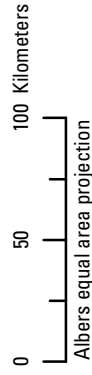
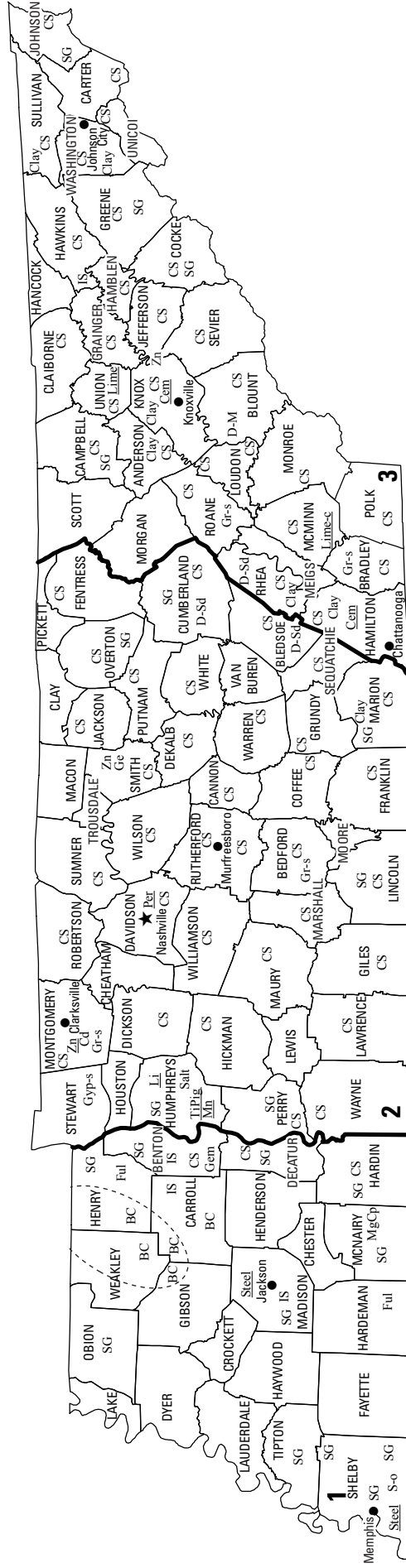




2012–2013 Minerals Yearbook

TENNESSEE

TENNESSEE



LEGEND

—	County boundary	CS	Crushed stone	<u>Mn</u>	Manganese plant
★	Capital	D-M	Dimension marble	MgCp	Magnesium compounds
●	City	D-Sd	Dimension sandstone	Per	Perlite
—	Crushed stone/sand and gravel district boundary	Ful	Fuller's earth	Salt	Salt
		Gem	Gemstones	SG	Construction sand and gravel
		Ge	Germanium (byproduct)	<u>Steel</u>	Steel plant
		Gr-s	Synthetic graphite	S-o	Sulfur (oil)
		Gyp-s	Synthetic gypsum	TiPig	Titanium pigment plant
		IS	Industrial sand	Zn	Zinc
		<u>Li</u>	Lithium plant	<u>Zn</u>	Zinc plant
		<u>Lime</u>	Lime plant		Concentration of mineral operations
		<u>Lime-c</u>	Lime plant - captive		

MINERAL SYMBOLS

(Principal producing areas)

BC	Ball clay
Cd	Cadmium (byproduct)
<u>Cem</u>	Cement plant
Clay	Common clay or shale

THE MINERAL INDUSTRY OF TENNESSEE

This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the Tennessee Department of Environment and Conservation, Division of Geology, for collecting information on all nonfuel minerals.

In 2013, the value of the nonfuel mineral production¹ in the State of Tennessee increased to \$966 million, 1.28% of the total U.S. nonfuel mineral production, ranking it 26th in the Nation. In 2012, the corresponding value was \$935 million, 1.22% of the U.S. total nonfuel mineral production, ranking it 24th among the 50 States. In 2013, on a per capita basis, nonfuel mineral production in Tennessee had a value of \$149 compared with the national average of \$238. In 2012, the per capita value was \$143 compared with the national average of \$241.

The value of nonfuel mineral production in Tennessee for the years 2006 through 2013 was as follows (in millions of dollars): \$864 (2006), \$992 (2007), \$859 (2008), \$695 (2009), \$838 (2010), \$878 (2011), \$935 (2012), and \$966 (2013).

In 2013, there were 2,014 employees in nonfuel mineral mines in Tennessee and 1,127 in mills and preparation plants. In 2012, the corresponding numbers were 2,057 in nonfuel mineral mines and 1,129 in mills and preparation plants (U.S. Mine Safety and Health Administration, 2013, p.15; 2014, p. 15). In 2013, the average annual wage in Tennessee for all mining was \$62,690 compared with \$44,273 for all industries. In 2012, the corresponding figures were \$65,085 and \$44,255, respectively (National Mining Association, unpub. data, February 4, 2016).

In 2013, on the basis of value, crushed stone remained the leading nonfuel mineral commodity in Tennessee (table 1). On the basis of quantity, Tennessee was again the leading producer of ball clay out of five producing States, and remained second in the production of zinc concentrate out of four producing States. The only U.S. primary zinc smelter was located in Tennessee. Byproducts of the smelter included cadmium metal and germanium concentrate, with the germanium-containing zinc ore coming from the Middle Tennessee Zinc mine complex, one of the two zinc mining complexes in the State. Though not a

leading producer of dimension stone overall, Tennessee ranked second in dimension marble out of four dimension-marble-producing States in 2013; it had been first in 2012. The State ranked seventh in dimension sandstone production out of 15 producing States in 2013 but was fifth in 2012.

Common clay, masonry cement, and portland cement were aggregated with other States to avoid disclosing company proprietary data. Common clay production in Tennessee and Kentucky decreased by 30% and value decreased by 13% in 2013, compared with 2012, and nationally common clay production and value decreased by 11% and 9%, respectively. Data for Tennessee's two cement plants were combined with six other cement plants in Alabama, Kentucky, and Tennessee; portland cement production at these eight plants increased by almost 2% while masonry cement increased by 26%. Nationally, portland and masonry cement increased by 3% and by 10%, respectively. Other nonfuel mineral commodities mined in the State included fuller's earth (montmorillonite), industrial sand and gravel, lime, natural gemstones, and salt. Industrial sand and gravel production increased by 5% in 2013 from 2012, but value increased by 34% because of higher prices, owing to increased demand for sand for use as proppants in the oil and gas industry.

Tennessee had several downstream metal- and industrial-mineral-processing plants that used raw materials from sources other than Tennessee mines. Though the only aluminum smelter in the State closed permanently in 2012, steel continued to be produced. Synthetic graphite, a source of carbon for steel as well as high-tech applications, was manufactured in the State. Synthetic gypsum was produced as a byproduct from flue gas desulfurization at industrial sites, such as powerplants.

References Cited

- U.S. Mine Safety and Health Administration, [2013], Mine injury and worktime, quarterly, January–December 2012: U.S. Mine Safety and Health Administration, Final, closeout edition, 33 p. (Accessed February 8, 2016, at http://arlweb.msha.gov/Stats/Part50/WQ/MasterFiles/MIWQ%20Master_20125.pdf.)
- U.S. Mine Safety and Health Administration, [2014], Mine injury and worktime, quarterly, January–December 2013: U.S. Mine Safety and Health Administration, Final, closeout edition, 34 p. (Accessed on February 8, 2016, at http://arlweb.msha.gov/Stats/Part50/WQ/MasterFiles/MIWQ%20Master_20135.pdf.)

¹The 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 USGS mineral production data published in this chapter are those available as of February 2016. Data in this report are rounded to three significant digits and percentages are calculated from unrounded data. All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—can be retrieved over the Internet at <http://minerals.usgs.gov/minerals>.

TABLE 1
NONFUEL MINERAL PRODUCTION IN TENNESSEE^{1,2}

(Thousand metric tons and thousand dollars)

Mineral	2011		2012		2013	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays, common	113	817	114	817	W	W
Sand and gravel:						
Construction	6,100	45,600	6,110	47,500	5,420	43,200
Industrial	1,050	16,500	1,040	26,600	1,090	35,600
Stone:						
Crushed	38,900 ^r	484,000 ^r	38,800	476,000	38,200	474,000
Dimension	W	W	32	7,210	32	6,140
Combined values of cadmium (byproduct from zinc concentrates), cement, clays (ball, fuller's earth), gemstones (natural), lime, salt, zinc, and values indicated by symbol W	XX	331,000 ^r	XX	377,000	XX	407,000
Total	XX	878,000	XX	935,000	XX	966,000

^rRevised. W Withheld to avoid disclosing company proprietary data; included in "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
TENNESSEE: CRUSHED STONE SOLD OR USED IN THE UNITED STATES, BY TYPE¹

Type	2012				2013			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone ²	118	36,600	\$449,000	\$12.27	121	36,300	\$455,000	\$12.51
Dolomite	1	508	5,930	11.66	1	349	4,250	12.19
Granite	1	590	7,920	13.42	1	680	5,000	7.34
Sandstone and quartzite ³	4	684	7,600	11.11	4	549	6,770	12.35
Miscellaneous stone	2	391	5,050	12.91	2	299	3,460	11.60
Total or average	XX	38,800	476,000	12.27	XX	38,200	474,000	12.41

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 kinds of stone.

³Includes sandstone-quartzite reported with no distinction between the two kinds of stone.

TABLE 3
TENNESSEE: CRUSHED STONE SOLD OR USED BY PRODUCERS, BY USE¹

Use	2012			2013		
	Quantity (thousand metric tons)	Value (thousands)	Unit value	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:						
Coarse aggregate (+1½ inch):						
Macadam	--	--	--	W	W	W
Riprap and jetty stone	257	\$3,800	\$14.77	246	\$3,540	\$14.37
Filter stone	50	385	7.71	84	771	9.17
Unspecified coarse aggregate	1,380	17,000	12.34	922	12,200	13.19
Coarse aggregate, graded:						
Concrete aggregate, coarse	441	3,920	8.90	961	11,400	11.81
Bituminous aggregate, coarse	--	--	--	W	W	W
Bituminous surface-treatment aggregate	--	--	--	71	834	11.77
Railroad ballast	--	--	--	W	W	W
Unspecified graded coarse aggregate	5,820	81,500	14.01	6,430	92,800	14.44
Fine aggregate (-¾ inch):						
Stone sand, concrete	482	5,300	10.99	W	W	W
Screening, undesignated	216	1,850	8.58	W	W	W
Unspecified fine aggregate	1,770	25,800	14.59	2,400	33,900	14.15
Coarse and fine aggregates:						
Graded road base or subbase	728	7,580	10.41	957	8,550	8.94
Unpaved road surface	--	--	--	W	W	W
Crusher run or fill or waste	401	4,150	10.35	641	4,560	7.12
Roofing granules	--	--	--	26	159	6.09
Unspecified coarse and fine aggregates	9,100	94,300	10.36	10,400	113,000	10.84
Unspecified and other construction materials	--	--	--	1	8	8.88
Agricultural:						
Agricultural Limestone	197	2,700	13.71	170	2,310	13.62
Poultry grit and mineral food	164	4,170	25.43	--	--	--
Unspecified and other agricultural uses	9	200	22.22	--	--	--
Chemical and metallurgical:						
Cement manufacture	1,300	6,430	4.96	W	W	W
Lime manufacture	W	W	W	--	--	--
Flux stone	89	2,730	30.72	--	--	--
Sulfur oxide removal	W	W	W	W	W	W
Special:						
Other fillers or extenders	288	5,380	18.66	--	--	--
Other miscellaneous uses and specified uses not listed						
Unspecified: ²						
Reported	7,740	78,900	10.20	6,880	77,100	11.22
Estimated	7,890	98,900	12.53	6,120	99,800	16.31
Total or average	38,800	476,000	12.27	38,200	474,000	12.41

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

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

²Reported and estimated production without a breakdown by end use.

TABLE 4
TENNESSEE: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2012, 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 (+1½ inch) ²	W	W	737	8,560	616	7,930
Coarse aggregate, graded ³	W	W	W	W	W	W
Fine aggregate (-¾ inch) ⁴	W	W	1,180	13,600	W	W
Coarse and fine aggregates ⁵	W	W	5,740	54,900	3,550	40,000
Other construction materials	--	--	--	--	--	--
Agricultural ⁶	W	W	W	W	W	W
Chemical and metallurgical ⁷	--	--	W	W	W	W
Special ⁸	--	--	W	W	--	--
Other miscellaneous uses and specified uses not listed	--	--	--	--	--	--
Unspecified:⁹						
Reported	9	97	6,460	65,700	1,280	13,200
Estimated	48	600	4,200	51,800	3,640	46,500
Total	2,440	35,100	22,700	253,000	13,600	188,000

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 riprap and jetty stone, filter stone, and unspecified coarse aggregate.

³Includes concrete aggregate (coarse) and unspecified graded coarse aggregate.

⁴Includes stone sand (concrete), screening (undesigned), and unspecified fine aggregate.

⁵Includes graded road base or subbase, crusher run, and unspecified coarse and fine aggregates.

⁶Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.

⁷Includes cement manufacture, lime manufacture, flux stone, and sulfur oxide removal.

⁸Includes other fillers or extenders.

⁹Reported and estimated production without a breakdown by end use.

TABLE 5
TENNESSEE: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2013, 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 (+1½ inch) ²	W	W	575	6,000	497	7,230
Coarse aggregate, graded ³	W	W	3,630	47,500	W	W
Fine aggregate (-¾ inch) ⁴	W	W	W	W	W	W
Coarse and fine aggregates ⁵	W	W	6,440	63,300	4,930	55,200
Other construction materials	--	--	--	--	W	W
Agricultural ⁶	W	W	87	1,050	W	W
Chemical and metallurgical ⁷	--	--	W	W	W	W
Special	--	--	--	--	--	--
Other miscellaneous uses and specified uses not listed	--	--	--	--	--	--
Unspecified:⁸						
Reported	9	99	4,700	54,900	2,170	22,100
Estimated	1	17	4,730	62,700	1,380	37,100
Total	1,980	29,900	22,000	253,000	14,200	191,000

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 riprap and jetty stone, filter stone, and unspecified coarse aggregate.

³Includes concrete aggregate (coarse) and unspecified graded coarse aggregate.

⁴Includes stone sand (concrete), screening (undesigned), unspecified other fine aggregate.

⁵Includes graded road base or subbase, crusher run, and unspecified coarse and fine aggregates.

⁶Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.

⁷Includes cement manufacture, lime manufacture, flux stone, and sulfur oxide removal.

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

TABLE 6
TENNESSEE: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2012,
BY MAJOR USE CATEGORY¹

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand) ²	1,790	\$13,400	\$7.46
Asphaltic concrete aggregates and road base materials ³	847	6,130	7.24
Other miscellaneous uses ⁴	165	1,760	10.68
Unspecified: ⁵			
Reported	25	170	6.80
Estimated	3,290	26,100	7.94
Total or average	6,110	47,500	7.77

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

²Includes plaster and gunite sands.

³Includes road and other stabilization (cement).

⁴Includes fill and golf course.

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

TABLE 7
TENNESSEE: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2013,
BY MAJOR USE CATEGORY¹

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand) ²	1,980	\$15,000	\$7.60
Asphaltic concrete aggregates and road base materials ³	641	5,630	8.78
Other miscellaneous uses ⁴	175	2,110	12.04
Unspecified: ⁵			
Reported	60	408	6.80
Estimated	2,570	20,100	7.80
Total or average	5,420	43,200	7.97

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

²Includes plaster and gunite sands.

³Includes road and other stabilization (cement).

⁴Includes fill.

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

TABLE 8
TENNESSEE: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2012,
BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate (including concrete sand) ²	W	W	W	W	W	W
Asphaltic concrete aggregates and road base materials ³	W	W	W	W	W	W
Other miscellaneous uses ⁴	75	576	32	277	58	960
Unspecified: ⁵						
Reported	25	170	--	--	--	--
Estimated	1,600	12,700	928	7,360	761	6,040
Total or average	3,390	24,200	1,710	13,500	1,020	9,810

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 plaster and gunite sands.

³Includes road and other stabilization (cement).

⁴Includes fill, and golf course.

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

TABLE 9
 TENNESSEE: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2013,
 BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate (including concrete sand) ²	W	W	W	W	W	W
Asphaltic concrete aggregates and road base materials ³	W	W	--	--	W	W
Other miscellaneous uses ⁴	108	1,180	--	--	67	928
Unspecified: ⁵						
Reported	60	408	--	--	--	--
Estimated	1,030	7,910	W	W	552	4,520
Total or average	3,270	23,700	1,310	11,100	843	8,400

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 plaster and gunite sands.

³Includes road and other stabilization (cement).

⁴Includes fill.

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