

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 lowvalue 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 891 million metric tons of construction sand and gravel was produced in the United States in 1994, a 2.5% increase compared with the estimated total of 1993, and a 6.8% increase over the actual total of 1992. After a decrease in production in 1991, sand and gravel production has had healthy increases for three consecutive years, an indication of continuous strong demand for construction aggregates in the United States. (See table 1.)

Foreign trade of construction sand and gravel remained relatively minor in 1994. Exports decreased 7.5% to 1.05 million tons, but the value increased 30% to \$20.3 million, compared with 1993.

Imports increased nearly 14% to 1.5 million tons, but the value decreased almost 4% to \$14.8 million. Because imports and exports are relatively tiny, domestic apparent consumption of construction sand and gravel is essentially equal to U.S. production of 891 million tons.

The 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 891 million tons in 1994. Of the four major geographic regions, the West again led the Nation in the production of construction sand and gravel with 314 million tons, or 35% of the U.S. total, followed by the Midwest with

287 million tons, or 32% of the total; the South with 194 million tons, or 22%; and the Northeast with 97 million tons, or 11%. Compared with 1993, production by major geographic regions increased 5% in the Midwest, 3.5% in the Northeast, 3% in the West, and was unchanged in the South. (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 21.5% of the U.S. total, followed by the Pacific with 171 million tons, or 19.2%; and the Mountain with 143 million tons, or 16.2% of the total. (See table 2.) Compared with 1993, production increased in all but three regions. The regions with decreases were the Mountain, 4.6%; the Middle Atlantic, 2.4%; and the South Atlantic, 9.8%.

A review of the production by size of operation indicates that 42.8% of the construction sand and gravel produced in 1994 came from 1,847 operations reporting between 100,000 and 499,999 tons per year; 25% came from 360 operations reporting between 500,000 and 999,999 tons per year; and 19.3% came from 115 operations reporting over 1,000,000 tons per year. A total of 6,020 operations were active in 1994. (See table 8.)

The estimated production by quarters for 1994 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 1994 was also available for most of the States. (See table 5.)

Construction sand and gravel was produced in 1994 in every State. The 10 leading States in descending order of tonnage, California, Texas, Michigan, Ohio, Washington, Illinois, Arizona, Minnesota, Wisconsin, and Colorado. Their combined production represented 50.4% of the national total. Compared with 1993, production increased in 31 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. Bureau of Mines "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.

LaFarge Corp. announced at the beginning of 1994 a restructuring to increase its cost competitiveness. The restructuring, into three North American regions, was implemented in order to improve organizational efficiency by reducing management layers, eliminating duplicative administrative functions, and standardizing procedures and information systems.

Lone Star Industries, which filed for bankruptcy under Chapter 11 in 1990, had its reorganization approved by a judge in late February. Some assets were retained and others were turned over to a liquidating company to help pay creditors and stockholders. In August, Lone Star was reported to be selling its RMC Lonestar plant in Santa Cruz, CA, to the U.K.-based RMC.

In March, Financial Times reported that British-based English China Clays (ECC) bought Kost Brothers, an aggregate producer near Fargo, ND. In May, ECC announced plans to demerge its construction materials division and form a new company called CAMAS plc. This new company will encompass all former ECC construction materials companies. In September, it was announced that CAMAS had acquired C&M Ready Mix Concrete of Boulder, CO, which includes 12 million tons of proven aggregate reserves.

In other news, Tarmac America announced a major reorganization in April. Tarmac America will be organized into three groups: Aggregates and Cement, Ready-Mix Concrete, and Concrete Products. Also, Tarmac America has moved its headquarters to Norfolk, VA.

Another large producer, Dravo Corp., decided in June to consolidate two divisions, Dravo Basic Materials Co. and Dravo Lime Co., into a single unit. The consolidations were taken after the company reported a first-quarter loss of \$2.6 million.

British-based Bruntcliffe Aggregates PLC acquired Culpeper Stone Co., Culpeper, VA, in August. The operations will be known as Atlantic States Materials Corp. Culpeper

operated two sand and gravel and three ready-mix concrete operations.

In September, Martin Marietta Materials (MMM) announced its plans to purchase Dravo Corp.'s construction aggregates business. Dravo operated 22 production facilities and MMM operated quarries in 13 states. MMM also acquired a quartzite sand quarry at Cummings, GA, from Buckhorn Minerals.

Meridian Aggregates Co. has purchased the assets of the Hatton, AR, quarry from Herzog Stone Products.

Consumption

Construction sand and gravel reported by producers to the U.S. Bureau of Mines 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 U.S. Bureau of Mines, 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."

Of the 891 million tons of construction sand and gravel produced in 1994, 316 million tons or 35.5% of the total were unspecified uses. Of the remaining 575 million tons, 42.1% was used as concrete aggregates; 23.8% for road base and coverings and road stabilization; 14% as asphaltic concrete aggregates and other bituminous mixtures; 13.1% as construction fill; 2.1% for concrete products such as blocks, bricks, pipes, etc.; 1.3% 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 above 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 above 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 South, 32.4%; the West, 31.9%; and the Midwest, 26%; regions with high levels of construction activity. Most of the sand and gravel for road base and coverings was used in the West,

45.5%, and the Midwest, 36.1%, while most of the sand and gravel used for asphaltic concrete aggregates and other bituminous mixtures was used in the West, 38.3% and the Midwest, 33%. (*See table 7.*)

Additional information regarding production-consumption of construction sand and gravel by major uses in each State and the State districts is published in the U.S. Bureau of Mines Minerals Yearbook State chapters, Volume II of the U.S. Bureau of Mines 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 total U.S. reports regarding the method of transportation were provided by the producers for 549 million tons or 61.6% of the total U.S. production of construction sand and gravel. Of this total, 76.1% was transported by truck, 3.3% by waterway, and 1.3% by rail. A significant amount of construction sand and gravel produced, about 18.8%, 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 1992, when the last full annual survey was conducted, the 1994 average unit prices increased nearly 5% to \$4.19 per ton. By uses, the unit prices varied from a high of \$8.02 for roofing granules to a low of \$2.54 for fill. The largest increases in unit prices by uses were recorded for filtration sands, 18%; snow and ice control sand, 13.5%; railroad ballast, 13.4%; concrete products, 9.5%; and road base and coverings, 9.4%. Average unit prices declined for plaster and gunite sands, 9.4% and road stabilization-cement, 8.9%. (*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 only about 1% of the domestic consumption.

Exports of construction sand decreased 5.5% to 564,000 tons, compared with that of 1993, but the value increased 47.2% to \$15.6 million. Canada was the major destination, receiving about 56% of the total, followed by Mexico with 26.2%. Exports of construction gravel declined 9.7% to 482,000 tons, while the value decreased 7.1% to \$4.6 million. Canada was the major destination receiving about 87.8% of the total. (*See table 12.*)

Imports increased to 1.5 million tons, but the value decreased almost 4% to \$14.8 million. Canada was the major source of imported construction sand and gravel with 74.7% of the total, followed by the Bahamas with 16.2%. (*See table 13.*)

Outlook

The demand for construction sand and gravel in 1995 is expected to be about 900 million tons, practically unchanged compared with that of 1994. It is estimated that the demand for construction sand and gravel will reach 915 million tons in 1996. 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 with the last 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. Bureau of Mines Publications

Stone, Crushed. Ch. in Minerals Yearbook V. I, annual.
Stone, Crushed. Ch. in Mineral Commodity Summaries, annual.
Sand and Gravel, Construction. Ch. in Mineral Commodity Summaries, annual.
State Mineral Summaries, annual.
State Chapters in Minerals Yearbook V. II.
Crushed Stone and Sand and Gravel, Mineral Industry Survey, quarterly.
Directory of Principal Crushed Stone Producers, Mineral Industry Survey, biennial.
Directory of Principal Sand and Gravel Producers, Mineral Industry Survey, biennial.
Directory of State Publications Listing Crushed Stone and Sand and Gravel Producers, biennial.

Other Sources

Aggregates Handbook, National Stone Association, 1991.

Aggregates, Sand, Gravel, and Crushed Rock Aggregates for Construction Purposes, The Geological Society, United Kingdom, 1985.

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

Earth Manual, A Water Resources Publication, U.S. Department of the Interior, Bureau of Reclamation, 1974.

Bulletin Inc., Geology of Nonmetallics, Bates, R. L., Harben, P. W. Metal 1984.

Handbook of Concrete Aggregates, A Petrographic and Technological Evaluation, Dolar-Mantuani, L. Noyes Publications, 1983.

Industrial Minerals and Rocks, Fifth Edition, American Institute of Mining, Metallurgical, and Petroleum Engineers, Inc. 1983.

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/

		1990	1991	1992	1993	1994
Sold or used by producers:						
Quantity 2/	thousand metric tons	829,000	708,000 e/	834,000 3/	869,000 e/ 3/	891,000
Value 2/	thousand dollars	\$3,270,000	\$2,810,000 e/	\$3,340,000 3/	\$3,530,000 e/ 3/	\$3,740,000
Exports	value, thousand dollars	\$11,900	\$19,000	\$18,000	\$15,600	\$20,300
Imports	do.	\$22,900	\$16,600	\$15,500	\$15,400	\$14,800

e/ Estimated.

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines 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	1993 e/				1994			
	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	31,900 r/	3.6	\$150,000	4.2	36,900	4.1	\$174,000	4.6
Middle Atlantic	61,500	7.0	326,000	9.2	60,000	6.7	327,000	8.7
Midwest:								
East North Central	181,000	20.8	683,000	19.4	192,000	21.5	714,000	19.1
West North Central	92,400	10.6	288,000	8.2	95,200	10.7	306,000	8.2
South:								
South Atlantic	69,600	8.0	295,000	8.4	62,800	7.0	267,000	7.1
East South Central	39,800	4.5	160,000	4.5	42,800	4.8	171,000	4.6
West South Central	78,600	9.0	315,000	8.9	88,100	9.9	361,000	9.7
West:								
Mountain	150,000	17.2	562,000	15.9	143,000	16.1	586,000	15.7
Pacific	164,000	18.9	751,000	21.3	171,000	19.2	832,000	22.3
Total	869,000	100	3,530,000	100	891,000	100	3,740,000	100

e/ Estimated. r/ Revised.

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines 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 1994,
BY QUARTER AND REGION 1/

(Thousand metric tons and thousand dollars)

Region	Quantity	Per- cent change 2/	Quantity	Per- cent change 2/	Quantity	Per- cent change 2/	Quantity	Per- cent change 2/	Total 3/	Value total
	1st Qtr.		2nd Qtr.		3rd Qtr.		4th Qtr.			
Northeast:										
New England	3,900	7.6	10,500	20.1	13,300	22.6	10,200	18.5	38,000	187,100
Middle Atlantic	7,200	1.0	20,500	6.9	24,100	6.0	20,400	22.1	72,140	393,300
Midwest:										
East North Central	17,400	0.1	53,200	10.6	60,900	1.0	49,300	-10.0	180,760	701,500
West North Central	12,300	30.9	29,700	16.3	38,000	19.3	26,900	-2.0	106,980	343,300
South:										
South Atlantic	13,500	0.1	19,000	1.1	19,900	6.4	17,500	-5.1	69,890	305,100
East South Central	7,600	12.4	12,300	9.9	13,100	13.9	10,600	3.9	43,640	181,000
West South Central	16,000	18.0	22,500	8.4	19,500	-29.7	16,200	-3.7	74,150	305,800
West:										
Mountain	31,000	24.0	44,400	16.8	49,400	16.5	36,700	-2.4	161,490	624,900
Pacific 4/	28,700	-2.0	40,700	-1.5	46,400	3.6	37,600	1.7	153,370	723,900
Total 3/	137,600	9.5	253,000	9.1	284,600	5.1	225,300	-0.9	913,900 5/	3,789,900 5/

1/ As published in the "Crushed Stone and Sand and Gravel in the Fourth Quarter of 1994" Mineral Industry Survey.

2/ All percentage changes are calculated using unrounded totals.

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	1993 e/			1994		
	Quantity (thousand metric tons)	Value (thousand dollars)	Unit value	Quantity (thousand metric tons)	Value (thousand dollars)	Unit value
Alabama	10,300	39,100	\$3.80	12,500	47,600	\$3.80
Alaska	13,100	42,600	3.25	15,700	56,200	3.58
Arizona	35,000	138,000	3.95	34,800	166,000	4.78
Arkansas	10,100	40,900	4.05	10,600	42,500	4.00
California	96,300	476,000	4.94	96,300	523,000	5.43
Colorado	29,000	118,000	4.05	29,000	109,000	3.76
Connecticut	6,400	34,900	5.45	5,420	28,000	5.17
Delaware	2,500	10,300	4.12	2,580	8,680	3.36
Florida	22,800	73,100	3.21	16,600	60,700	3.66
Georgia	4,600	16,600	3.61	5,520	19,800	3.59
Hawaii	--	--	--	521	4,740	9.10
Idaho	13,600	44,900	3.30	14,500	46,300	3.19
Illinois	34,500	137,000	3.98	37,900	150,000	3.96
Indiana	27,000	103,000	3.80	28,100	108,000	3.84
Iowa	16,600	64,700	3.90	15,300	58,200	3.80
Kansas	11,900	30,700	2.58	11,200	29,600	2.64
Kentucky	7,700	29,900	3.88	9,140	32,200	3.52
Louisiana	11,900	51,500	4.33	12,300	49,600	4.03
Maine	4,400	18,900	4.30	5,890	24,400	4.14
Maryland	11,200	72,200	6.45	8,920	61,200	6.86
Massachusetts	10,800	51,300	4.75	12,300	60,000	4.88
Michigan	45,000	158,000	3.50	48,800	160,000	3.28
Minnesota	30,500	85,400	2.80	29,500	90,000	3.05
Mississippi	14,500	57,300	3.95	12,400	53,200	4.29
Missouri	6,400	19,800	3.09	9,760	36,500	3.74
Montana	10,000	32,000	3.20	7,360	28,800	3.91
Nebraska	12,900	41,900	3.25	15,000	49,200	3.28
Nevada	24,900	108,000	4.32	22,700	106,000	4.67
New Hampshire	4,800	20,700	4.31	7,120	32,600	4.58
New Jersey	14,700	80,100	5.45	16,100	100,000	6.21
New Mexico	11,100	51,100	4.60	10,400	47,400	4.56
New York	34,900	162,000	4.63	28,000	138,000	4.93
North Carolina	11,100	53,800	4.85	11,100	50,700	4.57
North Dakota	7,700	20,400	2.65	6,810	18,500	2.72
Ohio	46,400	203,000	4.37	47,700	205,000	4.30
Oklahoma	9,700	27,300	2.81	8,480	27,200	3.21
Oregon	15,800	74,800	4.73	18,400	83,600	4.54
Pennsylvania	16,100	83,900	5.21	15,900	89,700	5.64
Rhode Island	2,500	13,900	5.56	2,310	14,200	6.14
South Carolina	6,800	21,800	3.21	8,600	26,100	3.03
South Dakota	8,300	25,000	3.01	7,700	23,700	3.08
Tennessee	7,200	34,000	4.72	8,710	38,000	4.36
Texas	47,100	195,000	4.14	56,700	242,000	4.27
Utah	16,000	56,000	3.50	21,100	69,600	3.30
Vermont	3,000	10,400	3.47	3,890	14,500	3.73
Virginia	9,000	40,500	4.50	8,060	33,400	4.14
Washington	40,200	158,000	3.93	39,600	165,000	4.17
West Virginia	1,400	6,700	4.79	1,380	5,970	4.33
Wisconsin	27,600	82,800	3.00	29,200	91,500	3.13
Wyoming	3,400	15,000	4.41	3,210	13,100	4.08
Total	869,000	3,530,000	4.06	891,000	3,740,000	4.20

e/ Estimated.

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines 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 1994,
BY QUARTER AND STATE 1/

(Thousand metric tons and thousand dollars)

State	Quantity 1st Qtr.	Per- cent change 2/	Quantity 2nd Qtr.	Per- cent change 2/	Quantity 3rd Qtr.	Per- cent change 2/	Quantity 4th Qtr.	Per- cent change 2/	Total 3/	Value total
Alabama	2,300	5.6	2,800	-6.6	3,000	12.2	2,500	3.6	10,600	41,300
Alaska 4/	--	--	--	--	--	--	--	--	13,500	45,200
Arizona	8,700	37.3	13,600	56.2	13,900	32.8	10,600	11.5	46,800	191,900
Arkansas	2,200	17.0	3,100	20.7	2,900	-2.6	2,500	-7.0	10,700	44,400
California	17,800	-4.8	24,100	-7.7	28,100	1.2	24,500	3.4	94,500	472,500
Colorado	4,600	7.6	7,800	-10.5	9,100	-1.4	6,200	-10.1	27,700	116,300
Connecticut	600	-1.3	1,700	4.7	2,400	11.6	1,900	-9.5	6,600	36,600
Delaware	100	-50.1	500	-47.0	800	20.9	500	-11.7	1,900	7,900
Florida	5,700	16.2	6,200	11.9	5,900	6.9	5,500	-20.2	23,300	78,100
Georgia	1,000	8.0	1,300	0.3	1,200	-8.5	1,100	-5.4	4,600	17,100
Hawaii 4/	--	--	--	--	--	--	--	--	--	--
Idaho	2,700	149.6	4,900	41.3	5,900	-0.3	4,100	31.0	17,600	59,800
Illinois	3,100	11.6	10,300	5.6	10,900	-7.7	8,500	-15.8	32,800	136,100
Indiana	3,700	11.8	8,800	16.4	8,900	-4.2	7,900	14.4	29,300	114,300
Iowa	1,800	40.7	5,600	22.0	6,300	7.0	4,500	-7.2	18,200	72,800
Kansas	2,300	51.5	3,900	12.3	4,200	12.1	3,100	-1.3	13,500	37,100
Kentucky	1,100	6.9	2,500	10.6	2,900	24.2	2,300	13.3	8,800	35,200
Louisiana	2,800	18.4	3,400	3.7	3,300	2.1	3,200	4.4	12,700	56,400
Maine	400	70.6	1,500	22.0	2,400	70.4	1,600	6.6	5,900	26,300
Maryland	1,700	-12.7	2,700	-8.2	3,200	1.5	2,900	-9.5	10,500	68,300
Massachusetts	1,900	10.9	3,400	19.0	3,500	-2.3	3,000	13.5	11,800	57,200
Michigan	3,100	-7.6	12,600	18.9	16,000	11.7	12,300	-26.4	44,000	160,600
Minnesota	2,900	-20.5	7,100	1.9	12,900	14.0	8,600	1.2	31,500	91,400
Mississippi	3,200	22.4	4,500	20.6	4,400	5.2	3,700	-8.5	15,800	64,800
Missouri	1,400	107.0	2,800	45.9	3,000	100.1	2,200	-5.3	9,400	30,500
Montana 5/	--	--	--	--	--	--	--	--	6,900	22,100
Nebraska	1,100	43.5	3,800	-9.5	4,200	-6.6	2,500	-28.5	11,600	38,300
Nevada	6,600	12.2	5,900	-5.2	6,800	11.8	5,100	-23.2	24,400	107,400
New Hampshire	500	-12.1	2,300	48.8	2,800	66.3	1,600	53.7	7,200	31,700
New Jersey	2,100	-5.5	4,400	7.5	4,700	6.4	4,200	9.3	15,400	85,500
New Mexico	2,500	33.5	2,900	-3.0	3,000	-7.3	3,000	-2.4	11,400	53,600
New York	4,800	35.2	11,500	17.9	14,200	12.6	11,900	33.2	42,400	203,500
North Carolina	2,100	-15.2	3,000	-9.6	3,500	26.9	2,800	14.4	11,400	56,400
North Dakota 5/	--	--	--	--	--	--	--	--	8,000	22,000
Ohio	5,100	-1.1	13,100	1.7	16,200	1.8	12,700	2.0	47,100	209,600
Oklahoma	2,300	31.1	2,800	8.0	3,100	3.2	2,400	2.2	10,600	31,300
Oregon	2,600	11.1	3,700	0.8	8,500	28.6	3,400	7.4	18,200	87,400
Pennsylvania	1,100	-18.8	5,000	0.1	5,900	1.5	4,900	22.4	16,900	89,100
Rhode Island 5/	--	--	--	--	--	--	--	--	2,800	15,800
South Carolina	1,600	23.3	2,100	25.2	1,900	3.2	1,800	-8.3	7,400	24,400
South Dakota	700	97.5	3,300	49.6	3,800	12.7	3,400	40.1	11,200	35,300
Tennessee	1,300	16.0	2,500	20.4	2,500	9.8	2,000	14.5	8,300	39,800
Texas	8,600	16.1	13,100	6.4	10,100	-46.6	7,900	-7.1	39,700	166,700
Utah 5/	--	--	--	--	--	--	--	--	21,700	79,200
Vermont	200	-8.3	700	-9.4	900	-23.5	1,300	70.3	3,100	10,900
Virginia	1,500	-16.0	2,600	1.5	2,800	7.3	2,300	17.0	9,200	42,300
Washington	8,400	4.3	13,300	17.5	11,300	1.6	9,200	-5.0	42,200	168,800
West Virginia	100	-35.6	400	-5.4	500	-2.3	400	41.6	1,400	6,700
Wisconsin	2,200	-20.8	8,300	12.1	9,100	0.4	7,800	-7.2	27,400	84,900
Wyoming	900	56.7	900	-15.0	900	-17.5	700	-4.2	3,400	15,100
Total	XX	XX	XX	XX	XX	XX	XX	XX	913,900	3,789,900

XX Not applicable.

1/ As published in the "Crushed Stone and Sand and Gravel in the Fourth Quarter of 1994" Mineral Industry Survey.

2/ All percentages changes are calculated using unrounded totals.

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 1994,
BY MAJOR USE 1/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregates (including concrete sand)	242,000	\$1,130,000	\$4.67
Plaster and gunite sands	7,460	39,700	5.32
Concrete products (blocks, bricks, pipe, decorative, etc.)	12,300	61,000	4.96
Asphaltic concrete aggregates and other bituminous mixtures	80,700	398,000	4.93
Road base and coverings	133,000	497,000	3.74
Road stabilization (cement)	2,050	7,150	3.49
Road stabilization (lime)	1,730	7,130	4.12
Fill	75,600	192,000	2.54
Snow and ice control	7,080	29,600	4.18
Railroad ballast	1,010	6,220	6.16
Roofing granules	182	1,460	8.02
Filtration	1,970	12,400	6.29
Other miscellaneous uses	9,290	42,300	4.55
Unspecified: 2/			
Actual	166,000	699,000	4.21
Estimated	150,000	611,000	4.07
Total	891,000	3,740,000	4.19

1/ Data rounded by the U.S. Bureau of Mines 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 1994,
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	5,330	29,700	125	880	148	988	3,290	18,200	5,140	22,000
Middle Atlantic	18,700	111,000	741	4,740	953	7,130	7,140	40,700	8,140	35,700
Midwest:										
East North Central	38,900	149,000	650	3,030	3,350	14,800	17,000	63,500	25,200	91,000
West North Central	24,000	89,500	702	2,930	1,910	7,230	9,590	34,300	24,200	64,200
South:										
South Atlantic	27,300	123,000	1,250	5,590	2,460	9,160	3,280	14,400	3,590	18,000
East South Central	14,600	59,300	239	1,130	578	2,600	5,140	23,900	3,440	12,100
West South Central	36,400	164,000	536	2,510	479	1,650	4,230	21,400	5,030	19,300
West:										
Mountain	32,400	161,000	963	4,820	928	4,830	15,100	82,300	35,000	121,000
Pacific	44,700	246,000	2,250	14,000	1,470	12,700	15,800	99,700	27,300	128,000
Total	242,000	1,130,000	7,460	39,700	12,300	61,000	80,700	398,000	137,000	511,000
	Fill		Snow and ice control		Railroad ballast		Other uses		Total	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Northeast:										
New England	4,910	14,300	1,850	7,190	50	383	16,100	80,000	36,900	174,000
Middle Atlantic	3,460	10,500	2,080	10,400	32	181	18,700	107,000	60,000	327,000
Midwest:										
East North Central	18,400	51,800	1,120	3,940	62	401	86,800	336,000	192,000	714,000
West North Central	7,460	17,300	873	3,050	81	614	26,500	86,600	95,200	306,000
South:										
South Atlantic	6,970	13,800	220	931	289	1,340	17,400	80,300	62,800	267,000
East South Central	1,950	4,510	16	90	1	3	16,800	67,300	42,800	171,000
West South Central	10,100	18,100	16	46	7	35	31,300	134,000	88,100	361,000
West:										
Mountain	9,120	21,200	517	2,050	146	1,200	48,900	187,000	143,000	586,000
Pacific	13,200	40,900	386	1,890	347	2,070	65,000	287,000	171,000	832,000
Total	75,600	192,000	7,080	29,600	1,010	6,220	327,000	1,370,000	891,000	3,740,000

1/ Data rounded by the U.S. Bureau of Mines 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 1994,
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	433	40.1	3,420	3.5	603	27.5	5,990	2.1	260	23.1	2,250	1.2
25,000 to 49,999	146	13.5	4,830	5.0	362	16.5	11,800	4.1	149	13.2	4,990	2.6
50,000 to 99,999	187	17.3	12,100	12.5	407	18.6	26,400	9.2	213	18.9	13,800	7.1
100,000 to 199,999	154	14.3	19,600	20.2	347	15.9	44,600	15.5	170	15.1	22,600	11.7
200,000 to 299,999	73	6.8	15,800	16.4	184	8.4	41,000	14.3	106	9.4	23,500	12.2
300,000 to 399,999	41	3.8	12,700	13.1	88	4.0	27,300	9.5	67	6.0	20,500	10.6
400,000 to 499,999	18	1.7	7,220	7.4	58	2.6	23,500	8.2	36	3.2	14,600	7.6
500,000 to 599,999	8	0.7	4,050	4.2	45	2.1	22,000	7.7	36	3.2	17,900	9.3
600,000 to 699,999	6	0.6	3,600	3.7	34	1.6	19,900	6.9	30	2.7	17,400	9.0
700,000 to 799,999	4	0.4	2,790	2.9	18	0.8	12,200	4.3	16	1.4	10,900	5.6
800,000 to 899,999	3	0.3	2,310	2.4	10	0.5	7,720	2.7	14	1.2	10,900	5.6
900,000 to 999,999	2	0.2	W	1.8	4	0.2	W	1.2	7	0.6	5,980	3.1
1,000,000 to 1,499,999	4	0.4	4,130	4.3	12	0.5	12,500	4.4	17	1.5	18,600	9.6
1,500,000 to 1,999,999	--	--	--	--	16	0.7	25,700	9.0	3	0.3	4,640	2.4
2,000,000 to 2,499,999	--	--	--	--	--	--	--	--	1	0.1	W	1.1
2,500,000 to 4,999,999	1	0.1	W	2.7	1	--	W	1.0	1	0.1	W	1.5
5,000,000 and over	--	--	--	--	--	--	--	--	--	--	--	--
Total	1,080	100	96,900	100	2,190	100	287,000	100	1,130	100	194,000	100

	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	424	26.1	3,800	1.2	1,720	28.6	15,400	1.7
25,000 to 49,999	238	14.6	7,820	2.5	895	14.9	29,500	3.3
50,000 to 99,999	276	17.0	18,000	5.7	1,080	18.0	70,300	7.9
100,000 to 199,999	237	14.6	31,500	10.0	908	15.1	118,000	13.3
200,000 to 299,999	134	8.2	29,700	9.5	497	8.3	110,000	12.4
300,000 to 399,999	77	4.7	24,500	7.8	273	4.5	85,000	9.5
400,000 to 499,999	57	3.5	22,600	7.2	169	2.8	68,000	7.6
500,000 to 599,999	34	2.1	17,100	5.4	123	2.0	61,000	6.9
600,000 to 699,999	23	1.4	13,400	4.3	93	1.5	54,300	6.1
700,000 to 799,999	33	2.0	22,600	7.2	71	1.2	48,500	5.4
800,000 to 899,999	19	1.2	14,500	4.6	46	0.8	35,400	4.0
900,000 to 999,999	14	0.9	11,800	3.8	27	0.4	22,900	2.6
1,000,000 to 1,499,999	36	2.2	38,200	12.2	69	1.1	73,400	8.2
1,500,000 to 1,999,999	11	0.7	17,000	5.4	30	0.5	47,300	5.3
2,000,000 to 2,499,999	3	0.2	W	1.9	4	0.1	7,970	0.9
2,500,000 to 4,999,999	8	0.5	W	7.6	11	0.2	32,200	3.6
5,000,000 and over	1	0.1	11,200	3.6	1	--	11,200	1.3
Total	1,630	100	314,000	100	6,020	100	891,000	100

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

1/ Data rounded by the U.S. Bureau of Mines 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 1994, BY GEOGRAPHIC REGION 1/

Geographic region	Mining operations on land				Dredging operations	Total active operations	
	Stationary	Portable	Stationary and portable	No plants or unspecified			
Northeast:							
New England		169	162	41	54	432	
Middle Atlantic		200	292	56	62	653	
Midwest:							
East North Central		398	385	101	132	1,100	
West North Central		238	433	54	94	1,090	
South:							
South Atlantic		119	48	13	91	410	
East South Central		120	24	7	18	234	
West South Central		217	70	15	79	482	
West:							
Mountain		290	513	107	54	981	
Pacific 2/		311	192	71	41	644	
Total		2,060	2,120	465	625	749	6,020

1/ Data rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ 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 1994, BY STATE 1/

State	Mining operations on land				Dredging operations	Total active operations
	Stationary	Portable	Stationary and portable	No plants or unspecified		
Alabama	38	7	2	8	21	76
Alaska 2/	5	8	--	3	1	17
Arizona	58	55	20	2	2	137
Arkansas	43	11	3	7	7	71
California	171	69	39	12	16	307
Colorado	55	112	35	10	11	223
Connecticut	24	19	8	3	1	55
Delaware	3	--	--	2	3	8
Florida	9	1	2	10	38	60
Georgia	10	--	--	2	31	43
Hawaii	2	3	--	2	--	7
Idaho	38	84	2	14	1	139
Illinois	53	31	23	13	31	151
Indiana	61	31	17	11	21	141
Iowa	48	51	3	14	40	156
Kansas	17	27	7	25	49	125
Kentucky	12	2	3	1	7	25
Louisiana	23	4	--	7	43	77
Maine	28	53	6	22	--	109
Maryland	23	6	4	18	3	54
Massachusetts	60	18	8	7	1	94
Michigan	93	144	19	52	12	320
Minnesota	75	164	23	23	3	288
Mississippi	42	3	1	8	26	80
Missouri	40	14	1	2	37	94
Montana	37	51	7	7	--	102
Nebraska	24	22	4	3	138	191
Nevada	19	44	11	9	1	84
New Hampshire	23	22	6	4	--	55
New Jersey	28	5	8	3	16	60
New Mexico	36	61	9	2	1	109
New York	116	253	34	52	11	466
North Carolina	26	21	1	34	31	113
North Dakota	12	59	8	1	--	80
Ohio	109	33	21	39	21	223
Oklahoma	20	13	3	16	30	82
Oregon	44	27	10	5	7	93
Pennsylvania	56	34	14	7	15	126
Rhode Island	9	--	5	--	--	14
South Carolina	19	8	2	13	17	59
South Dakota	22	96	8	26	--	152
Tennessee	28	12	1	1	11	53
Texas	131	42	9	49	21	252
Utah	33	73	17	8	--	131
Vermont	25	50	8	18	--	101
Virginia	23	12	4	12	15	66
Washington	89	85	22	19	5	220
West Virginia	6	--	--	--	1	7
Wisconsin	82	146	21	17	2	268
Wyoming	14	33	6	2	1	56
Total	2,060	2,120	465	625	749	6,020

1/ Data rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ 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 1994, BY REGION AND METHOD OF TRANSPORTATION 1/

(Thousand metric tons)

Geographic region	Truck	Rail	Water	Other	Not transported	Not specified	Total
Northeast:							
New England	18,300	263	--	--	4,500	13,800	36,900
Middle Atlantic	31,600	4	1,570	64	7,620	19,100	60,000
Midwest:							
East North Central	80,600	158	4,610	1,100	16,000	89,200	192,000
West North Central	47,800	442	4,210	144	9,950	32,700	95,200
South:							
South Atlantic	37,000	1,470	1,760	2	4,830	17,700	62,800
East South Central	18,900	580	1,470	47	3,180	18,600	42,800
West South Central	40,500	2,930	99	--	15,300	29,200	88,100
West:							
Mountain	74,400	32	--	789	15,300	52,500	143,000
Pacific	69,100	1,120	4,260	428	26,400	69,100	171,000
Total	418,000	6,990	18,000	2,570	103,000	342,000	891,000

1/ Data rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

TABLE 12
U.S. EXPORTS OF CONSTRUCTION SAND AND GRAVEL IN 1994,
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	2	35	(3/)	10
Bahamas, The	1	79	14	27
British Virgin Islands	--	--	3	36
Canada	316	3,030	423	2,180
Costa Rica	1	379	(3/)	15
Dominican Republic	--	--	2	32
El Salvador	4	98	--	--
Guadeloupe	--	--	11	132
Jamaica	1	55	--	--
Martinique	--	--	1	13
Mexico	148	4,060	13	1,540
Turks And Caicos Island	1	4	3	46
Other 4/	(3/)	111	(3/)	17
Total	475	7,860	473	4,080
South America:				
Argentina	9	1,460	(3/)	29
Ecuador	3	176	--	--
Peru	2	243	--	--
Venezuela	8	1,470	1	98
Other 5/	1	83	--	--
Total	23	3,430	1	127
Europe:				
Belgium	1	134	1	37
Czech Republic	5	98	--	--
Germany	29	841	2	81
Spain	1	42	--	--
Sweden	(3/)	87	1	20
United Kingdom	2	1,080	(3/)	8
Uzbekistan	1	3	--	--
Other 6/	1	364	(3/)	6
Total	42	2,650	2	152
Asia:				
Hong Kong	7	160	(3/)	14
Japan	10	609	1	88
Philippines	2	44	--	--
Singapore	3	145	--	--
Taiwan	1	58	2	108
Other 7/	(3/)	260	1	65
Total	23	1,280	5	276
Oceania:				
Other 8/	(3/)	196	(3/)	14
Total	(3/)	196	(3/)	14
Middle East:				
Other 9/	(3/)	62	--	--
Total	(3/)	62	--	--
Africa:				
Other 10/	(3/)	136	--	--
Total	(3/)	136	--	--
Grand total	564	15,600	482	4,640

1/ Data rounded by the U.S. Bureau of Mines 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 Belize, Bermuda, Cayman Islands, Guatemala, Haiti, the Netherlands Antilles, St. Lucia, and Trinidad and Tobago.

5/ Includes Brazil, Chile, Colombia, and Suriname.

6/ Includes Bulgaria, France, Hungary, Ireland, Italy, Latvia, the Netherlands, Norway, Russia, and Switzerland.

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

8/ Includes Australia, France, and Marshall Islands.

9/ Includes Kuwait, Saudi Arabia and the United Arab Emirates.

10/ Includes Algeria, Angola, Congo, Egypt, Nigeria, and Zaire.

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	1993		1994	
	Quantity	C.i.f. value 2/	Quantity	C.i.f. value 2/
Antigua and Barbuda	39	455	--	--
Australia	12	852	7	784
Bahamas, The	197	549	243	617
Barbados	8	72	--	--
British Virgin Islands	2	55	4	71
Canada	962	7,610	1,120	7,120
Dominica	9	71	14	162
Dominican Republic	2	49	--	--
France	1	206	1	222
Germany	3	2,140	55	2,880
Guyana	3	18	4	50
Japan	38	888	2	498
Macao	--	--	1	9
Malaysia	22	786	5	94
Martinique	--	--	16	154
Mexico	8	592	27	864
Netherlands Antilles	5	58	2	32
Norway	4	201	4	163
St. Lucia	--	--	1	5
Sweden	1	147	(3/)	94
United Kingdom	1	546	1	496
Other 4/		147	1	471
Total	1,320	15,400	1,500	14,800

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines 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, Chad, China, Denmark, Hong Kong, Iceland, India, Indonesia, Italy, Papua New Guinea, Peru, Philippines, Poland, Solomon Islands, and Taiwan.

Source: Bureau of the Census.