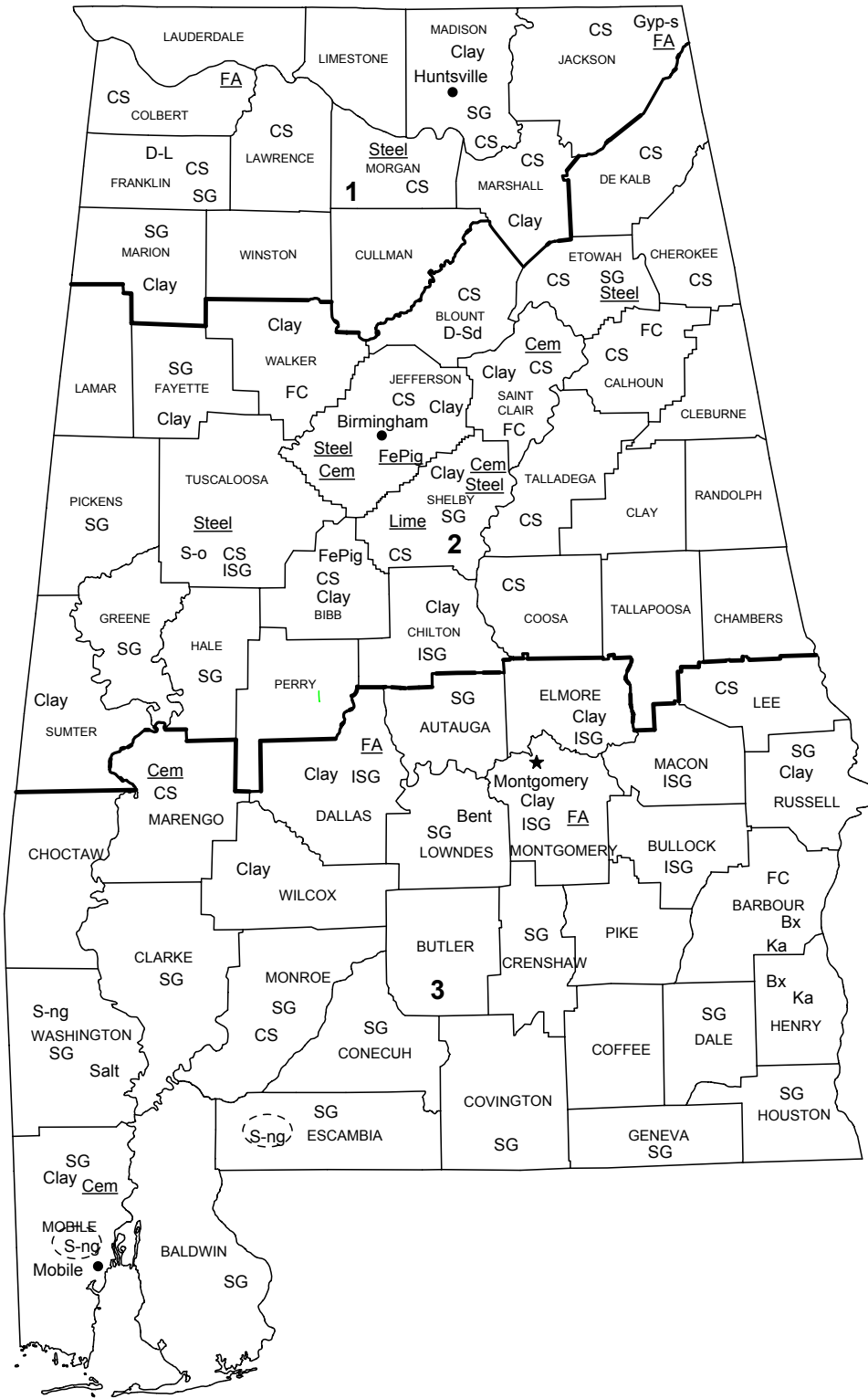


ALABAMA

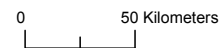


LEGEND

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

MINERAL SYMBOLS (Major producing areas)

- Bent Bentonite
- Bx Bauxite
- Clay Common clay
- Cem Cement plant
- CS Crushed stone
- D-L Dimension limestone
- D-Sd Dimension sandstone
- FA Ferroalloys plant
- FC Fire clay
- FePig Iron oxide pigments
- FePig Iron oxide pigment plant
- Gyp-s Synthetic gypsum
- ISG Industrial sand and gravel
- Ka Kaolin
- Lime Lime plant
- S-ng Sulfur (natural gas)
- S-o Sulfur (oil)
- Salt Salt
- SG Construction sand and gravel
- Steel Steel plant
- Concentration of mineral operations



THE MINERAL INDUSTRY OF ALABAMA

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

In 2002, the estimated value¹ of nonfuel mineral production for Alabama was \$968 million, based upon preliminary U.S. Geological Survey (USGS) data. This was about a 2.5% increase from that of 2001,² following a 2.1% increase from 2000 to 2001. The State increased to 16th in rank (17th in 2001) among the 50 States in total nonfuel mineral production value, of which Alabama accounted for almost 2.5% of the U.S. total.

The top four nonfuel mineral commodities produced in Alabama in 2002 continued to be cement (portland and masonry combined), crushed stone, lime, and construction sand and gravel (descending order of value). These four commodities accounted for about 94% of the State's total nonfuel mineral production value, whereas the combined value of cement and crushed stone represented about 74% of the total. In 2002, increased production and value of crushed stone led Alabama's rise in value. In 2001, the State's increase in value resulted mostly from increases in crushed stone, up \$12 million, lime, up \$6 million, and cement, up more than \$3 million. Smaller increases also occurred in common clays, up \$1.6 million, and dimension stone, up by about \$1 million. The largest decreases were those of construction sand and gravel and bentonite, down \$3.5 million and \$1.3 million, respectively (table 1).

Nonfuel mineral production in Alabama consisted entirely of industrial minerals. Compared with USGS estimates of the quantities produced in 2002 in the other 49 States, Alabama remained second in lime and kaolin; fourth in bentonite; one of the top five masonry-cement-producing States; and sixth in portland cement. The State rose to 1st from 3d in common clays, to 3d from 4th of six iron-oxide-pigment-producing States; to 6th from 8th in salt; and to 8th from 15th in gemstones (gemstones ranking based upon value). Additionally, Alabama was a significant producer of crushed stone, construction sand and gravel, and industrial sand and gravel (descending order of value). All metal production in the State, especially that of raw

steel, was the result of processing materials acquired from other domestic and foreign sources. Production of a natural mixture of bauxite (no longer used to produce primary aluminum) and bauxitic clay with a very low iron oxide content has been reported to the USGS since 1995 as kaolin; it is primarily used to make refractory products.

The narrative information that follows was provided by the Geological Survey of Alabama.³ In 2002, 160 companies or operations were involved in the mining and production of industrial nonfuel mineral resources in the State. Alabama's crushed stone industry surpassed the previous year's production with another year of record-breaking production. This included 46 limestone-dolomite operations that produced crushed stone; other crushed stone operations produced granite, quartzite, and sandstone. Birmingham-based Vulcan Materials Co. remained the largest construction aggregate producer in the country. In 2002, 90 sand and gravel operations (including both construction and industrial operations) produced materials. The Alabama Department of Transportation (ADT) was a large consumer of aggregate. Its current (2002) annual maintenance and construction program includes the consideration of nearly 11,000 miles of highway. This work represents one of the largest uses of concrete (asphaltic and bituminous-base) and aggregate (stone and gravel) in the State. In the course of its own work, the ADT publishes and periodically updates a listing of approved sources of coarse and fine aggregates (Alabama Development Office, 2003§⁴).

With regard to other industrial minerals, micronized calcium carbonate and building stone were produced by marble operations in the State; 22 clay pit operations (including bentonite, common clay and shale, fire clay, fuller's earth, and kaolin) actively produced clay in Alabama; while still other nonfuel mineral operations included the production of chalk, dimension stone (limestone, marble, and sandstone), salt, and recovered sulfur.

Exploration and Development

Mineral exploration in Alabama continued to focus on industrial mineral resources, and there were several large expansions of existing operations in the State. The Alabama Development Office reported to the GSA that recent capital investment in new or expanding industrial mineral operations in 2001-2 was more than \$2 million, including the nonfuel mineral commodities of cement, crushed stone, and fire clay.

More information on geology, hydrology, occurrence, mining history, and general economics of specific mineral resources in Alabama is available from the Geological Survey of Alabama.

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

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

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

³Lewis S. Dean, a geologist at the Geological Survey of Alabama, authored the text of the State mineral industry information provided by that agency.

⁴A reference that includes a section mark (§) is found in the Internet Reference Cited section.

Much of this information, as well as GSA contact information, is available at URL <http://www.gsa.state.al.us>.

Internet Reference Cited

Alabama Development Office, 2003, List I-1—Sources of coarse and fine aggregates—Montgomery, Alabama, accessed August 12, 2003, at URL http://www.dot.state.al.us/Bureau/Materials_Tests/Testing/msdsar/LISTS%5Cli-01.pdf.

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

(Thousand metric tons and thousand dollars unless)

Mineral	2000		2001		2002 ^P	
	Quantity	Value	Quantity	Value	Quantity	Value
Cement:						
Masonry	401	45,600 ^e	380	38,900 ^e	390	40,000 ^e
Portland	4,340	342,000 ^e	4,480	352,000 ^e	4,360	343,000 ^e
Clays:						
Bentonite	W	W	132	4,010	129	3,930
Common	2,090	23,200	2,050	24,800	2,280	24,300
Gemstones	NA	108	NA	108	NA	356
Lime	1,950	121,000	2,040	127,000	1,980	127,000
Sand and gravel:						
Construction	14,500	63,700	13,600	60,200	14,100	63,500
Industrial	731	10,100	743	9,420	743	9,420
Stone, crushed	48,500 ^r	296,000 ^r	49,400	308,000	53,000	337,000
Combined values of clays (kaolin), iron oxide pigments (crude), salt, stone (dimension marble and sandstone), and values indicated by symbol W	XX	24,400	XX	20,100	XX	19,600
Total	XX	926,000 ^r	XX	945,000	XX	968,000

^eEstimated. ^PPreliminary. ^rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined values" data. XX Not applicable.

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

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

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

Kind	2000				2001			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone ²	46 ^r	39,500	\$237,000	\$5.98	46	41,200	\$252,000	\$6.13
Dolomite	3	W	W	7.09	3	W	W	7.18
Marble	2 ^r	W	W	6.48 ^r	2	W	W	6.90
Sandstone	6	2,310	15,500	6.71	5	1,370	9,260	6.75
Granite	1	W	W	5.80	1	W	W	5.77
Slate	2	W	W	6.77	2	W	W	7.25
Miscellaneous stone	4	51	182	3.57	3	127	420	3.30
Total or average	XX	48,500 ^r	296,000 ^r	6.01 ^r	XX	49,400	308,000	6.24

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

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

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

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

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:			
Coarse aggregates (+1 1/2 inch):			
Macadam	W	W	\$7.57
Riprap and jetty stone	121	\$642	5.29
Filter stone	W	W	3.53
Other coarse aggregates	418	3,020	7.23
Total or average	576	3,850	6.69
Coarse aggregates, graded:			
Concrete aggregate, coarse	W	W	6.14
Bituminous aggregate, coarse	W	W	4.69
Bituminous surface-treatment aggregate	W	W	6.77
Other graded coarse aggregates	7,270	45,300	6.23
Total or average	7,510	46,700	6.22
Fine aggregate (-3/8 inch):			
Stone sand, concrete	W	W	6.50
Stone sand, bituminous mix or seal	W	W	7.15
Screening, undesignated	130	871	6.70
Other fine aggregates	2,440	16,000	6.57
Total or average	2,980	19,600	6.60
Coarse and fine aggregates:			
Graded road base or subbase	1,040	5,070	4.86
Unpaved road surfacing	W	W	7.11
Terrazzo and exposed aggregate	W	W	6.37
Crusher run or fill or waste	722	4,140	5.74
Other coarse and fine aggregates	5,230	32,800	6.28
Total or average	7,140	43,000	6.02
Other construction materials	1,290	9,320	7.21
Agricultural limestone	(2)	(2)	5.84
Chemical and metallurgical:			
Cement manufacture	(2)	(2)	2.85
Lime manufacture	3,270	21,100	6.47
Miscellaneous uses	16	140	8.75
Unspecified: ³			
Reported	16,900	110,000	6.53
Estimated	7,750	48,220	6.22
Total or average	24,600	158,000	6.43
Grand total or average	49,400	308,000	6.24

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

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

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

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

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

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1 1/2 inch) ²	293	1,670	W	W	W	W
Coarse aggregate, graded ³	W	W	W	W	W	W
Fine aggregate (-3/8 inch) ⁴	W	W	1,970	11,800	W	W
Coarse and fine aggregate ⁵	4,310	23,300	W	W	W	W
Other construction materials	--	--	1,290	9,320	--	--
Agricultural ⁶	W	W	W	W	--	--
Chemical and metallurgical ⁷	--	--	W	W	--	--
Other miscellaneous uses	4	21	12	119	--	--
Unspecified: ⁸						
Reported	3,400	22,300	10,400	70,200	3,020	17,500
Estimated	840	5,900	6,800	42,000	110	630
Total	12,400	73,900	32,900	204,000	3,900	29,000
Unspecified districts						
	Quantity	Value				
Construction:						
Coarse aggregate (+1 1/2 inch) ²	--	--				
Coarse aggregate, graded ³	93	713				
Fine aggregate (-3/8 inch) ⁴	22	144				
Coarse and fine aggregate ⁵	43	204				
Other construction materials	--	--				
Agricultural ⁶	--	--				
Chemical and metallurgical ⁷	--	--				
Other miscellaneous uses	--	--				
Unspecified: ⁸						
Reported	--	--				
Estimated	--	--				
Total	158	1,060				

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

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

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

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

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

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

⁶Includes agricultural limestone.

⁷Includes cement manufacture and lime manufacture.

⁸Reported and estimated production without a breakdown by end use.

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

Use	Quantity	Value	Unit
	(thousand metric tons)	(thousands)	value
Concrete aggregates (including concrete sand) ²	4,570	\$17,400	\$3.81
Concrete products (blocks, bricks, pipe, decorative, etc.)	148	1,210	8.18
Asphalt concrete aggregates and other bituminous mixtures	906	4,960	5.47
Road base and coverings	307	1,390	4.53
Road stabilization (lime)	26	171	6.58
Fill	253	750	2.96
Other miscellaneous uses	5	23	4.60
Unspecified: ³			
Reported	2,680	13,100	4.89
Estimated	4,600	20,300	4.46
Total or average	13,600	60,200	4.43

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

²Includes plaster and gunite sands.

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

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

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregates (including concrete sand) ²	827	5,010	1,270	5,140	2,480	7,220
Concrete products (blocks, bricks, pipe, decorative, etc.)	--	--	--	--	148	1,210
Asphaltic concrete aggregates and road base materials ³	249	1,290	411	2,570	580	2,660
Fill	136	510	9	19	108	221
Other miscellaneous uses ⁴	1	6	120	534	62	394
Unspecified: ⁵						
Reported	--	--	--	--	2,680	13,100
Estimated	45	200	110	470	4,400	19,630
Total	1,260	7,010	1,910	8,740	10,500	44,400

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

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

²Includes plaster and gunite sands.

³Includes road and other stabilization (lime).

⁴Includes snow and ice control.

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