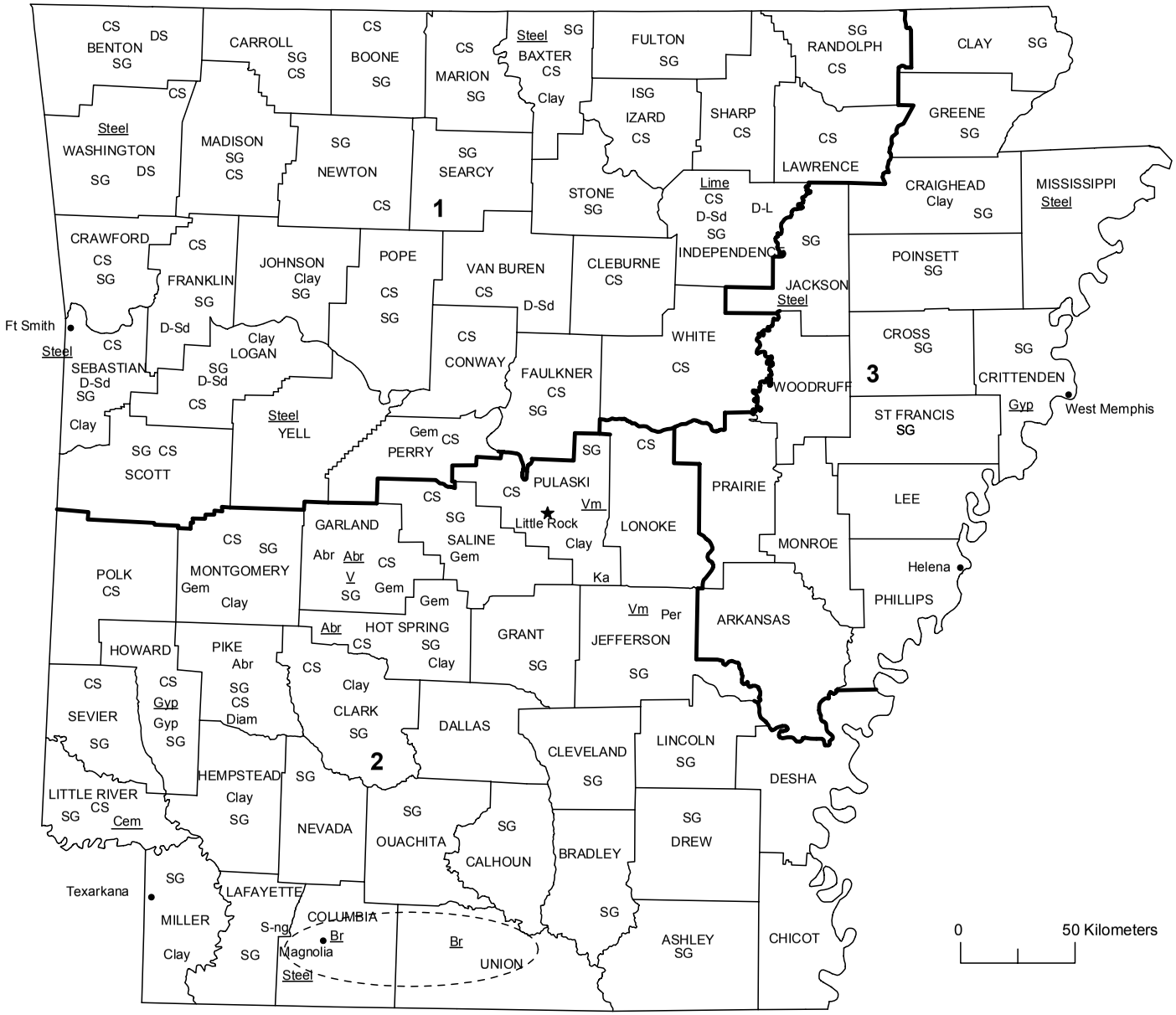
ARKANSAS



LEGEND

- County boundary
- ★ Capital
- • City
- 1 Crushed stone/sand and gravel districts

MINERAL SYMBOLS
(Major producing areas)

Abr	Abrasives
Abr	Abrasives plant
Br	Bromine plant
Cem	Cement plant
Clay	Common clay
CS	Crushed stone
Diam	Diamond
DS	Dimension stone
D-L	Dimension limestone
D-Sd	Dimension sandstone
Gem	Gemstones
Gyp	Gypsum
Gyp	Gypsum plant
ISG	Industrial sand and gravel
Ka	Kaolin
Lime	Lime plant
Per	Perlite
S-ng	Sulfur (natural gas)
SG	Construction sand and gravel
Steel	Steel plant
V	Vanadium plant
Vm	Vermiculite plant
	Concentration of mineral operations

Source: Arkansas Geological Commission/U.S. Geological Survey (2002)

THE MINERAL INDUSTRY OF ARKANSAS

This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the Arkansas Geological Commission for collecting information on all nonfuel minerals.

In 2002, the estimated value[1] of nonfuel mineral production for Arkansas was $543 million, based upon preliminary U.S. Geological Survey (USGS) data. This was about a 13% increase from that of 2001[2] and followed a 1% decrease from 2000 to 2001. The State rose to 26th from 28th in rank among the 50 States in total nonfuel mineral production value. Arkansas accounted for nearly 1.5% of the U.S. total.

In 2002, bromine remained, by value, Arkansas' leading nonfuel mineral, followed by crushed stone, cement (portland and masonry), and construction sand and gravel, altogether accounting for about 93% of the State's total nonfuel mineral value. Bromine and cement data must be concealed to protect proprietary company data. Arkansas' increase in value in 2002 resulted mostly from a substantial increase in the production and value of bromine, bolstered by smaller increases in the values for common clay, crushed stone, and lime. Common clay value was up about 340%, significant for that commodity, but the total dollar increase was small relative to that of bromine. Construction sand and gravel value was down slightly (table 1).

During 2001, increases in crushed stone, up $32 million, construction sand and gravel, up $9 million, plus a smaller increase in lime were offset by decreases in bromine and cement, down nearly a combined $50 million, resulting in the State's small net decrease for the year. While the values of kaolin and dimension stone were up slightly, those of gypsum, silica stone, industrial sand and gravel, gemstones, and tripoli were down by the same magnitude (table 1).

Based upon USGS estimates of quantities produced in the 50 States during 2002, Arkansas continued to be the leading bromine-producing State, accounting for most U.S. production. Michigan was the only other State that produced bromine. Mining operations in both States extracted subsurface, bromine-rich natural brines by submersible pump for subsequent processing. Arkansas continued to be the only State that produced silica stone; it was third of four tripoli-producing States, sixth in gemstones, and ninth in common clays. The State changed in rank to eighth from sixth in gypsum. Additionally, significant quantities of crushed stone, cement, construction sand and gravel, and industrial sand and gravel were produced in the State. The State's metal production, mostly that of raw steel, resulted from materials received from other domestic and foreign sources.

The Arkansas Geological Commission[3] (AGC) provided the following narrative information.

Commodity Review

Industrial Minerals

Aggregates.—There were about 90 active sand and gravel operations in Arkansas in 2000, the greatest number of these being in the southeastern part of the State (the Gulf Coastal Plain). During 2002, there were 109 active sand and gravel operations in Arkansas. There were nine new sand and gravel operations permitted by the Surface Mining and Reclamation Division (SMRD) of the Arkansas Department of Environmental Quality (ADEQ). These permits were issued to Big Slough Hunt Club; Guy King & Sons Inc.; Jenkins Gravel Co.; Luttrell Red Dirt Pit LLC; Miller Excavation Inc.; Teague Farms; and WeeRock, Inc. During 2002, ADEQ did not issue any Authorizations to Quarry pursuant to the Arkansas Quarry Operation, Reclamation and Safe Closure Act.

Arkhola Sand and Gravel Co. continued exploration for additional quarry sites in the western portion of the Arkansas River Valley. Arkhola developed a second quarry near Jenny Lind in Sebastian County. Arkhola produced asphalt mix at the Preston Quarry near Van Buren in Crawford County. Bennett Brothers Stone Co., Inc. obtained building stone materials from deposits in Garland and adjacent counties. Bobby Plant Asphalt Co., based in Murfreesboro, Pike County, produced stone from its quarry in the Jackfork Sandstone (Lower Pennsylvanian) south of Kirby in central Pike County.

Duffield Stone and Gravel Co. operated two sandstone quarries (Pennsylvanian) in Pope County; one in the Hartshorne Sandstone at Russellville and the other, called the Gumlog Quarry, in the upper Atoka Formation. The company continued exploration in the Arkansas River Valley. Pyramid Co. produced aggregate from the middle Atoka Formation (Pennsylvanian) north of Greenbriar in Faulkner County. McClinton-Anchor, Inc. continued exploring for new aggregate quarry sites in the limestone-bearing region of northwest Arkansas.

[1]The terms "nofuel mineral production" and related "values" encompass variations in meaning, depending upon the minerals or mineral products. Produciton 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.

[2]Values, 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.

[3]J. Michael Howard, Geology Supervisor/Mineralogist, authored the text of the State mineral industry information provided by the Arkansas Geological Commission.

Granite Mountain Quarries, Inc. (GMQ) produced aggregate from nepheline syenite at two quarries in Pulaski County. It produced from a new syenite aggregate quarry, known as Granite Mountain No. 3 quarry, near Bryant in Saline County. GMQ abandoned a new quarry operation northwest of DeQueen, Sevier County, in the Jackfork Sandstone (Pennsylvanian) and tested another site in the general region. It continued evaluating two other sites—one in the lower Atoka Formation west of Boles in southern Scott County and another in the Hartshorne Sandstone west of Greenwood in Sebastian County. Martin Marietta Co. actively quarried the Hatton Tuff lentil of the Stanley Group (Mississippian) at the Hatton Quarry in southern Polk County. It continued operations at the 270 Quarry near Magnet Cove in Hot Spring County, producing from the hornfels and quartzite alteration zone in the Stanley Group and recrystallized Arkansas Novaculite (Mississippian-Devonian) adjacent to the Cretaceous igneous intrusion. At this site, the company installed an asphalt plant, which became operational in 2000.

Minnesota Mining and Manufacturing Co. mined nepheline syenite from its Big Rock Arch Street Quarry to supply its roofing granule plant in Sweet Home, Pulaski County. Martin Marietta Co. continued concurrent mining of dike rock for aggregate in this quarry.

Rogers Group, Inc. continued aggregate operations at its Greenbriar Quarry in the middle Atoka Formation in Faulkner County (sandstone), its Conway County Quarry in upper Atoka Formation south of Solgohacia, and its Lowell Quarry in the limestone of the Boone Formation (Mississippian) in southern Benton County. Schwartz Stone Co. quarried sandstone from the Hartshorne Sandstone for aggregate and dimension stone north of Midway in Logan County. The Souter Construction Co. produced riprap from the Hollywood Quarry property in Clark County. Texas Industries Group continued evaluation of tuff deposits from leased property in southern Polk County. McGeorge Sand and Gravel Co. continued riprap barge operations along the Arkansas River from its River Mountain Quarry in the Hartshorne Sandstone north of New Blaine in eastern Logan County. Chrisman Co. mined aggregate in the Hartshorne Sandstone near Hunt in Johnson County and near Ratcliffe in Franklin County.

Vulcan Materials Co., based in Birmingham, AL, produced aggregate from its upper Morrowan Sandstone operation at Judsonia in White County. It also produced dolomitic limestone from lower Ordovician rocks near Black Rock in Lawrence County. Vulcan also continued to produce aggregate from the L&R Quarry in middle Atoka Sandstone near Floyd in White County. Vulcan continued aggregate exploration, focusing on Morrowan and Atokan Sandstones in White and Cleburne Counties. Charles Weaver Co. produced crushed aggregate from its quarry in the middle Atoka Formation near El Paso in White County.

Gypsum.—In 2002, BPB Gypsum purchased the James Hardie Gypsum Co. plant and mine as part of an overall acquisition of three James Hardie facilities and Western Mining and Minerals. The total price was $345 million. The production plant and mines, near Nashville in Howard County, continued to be the world's largest wallboard manufacturing plant, with an annual capacity of 130 million square meters. The plant and mine employed about 200 people. Principal markets for the wallboard were in the eastern United States. Product was shipped by rail and truck. Properties of the C.W. Harrison Gypsum Co. of Oklahoma in Pike County were inactive in 2002, but the company continued reclamation efforts begun in 1999.

Other Industrial Minerals.—The Butterfield Quarry in Hot Spring County, managed and operated by Mark Wallis Whetstones, produced high-silica novaculite. Shipments in 2002 continued to be sporadic. The company also continued sporadic operation of a whetstone-grade mine south of Lonsdale near the Saline-Hot Spring County line. Martin Marietta Co. began production at a deposit of high-silica novaculite near Glen Rose in Hot Spring County that it acquired from the Rogers Group in 2000.

Ash Grove Cement Co., sole producer of cement in the State, operated the Foreman plant in Little River County, using chalk from the Annona Formation and silica from the Marlbrook Formation (both Cretaceous). Ash Grove Cement Co., sole producer of cement in the State, operated the Foreman plant in Little River County, using chalk from the Annona Formation and silica from the Marlbrook Formation (both Cretaceous).

Acme Brick Co., near Malvern, continued operation of its Wilcox Group clay mines (Eocene) for brick production at Perla. Strategic Minerals Corp. continued operation of the mill facility at Potash Sulphur Springs, based on out-of-State vanadium-bearing feed.

Environmental Issues and Mine Reclamation

In 2002, Albemarle Corp. began projects to increase automation and efficiency at its flame-retardant manufacturing units at Magnolia, AR. During the past 3 years, Albemarle has reduced its water usage by 30%. In 2001 and 2002, Albemarle won an award for excellence given annually by the Synthetic Organic Chemical Manufacturers Association for voluntary environmental, health, and safety initiatives. Both Albemarle and Great Lakes Chemical Co. continued operations at bromine extraction and product production plants in Columbia and Union Counties, respectively.

Alcoa Inc. entered its 8th year of a 20-year project of land reclamation from a former bauxite property adjacent to the community of Bauxite in Saline County. Alcoa's land reclamation project included a large acreage of pre-law land. Umetco, Inc. initiated reclamation of the Wilson Springs Mines area in Garland County in 1997 and continued this effort. In 2002, Star Resources Corp. of Houston, Texas, began reclamation from a bulk testing area of one of its diamond properties, the Black Lick, northeast of the Crater of Diamonds State Park in Pike County.

Government Programs

The AGC Web site, which can be retrieved over the Internet via URL http://www.state.ar.us/agc/agc.htm, hosted about 65,000 visitors in 2002, its 4th year of operation. This was a 28% increase relative to 2001. Information posted on the Web site included State resource data, USGS annual nonfuel mineral production data, publications and ordering information, State stratigraphic and geologic data, Arkansas Board of Registration

for Professional Geologists, agency services, and news items. Links are provided to State Geological Surveys, Federal agencies, geology Web sites, organizations, and universities.

Also initiated by AGC staff in 2001 is a spreadsheet database designed to contain all known sites of mineral extraction in the State, excluding petroleum and natural gas. By the close of 2002, nearly 7,000 entries had been made. In 2002, two digitized 7.5-minute USGS topographic geologic maps were completed under the STATEMAP cooperative agreement, and four additional maps were started. Staff cartographers completed the digitization of four USGS 7.5-minute topographic geologic maps in Pulaski County that were undergoing final review. Late in 2002, staff initiated digitization of seven additional USGS 7.5-minute topographic geologic maps primarily in the Ouachita Mountains Region.

Operators of 26 quartz contracts with the U.S. Forest Service on the Ouachita National Forest in Arkansas generated about $10,000 in revenue from 4.5 metric tons (t) of production. The U.S. Bureau of Land Management earned revenue on quartz amounting to about $233 (5% royalty) from 2.3 t of production. In 2002, 614 diamonds with an average weight of 0.12 carat were recovered at the Crater of Diamonds State Park near Murfreesboro; seven diamonds weighed more than 1 carat each. More than 22,000 diamonds have been recovered since this property became a State park in 1972.

During 2002, there were 184 active, permitted, or authorized noncoal mine sites in Arkansas. Approximately 5,370 hectares was permitted or authorized for mining. The Arkansas Open-Cut Mining and Land Reclamation Code, an amended version of Regulation No. 15, became law on May 20, 2002.

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

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral		2000		2001		2002[p]	
		Quantity	Value	Quantity	Value	Quantity	Value
Clays, common		958	1,170	989	1,140	1,043	5,030
Gemstones		NA	925	NA	686	NA	688
Sand and gravel, construction		9,820	48,600	11,600	57,600	10,900	55,000
Silica stone[3]	metric tons	W	W	393	4,040	393	4,040
Stone, crushed		28,300	137,000	33,700	169,000	33,400	171,000
Combined values of bromine, cement, clays (kaolin), gypsum (crude), lime, sand and gravel (industrial), silica stone[3] (2000), stone [dimension limestone marble, sandstone (2000-01), dimension limestone and sandstone (2002)], tripoli and value indicated by symbol W		XX	296,000	XX	246,000	XX	307,000
Total		XX	484,000	XX	479,000	XX	543,000

[p]Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined values" data.
XX Not applicable.
[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
[2]Data are rounded to no more than three significant digits; may not add to totals shown.
[3]Grindstones, pulpstones, and sharpening stones; excludes mill liners and grinding pebbles.

TABLE 2

ARKANSAS: CRUSHED STONE SOLD OR USED, BY KIND[1]

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	25 r	9,150 r	$40,700 r	$4.44 r	26	10,600	$54,500	$5.13
Dolomite	2	W	W	5.02	2	W	W	5.41
Granite	6	10,200	53,400	5.21	6	9,530	50,200	5.27
Sandstone	18 r	5,250 r	25,100 r	4.78 r	16	7,860	36,800	4.69
Quartzite and quartz	7	W	W	4.68	1	W	W	4.74
Miscellaneous stone	10	W	W	5.14	5	W	W	4.59
Total or average	XX	28,300	137,000	4.84	XX	33,700	169,000	5.02

rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.

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

TABLE 3
ARKANSAS: CRUSHED STONE SOLD OR USED BY PRODUCERS
IN 2001, BY USE[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:			
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	1,610	$7,770	$4.82
Filter stone	76	312	4.11
Other coarse aggregates	121	876	7.24
Total or average	1,810	8,950	4.95
Coarse aggregate, graded:			
Concrete aggregate, coarse	W	W	5.25
Bituminous aggregate, coarse	W	W	6.31
Bituminous surface-treatment aggregate	W	W	7.63
Other graded coarse aggregates	3,660	75,300	20.57
Total or average	3,660	75,300	20.57
Fine aggregate (-3/8 inch):			
Stone sand, bituminous mix or seal	W	W	3.53
Screening, undesignated	477	1,900	3.97
Other fine aggregates	279	1,710	6.14
Total or average	756	3,610	4.77
Coarse and fine aggregates:			
Graded road base or subbase	2,440	13,000	5.33
Unpaved road surfacing	W	W	5.18
Roofing granules	W	W	11.02
Other coarse and fine aggregates	2,070	15,800	7.60
Total or average	4,520	28,800	6.37
Other construction materials	77	272	3.53
Agricultural:			
Limestone	44	313	7.11
Poultry grit and mineral food	(2)	(2)	9.17
Chemical and metallurgical:			
Cement manufacture	(2)	(2)	3.16
Lime manufacture	(2)	(2)	4.19
Special, other fillers or extenders	(2)	(2)	9.21
Other miscellaneous uses, abrasives	(2)	(2)	3.64
Unspecified:[3]			
Reported	13,000	62,600	4.82
Estimated	7,300	33,000	4.52
Total or average	20,300	95,600	4.71
Grand total or average	33,700	169,000	5.02

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

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

[2]Withheld to avoid disclosing company proprietary data, included in "Grand total."

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

TABLE 4
ARKANSAS: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2001,
BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1 1/2 inch)[2]	W	W	43	173	W	W
Coarse aggregate, graded[3]	1,770	10,600	W	W	W	W
Fine aggregate (-3/8 inch)[4]	W	W	29	103	W	W
Coarse and fine aggregate[5]	3,270	16,800	W	W	W	W
Other construction materials	73	258	4	14	--	--
Agricultural[6]	W	W	--	--	--	--
Chemical and metallurgical[7]	W	W	W	W	--	--
Special[8]	W	W	W	W	--	--
Other miscellaneous uses[9]	--	--	W	W	--	--
Unspecified:[10]					--	--
Reported	8,220	39,900	4,770	22,600	--	--
Estimated	1,900	7,900	5,400	25,000	--	--
Total	18,800	94,200	14,700	73,000	170	2,180

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

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

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

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

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

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

[6]Includes agricultural limestone and poultry grit and mineral food.

[7]Includes cement and lime manufacture.

[8]Includes other fillers and extenders.

[9]Includes abrasives.

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

TABLE 5
ARKANSAS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2001,
BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregates (including concrete sand)[2]	2,660	$13,700	$5.15
Asphalt concrete aggregates and other bituminous mixtures	769	4,790	6.23
Road base and coverings	470	1,630	3.47
Fill	16	42	2.63
Other miscellaneous uses[3]	36	198	5.50
Unspecified:[4]			
Reported	5,500	26,500	4.82
Estimated	2,200	10,740	4.86
Total or average	11,600	57,600	4.97

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

[2]Includes plaster and gunite sands.

[3]Includes filtration.

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

TABLE 6
ARKANSAS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2001,
BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregates (including concrete sand)[2]	216	1,460	1,540	6,890	902	5,320
Asphaltic concrete aggregates and road base materials	81	421	860	3,750	298	2,240
Fill	4	26	--	--	12	16
Other miscellaneous uses[3]	36	198	--	--	--	--
Unspecified:[4]						
Reported	1,600	6,130	2,980	15,800	918	4,540
Estimated	500	2,400	1,400	7,000	300	1,300
Total	2,420	10,700	6,820	33,500	2,400	13,500

-- Zero.

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

[2]Includes plaster and gunite sands.

[3]Includes filtration.

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