

# 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 2000, the estimated value<sup>1</sup> of nonfuel mineral production for Arkansas was \$506 million, based upon preliminary U.S. Geological Survey (USGS) data. This was about a 2% increase from that of 1999,<sup>2</sup> following a 2.7% increase from 1998 to 1999. The State remained 29th in rank among the 50 States in total nonfuel mineral production value, of which Arkansas accounted for more than 1% of the U.S. total.

In 2000, Arkansas' increase in value resulted from a \$10 million rise in the value of crushed stone, supported by a nearly \$2 million increase in portland cement. Bromine had a small dropoff in production resulting in a \$4 million decrease in value. Other changes included relatively small increases in the values of construction sand and gravel, gypsum, lime, and gemstones (in descending order of change), and a small decrease in masonry cement. In 1999, the State's rise in value was mainly attributable to a substantial increase in the value of bromine, the State's leading nonfuel mineral, based on value. This increase in bromine together with smaller yet significant increases in portland cement and industrial sand and gravel offset a \$35 million decrease in crushed stone plus smaller yet significant drops in the values of kaolin, construction sand and gravel, and gypsum, in descending order of change (table 1).

Based upon USGS estimates of quantities produced during 2000, 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 also remained first among two States that produce silica stone; third of four tripoli-producing States; and eighth in common clay. By value, Arkansas rose to seventh from eighth in the Nation in the production of gemstones. Additionally, significant quantities of crushed stone and industrial sand and gravel were produced in the State. The State's metal production, mostly that of raw

<sup>1</sup>The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 2000 USGS mineral production data published in this chapter are preliminary estimates as of July 2001 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. A telephone listing for the specialists may be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals/contacts/comdir.html>, by using MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset (request Document #1000 for a telephone listing of all mineral commodity specialists), or by calling USGS information at (703) 648-4000 for the specialist's name and number. All Mineral Industry Surveys—mineral commodity, State, and country—also may be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals>; facsimile copies may be obtained from MINES FaxBack.

<sup>2</sup>Values, percentage calculations, and rankings for 1999 may vary from the Minerals Yearbook, Area Reports: Domestic 1999, Volume II, owing to the revision of preliminary 1999 to final 1999 data. Data for 2000 are preliminary and are expected to change; related rankings may also be subject to change.

steel, resulted from materials received from other domestic and foreign sources.

The Arkansas Geological Commission<sup>3</sup> (AGC) provided the following narrative information. No bauxite was mined, but Alcoa Inc.'s plant in Saline County drew upon previously mined and stockpiled bauxite for the production of proppants used by the oil industry in formation fracturing procedures.

Acme Brick Co. acquired Wheeler Brick Co., Inc. in Jonesboro and Eureka Tile and Brick in Clarksville. Acme Brick also purchased the Hope Brick Works plant in Hempstead County, although the original owner still holds permits on clay in the area. Berkshire Hathaway Inc. bought the parent company of Acme Brick—Acme Building Brands.

Umetco, Inc. initiated reclamation of the Wilson Springs mines area in Garland County in late 1997 and has continued this effort through 2000. Strategic Minerals Corp. continued operation of the mill facility based on out-of-State vanadium-bearing feed.

Ash Grove Cement Co. operated the Foreman plant in Little River County. Both chalk from the Annona Chalk and silica from the Marlbrook Marl were used as source materials.

Star Resources Corp. of Houston, TX, drilled several potential diamond-bearing properties immediately northeast of the Crater of Diamonds State Park in Pike County in 2000.

Arkholia Sand and Gravel Co. explored for additional quarry sites in several formations in the western portion of the Arkansas River Valley. Arkholia was developing a second quarry near Jenny Lind in Sebastian County. A new asphalt plant was constructed at their Preston Quarry near Van Buren in Crawford County during 2000. Bennett Brothers Stone Co., Inc. obtained rough fieldstone, dimension stone, and other building stone materials from deposits in Garland County and nearby counties. Bobby Asphalt Co., based in Murfreesboro, Pike County, is in the development and early production phase of a major quarry in Jackfork Sandstone south of Kirby in central Pike County.

Duffield Stone and Gravel Co. completed its second year of operation of the Gumlog Quarry in upper Atoka Sandstone in Pope County and was proceeding with further exploration in the region. McClinton-Anchor, Inc. explored for new aggregate quarry sites; it examined limestone in the Ozarks Plateau region of northwest Arkansas.

Granite Mountain quarries produced aggregate from nepheline syenite at its two quarries in Pulaski County. It also began production of syenite aggregate from a newly developed quarry in Saline County and tested properties in both the eastern and western portions of the Arkansas Valley. Granite Mountain quarries also developed a rock aggregate (sandstone) site in southern Scott County. Martin Marietta Co. operated in volcanic tuff (traprock) at the Hatton Quarry in southern Polk County. It continued quarry operations at the 270 Quarry near

<sup>3</sup>J. Michael Howard, Geology Supervisor, authored the text of State minerals information provided by the Arkansas Geological Commission.

Magnet Cove in Hot Spring County. Martin Marietta Co. acquired the Glen Rose (former Tidwell) and Friendship quarries and an asphalt plant from the Rogers Group, Inc.

Minnesota Mining and Manufacturing Co. mined rock (nepheline syenite) from its Big Rock Arch Street Pike Quarry to supply its roofing granule plant in Sweet Home, Pulaski County. Additional rock was mined from this quarry by Martin Marietta Co. for aggregate.

Rogers Group continued to explore sandstone quarries in the upper and middle Atoka Formation at Toad Suck in eastern Perry County, north of Greenbrier, and at Beryl in Faulkner County. The Rogers Group actively worked their Greenbrier Quarry in Faulkner County (sandstone) and their Lowell Quarry in southern Benton County (limestone) for aggregate. Schwartz Stone Co. quarried sandstone from the Hartshorne Sandstone for use as crushed aggregate and dimension stone from a site north of Midway in Logan County. The Souter Construction Co. produced riprap from the Hollywood Quarry in Clark County. Texas Industries Group continued evaluating deposits of tuff from leased property in southern Polk County.

Vulcan Materials Co. of Birmingham, AL, produced aggregate from the upper Morrowan Sandstone at a quarry operation at Judsonia in White County. Vulcan also produced dolomitic limestone from lower Ordovician age rocks near Black Rock in Lawrence County. The company processed rock from the L&R Quarry in middle Atoka Sandstone near Floyd in White County. Vulcan acquired Rock Products, Inc. and has continued aggregate exploration in Morrowan and Atokan age Sandstones principally in Cleburne and White Counties. Charles Weaver Co. operated a quarry and crushing facility in the middle Atoka Formation near El Paso in White County.

The James Hardie Gypsum Co. was the world's largest single site wallboard producer (from gypsum) from its operations near Nashville in Howard County. Annual production was about 130 million square meters of wallboard. The plant and mine employ about 275 people. Principal market area for wallboard, which is shipped by rail and truck, is the eastern one-half of the United States. C.W. (Bill) Harrison Gypsum Co. of Oklahoma ceased gypsum-mining operations north of Highland, Pike County, in the summer of 1999. Reclamation of the mine began in 1999 and continued through 2000.

The Butterfield Quarry in Hot Spring County, managed and operated by the Mark Wallis Whetstones, Inc., sporadically mined both whetstone-grade and crushed novaculite for high-silica demands at a site south of Lonsdale near the Saline-Hot Spring County line. The Rogers Group evaluated high-silica novaculite near Glen Rose in the easternmost Ouachita Mountains for potential use in the ferrosilicon and silicon markets. This deposit and an asphalt plant were acquired by the Martin Marietta Co. in 2000.

There were approximately 100 active sand and gravel operations in Arkansas in 1999, the greatest number of these being in the southeastern one-half of the State (the Gulf Coastal Plain). For 2000, 19 new sand and gravel permits were issued by the Mining Division of the Arkansas Department of Environmental Quality (ADEQ). The permits were issued to Bonds Excavating Enterprises, Inc.; Cauldwell-McGrew Irrigation, Inc.; Delta Asphalt of Arkansas; Johnsville Sand & Gravel; Marion County Sand & Gravel, Inc.; McMasters Construction Co., Inc.; Meridian Aggregates, Inc.; Paul

Richardson Trucking, Inc.; Razorrock Materials Co.; Rogers Group, Inc.; Sevier County Aggregates, Inc.; White River Materials, Inc.; and Vulcan Materials Co. Some companies received more than one permit. Nine notifications of Intent to Quarry were received by ADEQ: Arkansas Phosphate & Lime Co. in Izard County; FeRiRis Stone, Inc. in White County; Flagstone Heights, Inc. in Washington County, L&N Construction, Inc. in Stone County; Martin Marietta Materials, Inc. in Pulaski County; Pope County Quarries, LLC in Pope County; Pryor Mountain Quarry in Cleburne County; and McGeorge Contracting Co., Inc. in Saline and Scott Counties. Authorization to Quarry were issued by the Mining Division of ADEQ for all the notifications received in 2000.

The AGC web site ([www.state.ar.us/agc/agc.htm](http://www.state.ar.us/agc/agc.htm)) hosted approximately 26,500 visitors during 2000, a dramatic increase from the first year on-line. Information posted on the web pages includes resource data, publications and ordering information, stratigraphic data, geology of Arkansas, Arkansas Board of Registration for Professional Geologists, Arkansas geology-related news items, and agency services. The AGC links page provides a complete link listing for State Geological Surveys, along with many Federal and Arkansas Government links. There is also an extensive list of links to active geology web sites, organizations, and universities.

Operators of 24 quartz contracts with the U.S. Forest Service on the Ouachita National Forest in Arkansas generated around \$21,000 in revenue. The U.S. Bureau of Land Management issued revenue on quartz amounted to \$3,650. About 45 metric tons of quartz was removed from quartz mines on the National Forest. Gas lease revenues were \$766,000 for the Ozark National Forest (\$679,280 in production revenues) and \$491,000 for the Ouachita National Forest (including \$4,000 from a location in southern Arkansas) in 2000.

The major product of the Ouachita-Ozark Highlands Assessment study, published in 2000, was a five-volume report on various aspects of the national forests in this region (the Ozark National Forest, the Ouachita National Forest, and the Mark Twain National Forest). The report included a summary of the mineral data for the assessment region. This is the fact-finding report on which policy decisions relating to national forests will be made for the next 10 to 15 years.

In 2000, the Arkansas Pollution Control and Ecology Commission implemented minor changes to Regulation Number 15, entitled "The Arkansas Open-Cut Mining and Land Reclamation Code." These changes included increasing the buffer zones adjacent to streams such that opencut mining operations must be at least 30 meters from the ordinary high-water mark of streams, unless the operator could document that a different buffer zone would still fully protect the stream. And, several minor provisions were added to the regulation aimed at protecting water quality and fish habitat for mine sites in and adjacent to streams. Also, the application for opencut mining must contain a map with existing ground level elevations tied to control points outside of the area to be mined. If the mine is proposed to be over 4 hectares (ha) in size, an Arkansas registered engineer or registered land surveyor must prepare the elevation map.

There were 140 active, permitted, and bonded noncoal mine sites in Arkansas during the year 2000. The Mining Division of the ADEQ issued 12 new noncoal mining permits in 2000.

ADEQ held reclamation bonds on approximately 2,800 ha of lands permitted for opencut mining in 2000 and released a total of 250 ha from reclamation bond.

TABLE 1  
NONFUEL RAW MINERAL PRODUCTION IN ARKANSAS 1/ 2/

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	1998		1999		2000 p/	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays, common	995	1,370	1,010	1,510	1,010	1,510
Gemstones	NA	912	NA	731	NA	856
Sand and gravel, construction	12,100	55,400	11,300	53,200	11,100	54,000
Silica stone 3/ metric tons	404	3,400	W	W	W	W
Stone, crushed	35,700	180,000	30,700	145,000	32,000	155,000
Combined values of bromine, cement, clays (kaolin), gypsum (crude), lime, sand and gravel (industrial), stone (dimension limestone, marble, sandstone), Tripoli	XX	242,000	XX	296,000	XX	294,000
Total	XX	484,000	XX	497,000	XX	506,000

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	1998				1999			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	23 r/	13,000 r/	\$60,600 r/	\$4.65 r/	25	8,420	\$38,100	\$4.52
Dolomite	2	W	W	4.54	2	W	W	4.83
Granite	6	12,300	64,100	5.21	6	12,500	58,200	4.66
Sandstone	18 r/	6,760 r/	37,800 r/	5.59	21	5,810	28,800	4.95
Quartzite and quartz	4	W	W	5.51	7	W	W	5.21
Miscellaneous stone	8	W	W	5.50 r/	13	W	W	5.99
Total or average	XX	35,700	180,000	5.05	XX	30,700	145,000	4.73

r/ Revised. 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; may not add to totals shown.

TABLE 3  
 ARKANSAS: CRUSHED STONE SOLD OR USED  
 BY PRODUCERS IN 1999, BY USE 1/ 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
<b>Construction:</b>			
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	207	\$1,210	\$5.83
Other coarse aggregate	131	772	5.89
Total or average	338	1,980	5.86
Coarse aggregate, graded:			
Concrete aggregate, coarse	425	2,000	4.71
Bituminous aggregate, coarse	731	4,200	5.75
Bituminous surface-treatment aggregate	W	W	8.36
Railroad ballast	28	184	6.57
Other graded coarse aggregate	900	5,200	5.77
Total or average	2,080	11,600	5.56
Fine aggregate (-3/8 inch):			
Stone sand, bituminous mix or seal	W	W	3.50
Screening, undesignated	W	W	5.82
Other fine aggregate	341	1,610	4.73
Total or average	341	1,610	4.73
Coarse and fine aggregates:			
Graded road base or subbase	1,980	9,720	4.92
Unpaved road surfacing	W	W	3.33
Crusher run or fill or waste	112	541	4.83
Roofing granules	W	W	8.36
Other coarse and fine aggregates	1,800	9,190	5.09
Total or average	3,890	19,500	5.00
Other construction materials	48	330	6.88
<b>Agricultural:</b>			
Agricultural limestone	(3/)	(3/)	6.30
Poultry grit and mineral food	(3/)	(3/)	3.60
Other agricultural uses	(3/)	(3/)	14.47
<b>Chemical and metallurgical:</b>			
Cement manufacture	(3/)	(3/)	2.30
Lime manufacture	(3/)	(3/)	3.59
<b>Special:</b>			
Asphalt fillers or extenders	(3/)	(3/)	5.05
Other fillers or extenders	(3/)	(3/)	5.81
<b>Other miscellaneous uses:</b>			
Abrasives	(3/)	(3/)	3.00
Other specified uses not listed	(3/)	(3/)	9.50
<b>Unspecified: 4/</b>			
Reported	15,600	74,900	4.80
Estimated	6,200	28,000	4.54
Total or average	21,800	103,000	4.73
Grand total or average	30,700	145,000	4.73

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/ Includes dolomite, granite, limestone, miscellaneous stone, quartz, quartzite, and sandstone.

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

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

TABLE 4  
ARKANSAS: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1999,  
BY USE AND DISTRICT 1/ 2/

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		Unspecified districts	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction:								
Coarse aggregate (+1 ½ inch) 3/	312	1,880	W	W	W	W	--	--
Coarse aggregate, graded 4/	W	W	W	W	W	W	--	--
Fine aggregate (-3/8 inch) 5/	W	W	--	--	W	W	--	--
Coarse and fine aggregate 6/	3,170	14,500	W	W	W	W	--	--
Other construction materials	48	330	--	--	--	--	--	--
Agricultural 7/	W	W	--	--	--	--	--	--
Chemical and metallurgical 8/	W	W	W	W	--	--	--	--
Special 9/	W	W	W	W	--	--	--	--
Other miscellaneous uses 10/	--	--	W	W	--	--	--	--
Unspecified: 11/								
Reported	5,720	27,200	9,870	47,600	--	--	20	90
Estimated	1,700	7,800	4,500	20,000	--	--	--	--
Total	13,900	68,000	16,600	76,000	88	860	20	90

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 dolomite, granite, limestone, miscellaneous stone, quartz, quartzite, and sandstone.

3/ Includes riprap and jetty stone, and other coarse aggregate.

4/ Includes bituminous aggregate (coarse), bituminous surface treatment aggregate, concrete aggregate, concrete aggregate (coarse), and railroad ballast and other graded coarse aggregate.

5/ Includes stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.

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

7/ Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.

8/ Includes cement manufacture and lime manufacture.

9/ Includes asphalt fillers or extenders and other fillers or extenders.

10/ Includes abrasives and other specified uses not listed.

11/ Reported and estimated production without a breakdown by end use.

TABLE 5  
ARKANSAS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1999,  
BY MAJOR USE CATEGORY 1/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate and concrete products	2,160	\$11,300	\$5.22
Asphaltic concrete aggregates and other bituminous mixtures	536	3,700	6.90
Road base and coverings	508	1,120	2.20
Fill	62	208	3.35
Other miscellaneous uses 2/	9	68	7.56
Unspecified: 3/			
Reported	6,700	31,200	4.66
Estimated	1,300	5,600	4.31
Total or average	11,300	53,200	4.72

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

2/ Includes filtration and snow and ice control.

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

TABLE 6  
 ARKANSAS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1999,  
 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 aggregate and concrete products	402	2,450	W	W	W	W
Asphaltic concrete aggregates and other bituminous mixtures	1	12	241	1,430	295	2,260
Road base and coverings	20	118	454	846	34	155
Fill	30	163	W	W	W	W
Other miscellaneous uses 2/	9	68	--	--	--	--
Unspecified: 3/						
Reported	2,540	8,720	3,980	21,600	182	867
Estimated	210	710	890	4,100	180	780
Total	3,210	12,200	6,320	31,200	1,730	9,680

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 filtration and snow and ice control.

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