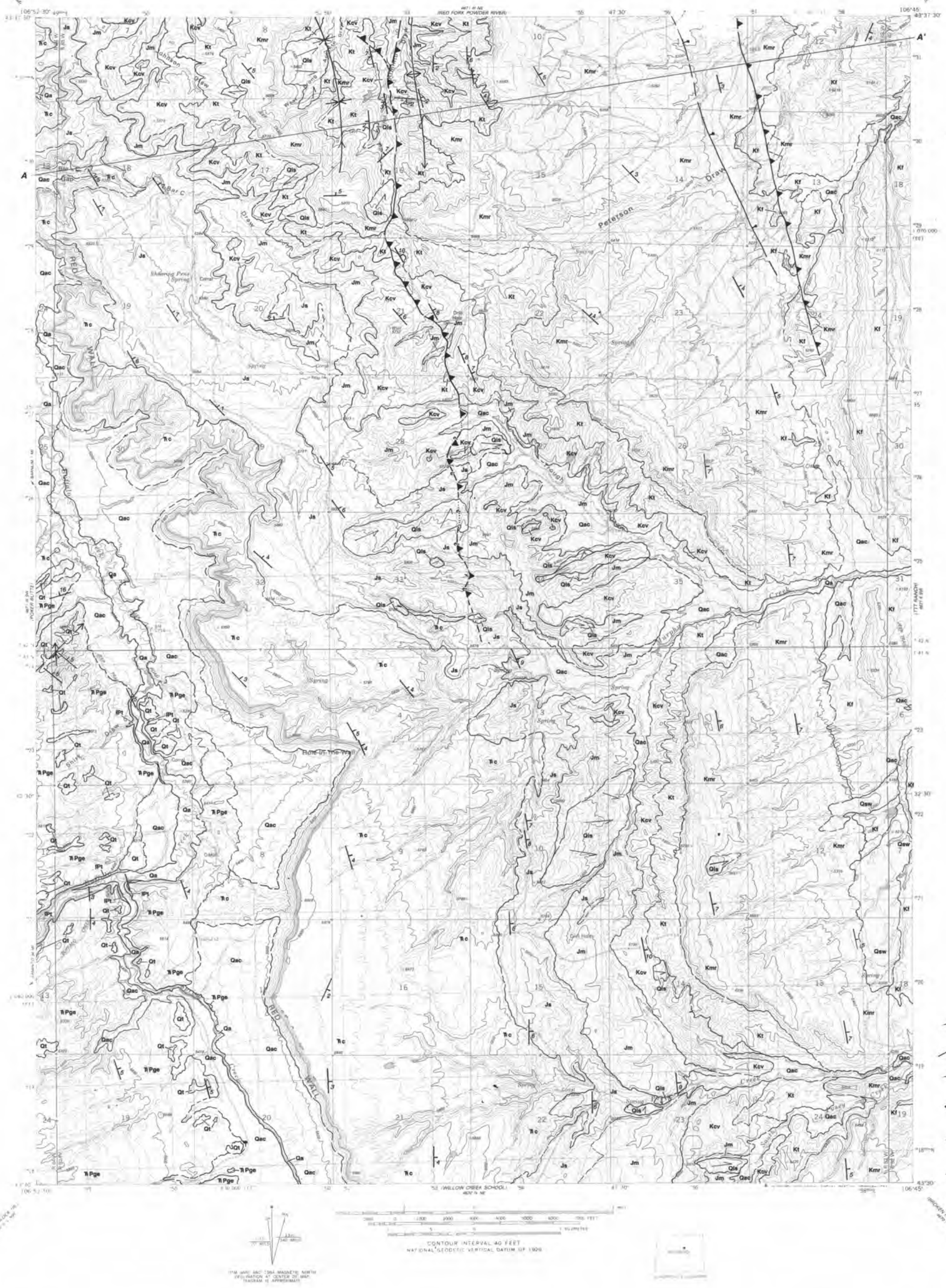
WYOMING STATE GEOLOGICAL SURVEY
Gary B. Glass, State Geologist

PRELIMINARY GEOLOGIC MAP 98-2
Hole-in-the-Wall Quadrangle
Johnson County, Wyoming



EXPLANATION

SEDIMENTARY ROCKS AND SURFICIAL DEPOSITS

Qa **Alluvial deposits (Holocene)**
Unconsolidated and poorly consolidated clay, silt, sand, and gravel, mainly in floodplains and lowest Holocene stream terraces. Thickness 0 to 50 feet.

Qac **Mixed alluvium and colluvium (Holocene/Pleistocene)**
Sand, silt, clay, and gravel deposited mainly along intermittent streams; includes slope wash and smaller alluvial fan deposits that coalesce with alluvium. Thickness approximately 0 to 50 feet.

Qt **Terrace deposits (Pleistocene)**
Beds of coarse sand and gravel with occasional boulders and lenses of silt and clay. Includes fragments of weathered sandstone and limestone cobbles, predominance varies depending on source of feeding stream. Occur along Buffalo Creek, 80 feet to over 350 feet above modern flood plain. Thickness approximately 0 to 10 feet.

Qls **Landslide deposits (Holocene/Pleistocene)**
Blocks of bedrock or loose slope debris; arrows point in the inferred direction of movement. Occur in the Mowry, Thermopolis, Morrison, and Sundance shales.

Qsw **Slope wash deposits (Holocene/Pleistocene)**
Unconsolidated alluvial deposits eroded from the Mowry Shale and sloping down onto the Frontier Formation on the east side of the map. Less than 20 feet thick.

UNCONFORMITY

Kf **Frontier Formation (Upper Cretaceous)**
Gray to black shale and siltstone, bentonite beds, and "salt and pepper" sandstones. First Wall Creek Sandstone Member forms top and Second Wall Creek Sandstone Member occurs lower in the section. Thickness is 800 to 850 feet.

Kmr **Mowry Shale (Upper Cretaceous)**
Hard, dark gray, siliceous shale with numerous fish scales and interbedded bentonite beds. Weathers to a characteristic silver-gray color. Black, hard shale in lower portion of the section. Contact with overlying Frontier Formation is at the base of the persistent "Clay Spur Bentonite". Thickness approximately 350 feet.

Kt **Thermopolis Shale and Muddy Sandstone (Lower Cretaceous) undivided**
Gray to black, soft, fissile shale. Lower dark gray shale contains numerous dahlite concretions. Muddy Sandstone, a fine- to medium-grained brown to gray sandstone, occurs at the top of this sequence and is mapped with it. Thickness 160 to 200 feet.

Kcv **Cloverly Formation (Lower Cretaceous)**
"Rusty Beds" at top are tan to black shale interbedded with siltstone and fine-grained sandstone. Lower portion is white to gray sandstone; variegated, brightly colored claystone, and locally, a chert pebble conglomerate at the base. Thickness is 100 to 140 feet.

UNCONFORMITY

Jm **Morrison Formation (Upper Jurassic)**
Upper portion composed of variegated light green and pink claystone, siltstone, and siliceous channel sandstones. Dinosaur bones and bone fragments are common in the upper potion of the section. Lower portion includes calcareous sandstone, shale, and mudstone. Thickness is 170 to 220 feet.

Js **Sundance Formation (Upper and Middle Jurassic)**
Olive green, glauconitic, silty shale with minor sand lenses in upper portion. Locally, a thin gray coquinal limestone occurs at the top of the sequence. Lower portion primarily yellowish gray, fine-grained sandstone. Middle portion can contain a thin fossiliferous limestone. Total thickness up to 350 feet.

UNCONFORMITY

Ꞧc **Chugwater Formation (Triassic)**
Members included from top to bottom are Crow Mountain Sandstone-reddish orange fine-grained, calcareous sandstone; Alcova Limestone-prominent 5 to 10 foot thick purplish gray limestone; and Red Peak Shale-red shale and siltstone with some fine-grained sandstone. Forms the prominent feature known as the Red Wall and the famous Hole-in-the-Wall. Thickness is 750 to 850 feet.

ꞦPge **Goose Egg Formation (Lower Triassic and Permian)**
Dark red to reddish orange shale and siltstone with interbedded gypsum, limestone, and dolomite, mainly in the lower portion. Formation thickness is 300 to 350 feet.

UNCONFORMITY

IPt **Tensleep Sandstone (Pennsylvanian)**
White to buff, medium- to very fine-grained, massive sandstone; interbedded with thin limestone and dolomite beds, especially toward the base. Upper and middle sandstones are usually characterized by large-scale crossbeds. Thickness is 350 to 400 feet.

MAP SYMBOLS

Formation contact
Dashed where approximately located.

Normal fault
Dashed where approximately located, dotted where concealed. Bar and ball on downthrown block.

Reverse fault
Dashed where approximately located, dotted where concealed. Sawteeth on upthrown block.

Anticline
Trace of axial plane and direction of plunge determined by field dip measurements and by photo interpretation. Dashed where approximately located, dotted where concealed.

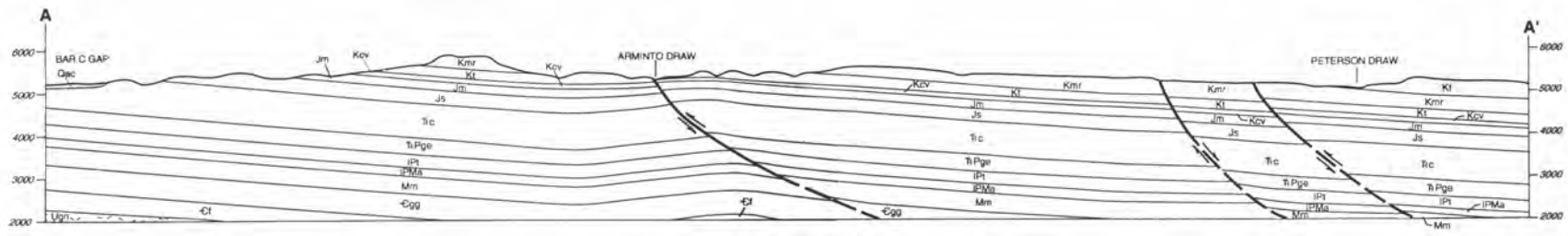
Syncline
Trace of axial plane and direction of plunge determined by field dip measurements and by photo interpretation. Dashed where approximately located, dotted where concealed.

Monocline
Trace of axial plane as determined by field measurements and by photo interpretation. Dashed where approximately located. Short arrow denotes steeper dipping limb.

Strike and dip of beds, showing angle of dip.

A—A' Cross section location
Line of section. Precambrian granite gneiss (Archean-3,000+ Ma in age)-**Ugn**-is shown on the cross section only as it does not crop out in map area. In addition, the sedimentary units **Ꞓf**-Flathead Sandstone (Middle Cambrian); **O-Ꞓgg**-Gallatin Limestone (Lower Ordovician and Upper Cambrian) and Gros Ventre Formation (Middle Cambrian) undivided; **Mm**-Madison Limestone (Upper and Lower Mississippian); and **IPMa**-Amsden Formation (Pennsylvanian and Upper Mississippian) are shown on the cross section but do not crop out in the map area.

This map has not been edited for conformity with the editorial standards of the Wyoming State Geological Survey.



PRELIMINARY GEOLOGIC MAP OF THE HOLE-IN-THE-WALL QUADRANGLE, JOHNSON COUNTY, WYOMING

by
Alan J. Ver Ploeg
1998