



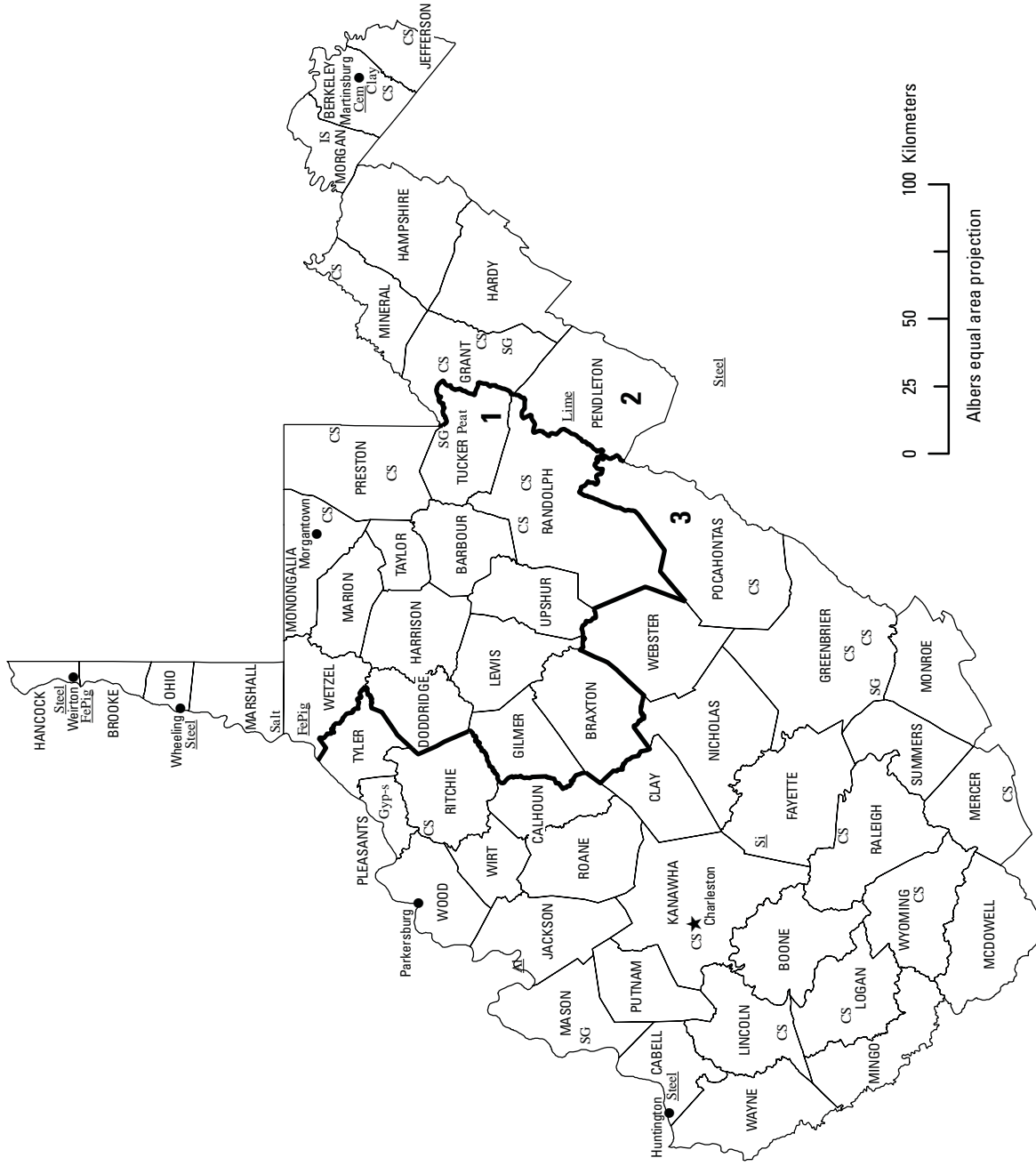
# 2006 Minerals Yearbook

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## WEST VIRGINIA

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# WEST VIRGINIA



**LEGEND**

- County boundary
- ★ Capital
- City
- Crushed stone/sand and gravel district boundary

**MINERAL SYMBOLS  
(Major producing areas)**

- Al Aluminum plant
- Cem Cement plant
- Clay Common clay
- CS Crushed stone
- FePig Iron oxide pigment plant
- Gyp-s Synthetic gypsum
- IS Industrial sand
- Lime Lime plant
- Peat Peat
- Salt Salt
- SG Construction sand and gravel
- Si Silicon metal plant
- Steel Steel plant

Source: West Virginia Geological and Economic Survey/U.S. Geological Survey (2006).

# THE MINERAL INDUSTRY OF WEST VIRGINIA

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

In 2006, West Virginia's nonfuel raw mineral production<sup>1</sup> was valued at \$230 million, based upon annual U.S. Geological Survey (USGS) data. This was a 10%, or \$21 million, increase from the State's total nonfuel mineral value of \$209 million in 2005, which was a nearly 26%, or \$43 million, increase from that of 2004.

In 2006, crushed stone continued to be West Virginia's leading nonfuel mineral commodity by value, accounting for 52% of the State's total nonfuel mineral production value. Cement (portland and masonry), lime, industrial sand and gravel, and construction sand and gravel followed (in descending order of value). These five mineral commodities accounted for 98% of the State's total value of nonfuel raw mineral production.

Crushed stone production was nearly the same in 2006 as in the previous year with the production of 14.5 million metric tons; nevertheless, the commodity's value increased by \$12 million and led the State's increase in nonfuel mineral production value for the year. Portland cement and masonry cement combined followed, rising by about \$11 million, as a result of increases in the production and unit value of portland cement, while small decreases took place in the same for masonry cement. Construction sand and gravel also showed increases in production and value; a 35% increase in production resulted in a 110%, or nearly \$2 million, increase in its value (table 1). The largest decrease in value took place in salt, in which a relatively small drop in the commodity's production resulted in a decrease in value of approximately \$4 million.

West Virginia continued to rank 10th among 15 producing States in the quantity of salt produced in the State and remained a significant producer of crushed stone. The State's mines produced industrial minerals and coal; no metals were mined in West Virginia. Primary aluminum and raw steel were produced in the State, but both metals were processed from materials acquired from foreign and other domestic sources. In 2006, West Virginia ranked 9th in the Nation (10th in 2005) in the production of primary aluminum among 11 producing States.

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<sup>1</sup>The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon the 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 2006 USGS mineral production data published in this chapter are those available as of March 2008. All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—can be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals>.

## Industry Trends and Developments

According to the West Virginia Geological and Economic Survey, although aggregate, by far, was the largest use for the State's limestone resources, additionally, limestone was processed for use in the production of cement and in steel production and for such uses as agricultural lime and ballast, flue gas desulfurization, fluidized bed combustion, low silica rock dust for the coal industry, metallurgical flux, stream revitalization, various chemical applications, and wastewater treatment (Britton, Blake, and McColloch, 2007).

## Commodity Review

### *Industrial Minerals*

**Stone, Crushed.**—The majority of West Virginia's limestone production was from a northeast-southwest trend in the counties along the eastern border with Virginia. The trend extended northeastward into the State's eastern panhandle along outcrop belts of thick carbonate units of Ordovician, Silurian, Devonian and Mississippian age (spanning an age of from about 480 million years to about 320 million years). The county that produced the most limestone was Monongalia County, from which stone was quarried from the Greenbrier Limestone of Mississippian age. In the western portion of the State in Ritchie County (anomalous to the norm of the State's eastern production trend), an underground limestone mine opened in 2005, from which approximately 590,000 metric tons (t) of stone was extracted; interestingly, this source was also the Greenbrier Limestone. Another mine in Harrison County produced more than 75,000 t of stone (also in 2005) from the Upper Pennsylvania Monongahela Formation.

Owing to several major highway construction projects, the demand for limestone aggregate was expected to continue to increase. These projects included the Coalfields Expressway in southern West Virginia and the Corridor H project across the east-central mountain portion of the State. Additionally, a number of large construction projects and smaller road projects throughout the State were expected to continue to demand additional aggregate (Britton, Blake, and McColloch, 2007).

## Reference Cited

Britton, J.Q., Blake, B.M., Jr., and McColloch, G.H., 2007, West Virginia, in annual review 2006: Mining Engineering, v. 59, no. 5, May, p. 123–125.

TABLE 1  
NONFUEL RAW MINERAL PRODUCTION IN WEST VIRGINIA<sup>1,2</sup>

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	2004		2005		2006	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays, common	161	441	186	524	W	W
Gemstones, natural	NA	1	NA	1	NA	1
Sand and gravel:						
Construction	524	2,500	318	1,630	429	3,470
Industrial	343	17,300	369	17,800	333	17,200
Stone, crushed	14,700	72,600	14,600 <sup>r</sup>	108,000 <sup>r</sup>	14,500	120,000
Combined values of cement, lime, peat, salt, stone (dimension sandstone), and value indicated by the symbol W	XX	73,500	XX	81,100	XX	89,100
Total	XX	166,000	XX	209,000 <sup>r</sup>	XX	230,000

<sup>r</sup>Revised. NA Not available. W Withheld to avoid disclosing company proprietary data. Withheld value included in "Combined values" data. XX Not applicable.

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

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

TABLE 2  
WEST VIRGINIA: CRUSHED STONE SOLD OR USED, BY KIND<sup>1</sup>

Kind	2005			2006		
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Number of quarries	Quantity (thousand metric tons)	Value (thousands)
Limestone	25 <sup>r</sup>	13,300 <sup>r</sup>	\$98,600 <sup>r</sup>	23	13,700	\$114,000
Sandstone	6	1,260	9,620	6	893	5,550
Total	XX	14,600 <sup>r</sup>	108,000 <sup>r</sup>	XX	14,500	120,000

<sup>r</sup>Revised. XX Not applicable.

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

TABLE 3  
WEST VIRGINIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2006, BY USE<sup>1</sup>

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
<b>Construction:</b>		
Coarse aggregate (+1½ inch):		
Macadam	W	W
Riprap and jetty stone	266	1,400
Filter stone	W	W
Other coarse aggregate	70	1,170
Total	620	4,530
Coarse aggregate, graded:		
Concrete aggregate, coarse	206	1,400
Bituminous aggregate, coarse	767	4,770
Bituminous surface-treatment aggregate	63	461
Railroad ballast	(2)	(2)
Other graded coarse aggregate	989	10,800
Total	2,030	17,500
Fine aggregate (-¾ inch):		
Stone sand, concrete	(3)	(3)
Stone sand, bituminous mix or seal	178	993
Screening, undesignated	210	1,580
Other fine aggregate	680	6,350
Total	1,070	8,920
Coarse and fine aggregate:		
Graded road base or subbase	1,340	7,290
Unpaved road surfacing	(4)	(4)
Crusher run or fill or waste	937	6,130
Other coarse and fine aggregates	1,060	9,490
Total	3,330	22,900
Other construction materials	727	6,040
Agricultural, limestone	(5)	(5)
Special, mine dusting or acid water treatment	(5)	(5)
Other miscellaneous uses, waste material	(5)	(5)
Unspecified: <sup>6</sup>		
Reported	4,460	39,500
Estimated	2,300	20,000
Total	6,740	60,000
Grand total	14,500	120,000

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

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

<sup>2</sup>Withheld to avoid disclosing company proprietary data; included with "Other graded coarse aggregates."

<sup>3</sup>Withheld to avoid disclosing company proprietary data; included with "Other fine aggregates."

<sup>4</sup>Withheld to avoid disclosing company proprietary data; included with "Other coarse and fine aggregates."

<sup>5</sup>Withheld to avoid disclosing company proprietary data; included in "Grand total."

<sup>6</sup>Reported and estimated production without a breakdown by end use.

TABLE 4  
WEST VIRGINIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2006, BY USE AND DISTRICT<sup>1</sup>

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch) <sup>2</sup>	W	W	W	W	W	W
Coarse aggregate, graded <sup>3</sup>	W	W	W	W	W	W
Fine aggregate (-¾ inch) <sup>4</sup>	W	W	W	W	W	W
Coarse and fine aggregate <sup>5</sup>	W	W	W	W	W	W
Other construction materials	727	6,040	--	--	--	--
Agricultural <sup>6</sup>	W	W	--	--	W	W
Special <sup>7</sup>	--	--	W	W	--	--
Other miscellaneous uses <sup>8</sup>	--	--	--	--	W	W
Unspecified: <sup>9</sup>						
Reported	3,170	28,000	561	5,000	729	6,430
Estimated	--	--	1,700	15,000	590	5,300
Total	5,240	43,800	5,120	47,900	4,190	28,300

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

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

<sup>2</sup>Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.

<sup>3</sup>Includes bituminous aggregate (coarse), bituminous surface-treatment aggregate, concrete aggregate (coarse), railroad ballast, and other graded coarse aggregate.

<sup>4</sup>Includes screening (undesignated), stone sand (bituminous mix or seal), stone sand (concrete), and other fine aggregate.

<sup>5</sup>Includes crusher run or fill or waste, graded road base or subbase, unpaved road surfacing, and other coarse and fine aggregates.

<sup>6</sup>Includes agricultural limestone.

<sup>7</sup>Includes mine dusting or acid water treatment.

<sup>8</sup>Includes waste material.

<sup>9</sup>Reported and estimated production without a breakdown by end use.