

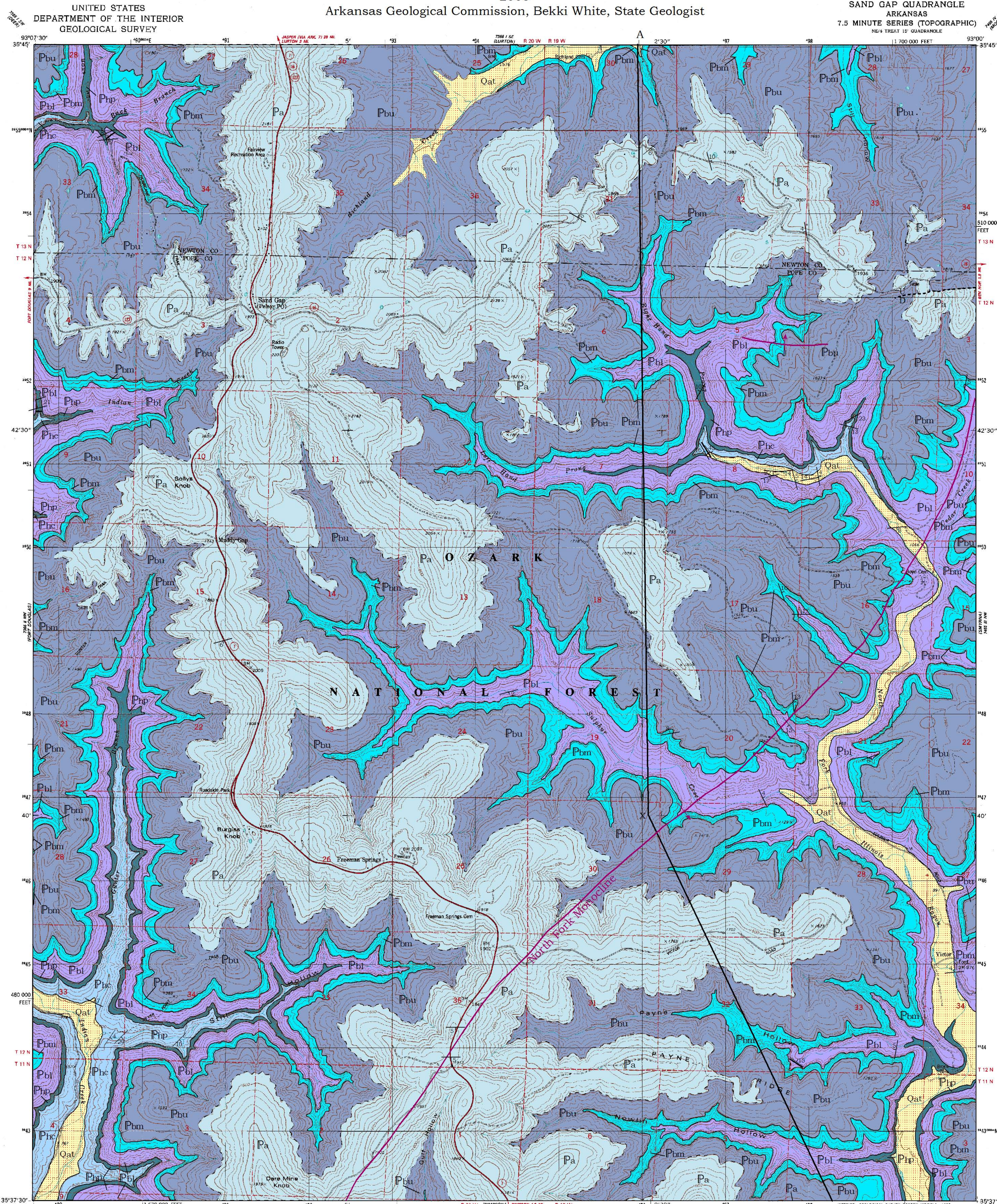
GEOLOGIC MAP OF THE SAND GAP QUADRANGLE, NEWTON AND POPE COUNTIES, ARKANSAS

Geology by Angela K. Braden and James M. Smith
Digital compilation by Walter K. Mayfield
2005

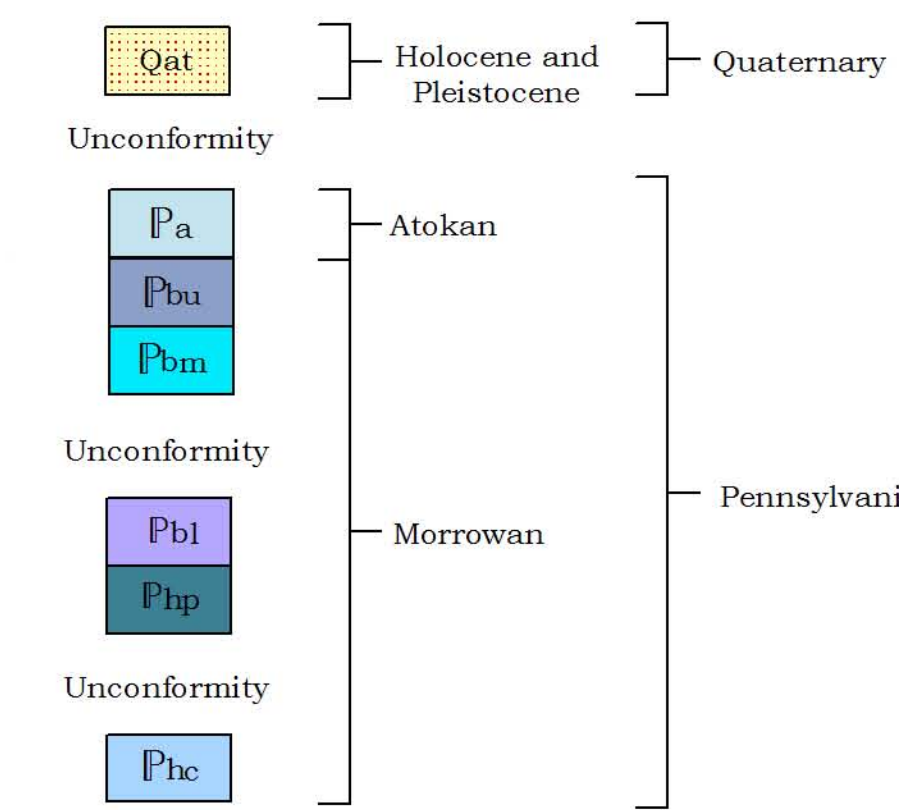
Arkansas Geological Commission, Bekki White, State Geologist

SAND GAP QUADRANGLE
ARKANSAS
7.5 MINUTE SERIES (TOPOGRAPHIC)

DIGITAL GEOLOGIC QUADRANGLE MAP
SAND GAP QUADRANGLE, AR
DGM-AR-00767



Correlation of Map Units



Hale Formation (Lower Pennsylvanian, Morrowan) - The Hale Formation consists of two Members; the Prairie Grove Member and the Cane Hill Member. Approximately 80-260 ft. (24-79 m) thick.

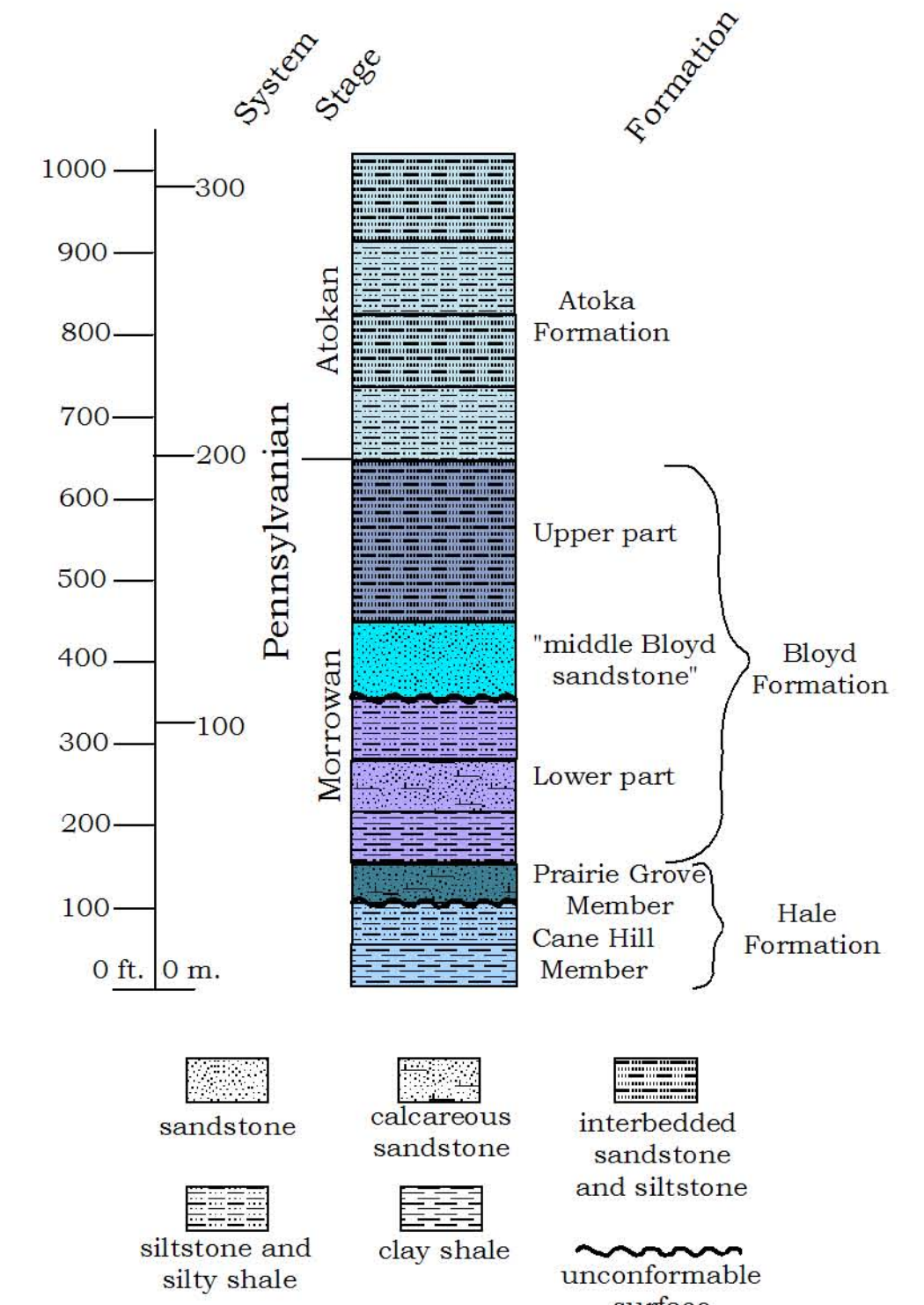
Prairie Grove Member - A fine to coarse-grained quartz sandstone with varying amounts of carbonate, crinoid fragments and quartz pebbles. Reddish gray to brown or mottled on fresh surfaces but weathers dark reddish-brown. Bedding varies from thin to massive and exhibits a rounded weathering profile. This unit often contains cross-beds, lensegging bands, and a pitted surface that is referred to as honeycomb weathering. The base of the Prairie Grove Member contains a fossiliferous quartz pebble conglomerate that contains clay drapes, limonite pebbles and clasts of shale, siltstone, and sandstone. This unit is a prominent bluff former throughout the quadrangle and in the southern part of the quadrangle this unit forms a double bluff. It is becoming increasingly difficult to differentiate the Prairie Grove Member due to additional sandstone packages in the Hale Formation and the lower part of the Bloyd Formation in the southern half of the quadrangle. The Prairie Grove Member is unconformable with the Cane Hill Member. Approximately 40-80 ft. (12-24 m) thick.

Cane Hill Member - A gray to black fissile clay to silty shale in the lower portion that contains iron nodules and small limonitic box work fragments. The upper portion consists of thin-bedded ripple marked micaceous siltstones and sandstones. Varies from black to dark gray on fresh surface to light gray and light orange-brown on weathered surface. Trace fossils and hydropod fragments are abundant. The base of the Cane Hill Member is not exposed in this quadrangle. Approximately 40-180 ft. (12-55 m) thick.

Description of Map Units

- Qat** - Alluvium and terrace deposits (Quaternary) - Unconsolidated clay, silt, sand and gravel including deposits on one or more terrace levels of local streams.
- Pa** - Atoka Formation (Middle Pennsylvanian, Atokan) - Consists of black to tan shales, interbedded with very thin to thin ripple-bedded micaceous siltstones, and thin to medium bedded, fine to very fine-grained sandstones with sub-angular to sub-rounded quartz grains. The sandstones are tan to buff colored on fresh and weathered surface and contain clay pebbles, lensegging bands, horizontal trace fossils, and cross-beds. Occasionally the sandstones contain pebble conglomerate zones with external molds of fossils. The sandstones vary from 10 - 20 ft. (3 - 6 m) thick. This contact is tentative and will be resolved with future mapping. Approximately 240-520 ft. (73 - 158 m) thick.
- Pbu** - Bloyd Formation (Lower Pennsylvanian, Morrowan) - In this quadrangle the individual members within the Bloyd Formation cannot be recognized because its limestone units (Brentwood and Keasler Limestones) are either missing or have become shaly and sandy. There are no other "marker zones" to divide the section into the recognizable members known from the type section in northwest Arkansas. Therefore the Bloyd Formation is divided informally into lower and upper parts (Hudson et al., 2001) separated by the "middle Bloyd sandstone" Zachry and Haley, 1975. Approximately 400-700 ft. (121-213 m) thick.
 - Upper part** - Consists of thin ripple-bedded to thick micaceous sandstones interbedded with clay to silty shales. The sandstone consists of fine to coarse-grained sub-angular to sub-rounded quartz. They are light-brown to gray on fresh surface but weather dark-gray. The shales are dark-gray to black on fresh and weathered surfaces. This interval contains many trace fossils and leaf features. Approximately 160-340 ft. (48-104 m) thick.
 - "middle Bloyd sandstone"** - A thin to massive, medium to coarse-grained, cross-bedded quartz or iron-cemented sandstone with sub-angular to sub-rounded quartz grains. Reddish, gray, or light tan on fresh surface but weathers brown to orange-brown due to iron content. The cross-bedded packages can be up to three feet thick and occasionally "overturned". Contains abundant hydropod fossils and rounded quartz pebbles. This sandstone forms a prominent bluff throughout this quadrangle and separates the upper from the lower part of the Bloyd Formation. A pebble clast conglomerate is present at some localities at the base of this sandstone. In sections 4 and 5 of T 12 N, R 19 W is Pedestal Rocks Special Interest Area. In this area tall sandstone pedestals occur, due mostly to the widening of well developed points in this area. The "middle Bloyd sandstone" is unconformable with the lower part of the Bloyd Formation. Approximately 80-120 ft. (24 - 37 m) thick.
 - Lower part** - Consists of interbedded very thin to thin ripple-bedded micaceous siltstones and sandstones that are fine to medium-grained interbedded with black clay to silty shales. Throughout the lower portion is black fissile clay shales to silty shales interbedded with thin to thick-bedded fossiliferous carbonate to sandy carbonate layers. The carbonate layers vary from red to gray on fresh and weathered surface and can be mottled. Sometimes the fossiliferous sandy layers look "rotten" due to decalcification. The quartz shales are medium-grained and sub-angular to sub-rounded. The contact between the lower part of the Bloyd Formation and the Prairie Grove is placed below a shaly layer conformable with the underlying massive calcareous sand of the Prairie Grove Member of the Hale Formation. This contact is conformable. Approximately 160 - 240 ft. (48 - 73 m) thick.
- Pbl** - "middle Bloyd sandstone" - A thin to massive, medium to coarse-grained, cross-bedded quartz or iron-cemented sandstone with sub-angular to sub-rounded quartz grains. Reddish, gray, or light tan on fresh surface but weathers brown to orange-brown due to iron content. The cross-bedded packages can be up to three feet thick and occasionally "overturned". Contains abundant hydropod fossils and rounded quartz pebbles. This sandstone forms a prominent bluff throughout this quadrangle and separates the upper from the lower part of the Bloyd Formation. A pebble clast conglomerate is present at some localities at the base of this sandstone. In sections 4 and 5 of T 12 N, R 19 W is Pedestal Rocks Special Interest Area. In this area tall sandstone pedestals occur, due mostly to the widening of well developed points in this area. The "middle Bloyd sandstone" is unconformable with the lower part of the Bloyd Formation. Approximately 80-120 ft. (24 - 37 m) thick.
- Pbp** - Lower part - Consists of interbedded very thin to thin ripple-bedded micaceous siltstones and sandstones that are fine to medium-grained interbedded with black clay to silty shales. Throughout the lower portion is black fissile clay shales to silty shales interbedded with thin to thick-bedded fossiliferous carbonate to sandy carbonate layers. The carbonate layers vary from red to gray on fresh and weathered surface and can be mottled. Sometimes the fossiliferous sandy layers look "rotten" due to decalcification. The quartz shales are medium-grained and sub-angular to sub-rounded. The contact between the lower part of the Bloyd Formation and the Prairie Grove is placed below a shaly layer conformable with the underlying massive calcareous sand of the Prairie Grove Member of the Hale Formation. This contact is conformable. Approximately 160 - 240 ft. (48 - 73 m) thick.
- Pbc** - Cane Hill Member - A gray to black fissile clay to silty shale in the lower portion that contains iron nodules and small limonitic box work fragments. The upper portion consists of thin-bedded ripple marked micaceous siltstones and sandstones. Varies from black to dark gray on fresh surface to light gray and light orange-brown on weathered surface. Trace fossils and hydropod fragments are abundant. The base of the Cane Hill Member is not exposed in this quadrangle. Approximately 40-180 ft. (12-55 m) thick.

Stratigraphic Section



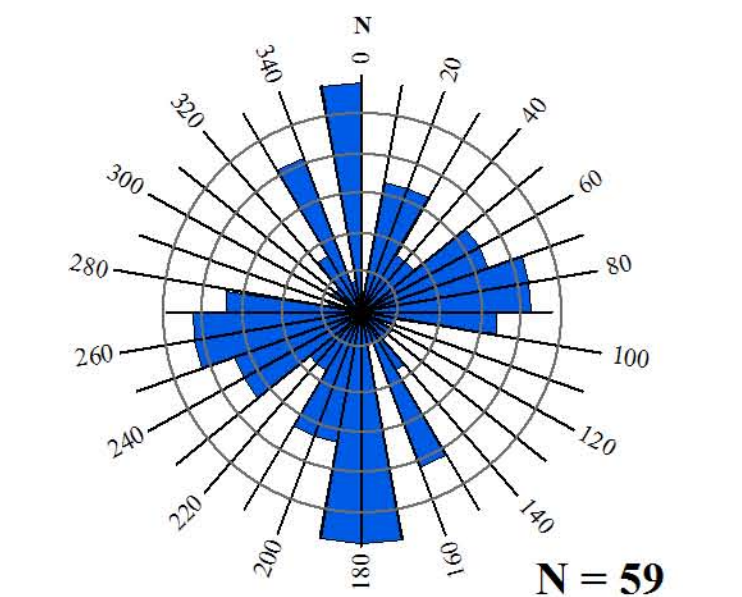
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Symbols

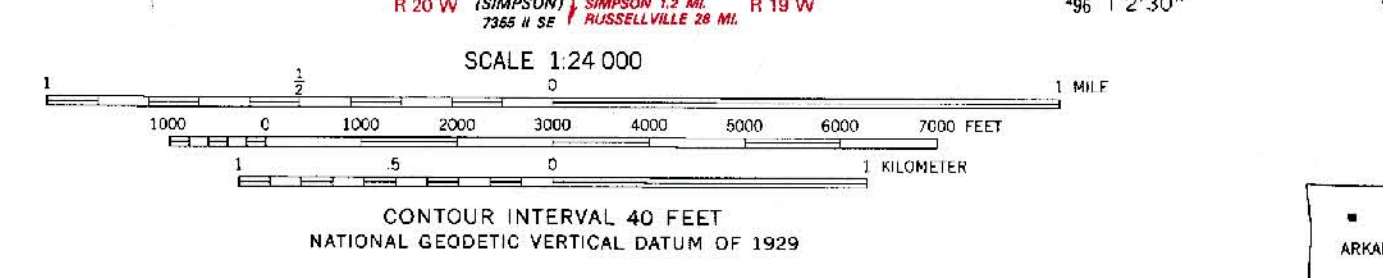
- Contact
- Contact - inferred
- Fault - Upthrown
- Fault - Downthrown
- Fault - Inferred
- Monocline
- Strike and dip of inclined bedding

Joint Frequency



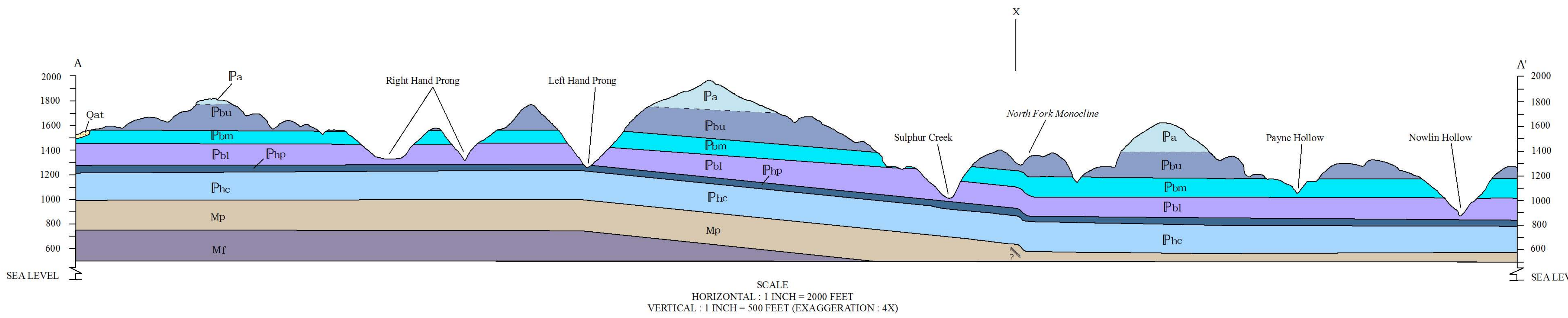
Rose diagram of strike frequency of joints recorded within the Sand Gap Quadrangle.

Mapped, edited, and published by the Geological Survey
Control by USGS and NOS/NOAA
Topography by photogrammetric methods from aerial photographs taken 1975. Field checked 1976. Map edited 1980
Projection and 10,000 foot grid ticks: Arkansas coordinate system, north zone (Lambert conformal conic)
1000-meter Universal Transverse Mercator grid, zone 15
1927 North American Datum
To place on the predicted North American Datum 1983
move the projection lines 6 meters south and
15 meters east as shown by dashed corner ticks
There may be private inholdings within the boundaries of the National or State reservations shown on this map
Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is un-checked



ROAD CLASSIFICATION
Primary highway, Light duty road, hard or hard surface
Secondary highway, Unimproved road, hard surface
Interstate Route, U.S. Route, State Route

SAND GAP, ARK.
NS4 TREAT 19 QUADRANGLE
N3357.5-W95007.5
1980
DMA 1355 11 N; SERIES 7884



SCALE
HORIZONTAL: 1 INCH = 2000 FEET
VERTICAL: 1 INCH = 500 FEET (EXAGGERATION: 4X)

Acknowledgments: This map was produced for STATEMAP, Cooperative Agreement Award O4HQAG0038, a matching-funds grants program with the US Geological Survey under The National Cooperative Geologic Mapping Program. Special thanks to the U.S. Forest Service and to private landowners who graciously allowed access to their property.

Disclaimer: This map was prepared in a digital format using ArcView 9, ArcGIS 9 software on computers at the Arkansas Geological Commission. The Arkansas Geological Commission 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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