

# THE MINERAL INDUSTRY OF FLORIDA

*This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Florida Department of Mines and Mineral Resources for collecting information on all nonfuel minerals.*

Florida ranked eighth among the 50 States in total nonfuel mineral production value<sup>1</sup> in 1996, according to the U.S. Geological Survey (USGS). This is a decline from seventh place in 1995. The estimated value for 1996 was more than \$1.5 billion; though slightly up from 1995, the value was virtually unchanged. This followed a more than 12% increase in 1995 from 1994 (based on final 1995 data). The State accounted for about 4% of the U.S. total nonfuel mineral production value.

Florida continued to be the Nation's leading phosphate rock-mining State in 1995, producing more than six times the quantity of material as that of the next-highest State. Phosphate rock is only produced in four States. The phosphate rock industry usually has the most impact on the State's raw nonfuel mineral economy. Other mineral commodities that commonly have a significant effect on Florida's overall nonfuel mineral production value are crushed stone and portland cement. In 1996, most of the State's nonfuel mineral commodities increased in value. Their combined total increased slightly more than equaled an 8.4% decrease in phosphate rock value. Only phosphate rock decreased in value. Compared with 1995, increases in zircon concentrate, crushed stone, and construction sand and gravel values accounted for 81% of nonfuel mineral commodity value gains for 1996. Other values that increased in 1996 were those for portland cement, fuller's earth clays, titanium concentrates (both ilmenite and rutile), masonry cement, magnesium compounds, industrial sand and gravel, peat, staurolite, and kaolin clays. This followed a strong year in 1995 for the Florida mining industry when, similarly, nearly all mineral commodities increased in value. Phosphate rock then lead the way with a 17.5% increase over the 1994 value. Moderate increases occurred in construction sand and gravel, titanium concentrates, crushed stone, portland cement, and magnesium compounds in 1995.

Overall in 1996, Florida's mining industry maintained its rebound in nonfuel mineral production value which had begun in 1994. Since reaching the State's second alltime high of \$1.61 billion in 1989, the State's mineral value had been on a downward trend. This culminated in the 9% drop to \$1.31 billion from 1992 to 1993; declining phosphate rock value was the principal contributor. Most other mineral commodities in 1993 increased. In 1994, the increased values of phosphate rock, crushed stone, and portland and masonry cements were principally responsible for the year's turnaround in mineral value.

Florida, almost exclusively an industrial-mineral-producing State, remained first in the quantity of peat produced, second in fuller's earth and magnesium compounds, third in crushed stone, and seventh in portland cement (all 1996 rankings are based on USGS-estimated data). The State climbed from third to first in the production of masonry cement, and Florida was the only State to produce zircon concentrates, staurolite, and ilmenite and rutile concentrates (titanium ores). Additionally, Florida mining pits produced significant quantities of construction sand and gravel.

The following narrative information was provided by the Florida Geological Survey<sup>2</sup> (FGS). The Florida Legislature passed a statute in 1996 that enabled the FGS to compile and hold (protect) proprietary data pertaining to Florida's mineral operations. This will allow the FGS to more fully participate with the USGS in its mineral industry information program.

The phosphate industry was dominated by IMC-Agrico Co. having mines and processing plants located in Hardee, Hillsborough, Manatee, and Polk Counties. Other companies engaged in phosphate mining in the State in 1996 included: Cargill Fertilizer, Inc. operations in Hardee and Polk Counties; C.F. Mining Corp., Hardee County; NU-Gulf, Inc., Manatee County; and PCS Phosphate Co., Hamilton County. PCS Phosphate's Hamilton County operation was formerly the White Springs operation of Occidental Chemical Agricultural Products Inc.

The Florida Limerock and Aggregates Institute (FLAI) represents a number of limestone operators in Florida. The Institute is an autonomous division of the Florida Concrete Products Association, with which it merged several years ago. The primary focus of the FLAI is to pursue promotional, technical, and regulatory matters of concern to the aggregates industry. The Florida aggregates industry is working closely with the Florida Department of Transportation (FDOT) to address technical issues, especially the quality of source materials and the end uses of those materials. The two organizations are working together to improve the effectiveness of the quality assurance program used to control aggregate quality in the State. Of late, one of their primary concerns has been the use of recycled asphalt pavement as an aggregate component of hot-asphalt mix. FDOT focused on improving the performance of asphalt pavements.

A second important issue for the limestone industry

product passing through multiple terminals, may serve to introduce more degradation of the physical characteristics of the aggregate product.

E. I. du Pont de Nemours & Co. Inc. planned to mine heavy minerals along the eastern edge of the Okefenokee Swamp. But the mining will occur over the border in Georgia and therefore, theoretically at least, should not directly affect Florida.

There were 10 peat mines in Florida. One of those, Stover Peat Co. near Tampa, was idle. The company currently has no plans to resume mining.

encompass variations in meaning, depending on 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 1996 USGS mineral production data published in this chapter are estimates as of February 1997. For some commodities, e.g., 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. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document # 1000 for a telephone listing of all mineral commodity specialists, or call USGS information at (703) 648-4000 for the specialist's name and number. This telephone listing may also be retrieved over the Internet at: <http://minerals.er.usgs.gov/minerals/contacts/comdir.html> .

<sup>2</sup>Steven Spencer, Coastal/Economic Geologist, authored the text submitted by the Florida Geological Survey.

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<sup>1</sup>The terms "nonfuel mineral production" and related "values"

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

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	1994		1995		1996 p/	
	Quantity	Value	Quantity	Value	Quantity	Value
Cement:						
Masonry	400	34,600	383	35,200	418	38,300
Portland	3,370	228,000	3,170	233,000	3,210	236,000
Clays 3/	430	55,000	421	54,300	433	55,900
Gemstones	NA	W	NA	W	NA	1
Peat	206	3,230	294 4/	5,390 4/	288 4/	6,200 4/
Sand and gravel:						
Construction	16,600	60,700	19,300	69,300	20,500	76,700
Industrial	540	6,120	547	6,340	535	6,590
Stone (crushed)	66,300 5/	343,000	68,000	350,000	70,000	368,000
Combined value of clays (common), magnesium compounds, phosphate rock, rare-earth metal concentrates (1994), staurolite, titanium concentrates (ilmenite and rutile), zircon concentrates, and values indicated by symbol W	XX	669,000	XX	783,000	XX	749,000
Total	XX	1,400,000	XX	1,540,000	XX	1,540,000

p/ Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

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

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

3/ Excludes certain clays; kind and value included with "Combined value" data.

4/ Data series changed to production beginning in 1995, prior years shipment data may not be comparable.

5/ Excludes certain stones; kind and value included with "Combined value" data.

TABLE 2  
FLORIDA: CRUSHED STONE 1/ SOLD OR USED BY PRODUCERS  
IN 1995, BY USE 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	96	\$591	\$6.16
Filter stone	11	120	10.90
Coarse aggregate, graded:			
Concrete aggregate, coarse	7,740	58,000	7.49
Bituminous aggregate, coarse	2,480	13,300	5.36
Bituminous surface-treatment aggregate	W	W	10.50
Railroad ballast	W	W	4.18
Other graded coarse aggregate	793	4,830	6.09
Fine aggregate (-3/8 inch):			
Stone sand, concrete	1,980	10,500	5.30
Stone sand, bituminous mix or seal	W	W	4.73
Screening, undesignated	2,770	13,100	4.73
Other fine aggregates	1,120	6,190	5.53
Coarse and fine aggregates:			
Graded road base or subbase	12,900	40,700	3.16
Unpaved road surfacing	243	1,190	4.90
Crusher run or fill or waste	5,670	15,100	2.66
Other coarse and fine aggregates	W	W	3.09
Other construction materials 3/	1,950	8,700	4.46
Agricultural:			
Agricultural limestone	406	3,200	7.88
Poultry grit and mineral food	199	2,190	11.00
Other agricultural uses	194	1,030	5.31
Chemical and metallurgical:			
Cement manufacture	(4/)	(4/)	1.40
Chemical stone	15	209	13.90
Glass manufacture	118	1,560	13.20
Special: Asphalt fillers or extenders	246	2,040	8.29
Other specified uses not listed	(4/)	(4/)	7.80

See footnotes at end of table.

TABLE 2--Continued  
 FLORIDA: CRUSHED STONE 1/ SOLD OR USED BY PRODUCERS  
 IN 1995, BY USE 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Unspecified: 5/			
Actual	21,800	138,000	6.33
Estimated	5,610	26,500	4.72
Total	68,000	350,000	5.14

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

1/ Includes calcareous marl, dolomite, granite, limestone, limestone-dolomite, and shell.

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

3/ Includes drain fields.

4/ Withheld to avoid disclosing company proprietary data; included in "Total."

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

TABLE 3  
 FLORIDA: CRUSHED STONE SOLD OR USED, BY KIND 1/

Kind	1994				1995			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone 2/	80 r/	64,000 r/	\$329,000 r/	\$5.14	74	64,700	\$333,000	\$5.15
Dolomite	4 r/	1,160	W	W	4	1,120	7,010	6.28
Shell	6	1160	4530	3.92	5	1,090	4,100	3.78
Calcareous marl	1 r/	(3/)	W	W	2	W	W	4.53
Granite	--	--	--	--	3	W	W	5.26
Total	XX	66,300 r/	343,000	5.18 r/	XX	68,000	350,000	5.14

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

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

2/ Includes "Limestone-dolomite," reported with no distinction between the two.

3/ Excludes calcareous marl quantity from State total to avoid disclosing company proprietary data.

TABLE 4  
FLORIDA: CRUSHED STONE 1/ SOLD OR USED BY PRODUCERS IN 1995, BY USE AND DISTRICT 2/

(Thousand metric tons and thousand dollars)

Use	District 1		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch) 3/	--	--	70	525	37	186
Coarse aggregate, graded 4/	--	--	7,040	56,700	4,120	20,200
Fine aggregate (-3/8 inch) 5/	--	--	4,060	21,400	2,960	13,900
Coarse and fine aggregate 6/	68	474	9,450	32,000	9,590	25,400
Other construction materials 7/	(8/)	(8/)	(8/)	(8/)	--	--
Agricultural 9/	(8/)	(8/)	(8/)	(8/)	--	--
Chemical and metallurgical 10/	--	--	(8/)	(8/)	--	--
Special 11/	--	--	246	2,040	--	--
Other miscellaneous uses 12/	--	--	(8/)	(8/)	--	--
Unspecified: 13/						
Actual	833	3,230	2,990	16,500	18,000	118,000
Estimated	1,100	5,310	1,970	9,550	2,540	11,600
Total	2,200	10,700	28,600	150,000	37,200	189,000

1/ Production reported in District 2 was included with "District 3" to avoid disclosing company proprietary data.

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

3/ Includes filter stone and riprap and jetty stone.

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

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

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

7/ Includes drain fields.

8/ Withheld to avoid disclosing company proprietary data; included in "Total."

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

10/ Includes cement manufacture, chemical stone for alkali works, and glass manufacture.

11/ Includes asphalt fillers or extenders.

12/ Includes other specified uses not listed.

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

TABLE 5  
FLORIDA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1995,  
BY MAJOR USE CATEGORY 1/

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	6,110	\$24,900	\$4.08
Plaster and gunite sands	359	1,460	4.05
Concrete products (blocks, bricks, pipe, decorative, etc.)	479	2,240	4.68
Asphaltic concrete aggregates and road base materials 2/	3,120	6,500	2.08
Other 3/	788	3,830	4.86
Unspecified: 4/			
Actual	3,320	13,500	4.06
Estimated	5,170	16,900	3.26
Total or average	19,300	69,300	3.58

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

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

3/ Includes filtration.

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

TABLE 6  
 FLORIDA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1995,  
 BY USE AND DISTRICT 1/

(Thousand metric tons and thousand dollars)

Use	District 1		District 2	
	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products 2/	W	W	W	W
Asphaltic concrete aggregates and road base materials 3/	W	W	W	W
Other miscellaneous uses 4/	1,540	3,910	4,790	20,600
Unspecified: 5/				
Actual	229	2,110	1,120	4,770
Estimated	2,060	7,070	2,110	6,710
Total	3,820	13,100	8,020	32,100
	District 3		District 4	
	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products 2/	1,350	5,710	--	--
Asphaltic concrete aggregates and road base materials 3/	1,610	3,760	867	1,520
Other miscellaneous uses 4/	696	3,390	--	--
Unspecified: 5/				
Actual	1,690	6,140	283	480
Estimated	889	2,700	119	408
Total	6,240	21,700	1,270	2,410

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

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

2/ Includes plaster and gunite sands.

3/ Includes fill, road and other stabilization (cement and lime).

4/ Includes filtration.

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