

Minerals and Energy

Geology

- The Nantahala and Pisgah National Forests lie within a geological area known as the **Blue Ridge province of the Appalachian Mountains**. These mountains form a southwest to northeast range through western NC and contain many peaks over 1 mile in elevation.
- The Blue Ridge Mountains are primarily comprised of **igneous and metamorphic rock types**. Most of the igneous rocks found in the Blue Ridge are common types; however, the mineral olivine that forms from dunite is considered an “exotic” mineral from the African continent, which was attached to the North American continent until about 350 million years ago.
- Geologic processes that formed the Blue Ridge mountains also produced a multitude of mineral resources of varying potential.
- Common variety minerals are those that are wide spread and do not contain valuable metals or gems. Examples include crushed stone, limestones, and marble.



Massey Branch Quarry

Active mines for common variety minerals

- The lease, sale, and permitting of mineral activity depends on the type of mineral sought and the mineral ownership. There are 3 active mines on the Nantahala National Forest.
- **Appalachian Properties, Inc. (158 acres)**. Hard rock mineral lease for olivine in Buck Creek, Clay County, Tusquitee Ranger District in the Nantahala National Forest. Management Area Designation 4D.
- **Massey Branch Quarry (36.4 acres)**. An aggregate stone quarry in Graham County, Cheoah Ranger District on the Nantahala National Forest. Management Area 2B.
- **Hewitt Quarry (about 25 acres)**. A limestone (really low-grade marble) quarry in Swain County, Cheoah Ranger District on the Nantahala National Forest (private minerals). Total private mineral area = 300 acres. Management Area Designation 2C.

Hydroelectric power – Four hydroelectric dams on the Nantahala NF

Nantahala Project – Duke Energy Carolinas, LLC (Issued February 2012)

Located in western North Carolina on the Nantahala River and on two tributaries, Dicks Creek and White Oak Creek.

This project occupies 41 acres of the Nantahala National Forest.

The Nantahala Project generates an average of 215,159 megawatt hours (MWh) of energy annually.

Queens Creek – Duke Energy Carolinas, LLC (Issued March 2002)

Located on Queens Creek, 1.5 miles upstream of its confluence with the Nantahala River, near the town of Topton, Macon County, NC.

The project does not occupy any federally-owned lands.

The Queens Creek Project historic annual average generation is 5,000 MWh.

East Fork Project – Duke Energy Carolinas, LLC (Issued May 2011)

The East Fork Project is located on the East Fork of the Tuckasegee River in western North Carolina and lies within the Tuckasegee River watershed, which is a subbasin of the Little Tennessee River.

The East Fork Project consists of three hydroelectric developments which are, Tennessee Creek, Bear Creek, and Cedar Cliff.

The East Fork Project generates an average of 94,710 MWh of energy annually.

Tapoco Project – Alcoa Power Generating, Inc. (Issued January 2005)

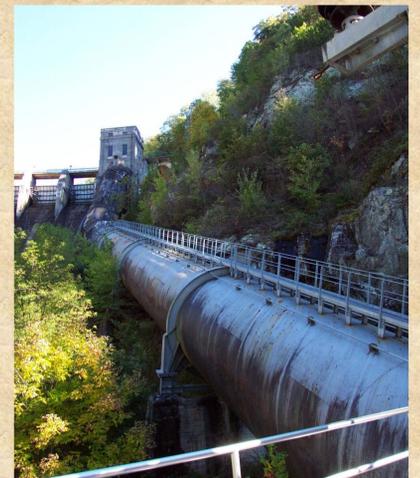
Located on the Little Tennessee and Cheoah Rivers in Graham and Swain Counties in North Carolina and Blount and Monroe Counties in Tennessee.

The project includes four developments: Santeetlah, Cheoah, Calderwood, and Chilhowee.

The Tapoco Project historically has generated about 1,445,582 MWh of electricity annually.



Cheoah Powerhouse



Cheoah Dam Penstock



Cheoah Dam

Recreational Rock hounding

- A substantial amount of exploration for minerals is done by “rockhounds”, who look for rocks and minerals as a dispersed recreation activity.
- Numerous old mines on National Forest lands and mineralized outcrops are especially attractive to rockhounds.
- Popular rock hounding areas include the Ray Mine near Burnsville, and the Buck Creek olivine deposit in Clay County.
- Minerals and gems that are collected in western NC include olivine, feldspar, mica, emeralds, kyanite, quartz, amethyst, rubies, sapphires.



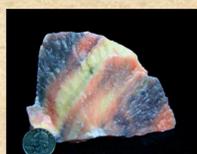
Quartz from North Carolina
(width = 13-inches)



Muscovite and Tourmaline
Ray Mica Mine - Yancey County, NC



Beryl in Granite Pegmatite
Ray Mica Mine
Yancey Co., North Carolina
(30 mm long)



Marble bands