

Tuscaloosa County

Comprising 1,336 square miles in west-central Alabama, Tuscaloosa County is the state's second largest county in area. It is bordered by Fayette and Walker counties to the north, Jefferson and Bibb counties to the east, Hale County to the south, Greene County to the southwest, and Pickens County to the west. The county straddles the Cumberland Plateau and East Gulf Coastal Plain physiographic sections of the Atlantic Plain region, resulting in a diverse geography that is forested and hilly in the northeast, and low-lying and somewhat swampy in the southwest.

Farming was the prevailing occupation in Tuscaloosa County throughout the nineteenth century and extensive forests brought timber industries to the area. The county sits atop the Warrior Coal Field, so coal mining was also important to the economy.

Today, Tuscaloosa County is home to a number of museums and cultural centers and offers many recreational opportunities for visitors. The Alabama Museum of Natural History on the University of Alabama campus displays fossils, rocks, and minerals. Fifteen miles south is the 320-acre Moundville Archaeological Park, the site of a Mississippian period settlement. To the east is a portion of Tannehill Ironworks Historical State Park, built around the pre-Civil War Tannehill Iron Works. There are numerous rivers and lakes in the county offering boating, swimming, hiking, etc.

Celebrating more than 100 years of Crimson Tide football and multiple national championships is the Paul W. Bryant Museum and at the Mercedes-Benz Visitor's Center in Vance, visitors can tour the plant and trace the history of Mercedes-Benz from 1886 to the present.



Super Site Selection Criteria

Tuscaloosa County was selected as a Super Site for this series on the basis of information reported in *Rocks and Minerals of Alabama – A Guide for Alabama Rockhounds (Circular 38, 1966)*.

The guide identified 4 different minerals—bituminous coal, chalcedony, limonite-goethite and siderite—as being prominent in two communities.

Coal and Chalcedony (jasper, onyx and agate) were found in the Brookwood area. The former in a road cut on Tuscaloosa County Road 59 north of Brookwood, and the latter at the old strip coal mines between Brookwood and Peterson on Tuscaloosa County Road 116.

Limonite-goethite and siderite were available in the Rickey (Caffee Junction) area approximately 20 miles southwest of Bessemer on US Highway 11.

Featured Rocks and Minerals



Bituminous Coal - $C_{137}H_{97}O_9NS$ – a form of carbon.

Coal is a sedimentary rock deposited in layers or beds with other sedimentary rocks, and more than half of all available coal resources are the bituminous variety. All coal once existed as growing plants which died, partly decayed, and were then preserved by burial. Over time, the dead plants were transformed into coal by a process called “coalification”. The dead plants first changed into peat. Then as more pressure and heat were applied, moisture and gases were forced out and the buried material became depleted in most elements except carbon.

Bituminous coal is essentially the third stage in the coalification process (peat > lignite > bituminous coal > anthracite > graphite). It consists of a carbonaceous residue and ash and typically appears to have bright and dull bands. The bright bands are well preserved woody material, such as branches or stems. The dull bands can contain mineral material washed into the swamp by streams, charcoal produced by fires in the swamp, or degraded plant materials.

The carbon content of bituminous coal is around 60-80%. The rest is composed of water, air, hydrogen, and sulfur. When burned, it produces good heat via a high, smoky white to yellow flame, but it also releases trace mineral impurities into the air as pollution. Bituminous coal is divided into two subtypes: thermal and metallurgical. In appearance, it is iron black to velvet black in color, well-jointed and often layered. It sometimes has a conchoidal fracture and smudges off on fingers and clothing when handled. It has a dull luster and falls at 2.0 on the Mohs scale.

The formation of a coal requires the coincidence of highly improbable events. It can only occur under one of two conditions: 1) a rising water level that perfectly keeps pace with the rate of plant debris accumulation; or, 2) a subsiding landscape that perfectly keeps pace with the rate of plant debris accumulation. Most coal seams are thought to have formed under condition #2 in a delta environment. Plant debris accumulates very slowly; about ten feet of debris will compact into just one foot of coal. Therefore, the fifty feet of plant debris needed to make a five-foot thick coal seam would require thousands of years to accumulate.

Numerous seams of bituminous coal underlie all of north Alabama except in areas where it has been eroded. Many towns in north Alabama were built around coal mines and are named for the mine. There are considered to be four coal fields, each separated from the other by a deep valley. Tuscaloosa County is situated over the Warrior Coal Field.

Electricity production is the primary use of coal in the United States, but it is also used in a number of manufacturing processes. Plastics, roofing, linoleum, synthetic rubber, insecticides, paint products, medicines, solvents and synthetic fibers all include some coal-derived compounds. Coal can also be converted into liquid and gaseous fuels, but these uses are mainly experimental and done on a small scale. Coke production remains an important use of coal. Coke is produced by heating coal under controlled conditions in the absence of air to drive off some of the volatile materials and concentrates the carbon content. The resulting product is then used as a high carbon fuel for metal processing and other uses where an especially hot-burning flame is needed.

Chalcedony – SiO₂ – an oxide mineral.

Chalcedony is not scientifically its own mineral species, but rather a combination of quartz and mogánite in microcrystalline form that can be found in sedimentary, igneous, and metamorphic rocks. All 50 States produce some variety of chalcedony.

Many semi-precious gemstones are in fact forms of chalcedony. In the gem trade, the name chalcedony usually describes only white or blue specimens, whereas other specimens from this group are sold under individual variety names, such as carnelian, heliotrope (also known as bloodstone), aventurine, and chrysoprase to name just a few. As a general rule, when chalcedony is concentrically banded (often in rather wild patterns) it is called by the subvariety name “agate”. When it is in flat layers/bands it is called by the subvariety name “onyx”.



Quantifying the crystal structure of chalcedony can be problematic; quartz has a trigonal crystal structure while mogánite is monoclinic, and chalcedony is now recognized as a combination of the two. It has no cleavage and an uneven, splintery to conchoidal fracture with a brittle tenacity. Transparent to translucent, its luster can be waxy, dull, greasy or silky, but it usually appears vitreous when polished. Streak is white and the many varieties of chalcedony fall between 6.0 to 7.0 on the Mohs scale. The mineral can assume a wide range of colors including orangish-red, yellow, light to dark green, violet and combinations of all those colors, but the colors most commonly seen are white to gray, grayish-blue or a shade of brown ranging from pale to nearly black. It is commonly triboluminescent, fluorescent, and piezoelectric.

In Alabama, agate is deposited from silica-rich aqueous solutions and is found frequently lining or filling cavities in rocks. It often occurs as petrified wood and is common in the gravel of the Coastal Plain area. Jasper, a variety of agate, is most often found in stream gravel and gravel deposits, and less often in veins and cavities. Onyx is characterized by its even or parallel stripes or bands of colors, usually black and white.

The earliest recorded use of chalcedony was for projectile points, knives, tools, and containers such as cups and bowls. Early man made weapons and tools from many varieties of chalcedony including agate, agatized coral, flint, jasper, and petrified wood. There was then a move to using certain items for ceremonial and personal adornment.

Today chalcedony is still a very important ornamental stone. The varieties agate, chrysoprase, carnelian, sard, tiger's eye, bloodstone, jasper, and moss agate are all carved into cabochons and beads, making fine, yet inexpensive, gems. The apple-green variety, chrysoprase, has a distinct color and commands a higher price than the other varieties. Chalcedony is also very popular among amateur collectors and sold in tourist shops worldwide, especially in tumbled form.



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| 1. Blue Chalcedony | 14. Red Jasper |
| 2. Chrysoprase | 15. Willow Creek Jasper |
| 3. Blue Chalcedony | 16. Biggs Jasper |
| 4. Blue Chalcedony | 17. Onyx |
| 5. Lavender Chalcedony | 18. Sardonyx |
| 6. Blue Chalcedony | 19. Bloodstone |
| 7. Chrysoprase | 20. Chrysocolla |
| 8. Carnelian | 21. Tiger's Eye |
| 9. Moss Agate | 22. Chrysocolla |
| 10. Plume Agate | 23. Petrified Palm Wood |
| 11. Blue Lace Agate | 24. Petrified Dinosaur Bone |
| 12. Fire Agate | 25. Petrified Dinosaur Bone |
| 13. Picture Jasper | |

Source: <http://www.bernardine.com/gemstones/>

Limonite-goethite – Note: this mineral was previously profiled in the Franklin County section of the *Learning Series: Alabama's Rocks and Minerals – “The Super Sites”*. Please see the July 2012 issue for complete details. It is available at: www.wiregrassrockhounds.com.

Siderite – Note: this mineral was previously profiled in the Franklin County section of the *Learning Series: Alabama's Rocks and Minerals – “The Super Sites”*. Please see the July 2012 issue for complete details. It is available at: www.wiregrassrockhounds.com.

Additional Minerals of Tuscaloosa County

In addition to bituminous coal, chalcedony, limonite-goethite and siderite the www.mindat.org website currently lists the presence of 18 other mineral specimens in Tuscaloosa County. They include: barite, beraunite, cacoxenite, gypsum, hematite, illite, jarosite, kaolinite, kyanite, montmorillonite, 'perfrified wood', pyrolusite, quartz (var: agate, chalcedony, chert, jasper), 'smectite group', talc and vivianite.

Over 70 mines are on record in Tuscaloosa County. They are in two clusters, more or less arranged in a straight line along the eastern county line extending from County Road 77 in the southern part of the county to State Road 216 in the northern part of the county. Many sites are for iron.

Sources:

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