6	30,400	\$150,100
Middle Atlantic	7,000	20.8	16,300	-4.9	17,600	-12.9	11,600	-31.1	52,500	325,500
Midwest:										
East North Central	20,100	10.5	53,900	-4.8	65,500	1.4	50,400	-3.7	190,000	683,100
West North Central	10,500	-4.1	24,200	-8.6	36,700	8.5	22,800	-4.8	94,300	287,900
South:										
South Atlantic	13,300	9.4	17,100	-0.2	16,200	-9.4	15,400	-2.0	61,900	295,000
East South Central	6,600	-10.8	10,600	-12.3	12,000	-6.3	9,400	-9.6	38,700	160,300
West South Central	19,300	2.0	23,500	-11.9	25,400	9.5	24,000	24.4	92,200	314,700
West:										
Mountain	31,000	4.5	39,400	1.8	41,900	-2.3	39,500	23.8	152,000	562,400
Pacific 4/	26,000	-9.2	40,300	-1.1	44,600	-3.4	39,800	2.3	151,000	708,500
Total 3/	137,800	2.0	233,500	-5.0	270,100	-1.6	220,700	0.6	878,000 5/	3,770,000 5/

1/ As published in the "Crushed Stone and Sand and Gravel in the Fourth Quarter of 1995" Mineral Industry Survey.

2/ All percentage changes are calculated using unrounded totals; percentage changes are from the previous year's corresponding quarter.

3/ Data may not add to totals shown because of independent rounding, and differences between projected totals by States and regions.

4/ Does not include Alaska and Hawaii.

5/ Includes Alaska.

TABLE 4
CONSTRUCTION SAND AND GRAVEL SOLD OR USED BY
PRODUCERS IN THE UNITED STATES, BY STATE 1/

State	1994			1995		
	Quantity (thousand metric tons)	Value (thousands)	Unit value	Quantity (thousand metric tons)	Value (thousands)	Unit value
Alabama	12,500	\$47,600	\$3.80	11,900	\$49,400	\$4.15
Alaska	15,700	56,200	3.58	13,700	48,500	3.55
Arizona	34,800	166,000	4.78	40,100	201,000	5.00
Arkansas	10,600	42,500	4.00	11,600	48,300	4.18
California	96,300	523,000	5.43	98,400	542,000	5.51
Colorado	29,000	109,000	3.76	34,100	141,000	4.12
Connecticut	5,420	28,000	5.17	6,410	37,500	5.85
Delaware	2,580	8,680	3.36	2,680	8,740	3.26
Florida	16,600	60,700	3.66	19,300	69,300	3.58
Georgia	5,520	19,800	3.59	5,780	23,100	4.00
Hawaii	521	4,740	9.10	405	4,030	9.95
Idaho	14,500	46,300	3.19	13,200	43,500	3.30
Illinois	37,900	150,000	3.96	36,100	147,000	4.07
Indiana	28,100	108,000	3.84	24,900	93,900	3.78
Iowa	15,300	58,200	3.80	14,300	57,000	4.00
Kansas	11,200	29,600	2.64	11,100	29,400	2.65
Kentucky	9,140	32,200	3.52	8,710	31,700	3.63
Louisiana	12,300	49,600	4.03	11,300	50,200	4.43
Maine	5,890	24,400	4.14	6,420	26,900	4.18
Maryland	8,920	61,200	6.86	9,700	61,700	6.36
Massachusetts	12,300	60,000	4.88	11,700	67,500	5.76
Michigan	48,800	160,000	3.28	53,500	178,000	3.34
Minnesota	29,500	90,000	3.05	31,900	99,400	3.11
Mississippi	12,400	53,200	4.29	11,800	53,000	4.51
Missouri	9,760	36,500	3.74	8,840	32,400	3.66
Montana	7,360	28,800	3.91	8,870	34,900	3.93
Nebraska	15,000	49,200	3.28	13,700	47,100	3.43
Nevada	22,700	106,000	4.67	22,500	110,000	4.87
New Hampshire	7,120	32,600	4.58	7,190	34,300	4.77
New Jersey	16,100	100,000	6.21	14,000	80,300	5.74
New Mexico	10,400	47,400	4.56	10,400	50,700	4.88
New York	28,000	138,000	4.93	27,300	134,000	4.92
North Carolina	11,100	50,700	4.57	10,100	50,100	4.96
North Dakota	6,810	18,500	2.72	8,420	23,900	2.83
Ohio	47,700	205,000	4.30	45,300	196,000	4.33
Oklahoma	8,480	27,200	3.21	7,800	25,100	3.22
Oregon	18,400	83,600	4.54	18,200	85,000	4.66
Pennsylvania	15,900	89,700	5.64	17,100	93,100	5.44
Rhode Island	2,310	14,200	6.14	2,790	21,500	7.71
South Carolina	8,600	26,100	3.03	8,880	29,000	3.27
South Dakota	7,700	23,700	3.08	8,730	26,200	3.00
Tennessee	8,710	38,000	4.36	8,020	36,700	4.58
Texas	56,700	242,000	4.27	61,100	271,000	4.43
Utah	21,100	69,600	3.30	23,800	80,200	3.38
Vermont	3,890	14,500	3.73	3,220	11,000	3.43
Virginia	8,060	33,400	4.14	9,710	42,300	4.36
Washington	39,600	165,000	4.17	37,700	155,000	4.10
West Virginia	1,380	5,970	4.33	1,800	7,650	4.25
Wisconsin	29,200	91,500	3.13	32,200	102,000	3.16
Wyoming	3,210	13,100	4.08	3,860	17,500	4.55
Total	891,000	3,740,000	4.20	910,000	3,910,000	4.29

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

TABLE 5
CONSTRUCTION SAND AND GRAVEL SOLD OR USED BY PRODUCERS IN THE UNITED STATES IN 1995,
BY QUARTER AND STATE 1/

State	Quantity 1st quarter (thousand metric tons)	Per- cent change 2/	Quantity 2d quarter (thousand metric tons)	Per- cent change 2/	Quantity 3d quarter (thousand metric tons)	Per- cent change 2/	Quantity 4th quarter (thousand metric tons)	Per- cent change 2/	Total 3/ (thousand metric tons)	Value total (thousands)
Alabama	2,600	-3.8	3,200	-2.7	3,400	-3.0	3,200	8.0	12,400	\$47,700
Alaska 4/	--	--	--	--	--	--	--	--	15,500	56,600
Arizona	9,100	16.4	10,600	9.6	10,100	2.3	10,000	34.2	39,800	193,000
Arkansas	2,200	1.6	2,800	-9.6	3,300	13.1	3,000	21.9	11,300	46,900
California	15,400	-15.2	25,500	4.1	27,900	-2.6	26,500	6.0	95,300	524,000
Colorado	4,300	-11.2	7,000	-14.9	9,900	4.3	8,200	27.1	29,400	113,000
Connecticut	700	31.4	1,400	1.3	1,500	-19.4	1,100	-32.0	4,700	24,700
Delaware	600	253.3	700	10.7	600	-46.5	600	-8.3	2,500	8,550
Florida	4,000	-0.7	4,100	-6.8	3,900	-6.3	4,100	3.6	16,100	60,400
Georgia	1,300	3.7	1,500	-1.6	1,500	7.8	1,300	-1.9	5,600	21,000
Hawaii 4/	--	--	--	--	--	--	--	--	600	5,700
Idaho	1,500	-30.7	5,000	25.9	4,600	-5.1	3,500	-1.4	14,600	48,900
Illinois	3,600	-0.2	10,100	-14.5	11,400	-9.1	8,900	-9.4	34,000	139,000
Indiana	3,300	-4.8	6,800	-20.2	8,500	-0.7	6,400	-16.7	25,000	97,500
Iowa	1,300	-12.9	4,100	-11.9	6,000	13.1	3,600	-6.3	15,000	57,800
Kansas	1,100	-42.9	2,800	-11.7	3,800	8.2	2,200	-16.7	9,900	26,600
Kentucky	1,000	-10.8	2,400	-8.7	2,900	-5.2	1,900	-19.1	8,200	29,500
Louisiana	2,700	-0.9	3,500	4.7	3,100	-3.4	2,800	-10.4	12,100	50,800
Maine	400	5.4	1,600	6.6	1,600	-33.9	1,400	-14.1	5,000	21,000
Maryland	1,400	-4.9	2,400	7.4	2,300	-16.0	2,000	-19.6	8,100	56,300
Massachusetts	1,600	-19.2	2,800	-20.4	3,100	-16.5	2,400	-20.9	9,900	49,000
Michigan	4,300	23.1	15,400	10.6	18,400	4.1	14,700	7.3	52,800	182,000
Minnesota	3,300	23.5	8,700	30.3	12,700	4.9	8,200	1.9	32,900	105,000
Mississippi	2,000	-22.5	2,900	-20.1	3,300	-4.6	2,700	-7.2	10,900	48,000
Missouri	1,400	-2.9	1,500	-47.6	3,100	0.2	2,300	3.5	8,300	31,500
Montana 5/	--	--	--	--	--	--	--	--	8,500	34,400
Nebraska	1,800	22.4	5,200	5.3	7,800	45.0	4,200	30.6	19,000	65,600
Nevada	4,900	-20.7	5,500	0.1	5,300	-16.2	5,500	17.6	21,200	101,000
New Hampshire	900	79.2	1,400	-37.6	2,100	-24.4	1,600	0.9	6,000	27,500
New Jersey	2,700	23.0	4,200	-7.6	4,000	-19.2	3,200	-28.2	14,100	88,100
New Mexico	2,700	17.6	3,300	22.9	3,100	13.3	2,900	6.8	12,000	56,400
New York	2,900	-2.4	8,000	3.7	8,500	-11.2	5,300	-31.3	24,700	124,000
North Carolina	2,500	19.6	3,000	3.0	2,600	-23.1	3,900	44.0	12,000	56,400
North Dakota 5/	--	--	--	--	--	--	--	--	7,000	20,000
Ohio	5,700	11.3	13,200	-1.5	17,200	5.9	12,900	0.3	49,000	218,000
Oklahoma	1,800	-2.7	2,200	-0.6	2,700	6.5	2,300	18.4	9,000	30,600
Oregon	2,800	25.1	4,100	13.6	5,400	-27.2	4,700	-9.1	17,000	79,100
Pennsylvania	1,600	48.2	4,200	-9.8	4,900	-11.2	3,100	-32.6	13,800	79,400
Rhode Island 5/	--	--	--	--	--	--	--	--	2,900	18,100
South Carolina	2,000	5.4	2,800	13.9	2,500	17.5	1,800	-10.7	9,100	29,100
South Dakota	500	17.8	1,600	-29.2	2,500	-6.2	1,200	-48.0	5,800	18,600
Tennessee	1,300	2.7	2,100	-18.1	2,300	-15.3	1,800	-18.2	7,500	32,900
Texas	12,800	4.2	15,000	-19.8	16,400	14.1	16,400	44.5	60,600	267,000
Utah 5/	--	--	--	--	--	--	--	--	18,000	61,200
Vermont	300	-9.7	500	-39.6	900	-24.7	600	-64.3	2,300	8,720
Virginia	1,600	27.4	2,300	0.1	2,200	-9.7	1,900	-5.1	8,000	33,900
Washington	8,000	1.5	10,300	-17.4	11,300	6.5	8,100	-6.4	37,700	160,000
West Virginia	100	30.2	400	-14.9	400	-13.5	300	-25.9	1,200	5,260
Wisconsin	3,200	38.2	8,600	-2.4	10,300	5.9	7,800	-6.9	29,900	97,200
Wyoming	1,100	35.4	1,500	70.0	1,100	38.7	1,200	83.4	4,900	20,600
Total	XX	XX	XX	XX	XX	XX	XX	XX	878,000	3,770,000

XX Not applicable.

1/ As published in the "Crushed Stone and Sand and Gravel in the Fourth Quarter of 1995" Mineral Industry Survey.

2/ All percentage changes are calculated using unrounded totals; percentage changes are from the previous year's corresponding quarter.

3/ Data may not add to totals shown because of independent rounding, and differences between projected totals by States and by regions.

4/ State not included in quarterly review.

5/ Due to a low number of reporting companies, no production estimates by quarters were generated.

TABLE 6
CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN THE UNITED STATES IN 1995,
BY MAJOR USE 1/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregates (including concrete sand)	225,000	\$1,090,000	\$4.86
Plaster and gunite sands	8,260	44,400	5.38
Concrete products (blocks, bricks, pipe, decorative, etc.)	10,900	60,000	5.51
Asphaltic concrete aggregates and other bituminous mixtures	69,400	351,000	5.06
Road base and coverings	124,000	464,000	3.74
Road stabilization (cement)	4,810	15,600	3.24
Road stabilization (lime)	2,320	8,820	3.81
Fill	69,100	187,000	2.70
Snow and ice control	5,840	23,500	4.03
Railroad ballast	1,290	6,900	5.36
Roofing granules	218	1,600	7.32
Filtration	1,200	6,760	5.61
Other miscellaneous uses	12,000	56,300	4.69
Unspecified: 2/			
Actual	181,000	778,000	4.29
Estimated	195,000	810,000	4.17
Total	910,000	3,910,000	4.29

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

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

TABLE 7
CONSTRUCTION SAND AND GRAVEL SOLD OR USED BY PRODUCERS IN THE UNITED STATES IN 1995,
BY GEOGRAPHIC REGION AND MAJOR USE 1/

(Thousand metric tons and thousand dollars)

Geographic region	Concrete aggregates (including concrete sand)		Plaster and gunite sands		Concrete products (blocks, bricks, pipe decorative, etc.)		Asphaltic concrete aggregates and other bituminous mixtures		Road base and coverings 2/	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Northeast:										
New England	5,210	32,800	115	922	181	2,180	1,970	10,600	4,860	20,400
Middle Atlantic	15,300	96,700	650	4,120	869	4,960	5,720	32,500	7,330	32,600
Midwest:										
East North Central	37,700	146,000	650	2,740	2,800	12,500	14,500	56,200	25,000	96,000
West North Central	20,100	77,300	475	1,940	1,090	4,390	5,940	24,800	22,900	58,200
South:										
South Atlantic	24,500	114,000	998	4,400	1,880	8,770	2,520	9,310	2,130	9,560
East South Central	12,500	54,100	431	2,440	872	4,170	4,350	20,600	3,480	13,700
West South Central	33,000	155,000	725	3,170	322	1,110	3,920	18,300	4,410	16,200
West:										
Mountain	32,900	177,000	1,210	5,100	1,410	8,190	15,300	81,600	36,800	129,000
Pacific	43,900	241,000	3,010	19,600	1,450	13,800	15,300	97,700	24,500	113,000
Total	225,000	1,090,000	8,260	44,400	10,900	60,000	69,400	351,000	131,000	489,000
Geographic region	Fill		Snow and ice control		Railroad ballast		Other uses		Total	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Northeast:										
New England	3,680	11,600	1,630	6,180	134	645	20,000	113,000	37,800	199,000
Middle Atlantic	5,060	15,100	1,600	6,910	32	205	21,800	115,000	58,400	308,000
Midwest:										
East North Central	17,200	50,800	1,040	3,620	37	146	93,100	349,000	192,000	717,000
West North Central	5,610	11,000	646	2,080	224	490	40,000	135,000	97,000	315,000
South:										
South Atlantic	7,330	17,400	103	591	260	1,200	28,300	127,000	68,000	292,000
East South Central	1,450	3,870	24	177	1	3	17,300	71,700	40,400	171,000
West South Central	8,590	16,700	17	55	--	--	40,800	184,000	91,800	395,000
West:										
Mountain	8,320	19,800	511	2,390	318	2,340	60,200	252,000	157,000	678,000
Pacific	11,900	40,300	277	1,550	281	1,870	67,800	306,000	168,000	834,000
Total	69,100	187,000	5,840	23,500	1,290	6,900	389,000	1,650,000	910,000	3,910,000

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

2/ Includes road and other stabilization (cement and lime).

TABLE 8
CONSTRUCTION SAND AND GRAVEL PRODUCTION IN THE UNITED STATES IN 1995,
BY REGION AND SIZE OF OPERATION 1/

Size range (metric tons)	Northeast				Midwest				South			
	Number of operations	Percent of total	Quantity (thousand metric tons)	Percent of total	Number of operations	Percent of total	Quantity (thousand metric tons)	Percent of total	Number of operations	Percent of total	Quantity (thousand metric tons)	Percent of total
Less than 25,000	390	38.3	3,240	3.4	513	24.5	5,050	1.7	233	21.8	2,310	1.2
25,000 to 49,999	138	13.5	4,550	4.7	360	17.2	12,000	4.2	131	12.3	4,280	2.1
50,000 to 99,999	179	17.6	11,700	12.1	408	19.5	26,500	9.2	206	19.3	13,600	6.8
100,000 to 199,999	154	15.1	19,600	20.4	326	15.6	43,300	15.0	162	15.2	21,100	10.6
200,000 to 299,999	70	6.9	15,300	16.0	185	8.9	41,100	14.2	104	9.8	22,700	11.3
300,000 to 399,999	37	3.6	11,500	12.0	82	3.9	25,800	8.9	69	6.5	21,200	10.6
400,000 to 499,999	22	2.2	8,570	8.9	76	3.6	30,800	10.6	31	2.9	12,500	6.2
500,000 to 599,999	8	0.8	4,030	4.2	43	2.1	21,200	7.3	34	3.2	16,700	8.3
600,000 to 699,999	8	0.8	4,740	4.9	23	1.1	13,400	4.6	28	2.6	16,400	8.2
700,000 to 799,999	4	0.4	2,710	2.8	26	1.2	17,700	6.1	13	1.2	8,730	4.4
800,000 to 899,999	3	0.3	2,240	2.3	15	0.7	11,500	4.0	11	1.0	8,430	4.2
900,000 to 999,999	2	0.2	1,760	1.8	5	0.2	4,160	1.4	13	1.2	11,100	5.6
1,000,000 to 1,499,999	2	0.2	2,140	2.2	12	0.6	13,500	4.7	23	2.2	25,100	12.6
1,500,000 to 1,999,999	1	0.1	1,500	1.6	14	0.7	20,900	7.2	5	0.5	7,190	3.6
2,000,000 to 2,499,999	--	--	--	--	1	0.1	2,020	0.7	3	0.3	6,170	3.1
2,500,000 to 4,999,999	1	0.1	2,460	2.6	--	--	--	--	1	0.1	2,680	1.3
5,000,000 and over	--	--	--	--	--	--	--	--	--	--	--	--
Total	1,019	100	96,100	100	2,092	100	289,000	100	1,067	100	200,000	100

Size range (metric tons)	West				U.S. total			
	Number of operations	Percent of total	Quantity (thousand metric tons)	Percent of total	Number of operations	Percent of total	Quantity (thousand metric tons)	Percent of total
Less than 25,000	397	25.3	3,490	1.1	1,533	26.7	14,100	1.5
25,000 to 49,999	211	13.5	6,810	2.1	840	14.6	27,700	3.0
50,000 to 99,999	245	15.6	16,200	5.0	1,038	18.1	68,000	7.5
100,000 to 199,999	233	14.9	30,700	9.4	875	15.2	115,000	12.6
200,000 to 299,999	144	9.2	31,400	9.7	503	8.8	111,000	12.1
300,000 to 399,999	77	4.9	24,500	7.5	265	4.6	83,000	9.1
400,000 to 499,999	63	4.0	25,600	7.9	192	3.3	77,400	8.5
500,000 to 599,999	50	3.2	24,700	7.6	135	2.4	66,600	7.3
600,000 to 699,999	30	1.9	17,500	5.4	89	1.6	52,100	5.7
700,000 to 799,999	25	1.6	17,100	5.3	68	1.2	46,200	5.1
800,000 to 899,999	15	1.0	11,500	3.5	44	0.8	33,600	3.7
900,000 to 999,999	14	0.9	12,000	3.7	34	0.6	29,000	3.2
1,000,000 to 1,499,999	37	2.4	40,800	12.5	74	1.3	81,600	9.0
1,500,000 to 1,999,999	14	0.9	22,600	7.0	34	0.6	52,200	5.7
2,000,000 to 2,499,999	6	0.4	12,300	3.8	10	0.2	20,500	2.3
2,500,000 to 4,999,999	6	0.4	16,700	5.1	8	0.1	21,900	2.4
5,000,000 and over	1	0.1	11,200	3.5	1	0.1	11,200	1.2
Total	1,569	100	325,000	100	5,747	100	910,000	100

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

TABLE 9
NUMBER OF CONSTRUCTION SAND AND GRAVEL OPERATIONS AND PROCESSING PLANTS IN THE
UNITED STATES IN 1995, BY GEOGRAPHIC REGION

Geographic region	Mining operations on land				Dredging operations	Total active operations
	Stationary	Portable	Stationary and portable	No plants or unspecified		
Northeast:						
New England	180	162	37	42	2	423
Middle Atlantic	191	262	53	52	38	596
Midwest:						
East North Central	391	388	96	100	87	1,062
West North Central	240	426	41	75	248	1,030
South:						
South Atlantic	128	47	14	84	130	403
East South Central	111	28	6	16	61	222
West South Central	202	65	11	73	91	442
West:						
Mountain	272	526	98	42	19	957
Pacific 1/	299	187	67	35	24	612
Total	2,014	2,091	423	519	700	5,747

1/ An undetermined number of operations leased from the Bureau of Land Management in Alaska are counted as one operation.

TABLE 10
NUMBER OF CONSTRUCTION SAND AND GRAVEL OPERATIONS AND PROCESSING PLANTS IN THE
UNITED STATES IN 1995, BY STATE

State	Mining operations on land				Dredging operations	Total active operations
	Stationary	Portable	Stationary and portable	No plants or unspecified		
Alabama	38	10	--	9	20	77
Alaska 1/	7	7	--	2	1	17
Arizona	60	55	21	1	2	139
Arkansas	38	9	2	4	6	59
California	166	74	38	8	15	301
Colorado	58	123	29	9	12	231
Connecticut	23	21	7	2	1	54
Delaware	2	1	--	2	3	8
Florida	14	4	2	7	35	62
Georgia	11	2	--	1	31	45
Hawaii	1	1	--	2	--	4
Idaho	32	85	3	6	1	127
Illinois	48	32	25	12	33	150
Indiana	58	35	17	6	21	137
Iowa	48	57	2	10	37	154
Kansas	15	30	7	19	47	118
Kentucky	12	3	3	1	7	26
Louisiana	26	9	1	6	38	80
Maine	30	56	5	17	--	108
Maryland	21	3	6	19	3	52
Massachusetts	69	16	7	6	1	99
Michigan	99	140	20	44	11	314
Minnesota	84	152	17	19	1	273
Mississippi	36	4	2	6	24	72
Missouri	34	11	2	1	34	82
Montana	32	58	5	8	--	103
Nebraska	25	18	1	3	129	176
Nevada	17	40	11	10	1	79
New Hampshire	24	18	7	4	--	53
New Jersey	25	4	7	4	15	55
New Mexico	35	54	8	2	1	100
New York	103	229	32	39	8	411
North Carolina	25	19	1	32	29	106
North Dakota	13	61	5	2	--	81
Ohio	108	25	20	29	20	202
Oklahoma	19	7	3	16	28	73
Oregon	44	30	7	4	4	89
Pennsylvania	63	29	14	9	15	130
Rhode Island	10	--	4	--	--	14
South Carolina	20	6	2	11	14	53
South Dakota	21	97	7	21	--	146
Tennessee	25	11	1	--	10	47
Texas	119	40	5	47	19	230
Utah	25	77	15	4	--	121
Vermont	24	51	7	13	--	95
Virginia	21	12	3	12	14	62
Washington	81	75	22	19	4	201
West Virginia	14	--	--	--	1	15
Wisconsin	78	156	14	9	2	259
Wyoming	13	34	6	2	2	57
Total	2,014	2,091	423	519	700	5,747

1/ An undetermined number of operations leased from the Bureau of Land Management in Alaska are counted as one operation.

TABLE 11
CONSTRUCTION SAND AND GRAVEL SOLD OR USED BY PRODUCERS IN THE UNITED STATES
IN 1995, BY REGION AND METHOD OF TRANSPORTATION 1/

(Thousand metric tons)

Geographic region	Truck	Rail	Water	Other	Not transported	Not specified	Total
Northeast:							
New England	14,000	16	66	65	3,460	20,100	37,800
Middle Atlantic	25,800	78	1,060	2	6,890	24,600	58,400
Midwest:							
East North Central	73,200	250	4,930	1,450	17,500	94,600	192,000
West North Central	41,200	233	3,620	49	6,030	45,800	97,000
South:							
South Atlantic	32,900	1,070	1,120	--	5,090	27,900	68,000
East South Central	17,400	737	1,780	20	2,260	18,200	40,400
West South Central	38,600	3,300	63	--	8,300	41,600	91,800
West:							
Mountain	92,600	759	--	244	12,000	51,200	157,000
Pacific	67,400	1,180	4,800	765	20,700	73,600	168,000
Total	403,000	7,620	17,400	2,600	82,200	398,000	910,000

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

TABLE 12
U.S. EXPORTS OF CONSTRUCTION SAND AND GRAVEL IN 1995,
BY COUNTRY 1/

(Thousand metric tons and thousand dollars)

Country or territory	Sand		Gravel	
	Quantity	F.a.s. value 2/	Quantity	F.a.s. value 2/
North America:				
Aruba	(3/)	13	(3/)	5
Bahamas, The	(3/)	27	(3/)	55
British Virgin Islands	--	--	2	26
Canada	251	3,630	369	1,960
Costa Rica	1	271	(3/)	41
Dominican Republic	(3/)	34	(3/)	17
El Salvador	--	--	(3/)	3
Guadeloupe	--	--	4	48
Jamaica	(3/)	26	(3/)	3
Mexico	416	4,270	19	1,960
Turks and Caicos Island	--	--	(3/)	10
Other 4/	10	287	41	709
Total	677	8,560	436	4,830
South America:				
Argentina	11	1,990	2	336
Ecuador	1	117	--	--
Peru	10	409	--	--
Venezuela	68	2,480	(3/)	34
Other 5/	1	38	1	25
Total	90	5,040	3	395
Europe:				
Belgium	10	249	(3/)	9
Germany	(3/)	320	1	44
Spain	(3/)	12	--	--
Sweden	14	74	--	--
United Kingdom	(3/)	31	(3/)	9
Other 6/	7	2,010	11	43
Total	31	2,700	11	105
Asia:				
Hong Kong	1	94	(3/)	4
Japan	20	593	1	34
Philippines	1	15	(3/)	6
Singapore	3	128	--	--
Taiwan	(3/)	42	2	82
Other 7/	5	477	1	50
Total	29	1,350	3	176
Oceania, other 8/	15	478	(3/)	12
Middle East, other 9/	2	168	(3/)	20
Africa, other 10/	5	862	--	--
Grand total	850	19,200	453	5,540

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

2/ Value of material at U.S. port of export; based on transaction price, including all charges incurred in placing material alongside ship.

3/ Less than 1/2 unit.

4/ Includes Bermuda, Cayman Islands, Guatemala, Haiti, the Netherlands Antilles, Panama, and Trinidad and Tobago.

5/ Includes Bolivia, Brazil, Chile, Colombia, Guyana, Paraguay, and Suriname.

6/ Includes Bulgaria, Denmark, France, Ireland, Italy, the Netherlands, Norway, Russia, Switzerland, and Turkey.

7/ Includes China, Indonesia, the Republic of Korea, Malaysia, Pakistan, and Thailand.

8/ Includes Australia and Marshall Islands.

9/ Includes Israel, Lebanon, Saudi Arabia, and Syria.

10/ Includes Algeria, Egypt, Ghana, Mozambique, Nigeria, and Zambia.

Source: Bureau of the Census.

TABLE 13
U.S. IMPORTS FOR CONSUMPTION OF CONSTRUCTION SAND AND GRAVEL,
BY COUNTRY 1/

(Thousand metric tons and thousand dollars)

Country or Territory	1994		1995	
	Quantity	C.i.f. value 2/	Quantity	C.i.f. value 2/
Australia	7	784	15	1,350
Bahamas, The	267	617	208	438
British Virgin Islands	4	71	4	69
Canada	1,230	7,120	866	5,590
Dominican Republic	15	162	19	242
France	1	222	1	258
Germany	55	2,880	3	664
Guyana	4	50	--	--
Japan	2	498	8	792
Macao	1	9	2	21
Malaysia	5	94	--	--
Martinique	18	154	23	212
Mexico	30	864	75	651
Netherlands Antilles	2	32	(3/)	2
Norway	4	163	--	--
St. Lucia	1	5	--	--
Sweden	(3/)	94	(3/)	30
United Kingdom	1	496	1	668
Other 4/	3	471	6	965
Total	1,500	14,800	1,120	12,000

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

2/ Value of material at U.S. port of entry; based on purchase price and includes all charges (except U.S. import duties) in bringing material from foreign country to alongside carrier.

3/ Less than 1/2 unit.

4/ Includes Belgium (1994), Brazil (1995), Chad (1994), China, Czech Republic (1995), Denmark (1995), Finland (1995), Hong Kong (1994), Iceland (1994), India, Indonesia, Italy, New Zealand, Papua New Guinea (1994), the Philippines, Poland (1994), Singapore (1995), Solomon Islands, Taiwan and the Ukraine.

Source: Bureau of the Census.