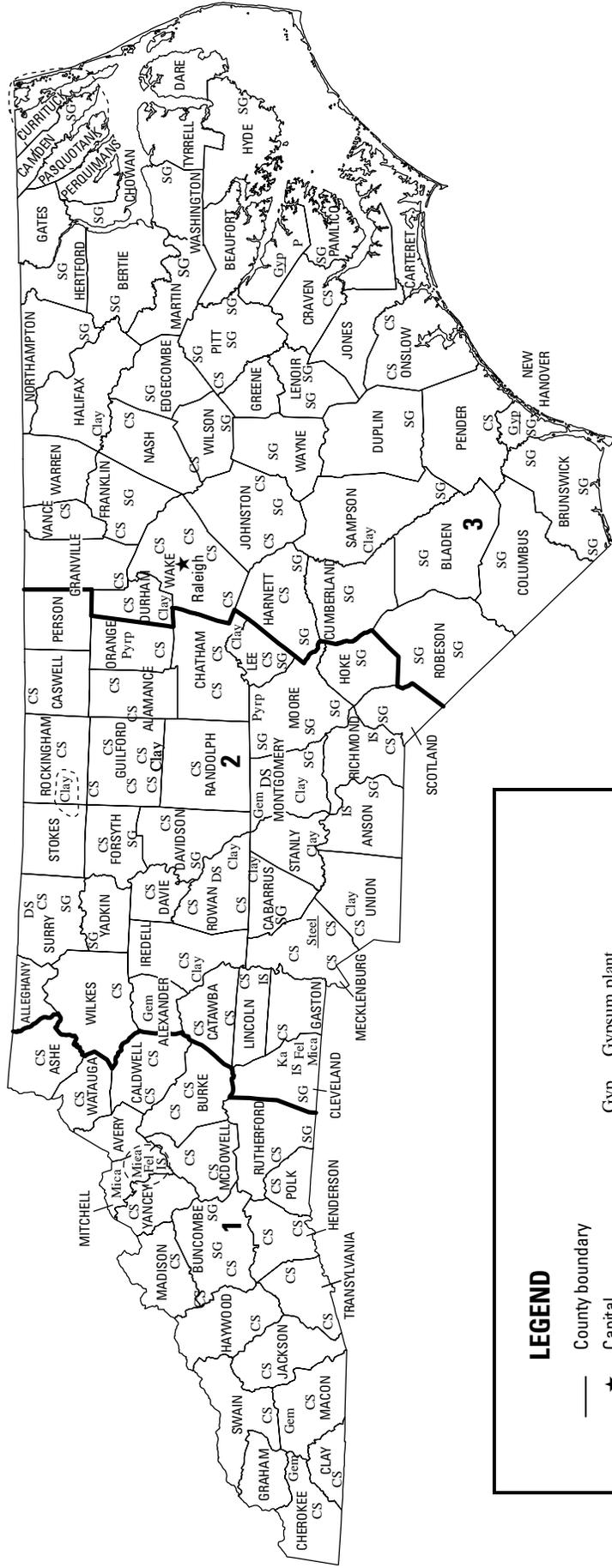




2007 Minerals Yearbook

NORTH CAROLINA [ADVANCE RELEASE]

NORTH CAROLINA



LEGEND

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

MINERAL SYMBOLS (Major producing areas)

- Clay Common clay
- CS Crushed stone
- DS Dimension stone
- Fel Feldspar
- Gem Gemstones
- Gyp Gypsum plant
- IS Industrial sand
- Ka Kaolin
- Mica Mica
- P Phosphate rock
- Pyrp Pyrophyllite
- SG Construction sand and gravel
- Steel Steel plant
- Concentration of mineral operations

THE MINERAL INDUSTRY OF NORTH CAROLINA

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

In 2007, North Carolina's nonfuel raw mineral production¹ was valued at \$1.2 billion, based upon annual U.S. Geological Survey (USGS) data. This was a \$160 million, or more than 15%, increase from the State's total nonfuel mineral value of \$1.04 billion in 2006, which was up \$178 million, or nearly 21%, from that of 2005. North Carolina rose to 21st from 22d in rank among the 50 States in total nonfuel mineral production value and accounted for more than 1.7% of the U.S. total. (The State's actual total nonfuel mineral values for 2005–06 were substantially higher than those reported in table 1, from which specific production values for phosphate rock, pyrophyllite (crude), and stone [crushed quartzite (2005)] were withheld to conceal company proprietary data.)

Crushed stone remained North Carolina's leading nonfuel raw mineral in 2007, accounting for nearly 75% of the State's total value of nonfuel mineral production. It was followed (in descending order of value) by phosphate rock, construction sand and gravel, industrial sand and gravel, common clays, dimension stone, feldspar, and mica (crude). The largest increases in value for the year took place in industrial sand and gravel and crushed stone, up nearly \$37 million and \$30 million, respectively (table 1). While most of the State's other mineral commodities showed small decreases in production value, the largest decrease was that of phosphate rock, which was withheld—company proprietary data.

In 2007, North Carolina continued to be the only State that produced pyrophyllite; to lead the Nation in the quantities of feldspar and crude mica produced; and to be 2d of four phosphate rock-producing States. With the resumption of olivine production, the State was 2d of two States in the production of that mineral commodity and it rose to 6th from 10th in industrial sand and gravel production and to 8th from 10th in gemstones production (gemstones based upon value). Decreasing in rank were the State's mineral commodities of common clays to third from second, crushed stone to seventh from sixth, and dimension stone to ninth from seventh. Additionally, significant quantities of construction sand and gravel were produced in North Carolina. Metal production in the State, especially that of raw steel, resulted from the processing of recycled materials or raw materials received from other domestic and foreign sources.

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 2007 USGS mineral production data published in this chapter are those available as of June 2009. 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>.

The following narrative information was provided by the North Carolina Geological Survey² (NCGS), a State government agency within the North Carolina Department of Environment and Natural Resources, Division of Land Resources (DLR).

Commodity Review

Industrial Minerals

Aggregates.—Hanson PLC (parent company of Hanson Building Materials America, Inc.) and Hanson Aggregates, was purchased by HeidelbergCement AG of Germany. Vulcan Materials Co. purchased Florida Rock Industries, Inc., which had construction material production and processing operations in the mid-Atlantic and southeastern United States, including operations in North Carolina. Vulcan Materials also purchased Burke County Stone Quarry in western North Carolina near Morganton (Business Wire, 2007).

In 2007, mining on lands of the U.S. Department of Agriculture's U.S. Forest Service was limited, generally being at very low levels. Such operations were essentially limited to one crushed stone quarry near Robbinsville, NC, and one sand pit located in Carteret County. A landscape stone operation previously active in Jackson County did not operate in 2007.

Feldspar and Mica.—Imerys Group of Paris, France, purchased The Feldspar Corp. The company's acquisition added the Spruce Pine feldspar operation (including feldspathic sand, a blend of quartz sand and potash feldspar), and kaolin plants in the States of Florida and Georgia. Additionally, General Chemical Co. based in New Jersey acquired the mica mining locations of Kings Mountain, NC (muscovite mica), and Suzor Township, Quebec, Canada (phlogopite mica).

Gemstones.—North Carolina Emerald Co. found a 972.5-carat emerald crystal at its site located near Hiddenite in Alexander County, NC; the same property has produced a number of other stones during the past few years.

Government Activities and Programs

State Government

Mine Permitting.—The DLR Land Quality Section (LQS) was the State's permitting group for mines, erosion and sediment control, and dams. Increases in the fees for mining permits were set and became effective on the first day of July; the new fee amounts were contained in the revised mining permit application that was accessible over the Internet at <http://www.dlr.enr.state.nc.us/pages/forms.html>, and fee increases for

²Jeffrey C. Reid, Senior Geologist, Minerals and Geographic Information Systems, authored the text for the State mineral industry information provided by the North Carolina Geological Survey.

sedimentation plan approvals were accessible by way of the same page.

In support of the LQS and DLR's Mining Program, the NCGS continued to review applications to open, modify, renew, or release mines in 2007. The permitted active and inactive mine inventory is continually updated with the revised listings posted in June and December on the LQS Web site at <http://www.dlr.enr.state.nc.us/pages/miningprogram.html>.

The LQS hosted the 35th Annual Meeting of the National Association of State Land Reclamationists (NASLR) in September in Asheville, NC.

The North Carolina Geological Survey.—The NCGS continued its investigation of offshore sand resources and 7.5-minute geologic quadrangle mapping in the Piedmont and Blue Ridge Mountain geologic provinces. Also, landslide investigations continued in western North Carolina and three online natural hazard maps were released (North Carolina Geological Survey, 2007). Among various maps and other publications that were released in 2007 was a Map of Earthquake Epicenters in North Carolina and Portions of Adjacent States (1698–2006).

Information regarding a variety of geologic, mining, mineral resource and mineral production information, and information regarding topographic and geological and other maps may be accessed at <http://www.geology.enr.state.nc.us/>.

North Carolina State University Minerals Research Laboratory (MRL).—The MRL, which is located in Asheville, NC, is a unit of North Carolina State University. During 2007, the MRL focused its efforts on sponsored work from all continents for process development of various industrial minerals. Some of the year's projects concerned chrome ores, garnet deposits, frac sand, high purity quartz, and feldspars. Additionally, the lab acquired more pilot-plant equipment to facilitate the increasing demand of pilot-plant projects.

A new 'In-State Advisory Council' was formed to guide work that was funded by the State to promote minerals and therewith potentially increase revenue within the State. In the near term, developing better utilization of mine tailings, diamond exploration and processing, and the removal of metals from municipal sewerage ash were determined to be the issues upon which to focus State-funded work. The MRL continued some work outside of the State on a commercially sponsored basis. Details on the MRL's activities can be accessed at <http://www.engr.ncsu.edu/mrl/>.

Environmental Issues and Alternative Use of Quarries

The southeastern United States, and of particular note North Carolina, was in a drought classified as "exceptional"—the highest (driest) of five categories. With substantial and increasing drought during the year, 78 of North Carolina's 100 counties, including all of the mid-State counties around the "Research Triangle" of Duke University, North Carolina State University, and the University of North Carolina at Chapel Hill (respectively in the cities of Durham, Raleigh, and Chapel

Hill), were in the "exceptional," drought category for most of the month of December. In the next category down of extreme drought were 9 counties, while 13 counties in the eastern end of the State experienced severe drought (North Carolina Drought Management Advisory Council, 2007).

Many cities faced critical water supply shortages. Quarries were considered for potential water sources, abandoned quarries being for immediate use, while others were being considered for future use once mining operations cease if current conditions persisted or reoccurred. For example, the city of Rocky Mount was using an abandoned quarry, which it bought after Hurricane Fran of 1996, to supplement the city's water needs during the drought. The abandoned quarry holds about 1.5 billion liters (400 million gallons) of water. The city was in the planning stages of acquiring another nearby quarry when mining activities cease.

Reclamation Awards

Among awards given to North Carolina's mining industry were several presented to Vulcan Materials Co. Vulcan Materials was rated most admired construction material company by Fortune magazine. Vulcan Material's Hendersonville Quarry was recognized as a Wildlife and Industry Together (WAIT) site by the North Carolina Wildlife Federation. The WAIT program is designed to foster public awareness and participation in conservation, wildlife restoration, and wildlife protection activities. Vulcan Materials' (Midwestern Division) Gold Hill Quarry received the National Stone, Sand & Gravel Association's (NSSGA) 2006 Community Relations Pinnacle Award, the NSSGA 2006 National Stars of Excellence Two Star Award, and the Association's Silver Award for Environmental Excellence. Additionally, Vulcan Materials received the NSSGA Bronze Award for Environmental Excellence for the company's Boone and Smith Grove Quarries.

Other awards included Aggregates Manager magazine 2006 "AggMan of the Year Award" for industry leadership to Martin Marietta Materials President and Chief Operating Officer; the Barry K. Wendt Memorial Commitment Award to a Luck Stone Corp. Vice President of Real Estate; the NSSGA Safety Excellence plaque to Hedrick Industries for its Lake Norman and North Buncombe Quarries; and the NSSGA Certificate of Achievement in Environmental Excellence to Carolina Sunrock LLC for the company's Butner and Kittrell Quarries.

References Cited

- Business Wire, 2007, Vulcan Materials acquires quarries in North Carolina and Illinois: Business Wire, January 25, 1 p. (Accessed January 4, 2010, at <http://www.highbeam.com/doc/1G1-158334332.html>.)
- North Carolina Drought Management Advisory Council, 2007, U.S. drought monitor of North Carolina, 12/11/2007—12/25/2007: North Carolina Drought Management Advisory Council, 12/11/2007 archive Web page, 3 p. (Accessed January 5, 2010, at <http://www.ncdrought.org/archive/>.)
- North Carolina Geological Survey, 2007, NC Geological Survey Web site updates: North Carolina Geological Survey Web site. (Accessed January 5, 2010, at <http://www.geology.enr.state.nc.us/news.htm>.)

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

(Thousand metric tons and thousand dollars)

Mineral	2005		2006		2007	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays:						
Common	2,180	13,900	2,340	24,200	1,720	19,100
Kaolin	27	593	26	950	20	792
Feldspar	351	19,000	362	19,100	W	W
Gemstones, natural	NA	280	NA	282	NA	384
Mica, crude	39	10,200	57	12,600	43	10,300
Sand and gravel:						
Construction	12,000	63,900	12,900	70,000	11,400	62,300
Industrial	1,150	29,200	1,220	24,700	1,670	61,500
Stone:						
Crushed	73,600 ³	708,000 ³	78,800 ^r	868,000 ^r	70,300	898,000
Dimension	39	17,000	41	17,800	41	17,800
Combined values of olivine (2007), phosphate rock, pyrophyllite (crude), stone [crushed quartzite (2005)], and value indicated by symbol W	XX	(4)	XX	(4)	XX	130,000
Total	XX	862,000	XX	1,040,000 ^r	XX	1,200,000

^rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data. Withheld values included in "Combined value" 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.

³Excludes certain stones; kind and value included with "Combined values" data.

⁴Value excluded to avoid disclosing company proprietary data.

TABLE 2
NORTH CAROLINA: CRUSHED STONE SOLD OR USED, BY TYPE¹

Type	2006			2007		
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Number of quarries	Quantity (thousand metric tons)	Value (thousands)
Limestone	13 ^r	8,620 ^r	\$92,000 ^r	12	7,570	\$93,300
Dolomite	1	436	4,970	1	411	5,260
Granite	85 ^r	58,600 ^r	646,000 ^r	84	53,700	689,000
Traprock	7	7,900	91,000	7	6,200	81,100
Sandstone and Quartzite	1	(2)	4	1	(2)	5
Slate	2	1,440	15,100	2	928	11,000
Miscellaneous stone	3	1,840	18,700	2	1,440	18,200
Total	XX	78,800 ^r	868,000 ^r	XX	70,300	898,000

^rRevised. XX Not applicable.

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

²Less than ½ unit.

TABLE 3
NORTH CAROLINA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2007, BY USE¹

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
Construction:		
Coarse aggregate (+1½ inch):		
Riprap and jetty stone	199	2,610
Filter stone	254	3,350
Other coarse aggregate	528	9,890
Coarse aggregate, graded:		
Concrete aggregate, coarse	1,340	27,200
Bituminous surface-treatment aggregate	W	W
Railroad ballast	1,280	12,500
Other graded coarse aggregate	7,450	121,000
Fine aggregate (¾ inch):		
Stone sand, bituminous mix or seal	241	2,850
Screening, undesignated	943	11,800
Other fine aggregate	2,580	29,500
Coarse and fine aggregates:		
Graded road base or subbase	1,870	27,500
Crusher run or fill or waste	1,570	18,000
Other coarse and fine aggregates	8,060	99,000
Special, Whiting or whiting substitute	W	W
Unspecified: ²		
Reported	38,700	465,000
Estimated	4,800	61,000
Total	70,300	898,000

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

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

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

TABLE 4
NORTH CAROLINA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2007, 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	602	9,890	W	W
Coarse aggregate, graded ³	W	W	W	W	1,980	34,600
Fine aggregate (¾ inch) ⁴	W	W	W	W	W	W
Coarse and fine aggregate ⁵	2,390	31,300	W	W	W	W
Special ⁶	W	W	--	--	--	--
Unspecified: ⁷						
Reported	2,640	31,500	19,600	231,000	16,500	202,000
Estimated	3,700	47,000	241	3,100	871	11,000
Total	11,700	155,000	35,800	448,000	22,800	295,000

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

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

⁴Includes screening (undesignated), stone sand (bituminous mix or seal), and other fine aggregate.

⁵Includes crusher run or fill or waste, graded road base or subbase, and other coarse and fine aggregates.

⁶Includes whiting or whiting substitute.

⁷Reported and estimated production without a breakdown by end use.

TABLE 5
NORTH CAROLINA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2007,
BY MAJOR USE CATEGORY¹

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	5,360	\$29,500	\$5.51
Plaster and gunite sands	21	379	18.05
Concrete products (blocks, bricks, pipe, decorative, etc.)	239	1,530	6.41
Asphaltic concrete aggregates and other bituminous mixtures	440	2,270	5.15
Road base and coverings ²	635	3,670	5.78
Fill	1,690	5,410	3.20
Snow and ice control	8	66	8.25
Golf course	21	188	8.95
Other miscellaneous uses ³	78	737	9.45
Unspecified: ⁴			
Reported	1,250	9,630	7.69
Estimated	1,600	8,900	5.46
Total or average	11,400	62,300	5.48

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

²Includes road and other stabilization (lime).

³Includes railroad ballast.

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

TABLE 6
NORTH CAROLINA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2007,
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 and concrete products ²	253	2,880	2,020	9,080	3,340	19,400
Asphaltic concrete aggregates and road base materials ³	W	W	W	W	640	2,290
Fill	8	71	10	50	1,670	5,250
Other miscellaneous uses ⁴	238	2,420	232	1,590	51	446
Unspecified: ⁵						
Reported	31	202	150	2,330	1,070	7,090
Estimated	29	200	500	2,600	1,100	6,100
Total	558	5,730	2,890	15,700	7,890	40,600
	Unspecified districts					
	Quantity	Value				
Concrete aggregates and concrete products ²	8	36				
Asphaltic concrete aggregates and road base materials ³	--	--				
Fill	8	36				
Other miscellaneous uses ⁴	--	--				
Unspecified: ⁵						
Reported	--	--				
Estimated	--	--				
Total	16	71				

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 golf course, railroad ballast, and snow and ice control.

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