GEOLOGIC MAP OF THE OKOLONA NORTH QUADRANGLE, CLARK COUNTY, ARKANSAS

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Digital Compilation by William D. Hanson and Daniel K. Smith
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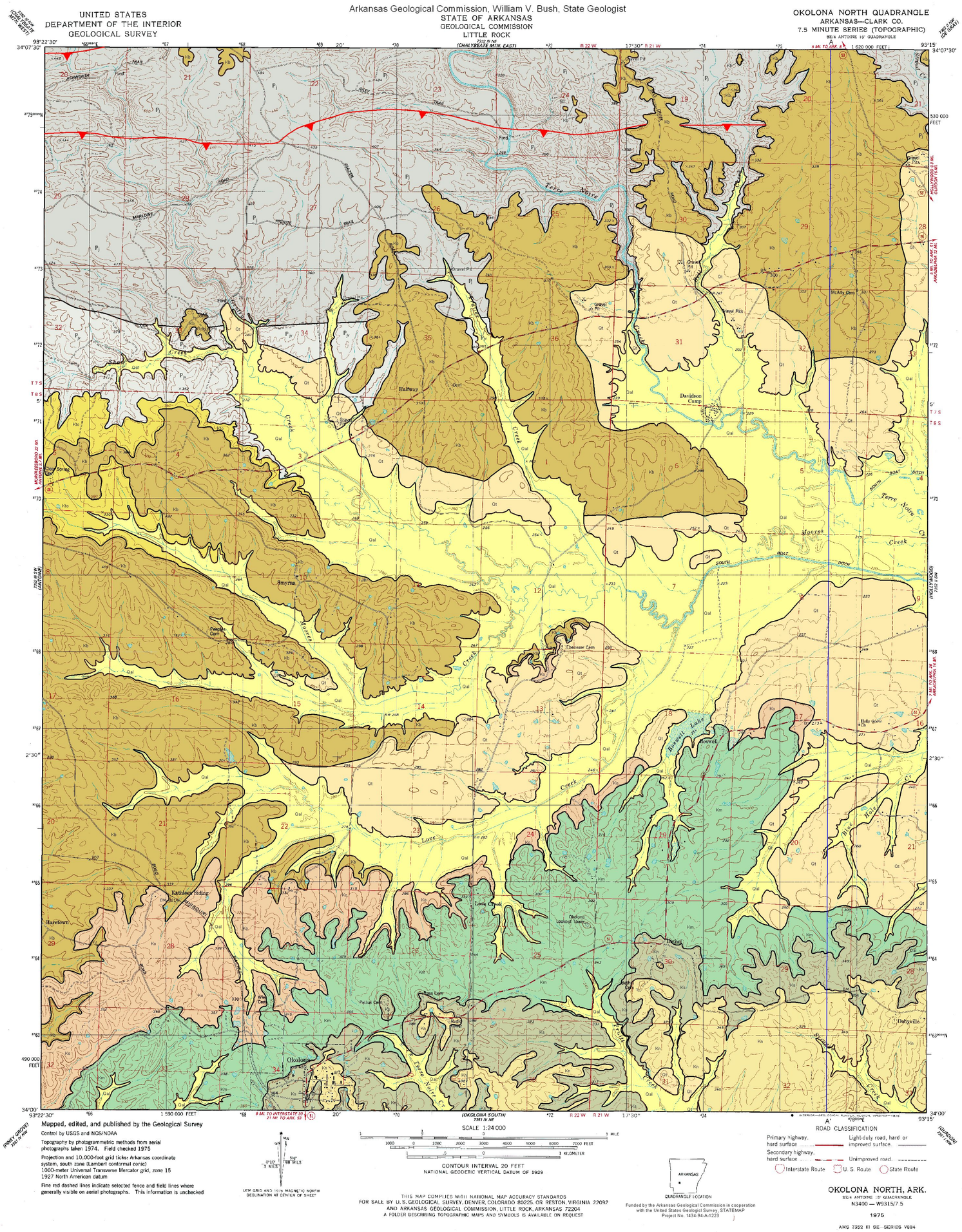
Arkansas Geological Commission, William V. Bush, State Geologist
STATE OF ARKANSAS
GEOLOGICAL COMMISSION
LITTLE ROCK



CORRELATION OF MAP UNITS

Qal, Qt	Quaternary	CENOZOIC
UNCONFORMITY		
Kn	Upper Cretaceous	MESOZOIC
UNCONFORMITY		
Ks		
UNCONFORMITY		
Km		
UNCONFORMITY		
Ko		
UNCONFORMITY		
Kb		
UNCONFORMITY		
Kto		
UNCONFORMITY		
P_{jv}, P_j	Pennsylvanian	PALEOZOIC

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 25 feet. Areas of alluvium are presently receiving sediment deposition.

Qt — **Terrace Deposits (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. 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 — **Nacatoch Sand (Upper Cretaceous)** - The Nacatoch Sand is composed of unconsolidated, cross-bedded, yellow to orange fine quartz sand, inter-bedded gray clay, and clay rip-up clasts. The Nacatoch Sand is approximately 120 feet thick in the mapped area. The unit strikes to the northeast and has a dip of approximately 80 feet per mile to the southeast. Fossils found in the unit include corals, echinoderms, bryozoa, annelids, bivalves, gastropods, cephalopods, crab remains, and shark teeth. The Nacatoch Sand was deposited in a nearshore marine environment and rests unconformably on top of the Saratoga Chalk.

Ks — **Saratoga Chalk (Upper Cretaceous)** - The Saratoga Chalk is a fossiliferous, hard, glauconitic chalk with beds of marly chalk and chalky sand. It is blue-gray when freshly exposed and weathers white, light-gray, and light-brown. The Saratoga Chalk is 30 to 40 feet thick in the mapped area. The unit strikes to the northeast and has a dip of approximately 80 feet per mile to the southeast in this quadrangle. Fossils found in the unit include sponges, bryozoa, echinoderms, annelids, bivalves, gastropods, cephalopods, crustaceans, and fish teeth. The Saratoga Chalk was deposited in a nearshore marine environment and rests unconformably on top of the Marlbrook Marl.

Km — **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 reptile remains. The Marlbrook Marl is approximately 160 feet thick in the mapped area. The unit strikes to the northeast and has a dip of approximately 80 feet per mile to the southeast in this quadrangle. The Marlbrook Marl was deposited in a nearshore marine environment and rests unconformably on top of the Ozan Formation.

Ko — **Ozan Formation (Upper Cretaceous)** - The Ozan Formation consists of marl and sandy marl. The unit is fossiliferous, micaceous, and weathers to a yellow-brown sticky clay. Thicknesses in the quadrangle are generally less than 100 feet. Notable fossils include the *Exogyra ponderosa* and *Gryphaea*. The outcrop belt extends from west of Arkadelphia, southwest to the Arkansas-Oklahoma border, and dip approximately 80 feet per mile to the south. The unit was deposited in a nearshore marine environment and rests unconformably on the Brownstown Marl.

Kb — **Brownstown Marl (Upper Cretaceous)** - The Brownstown Marl is composed of gravel, sand, and clay at its northern exposures and grades into a calcareous clay, marl, and sandy marl in the southern exposures on this quadrangle. 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, southwest to the Arkansas-Oklahoma border, and dips approximately 80 feet per mile to the south. The approximate thickness in the quadrangle is 200 feet. The unit was deposited in a nearshore marine environment and rests unconformably on the Tokio Formation.

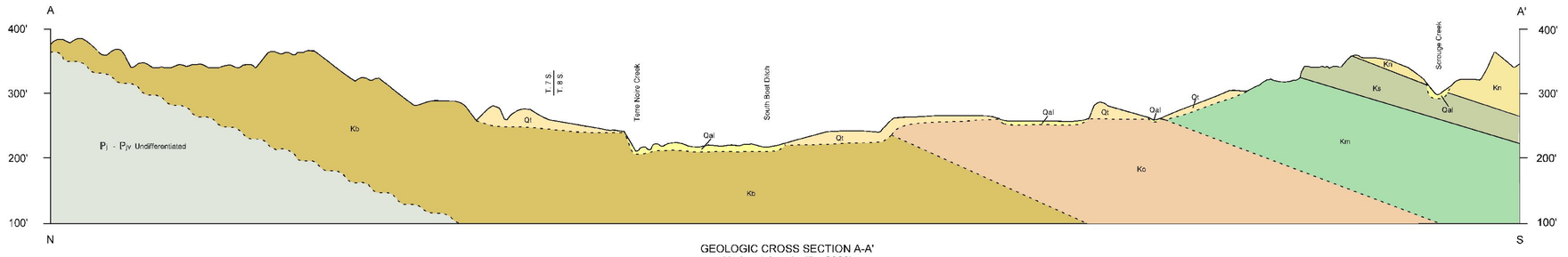
Kto — **Tokio Formation (Upper Cretaceous)** - The Tokio Formation consists of cross-bedded sand, gravel, and gray clay. Minor sand and clay lenses occur within the gravel, while sand commonly fills the interstitial spaces around the gravel. The gravels range from pea-size to 6 inches in diameter and are composed of quartz, novaculite, sandstone, and quartzite. 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. 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 border, and dips to the south at approximately 80 feet per mile. The approximate thickness in the quadrangle is less than 40 feet. The unit was deposited in a nearshore marine environment on a major unconformable surface which separates it from the underlying Johns Valley Shale.

P_{jv} — **Johns Valley Shale (Pennsylvanian)** - The Johns Valley Shale typically consists of alternating intervals of grayish-black shale and light gray, micaceous, silty, fine- to medium-grained sandstone. The shale usually weathers to a buff gray color and the sandstone weathers to a light to dark brown color. Thin beds of siliceous shale and chert with siderite concretions are present in some shales. Chaotic rock intervals occur near the base of the formation and may contain exotic, calcareous, fossiliferous siltstones. Carbonized plant remains occur in some of the silty sandstones. The formation has a thickness of about 2,500 feet. Structural deformation prevents an accurate estimate of the thickness for this area. Deep marine turbidite deposition is indicated by the abundant sedimentary features and trace fossils. The formation is conformable with the underlying Jackfork Sandstone. The overlying Atoka Formation (Pennsylvanian) is missing on this quadrangle.

P_j — **Jackfork Sandstone (Pennsylvanian)** - The Jackfork Sandstone contains alternating layers of grayish black shale, fine- to medium-grained, light-gray, quartzose sandstone. Shales weather reddish- to tannish-gray in color. The sandstone weathers white to reddish-brown in color. Some quartz granule-conglomerate is present in massive quartzose sands in the upper and lower portions of the formation. Thin intervals of black siliceous shales with some pinkish siderite laminae are sometimes present. Debris flows containing clasts of shale, sandstone, and siderite are present locally. Some slurried silty sandstones contain coalified plant remains. Deep marine turbidite deposition is indicated by the sedimentary feature types and trace fossils. In the Athens Plateau, the Jackfork Sandstone has a total thickness of about 7,500 feet.

SYMBOLS

- Contact
- Thrust Fault
- Strike and Dip (45)
- Gravel Pit



GEOLOGIC CROSS SECTION A-A'
Horizontal scale 1" = 2000'
Vertical scale 1" = 100'

REFERENCES

Bush, W.V., and Clardy, B.F., 1971, Geological Map of the Okolona North Quadrangle, Clark County, Arkansas: Arkansas Geological Commission, Open-File Report, Scale 1:24,000.
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McFarland, John David, 1998, Stratigraphic Summary of Arkansas: Arkansas Geological Commission Information Circular 36, 39 p.