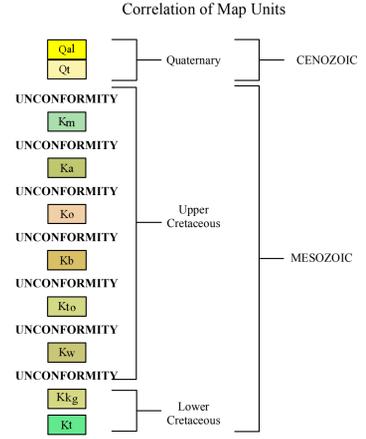
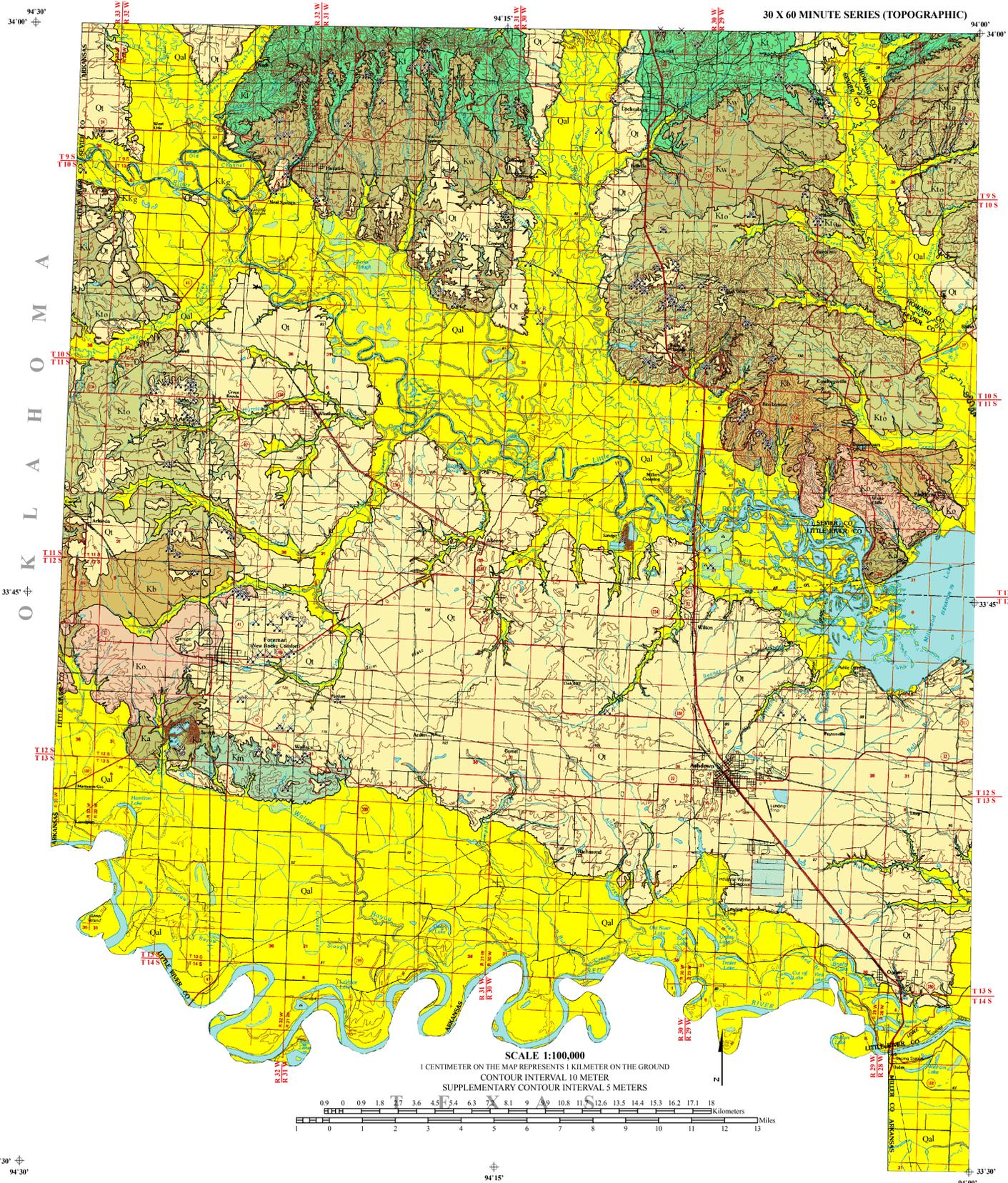
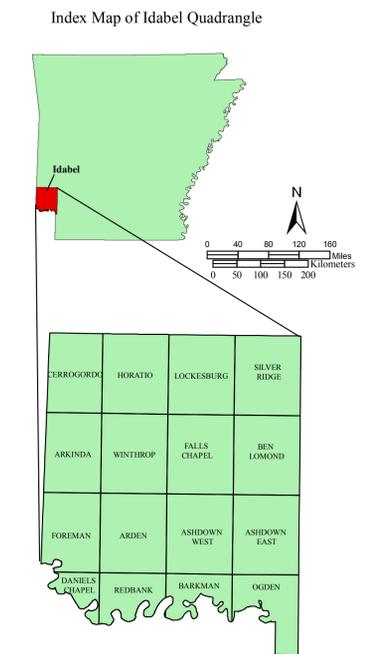


# GEOLOGIC MAP OF THE ARKANSAS PORTION OF THE IDABEL QUADRANGLE, LITTLE RIVER, SEVIER, MILLER AND HOWARD COUNTIES, ARKANSAS

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- ### Description of Map Units
- Qal** - **Alluvium (Quaternary)** - Variably sized gravel overlain by unconsolidated sand, silt, and clay comprises the unit. This unit occurs in the floodplains of streams and rivers. The sediments form a rich loam and are excellent for agriculture. Gravels, primarily novaculite, originated in the Ouachita Mountain region and from local Cretaceous formations. Thickness varies from 0 to 30 feet (9 meters). Areas of alluvium are presently receiving sediment deposition.
  - Qt** - **Terrace Deposit (Quaternary)** - Terrace deposits generally grade from basal gravel to silt and clay at the top. Gravels, primarily novaculite, originated in the Ouachita Mountain region and from local Cretaceous formations. Thicknesses are generally less than 50 feet (15 meters). Terraces are topographic features which are former floodplains of nearby streams and/or rivers. The sediments form a rich loamy soil. The basal gravel is sometimes utilized for water-well production and gravel-mining operations.
  - Kn** - **Marlbrook Marl (Upper Cretaceous)** - The Marlbrook Marl is a uniform chalky marl that is blue-gray when freshly exposed and weathers white to light brown. The unit is moderately fossiliferous in the upper part and slightly fossiliferous in the lower part. Notable fossils include *Exogyra*, *Gryphaea*, and *Ostrea* oyster species and reptilian remains. The Marlbrook Marl is approximately 80 feet (24 meters) thick in the mapped area. The unit strikes to the northeast and has a dip of approximately 80 feet (24 meters) per mile to the southeast in this quadrangle. The Marlbrook Marl was deposited in a nearshore marine environment and rests unconformably on the Annona Formation.
  - Ka** - **Annona Chalk (Upper Cretaceous)** - The Annona Chalk is a hard, massive, thick-bedded, fossiliferous chalk. The chalk is gray-blue when fresh and weathers white. Notable fossils occurring in the unit are *Gryphaea*, *Echinocorya texana*, and *Inoceramus*. The unit outcrops from north of Columbus, AR, southwest to the Arkansas-Oklahoma state line near Foreman, AR, and dips to the south approximately 80 feet (24 meters) per mile. The thickness in the area is about 120 feet (36 meters). The unit was deposited in a nearshore marine environment following an unconformity separating it from the underlying Ozan Formation.
  - Ko** - **Ozan Formation (Upper Cretaceous)** - The Ozan Formation consists of sandy marl, marl, and a sandy glauconitic marl. The unit is fossiliferous, micaceous, and weathers to a yellow-brown sticky clay. The basal sandy glauconitic marl, known as the Buckrange Sand Lentil, has shark teeth and phosphate nodules, and is about 15 feet (4.5 meters) thick. Thickness of the unit on this quadrangle is about 150 feet (45 meters). Notable fossils are the *Exogyra ponderosa* and *Gryphaea*. The outcrop belt extends from west of Arkadelphia, southwest to the Arkansas-Oklahoma border, and dips approximately 80 feet (24 meters) per mile to the southwest. The unit was deposited in a nearshore marine environment and rests unconformably on the Brownstown Marl.
  - Kb** - **Brownstown Marl (Upper Cretaceous)** - The Brownstown Marl consists of dark-gray calcareous clay, marl, and sandy marl. The unit is fossiliferous and weathers yellow to gray in color. Notable fossils are the *Exogyra ponderosa* and *Inoceramus*. The outcrop belt extends from east of Arkadelphia, AR, southwest to the Arkansas-Oklahoma state line, and dips approximately 80 feet (24 meters) per mile to the south. The approximate thickness in the quadrangle is 220 feet (67 meters). The unit was deposited in a nearshore marine environment and rests unconformably on the Tokio Formation.
  - Kto** - **Tokio Formation (Upper Cretaceous)** - The Tokio Formation consists of cross-bedded sand, gravel, gray clay, and volcanic ash. Basal cross-bedded gravels are approximately 30 feet (9 meters) thick. Minor sand and clay lenses occur within the gravel, while sand commonly fills the interstitial spaces around the gravel. Thinner beds less than 1 foot in thickness (0.3 meters) and lenses of gravel occur within the formation's sand intervals. The gravels range from pea-size to 6 inches (15 centimeters) in diameter and are composed of quartz, novaculite, sandstone, and quartzite. Iron-oxide-cemented conglomerates may be present locally. The cross-bedded sands are medium-to-fine-grained quartz with minor amounts of heavy minerals, glauconite, iron-oxide concretions, and rip-up clasts of gray clay. Sands weather yellow to orange-red in color. Gray clays are lignitic, pyritic, fossiliferous, and may contain leaf imprints. The volcanic ash is light gray to white and has altered to kaolinitic clay. The source area for much of the formation's sediment was the Ouachita Mountain region. The formation outcrop belt extends from near Arkadelphia, southwest to the Arkansas-Oklahoma state line, and dips to the south at approximately 300 feet (91 meters) per mile. The approximate thickness in the quadrangle is 80 feet (24 meters). The unit was deposited in a nearshore marine environment on an unconformable surface which separates it from the underlying Woodbine Formation (Upper Cretaceous).
  - Ksw** - **Woodbine Formation (Upper Cretaceous)** - The Woodbine Formation consists of water-laid, cross-bedded tufts, tuffaceous sands, gravel, and red and gray clay. Basal cross-bedded gravels are approximately 20 feet (6 meters) thick and form a 1/2 to 6 inches (1 centimeter to 15 centimeters) in diameter, well-rounded and are composed of novaculite, quartz, sandstone, and quartzite. Iron-cemented conglomerates may be present locally. Igneous rock pebbles and cobbles are interbedded within the tufts. Unweathered tufts range from the area between Marfessboro and Lockesburg, Arkansas. The source area for the gravels was the Ouachita Mountain region west of the Arkansas-Oklahoma state line, and dips approximately 80 feet (24 meters) per mile to the south. The unit was deposited in a near-shore marine environment following a major unconformity which separates it from the underlying Trinity Group (Lower Cretaceous). The approximate thickness in the quadrangle is 250 feet (76 meters).
  - Kkg** - **Kiamichi Clay and Goodland Limestone (Lower Cretaceous)** - The Kiamichi Formation consists of gray and green marls with lenses of gray fossiliferous limestone. The unit is approximately 20 feet (6 meters) thick in the mapped area. The prevalent fossil is the *Gryphaea navia*. The unit was deposited in a near-shore marine environment and is conformable with the underlying Trinity fossils Group. The Goodland Limestone consists of limestones interbedded with calcareous clay and thinly-bedded calcareous sandstone. Limestone beds range from 6 to 24 inches (15 - 60 centimeters) in thickness. The unit is approximately 35 feet (10 meters) thick in the quadrangle. The Goodland Limestone was deposited in a near-shore marine environment, and is conformable with the underlying Kiamichi Formation. Outcrops of these formations can only be found 1/2 mile (0.8 kilometers) north of Cerrogordo, Arkansas, and at the Little River County Club, Little River County, Arkansas.
  - Kt** - **Trinity Group (Lower Cretaceous)** - The Trinity Group consists of gravel, sand, clay, gypsum, Celestine, and barite. The group is exposed in an east-west trending belt and dips south approximately 100 feet (30 meters) per mile. Sediments comprising this unit originated to the north in the Ouachita Mountain region and were deposited following a major unconformity on an upturned and eroded Paleozoic surface in a near-shore marine environment. The Paluxy Sand Member is the only member of the Trinity Group exposed in the quadrangle. This member is composed of cross-bedded medium-to fine-grained quartz sand, minor gravel, and bedded gray, light gray and brown clay. Sands weather from yellow to orange-red in color. The thickness of the unit in the quadrangles is approximately 200 feet (60 meters).



- ### Symbols
- Contact
  - Sand and Gravel Pit
  - Abandoned Sand and Gravel Pit
  - Reclaimed Sand and Gravel Pit
  - Chalk
  - Abandoned Chalk

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