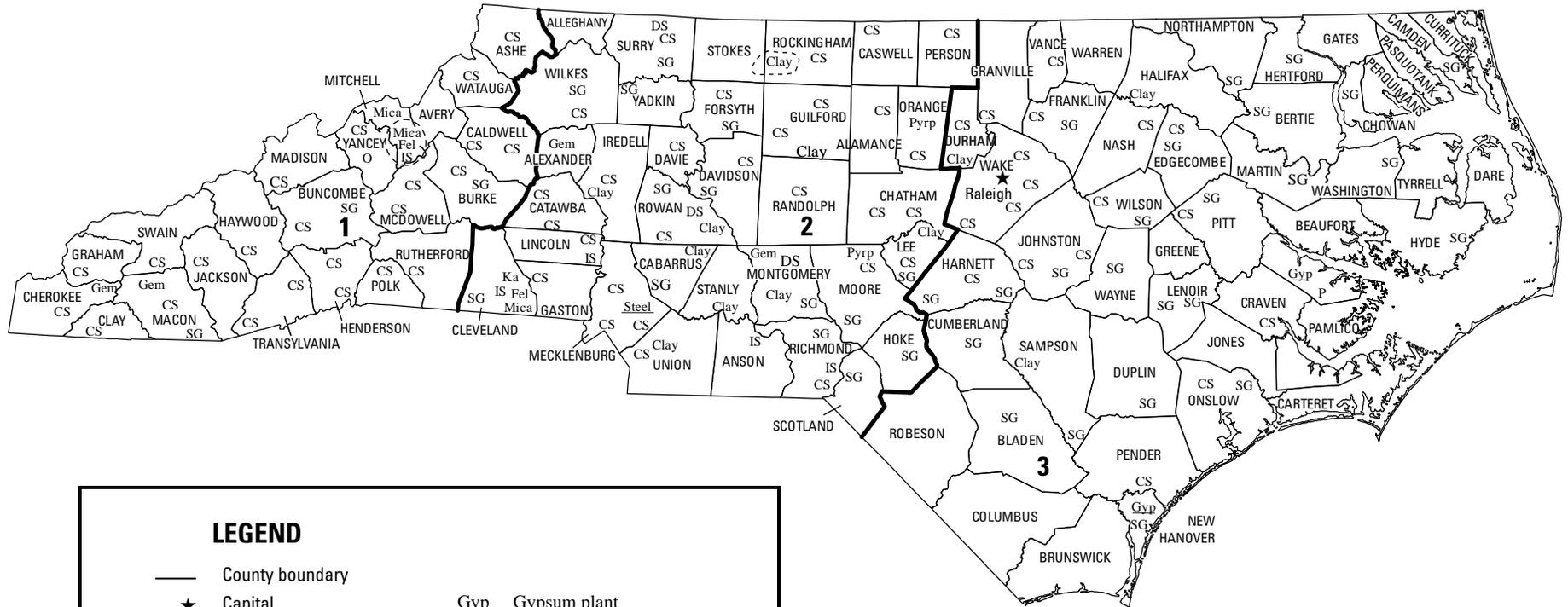




2008 Minerals Yearbook

NORTH CAROLINA

NORTH CAROLINA



LEGEND

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

MINERAL SYMBOLS (Principal producing areas)

Clay	Common clay	Gyp	Gypsum plant
CS	Crushed stone	IS	Industrial sand
DS	Dimension stone	Ka	Kaolin
Fel	Feldspar	Mica	Mica
Gem	Gemstones	P	Phosphate rock
		O	Olivine
		Pyrpy	Pyrophyllite
		SG	Construction sand and gravel
		Steel	Steel plant
		(dashed circle)	Concentration of mineral operations

Source: North Carolina Geological Survey/U.S. Geological Survey (2008).

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 2008, North Carolina's nonfuel raw mineral production was valued at \$1.09 billion, based upon annual U.S. Geological Survey (USGS) data. This was an \$80 million, or an almost 7%, decrease from the State's total nonfuel mineral value of \$1.17 billion in 2007, which was up \$130 million, or almost 13%, from that of 2006. North Carolina fell to 23d from 21st in rank among the 50 States in total nonfuel mineral production value and accounted for more than 1.5% of the U.S. total. The State's actual total nonfuel mineral value for 2006 was higher than those reported in table 1, from which specific production values for phosphate rock and pyrophyllite (crude) were withheld to conceal company proprietary data.

Crushed stone remained North Carolina's leading nonfuel raw mineral in 2008, accounting for almost 74% of the State's total nonfuel mineral production value. It was followed (in descending order of value) by phosphate rock, construction sand and gravel, industrial sand and gravel, dimension stone, feldspar, and common clays. These seven commodities accounted for nearly 99% of the total nonfuel mineral production value. In a reversal from 2007, the largest increase in 2008 in total production value took place in phosphate rock, which in 2007 had shown the largest decrease (actual value withheld—company proprietary data). The second largest increase in production value took place in dimension stone, up almost \$4.8 million. Smaller increases were seen with olivine and gemstones. In 2008, all other mineral commodities showed a decline in both production and production value. In another reversal from 2007, the largest decrease in 2008 in production value took place with crushed stone, down 10%, or \$92 million. The mineral commodity's production value had increased from 2006 to 2007 by more than \$30 million, or 3.5%.

In 2008, North Carolina continued to be the only State that produced andalusite and pyrophyllite. The State ranked first for the production of feldspar out of seven feldspar-producing States—its rank since at least 1994. For the second year, North Carolina continued to be second of only two olivine-producing States, behind Washington. Since 2005, the State has continued to rank second for phosphate rock production out of the four phosphate rock-producing States, and since 2007, third for common clays. In 2008, North Carolina continued to be ranked sixth for industrial sand, and seventh for crushed stone. Dimension stone rose from ninth in 2007 to seventh in 2008. Based upon production value only, gemstones rose in rank from eighth to sixth. The State decreased to second from first among the crude mica-producing States; this is the first time since at least 1994 that North Carolina has not been the leading mica-producing State.

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

Commodity Review

Industrial Minerals

Cement.—Carolinas Cement Co. (a subsidiary of Titan America Inc., Norfolk, VA) proposed the construction of a new cement plant and limestone mining operation at Castle Hayne, New Hanover County. The company planned for the \$450 million facility to be operational by 2010–11 and to employ approximately 160 full-time employees. The project encompasses more than 750 hectares (ha) (more than 1,800 acres or almost 3 square miles), including the former Ideal Cement plant, an existing stone quarry, and wetlands. Carolinas Cement began the State and Federal permitting processes in 2008 and undertook several environmental studies (Mazzolini, 2008).

Diamond.—A small diamond was reported found on June 21, 2008, while an attendee was gold panning during the annual meeting of the Western Piedmont Mineral and Gem Society of Conover, held at the Lucky Strike Gold Mine, Vein Mountain, south of Marion. The stone's identity and source has not been authenticated by a laboratory.

Gemstones, Emeralds.—For the first time, mining has exposed underlying bedrock hosting the gem-quality emeralds of the Hiddenite District, Alexander County. These new mine exposures provide new insights to geology and mineralogy of the emerald-bearing cavities. A May 2008 field trip to the North American Emerald Mines, Inc.'s NAEM Mine showcased recently determined mineral stratigraphy of emerald-bearing veins and pockets (Speer, 2008). The Hiddenite District has consistently produced North America's largest emeralds since the deposit's discovery in the mid-1870s. The North American Emerald Mine property has produced 70% of the district's estimated 60,000 carats of emeralds including 10 of North America's largest emeralds.

Feldspar and Quartz.—In late November 2008, at Unimin Corporation's feldspar and quartz operation in Spruce Pine, the quartz plant suffered substantial fire damage in late November 2008. Less substantial damage occurred at the company's feldspar plant. Unimin planned to rebuild the plant. Unimin reported that its other nearby quartz plant, also in Spruce Pine, was doing the work that was previously done at the Spruce Pine plant. Before the fire, the plant produced an estimated 130,000 metric tons per year (t/yr) (Industrial Minerals, 2008).

Gypsum.—Construction of synthetic gypsum plants were announced for two locations in North Carolina several years ago in response to the State's Clean Air Act. One, operated by BPB (Certainteed), is located near Roxsboro in Person County. As of December 2008, grading had commenced, with an estimated 10 months required to grade the footprint of the almost 47,000-square-meter (-m²) (500,000-square-foot) facility. Local permits had been received by the company and highways and bridges leading to the site had been upgraded [Glen Newsome, Executive Director

(retired), Person County Economic Commission, written commun., December 12, 2008]. This facility is located adjacent to a Progress Energy Corp.'s Mayo coal-fired electrical plant.

Lithium.—The N.C. Geological Survey received several inquiries regarding lithium resources for automobile battery applications. North Carolina is well known for the Kings Mountain District lithium deposits located in the Piedmont region. These lithium mines are currently inactive. Chemetall's Kings Mountain Plant develops new products and manufactures a wide array of lithium-based products. At Kings Mountain, lithium bromide brine is produced for use in industrial absorption air conditioning systems. Lithium chloride brine is important for food dehydration and dehumidification and other industries where moisture control is critical. Additionally, lithium sulfate is produced for use in photographic developers (Chemetall, 2011).

Phosphate Rock.—PCS Phosphate continued its efforts to renew its permit and proposed mining area expansion. On January 15, 2009, the State Division of Water Quality issued an amendment to the water quality certification for the expansion of mining areas that was issued in December 2008 (NCDENR, 2009).

Government Activities and Programs

State Government

Mine Permitting.—In support of the Land Quality Section (LQS) of DLR's Mining Program, the NCGS continued to review applications to open, modify, renew, or release mines and mining permits in 2008. 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 North Carolina Geological Survey.—Information regarding the State's geology, mining, mineral resources, mineral production, and topographic and geologic maps may be accessed at <http://www.geology.enr.state.nc.us/>.

North Carolina State University Minerals Research Laboratory (MRL).—The MRL, in Asheville, NC, is a unit of North Carolina State University. During 2008, the MRL focused its efforts on sponsored work for process development of various industrial minerals. Some of the year's projects concerned aluminum refractory ores, garnet deposits, frac sand, high-purity quartz, and feldspars. A new maintenance and fabrication shop was installed to better service the equipment and to build new experimental equipment. The multiple building compound underwent major renovations to ensure the lab's use for coming decades. MRL's new URL is <http://mrl.ies.ncsu.edu/>.

The instate work focus of the lab is on the utilization of mineral tailings. MRL will continue to do work outside of the State on a commercial-sponsored basis through the Chief Engineer, John Schlanz.

Industry News, Community Involvement, and Awards

On February 8, 2008, the North Carolina Commissioner of Labor presented the Mining Star award to the Waynesville Quarry, operated by Harrison Construction. The Mining Star Program is designed to recognize and promote effective safety and health programs. The Waynesville Quarry is the first crushed stone operation in North Carolina to receive this award.

Several Vulcan Construction Materials' quarries were recognized for excellence in labor and environmental practices. The North Carolina Department of Labor Awards Program honored Vulcan's Elkin Quarry with a Gold Award for the 42d consecutive year. To be a recipient of the gold award, a site must be free of fatal accidents, and the total number of days in which employees were away from work, placed under restriction, or transferred must be at least 50% below the industry rate. Vulcan's 115 Quarry in North Wilkesboro was recognized as a Wildlife and Industry Together (WAIT) site by the North Carolina Wildlife Federation. This certification recognizes Vulcan's work toward creating valuable wildlife habitat on its grounds. Vulcan also had 65 employees serve with Winston-Salem Habitat for Humanity to celebrate the company's 50th anniversary.

Martin Marietta's East Alamance Quarry worked with the town of Green Level to help dedicate a new community park. Martin Marietta donated material for the new walking track, in addition to coordinating the grand opening and supplying refreshments for the event.

The President and CEO of Luck Stone Corporation was named the 2008 recipient of the Mark S. Walsh Leadership Award, which he received at the Young Leader's Council (YLC) Annual Meeting held April 24–27 in Cancun, Mexico.

The National Stone, Sand & Gravel Association (NSSGA) awarded several North Carolina operations with excellence awards at the National Convention, held in Las Vegas, NV, in March 2008, for work done during 2007. The Swannanoa operation of Hedrick Industries and the Stokesdale operation of Vulcan won the Gold and Bronze Awards for Excellence in Community Relations, respectively. Vulcan's Gold Hill, Boone, and Mocksville operations won Silver (Gold Hill) and Bronze Awards (Boone and Mocksville) for Environmental Excellence.

References Cited

- Chemetall Lithium Division, 2011, North America: Kings Mountain, NC, Chemetall. (Accessed June 3, 2011, at <http://www.chemetalllithium.com/en/about-us/production-sites/north-america.html>.)
- Industrial Minerals, 2008, Fire damage at Spruce Pine quartz: Industrial Minerals, December 2. (Accessed June 9, 2011, at <http://www.indmin.com/Article/2060047/Fire-damage-at-Spruce-Pine-quartz.html>.)
- Mazzolini, Chris, 2008, Titan officials confirm plans to build cement plant in Castle Hayne: Star News Online, May 20. (Accessed April 5, 2011, at <http://www.starnewsonline.com/article/20080520/ARTICLE/805200348>.)
- North Carolina Department of Environment and Natural Resources (NCDENR), Office of Public Affairs, 2009, Amendment to water quality certification granted for PCS Phosphate expansion: Raleigh, NC, January. (Accessed June 3, 2011, at h2o.enr.state.nc.us/admin/pubinfo/documents/PCS401_0109.doc.)
- Speer, W.E., 2008, Emerald crystal pockets of the Hiddenite District, Alexander Co., NC: The Geological Society of America, Southeastern Section, annual meeting, 57th, Charlotte, NC, April 10–11, 2008, presentation, 32 p. (Accessed June 3, 2011, at <http://gsa.confex.com/gsa/viewHandout.cgi?uploadid=293>.)

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

(Thousand metric tons and thousand dollars)

Mineral	2006		2007		2008	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays:						
Common	2,340	24,200	1,720	19,500 ^r	1,260	12,900
Kaolin	26	950	20	792	15	W
Feldspar	362	19,100	W	W	W	W
Gemstones, natural	NA	282	NA	384	NA	659
Mica, crude	57	12,600	43	10,300	22	4,580
Sand and gravel:						
Construction	12,900	70,000	11,400	62,300	9,700	58,300
Industrial	1,220	24,700	1,670	31,300 ^r	1,500	29,400
Stone:						
Crushed	78,800	868,000	70,200 ^r	898,000	57,500	806,000
Dimension	46 ^r	19,800 ^r	48 ^r	20,400 ^r	58	25,200
Combined values of andalusite (2007–08), phosphate rock, pyrophyllite (crude), and values indicated by symbol W	XX	(3)	XX	131,000 ^r	XX	153,000
Total	XX	1,040,000	XX	1,170,000 ^r	XX	1,090,000

^rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data. Withheld values 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.

³Value withheld to avoid disclosing company proprietary data.

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

Type	2007			2008		
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Number of quarries	Quantity (thousand metric tons)	Value (thousands)
Limestone	13 ^r	7,980 ^r	\$98,500 ^r	14	6,310	\$86,600
Dolomite	-- ^r	-- ^r	-- ^r	--	--	--
Granite	83 ^r	53,200 ^r	681,000 ^r	85	41,500	585,000
Traprock	7	6,200	81,100	7	8,240	115,000
Sandstone and quartzite	-- ^r	-- ^r	-- ^r	--	--	--
Slate	2	928	11,000	2	686	8,960
Miscellaneous stone	4 ^r	1,940 ^r	26,200 ^r	4	708	10,800
Total	XX	70,200 ^r	898,000	XX	57,500	806,000

^rRevised. XX Not applicable. -- Zero.

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

TABLE 3
NORTH CAROLINA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2008, BY USE¹

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
Construction:		
Coarse aggregate (+1½ inch):		
Riprap and jetty stone	220	3,030
Filter stone	260	3,440
Other coarse aggregate	343	7,670
Coarse aggregate, graded:		
Concrete aggregate, coarse	593	12,000
Bituminous aggregate, coarse	286	4,710
Bituminous surface-treatment aggregate	W	W
Railroad ballast	1,690	18,000
Other graded coarse aggregate	6,960	124,000
Fine aggregate (-¾ inch):		
Stone sand, bituminous mix or seal	W	W
Screening, undesignated	886	13,800
Other fine aggregate	2,050	26,500
Coarse and fine aggregates:		
Graded road base or subbase	2,230	35,400
Unpaved road surfacing	W	W
Crusher run or fill or waste	1,220	15,300
Other coarse and fine aggregates	5,210	73,200
Other construction materials	287	4,030
Agricultural, poultry grit and mineral food	W	W
Special, whiting or whiting substitute	W	W
Unspecified: ²		
Reported	31,400	410,000
Estimated	2,900	41,000
Total	57,500	806,000

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.

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

TABLE 4
NORTH CAROLINA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2008, 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	352	5,240	W	W	W	W
Coarse aggregate, graded ³	2,480	39,300	W	W	W	W
Fine aggregate (-¾ inch) ⁴	766	11,500	W	W	W	W
Coarse and fine aggregate ⁵	2,610	39,800	W	W	W	W
Other construction materials	218	3,060	69	974	--	--
Agricultural ⁶	W	W	W	W	--	--
Special ⁷	W	W	--	--	--	--
Unspecified: ⁸						
Reported	1,340	17,400	17,100	224,000	13,000	169,000
Estimated	2,100	29,000	191	2,700	626	8,800
Total	9,880	149,000	29,100	405,000	18,500	252,000

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 aggregate (coarse), 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, unpaved road surfacing, and other coarse and fine aggregates.

⁶Includes poultry grit and mineral food.

⁷Includes whiting or whiting substitute.

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

TABLE 5
NORTH CAROLINA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2008,
BY MAJOR USE CATEGORY¹

Use	Quantity	Value (thousands)	Unit value
	(thousand metric tons)		
Concrete aggregate (including concrete sand)	3,900	\$22,600	\$5.80
Plaster and gunitite sands	55	557	10.13
Concrete products (blocks, bricks, pipe, decorative, etc.)	164	1,080	6.59
Asphaltic concrete aggregates and other bituminous mixtures	347	1,770	5.11
Road base and coverings ²	687	5,080	7.40
Fill	804	3,080	3.83
Snow and ice control	13	87	6.69
Other miscellaneous uses ³	115	898	7.81
Unspecified: ⁴			
Reported	1,540	10,400	6.73
Estimated	2,070	12,800	6.16
Total or average	9,700	58,300	6.01

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

²Includes road and other stabilization (cement and lime).

³Includes golf course and railroad ballast.

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

TABLE 6
NORTH CAROLINA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2008,
BY USE AND DISTRICT^{1,2}

(Thousand metric tons and thousand dollars)

Use	Districts 1 and 2		District 3		Unspecified districts	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregates and concrete products ³	1,440	7,860	2,680	16,400	2	7
Asphaltic concrete aggregates and road base materials ⁴	W	W	W	W	--	--
Fill	35	135	768	2,940	2	7
Other miscellaneous uses ⁵	394	2,130	767	5,710	--	--
Unspecified: ⁶						
Reported	549	3,180	995	7,220	--	--
Estimated	353	2,250	1,720	10,500	--	--
Total	2,770	15,600	6,930	42,800	3	14

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.

²Specified districts are combined to avoid disclosing company proprietary data.

³Includes plaster and gunite sands.

⁴Includes road and other stabilization (cement and lime).

⁵Includes golf course, railroad ballast, and snow and ice control.

⁶Reported and estimated production without a breakdown by end use.