Coosa County

Encompassing approximately 657 square miles, Coosa County lies wholly within the Piedmont physiographic section. It is bounded to the north by Talladega and Clay counties, to the east by Tallapoosa County, to the south by Elmore County, and to the west by Chilton and Shelby counties.

Located in east-central Alabama, Coosa County is home to several recreational water resources, including Lay, Martin, and Mitchell lakes. The Coosa River runs along the western border of the county, and several of its tributaries, including Paint, Weogufka, Hatchet, Swamp, and Weoka creeks, cross the county.

Shortly before the Civil War, Coosa County was said to be the source for fine statuary marble used in furniture and tombstones throughout the southern part of the state. The major agricultural product at the time was cotton. Diversification after the war saw farmers turn to raising livestock as well as corn, wheat, and oats as supplemental crops. Given the county's many waterways, gristmills were also a popular moneymaker.

Today, Coosa County offers some of the best fishing in the state and is the home of Old Jail, the oldest jail in Alabama. Built in Rockford around 1825, it is listed on the National Register of Historic Places.

Super Site Selection Criteria

Coosa 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 map identified 14 different minerals spread across four communities.

Mitchell Dam – actinolite-tremolite, gneiss and hornblende were associated with a deep road cut on the east side of the bridge where the Coosa River crosses Alabama Highway 22.

Pentonville – beryl, kaolinite and pegmatite were found on the south side of the road that runs through Williams prospect, just west of the Pentonville crossroad south of Rockford.

Rockford – cassiterite, feldspar, muscovite, and tantalite were found in an area south of Alabama Highway 22 approximately 1.9 miles west of town. About the same distance to the east of Rockford on Highway 22 (near the Hissop Tin Mine) was an area for collecting cassiterite, feldspar, muscovite, phyllite and tourmaline.

Thomas Crossroads – diorite and granite specimens were found on Alabama Highway 9 just over a mile north of the Highway 22 and Highway 9 intersection.

Featured Rocks and Minerals

Actinolite-tremolite – $Ca_2(Mg,Fe)_5Si_8O_{22}(OH)_2$ and $Ca_2Mg_5Si_8O_{22}(OH)_2$ – calcium-iron-magnesium silicates.

Actinolite and tremolite are two very similar and fairly common minerals that form a series with each other and essentially share the same chemical formula. Actinolite contains a high percentage of iron and is usually grass green.

Tremolite has little or no iron and is usually white to pinkish white. Both are in the monoclinic crystal system and fall at 5.0 – 6.0 on the Mohs scale. They are each transparent to translucent, have perfect cleavage and produce a white streak. Both have a vitreous luster, though actinolite can tend toward the dull side, and actinolite has uneven fracture while tremolite is better described as brittle.

Actinolite is commonly found in metamorphic rocks, such as contact aureoles surrounding cooled intrusive igneous rocks. Tremolite is most frequently found in impure crystalline dolomitic limestone, and is often associated with talc. The two minerals manifest as radiating-bladed crystals in massive, compact aggregates.

They have no economic value, but often serve as guides to the location of talc and asbestos. Some forms of actinolite are used as gemstones, one being nephrite; a type of jade. A variety of tremolite is called "mountain leather" or "mountain cork" and is an oddity in the mineral world. The tremolite fibers form a felted mass that has all the appearances and feel of a piece of cloth. A violet variety of tremolite is called "hexagonite" and makes for a nice collection specimen with its attractive color and crystalline habit.

Because tremolite is unstable at high temperatures (converts to diopside) its presence is an indicator that the rock has not endured terribly high temperatures. Dust from asbestiform varieties of actinolite and tremolite can cause serious and irreversible lung disease when inhaled. Collectors should avoid creating or inhaling dust.

Beryl – $Be_3Al_2(SiO_3)_6$ – a beryllium aluminum cyclosilicate.

As a rule, Beryl is a mineral of ancient, deeply buried rocks, so it is almost Exclusively found in pegmatite, having been formed by beryllium-bearing gases or very hot solutions concentrated in high-temperature veins and pockets.

A member of the hexagonal crystal system, beryl has imperfect cleavage, conchoidal to irregular fracture and a brittle tenacity. It is a relatively hard mineral, falling at 7.5 – 8.0 on the Mohs scale. It is typically transparent to translucent with a vitreous to resinous luster, and produces a colorless streak. Crystals appear prismatic, crystalline or columnar and range from very small to several meters in size. Massive beryl resembles quartz, but is easily distinguishable by its hardness and specific gravity.

Pure beryl is colorless, but it is frequently tinted by impurities, thus creating some of the most well-known and prized gemstones. The green color in emerald is usually caused by traces of chromium, and the blue color of aquamarine is usually caused by iron. Other, less well-known colors of beryl are also used as gems, including pink (morganite), yellow-orange (golden beryl), and yellow-green (heliodor). White beryl (goshenite) and red beryl (formerly called bixbite) are less frequently faceted into gemstone cuts.

In Alabama, beryl has been found in pegmatites and in mica schists in the Piedmont area. It occurs in pockets associated with quartz, mica, feldspar, or kaolin, and frequently tourmaline. Alabama beryl is commonly a translucent yellowish green and generally has a hexagonal crystal form.

Aside from its use as a gemstone, beryl is the most important ore of beryllium, which is used with copper to increase its hardness, tensile strength, and fatigue resistance.

Cassiterite – SnO_2 – an oxide of tin.

The most widely mined ore of tin, cassiterite forms in high-temperature veins usually related to granitic rocks, pegmatites, and areas of contact metamorphism. It is also found in placer deposits where it is known as "stream tin". Ancient peoples recovered cassiterite from streams by panning. Even today, panning via the use of large-scale mechanical dredging operations in streams is a major means of producing cassiterite.

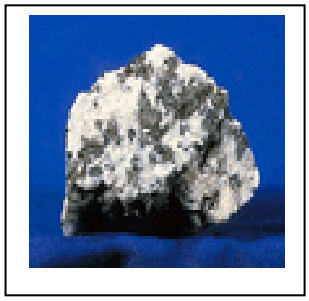
Cassiterite is a member of the tetragonal crystal system and is found in

pyramidic, prismatic, radially fibrous botryoidal crusts and concretionary masses. It has an imperfect cleavage with a subconchoidal to uneven fracture and a brittle tenacity. On the Mohs scale it falls at a 6.0 – 7.0 level of hardness. Colors range from black, brownish black, reddish brown, red, yellow, gray and white. It also streaks white. While generally opaque, it is translucent in thin crystals. Its adamantine to dull luster and multiple crystal faces can produce a desirable gem.

In Alabama, cassiterite occurs principally in pegmatites, but minor amounts may be obtained from stream gravel. The color of Alabama cassiterite is usually reddish brown to reddish black. The crystals found in pegmatites occur as short stubby prisms, but frequently massive cassiterite may be found. Specimens taken from stream gravel have a worn, pebbly appearance. Cassiterite does not occur in sufficient quantities in the United States to be mined economically on a large scale, but in the area between Rockford and Goodwater, numerous small cassiterite-bearing pegmatites occur.

Cassiterite has a relatively low melting point—easily attainable in a wood fire—and is therefore easy to melt and cast in molds. (Note: When pure tin is bent rapidly, it makes a peculiar squealing noise known as the “tin cry.”) It, and other tin ores, are used to coat so-called “tin” cans. Since tin does not oxidize in air or water, it is applied to the surface of flat-rolled steel to make tin plate which is then fabricated into cans. This accounts for about one-fourth of the tin consumed annually. Other uses include the production of metal alloys, such as bronze and pewter, and as a solder for electrical applications. Also, window glass is made by pouring molten glass onto molten tin; this process results in flat sheets of glass.

Diorite – an igneous plutonic rock.



Diorite is a very hard, medium- to coarse-grained rock of igneous plutonic origin that is something between a granite and a gabbro. Unlike granite, diorite has no, or very little, quartz or alkali feldspar; unlike gabbro it is fairly light colored—half black and half white. The large interlocking crystals are easily visible and not aligned in any consistent direction.

The principal minerals found in diorite are feldspar, hornblende, and biotite. A high chemical percentage of iron and magnesium in the principle minerals gives the rock its dark color. Because it is commonly speckled black and white, it is often referred to as "salt and pepper" rock. It can also be black or bluish-grey, and frequently has a greenish cast.

Diorite results from partial melting of a mafic rock above a subduction zone. It is commonly produced in volcanic arcs, and in cordilleran mountain building. Its phaneritic texture develops from the slow cooling and crystallization of magma trapped within the earth's crust. However, while diorite is considered to be an igneous rock, some diorite-type rocks are produced by intense metamorphism.

It can grade into granite and frequently in the Piedmont area of Alabama both types of rock may be found near each other in the same outcrop. Diorite and diorite-type rocks occur in widely scattered areas in the Piedmont area and outcrops are difficult to locate exactly.

Although diorite is rough-textured in nature and difficult to carve, it has the ability to take a high polish and to provide a durable finished work. Ancient civilizations, such as Egypt, Babylonia, and Assyria used diorite balls to work granite. Another comparatively frequent use of diorite was for inscription in works of art, as it is easier to carve in relief than in three-dimensional statuary. Diorite art from later periods exists; however, the rock quickly became more popular as a structural stone for constructing buildings and roads due to its durability. Today many diorite cobblestone streets can be found in England, Guernsey and Scotland, and scattered throughout the world.

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

Gneiss – a coarse-textured complex metamorphic rock.

Gneiss is a type of rock with a great variety of large mineral grains arranged in wide bands which originally may have been of either igneous or sedimentary origin. Common and widely distributed, it makes up the largest part of the earth's lower crust. Drill straight down on any continent—pretty much anywhere—and you will eventually strike gneiss.

Though the term “gneiss” refers more to a type of rock texture than to composition, gneissic rocks are usually composed of feldspar and mica, plus one of the dark rock-forming minerals such as hornblende and possibly one or two other distinctive minerals, e.g., kyanite or garnet. They do not carry large quantities of micas, chlorite or other platy minerals.

The dark-colored minerals are generally arranged in broad irregular streaks or bands, giving a genissoid or gneissic appearance. There are several varieties of gneiss, such as graphite gneiss, muscovite gneiss, and hornblende gneiss. Each variety takes its name from the dominating mineral present, in excess of the common rock-forming minerals. Exposures of gneissic rocks are similar to diorite, granite, and other erosional resistant rocks; they have a smooth outer surface, but chip off as irregularly shaped fragments.

The origin of gneissic rocks is not clearly understood, but many believe they reflect the composition of the original material before metamorphism occurred and also reflect the temperature of the metamorphic processes involved. In effect, they are formed when a sedimentary or igneous rock has been deeply buried and subjected to high temperatures and pressures. Nearly all traces of the original structures and fabric are wiped out as the minerals migrate and recrystallize into bands of mafic and felsic minerals. Less than 50 percent of the minerals are aligned in thin, foliated layers and unlike schist (which is more strongly aligned), gneiss doesn't fracture along the planes of the mineral streaks. If the metamorphic conditions continue, gneisses can turn to migmatite and then totally recrystallize into granite.

Gneissic rocks are often used as a raw material in construction and in the building industry. In recent years, many forms of gneissic rocks have been used for ornamental stone because of the patterns produced by the mineral banding.

Granite – a coarse-grained igneous rock.

Granite is an igneous rock composed primarily of four minerals: quartz, feldspar, mica, and usually either biotite or hornblende. Magma cooling very slowly far under the earth's surface allows crystals of the four minerals to grow large enough to be easily seen by the naked eye.

Since it is not a homogenous rock, its composition varies depending upon its location. Granites are light-colored—usually in the gray or pink family—however, their appearance is ultimately determined by the colors of the feldspar and other minerals, which can vary widely when combined. Darker granites, and even green granite, are known.

Granite is currently known only on earth, where it forms a major part of the continental crust and is the most abundant basement rock that underlies the relatively thin sedimentary veneer of the continents. At the surface, granite is exposed in the cores of many mountain ranges, within large areas known as "batholiths," and in the core areas of continents known as "shields." Though very hard and dense, it has a high silica content and crumbles easily when weathered. The feldspar and mica break down into clay minerals, leaving the very resistant quartz grains behind. Most beach sand is composed of quartz grains derived from granite.

On the grandest scale, granite represents the way the continents maintain themselves. The minerals in granitic rocks break down into clay and sand and are carried to the sea. Plate tectonics returns these materials through seafloor spreading and subduction, sweeping them beneath the edges of the

continents. There they are rendered back into feldspar and quartz, ready to rise again when and where the conditions are right.

Granite is the rock most often quarried as a "dimension stone" (a natural rock material that has been cut into blocks or slabs of specific length, width and thickness). It has been used for thousands of years in both interior and exterior applications and can be smoothed to a very high polish. It is the best-known igneous rock because it is used to make many objects we encounter in daily life, including counter tops, floor tiles, paving stone, curbing, stair treads, building veneer and cemetery monuments.

While the geological definition of granite is “any plutonic rock in which the mineral quartz makes up 10 to 50 per cent of the felsic components, and the ratio of alkali to total feldspar is between 65 and 95 per cent”, in the commercial stone industry “granite” is simply any rock that is harder than marble and has visible grains. Under this definition gabbro, basalt, pegmatite, schist, gneiss, syenite, monzonite, anorthosite, grannodiorite, diabase, diorite and many other rocks will be called “granite”.

Hornblende – Ca2(Mg, Fe, Al)5 (Al, Si)8O22(OH)2 – a series of complex silicate minerals that belong to the amphibole mineral group.

Hornblende is an isomorphous mixture of three molecules: a calcium-iron-magnesium silicate, an aluminum-iron-magnesium silicate, and an iron-magnesium silicate. Though not a recognized mineral in its own right, hornblende is an important and widely distributed rock-forming mineral that is a common constituent of many igneous and metamorphic rocks, such as granite, syenite, diorite, gabbro, basalt, andesite, gneiss, and schist.

A member of the monoclinic crystal system, hornblende has a vitreous to dull luster, an uneven fracture and imperfect cleavage at 56 and 124 degrees. It falls at 5.0 – 6.0 level of hardness on the Mohs scale and produces a pale gray to gray-white streak. The crystals may be columnar or fibrous and can grow to a fairly large size of several feet long and nearly a foot across. Although it often occurs in massive aggregates of interlocking crystals, other specimens of hornblende can be acicular clusters or needle thin crystal aggregates.

Minerals in the hornblende series include pargasite, hastingsite, tschermakite, and a rare variety known as edenite that that contains less than 5% of iron oxide, is gray to white in color, and named for its locality in Edenville, NY.

The presence of aluminum in hornblende is the principal chemical difference between it and tremolite. It is usually distinguished from the other amphiboles—tremolite, actinolite, and anthophyllite—by its dark green to black color. The iron rich members of the series are a dark black and less likely to be translucent.

Hornblende has no economic value and is not often a collection mineral because good crystals are somewhat difficult to find, even though the mineral is widespread. However, a few specimens are extraordinary and make for valuable additions to a collection. Many times a specimen of a more valuable mineral will be accented by the opaque black crystals of hornblende.

Kaolinite – Al2Si2O5(OH)4 – a hydrous aluminum silicate.

Kaolinite belongs to a group of submicroscopic crystalline substances known as clay minerals. It may be recognized by its clay-like character, soft earthy appearance and greasy feel. It is generally white, but may be tinted shades of yellow, red, or gray by impurities. It is also known as “china clay” and kaolin.

A member of the triclinic crystal system, kaolinite rarely occurs as crystals, but Instead as microscopic pseudohexagonal plates and clusters of plates aggregated into compact, claylike masses. It has perfect cleavage and is flexible, but inelastic.

On the Mohs scale it is very soft (2.0 – 2.5). Luster is pearly to dull, and it streaks white. Kaolinite can contain very small traces of uranium and thorium, and is therefore useful in radiological dating.

This clay occurs in abundance in soils that have formed from the chemical weathering of aluminum silicate minerals like feldspar in hot, moist climates—for example in tropical rainforests. In Alabama, kaolinite may be found in the Piedmont area where it is associated with feldspar-bearing metamorphic gneiss, granite, and pegmatite. Kaolinite-bearing clays are mined in numerous parts of the state.

Kaolinite has many applications in a wide variety of industries. It is useful as a mineral in making ceramics, porcelains, refractories and for the manufacture of common brick and face brick. It is used as a paint or white wash, and as a titanium dioxide extender to modify gloss levels. It serves as a light diffusing material in white incandescent light bulbs.

It is important to the production of glossy paper for magazines. While a single magazine made using kaolin does not contain enough radioactive material to be detected by a security sensor, a truckload of glossy paper could occasionally trip an overly-sensitive radiation monitor.

Kaolinite has also seen some use in organic farming, as a spray applied to crops to deter insect damage, and, in the case of apples, to prevent sun scald. It is used for facial masks or soap in the cosmetics industry, and in the medical arena, it was recently developed for use as a nanoparticle infusion in traditional gauze, known commercially as QuikClot Combat Gauze.

Long used as a folk medicine to soothe an upset stomach, it is eaten for pleasure, by some, or to suppress hunger—especially during pregnancy. More recently, industrially-produced kaolinite preparations were instituted as a treatment of diarrhea; the most common of these was Kaopectate (later abandoned in favor of bismuth subsalicylate). Kaolinite is also used as a food additive in toothpaste.

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

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

Phyllite – a type of foliated metamorphic rock.

Phyllite is a fine-grained metamorphic rock which resembles slate, but has texture similar to schist. With its parent rock being a shale or pelite, phyllite represents a gradation in the degree of metamorphism between slate and mica schist. Essentially, as metamorphism increases, shale becomes slate and slate becomes phyllite, which, in turn, grades into schist.

Its constituent platy minerals—quartz, sericite mica, and chlorite—are larger than those in slate, but are not visible with the naked eye. (In slate, the mica is microscopic in size, and in schist the other minerals are visible.) Also, unlike slate, phyllite has a definite sheen; the minute crystals impart a silky, sometimes golden sheen to the surfaces of cleavage. Phyllites are usually black to gray-blue or light greenish gray in color, but dark red and green varieties also exist. It has a good fissility and the foliation is commonly crinkled or wavy in appearance.

Slates and phyllites typically form along the edges of regional metamorphic belts where clay-rich, marine sedimentary rocks have been caught between colliding continental plates, or scraped off the seafloor into an accretionary wedge above a subduction zone. Slates and phyllites may also form in sedimentary basins where marine muds have been extremely deeply buried. The amount of heat and pressure required to transform shale to phyllite is generally sufficient to destroy any original sedimentary layering.

Phyllite is generally classified according to the slate from which it was derived. If the phyllite is composed essentially of muscovite mica, it is called a sericite schist. Phyllite generally has no economic value, although rare occurrences of ore minerals have been found.

Tantalite – (Fe,Mn)Ta2O6 – an oxide of rare earth elements.

Tantalite and columbite are oxides of tantalum, niobium, iron and manganese, and frequently contain small amounts of tin and tungsten. These minerals form a complex chemical series with similar physical properties. In fact, the two are often grouped together as a semi-singular mineral called columbite-tantalite in many mineral field guides.

If niobium predominates, the mineral is designated columbite; if tantalum predominates, the mineral is designated tantalite. Often associated with quartz, mica, and feldspar, both minerals can be found, more or less together, in granitic pegmatites, rich in lithium and phosphorus minerals. Columbite will concentrate at the edges of the pegmatite and tantalite will enrich the core.

A member of the orthorhombic crystal system, tantalite has good cleavage in one direction and a subconchoidal fracture. Luster is submetallic to almost resinous, and it falls at 6.0 – 6.5 on the Mohs scale. Colors range from dark black, iron-black, dark brown and reddish brown. It also streaks brownish-red to black. Crystals are commonly short prismatic, but can also be equant, granular or disseminated. Frequently, they are found in a complex crystal forms such as square or heart-shaped prisms. Tantalite can be easily distinguished from the very similar columbite via a check of specific gravity (8.0+ compared to columbite's 5.2).

Alabama's tantalite is found as small irregular, hackled particles, partly in crystalline form resembling bits of charred wood.

The tantalum recovered from tantalite is classified as a rare earth element and is sought for making surgical tools, rocket engine metals, electronic equipment, camera lenses and acid-resisting chemical equipment because it has a very high melting point (2996°C) and is remarkably resistant to attack by air, water and most acids. Since it is non-reactive and non-irritating to body tissues, it is also is used in making the rods that attach to broken bones and skull plates, and wire meshes that help repair nerves and muscles.

Tantalite has a dimorphic relationship to another mineral called tapiolite. The two have exactly the same chemistry, but tapiolite has a tetragonal structure as opposed to the orthorhombic structure of tantalite. As mineral specimens, tantalite can be a nice addition to one's collection. Good crystals are both complex and handsome.

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

Additional Minerals of Coosa County

In addition to actinolite-tremolite, beryl (var: aquamarine, goshenite, heliodor, and morganite), cassiterite, diorite, feldspar, gneiss, granite, hornblende, kaolinite, muscovite, pegmatite, phyllite, tantalite and tourmaline, the www.mindat.org website currently lists the presence of 80 other mineral specimens or mineral variations in Coosa County: albite (var: oligoclase), 'allanite', 'alum group', andalusite, 'apatite', augite, autunite, barbosalite, beraunite, bermanite, biotite, birnessite, cacoxenite, chalcanthite, chalcopyrite, 'chlorite group', clinozoisite, 'columbite-tantalite', corundum (var: sapphire), cryptomelane, cummingtonite, dravite, enstatite, epidote, ferrisicklerite, fluorite, 'garnet', goethite, gold, graphite, halotrichite, hedenbergite, heterosite, hureaulite, hypersthene, 'jahnsite', kyanite, laueite, lepidolite, leucophosphite, limonite, lipscombite, lithiophorite, magnetite, 'marble', meta-autunite, microcline group (var: uranmicrolite), molybdenite, 'monazite', 'moonstone', nanpingite, 'perthite', phosphosiderite, pyrite, pyrolusite, quartz (var: rock crystal and smoky quartz), rockbridgeite, roscoelite, rutile, 'scapolite', schorl, sillimanite, silver, spessartine, spodumene, staurolite, stewartite, strunzite, 'tapiolite', topaz, triphylite, triplite, turquoise, vivianite, 'wad', wavellite, wodginite, zircon, and zoisite.

Over 250 mines are on record in Coosa County. Most sites are spread widely across the upper two-thirds of the county with a noticeable cluster in and around Rockford.

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