

Geologic Map of the Atkins Quadrangle, Pope, Yell and Conway Counties, Arkansas

Geology by Boyd R. Haley, Charles G. Stone and Angela K. Chandler

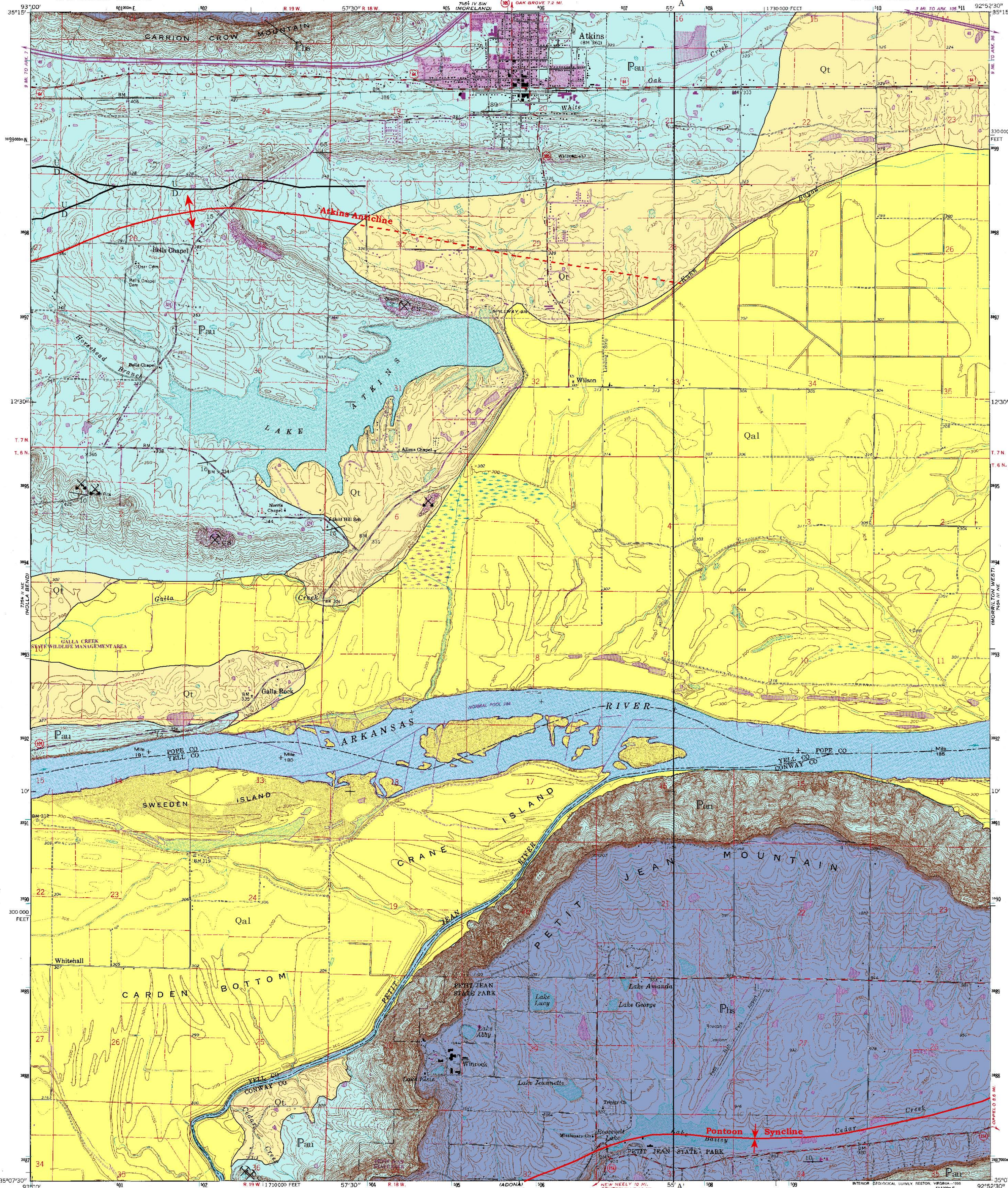
2008

Arkansas Geological Survey, Bekki White, State Geologist

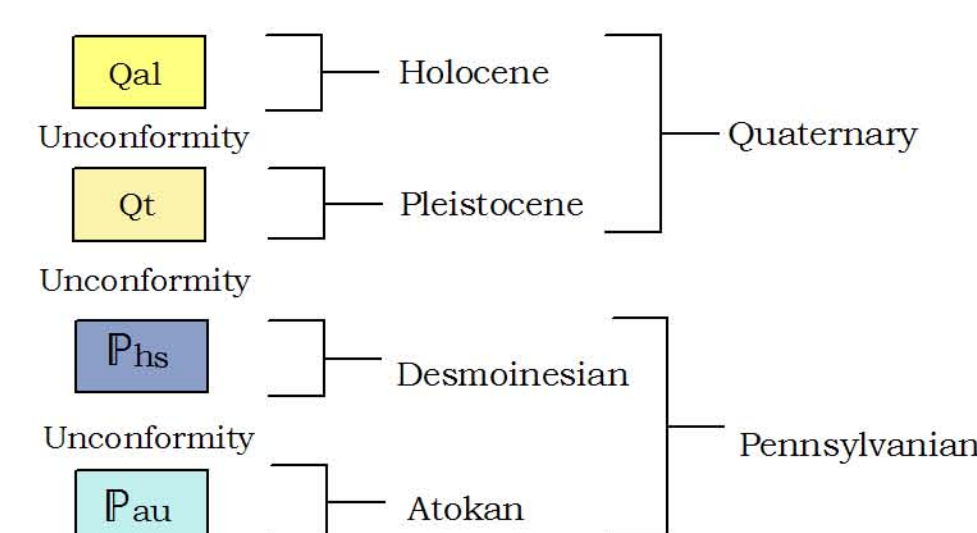
Digital Geologic Quadrangle Map
Atkins Quadrangle, Arkansas
DGM-AR-00037

DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ARKANSAS
7.5 MINUTE SERIES (TOPOGRAPHIC)



Correlation of Map Units



Terrace deposits exposed along Highway 105 south of Atkins.

Introduction

The Atkins quadrangle was mapped by Boyd R. Haley and Charles G. Stone in 1995 through COGEMAP, a cooperative mapping project with the Oklahoma Geological Survey and the U.S. Geological Survey. This area was revisited in 2007 for a State Park Series centered on Petit Jean State Park and as a result this map was digitized and the layout compiled as a Digital Geologic Map, DGM-AR-00005.

The Atkins quadrangle is located in the Arkansas River Valley physiographic region. Several structures (anticlines and synclines) are present as a result of the tectonic forces during the Ouachita orogenic (mountain building) event. This area contains broad valleys consisting of less-resistant shales with resistant sandstones forming the ridges.



Sandstone blocks (Atoka Formation) along the Atkins Anticline north of Lake Atkins.

Description of Map Units

Qal **Alluvium (Quaternary, Holocene)** - Consists of various alluvial deposits, tan to buff in color, composed of sand, clay and gravel. Approximately 10-30 ft. of section exposed along the Arkansas River and the Petit Jean River.

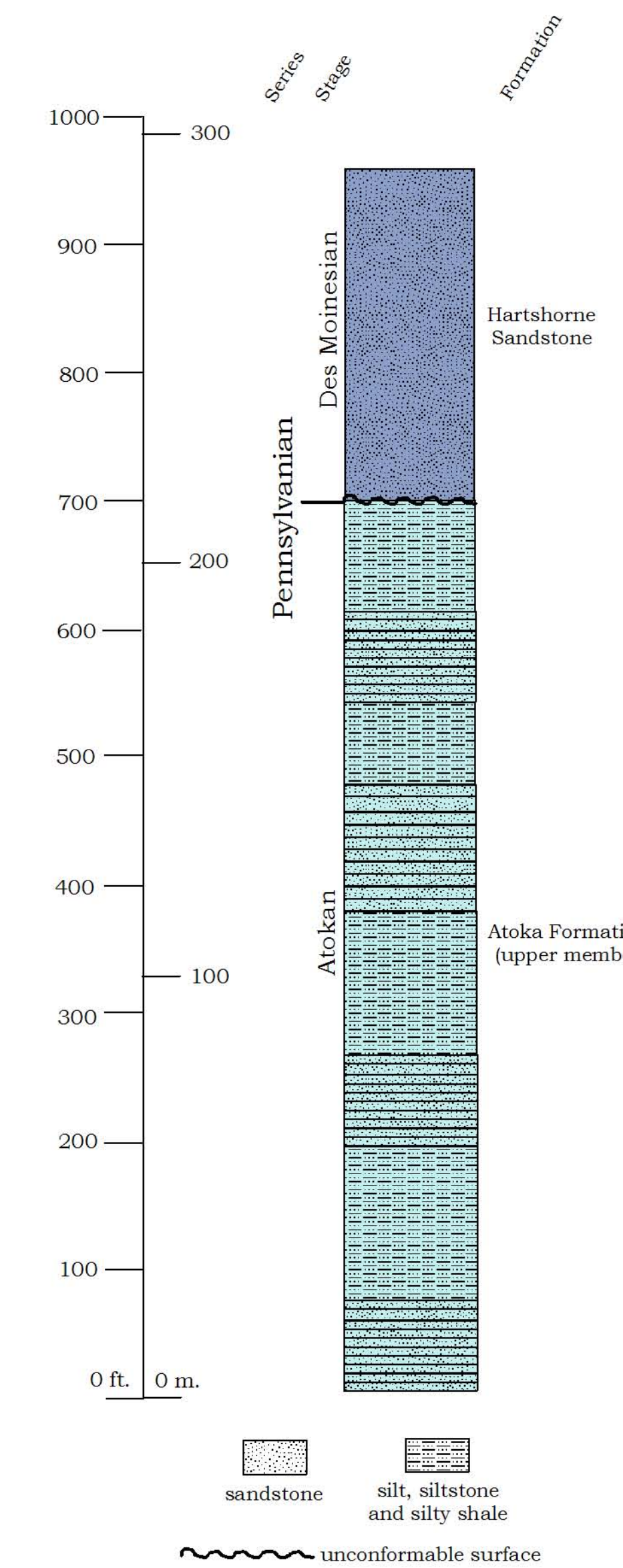
Qt **Terrace deposits (Quaternary, Pleistocene)** - Consists of various low to high level terrace deposits, reddish-orange in color, composed mostly of fine-grained sand with varying amounts of clay and gravel. Mussel shells from a terrace approximately 30 feet above the present river level have yielded a Carbon-14 dating of 38,000 years in age (Stone, 1975). Approximately 30-50 feet thick.

Phs **Hartshorne Sandstone (Pennsylvanian, Des Moinesian)** - A very fine to medium-grained micaceous sandstone that is thin to massive-bedded. The massive beds contain tabular cross-beds. The sandstone is usually a light red or orange to buff or white on fresh surfaces but weathers a dark gray. The quartz grains are angular to sub-rounded. Also contains some intervals of siltstone and shale. This formation is exposed on top of Carrion Crow Mountain and Petit Jean Mountain and contains the well known "turtle rocks" and box-work or "carpet rock" seen in Petit Jean State Park (Chandler, 2007). The Hartshorne Sandstone is unconformable with the underlying Atoka Formation. Approximately 200-300 ft. thick in this area.

Pau **Atoka Formation (Pennsylvanian, Atokan)** - The Atoka Formation is divided into upper, middle and lower members based on regionally mappable shale or sandstone intervals (McFarland, 1998). Only the upper member is exposed on this quadrangle.

Upper member - Consists of micaceous clay to silty shales, siltstones and thin-bedded sandstones. Some silty sequences contain very thin-bedded rounded concretions. This unit contains limonite pebble beds and occasional fossiliferous beds containing mostly gastropods and bivalves. More commonly seen are plant fossils and trace fossils such as *Conostictites*. Coal stringers and thin coal beds less than one inch are abundant in this member. The Atoka Formation is present in the town of Atkins and along the hillsides of Carrion "Crow" Mountain and Petit Jean Mountain and in the surrounding valleys. Approximately 650-700 ft. of section is exposed in the area.

Stratigraphic Column



Symbols

- Formation contact
- +— Syncline
- +— Anticline
- U Fault
- U - upthrown side
- D - downthrown side
- 12 Strike and dip of inclined bedding
- Bedding
- CS Quarry - crushed stone
- X Gravel Pit

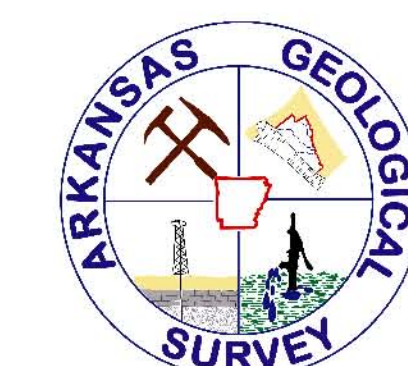
References

- Chandler, Angela K., 2007, The geologic story of Petit Jean State Park: Arkansas Geological Survey, State Park Series 2, 10 p., 4 trail maps.
- Haley, Boyd R., and Stone, Charles G., 1995, Geologic map of the Atkins Quadrangle: Arkansas Geological Commission Geologic Worksheet, 1 sheet.
- Haley, Boyd R., and Stone, Charles G., 1995, Geologic map of the Atkins Quadrangle: Arkansas Geological Commission Geologic Worksheet, 1 sheet.
- Haley, Boyd R., and Stone, Charles G., 1995, Geologic map of the Morrilton West Quadrangle: Arkansas Geological Commission Geologic Worksheet, 1 sheet.
- Howard, J.M., 2008, Arkansas mineral commodity database: Arkansas Geological Survey, in house data.
- McFarland, John David, 1998, Stratigraphic summary of Arkansas: Arkansas Geological Commission Information Circular, IC 36, 39 pp.
- Stone, Charles G., 1975, A brief summary of the Petit Jean Mountain Region: Arkansas Geological Commission Open file report, 8 pp.
- Stone, Charles G. and McFarland, John D. III, with the cooperation of Haley, Boyd R., 1981, Field guidebook to the Paleozoic rocks of the Ouachita Mountains and Arkansas Valley Provinces, Arkansas: Arkansas Geological Commission Guidebook 81-1, 140 pp.

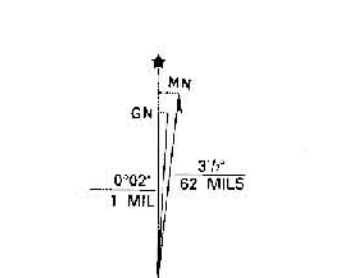
Acknowledgments: This geologic map is a compilation of the Atkins quadrangle that was mapped in 1995 for COGEMAP, Cooperative Geologic Mapping Program, a program with the U.S. Geological Survey. Many thanks to Charles Stone and Boyd Haley for their assistance in creating this digital map with layout.

Disclaimer: This map was prepared in a digital format using ArcView 9.2, ArcGIS 9 software on computers at the Arkansas Geological Survey. The Arkansas Geological Survey does not guarantee the accuracy of this map especially when used on any other system or with any other software. As mapping continues and is refined, the data presented on this map may be updated. For the latest edition of this publication please contact our office.

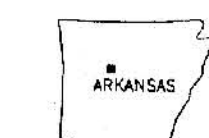
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Produced by the United States Geological Survey
Compiled by photogrammetric methods from imagery dated 1958
Field checked 1961
North American Datum of 1927 (NAD 27). Projection and 10 000-foot ticks, Arkansas coordinate system, north zone (Lambert conformal conic)
Base: 1000-meter Universal Transverse Mercator ticks, zone 15
North American Datum of 1983 (NAD 83) is shown by dashed corner ticks. The values of the shift between NAD 27 and NAD 83 for 7.5 minute intersections are obtainable from National Geologic Survey MIDCON software.
There may be private inholdings within the boundaries of the National or State reservations shown on this map.

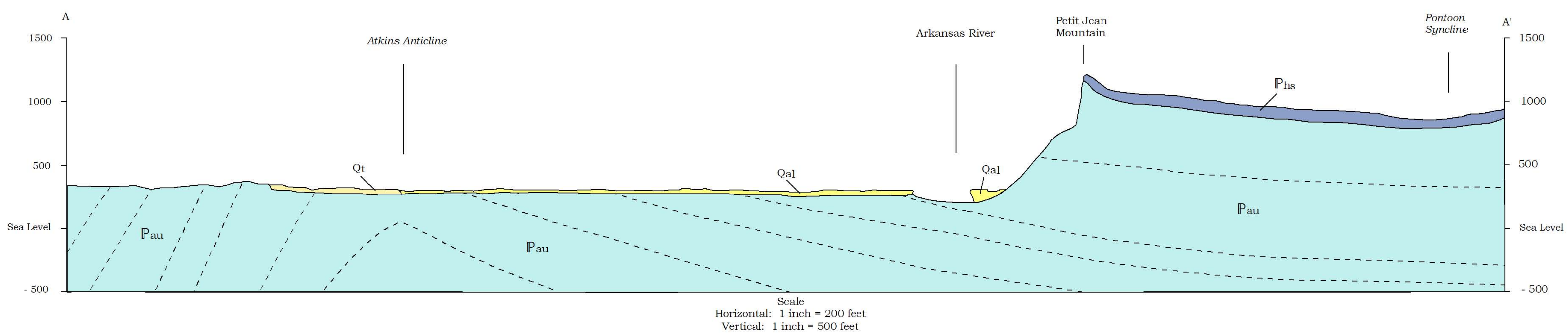


SCALE 1:24,000
CONTOUR INTERVAL 10 FEET
DOTTED LINES REPRESENT 5-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929



ATKINS, AR
3509288-17-024
1989
DMA 7454 10 NW SERIES 9854

Revisions shown in purple compiled in cooperation with State of Arkansas agencies from imagery dated 1989 and other sources. Map edited 1995.
Information shown in purple may not meet USGS content standards and may conflict with previously mapped contours.



Scale
Horizontal: 1 inch = 200 feet
Vertical: 1 inch = 500 feet