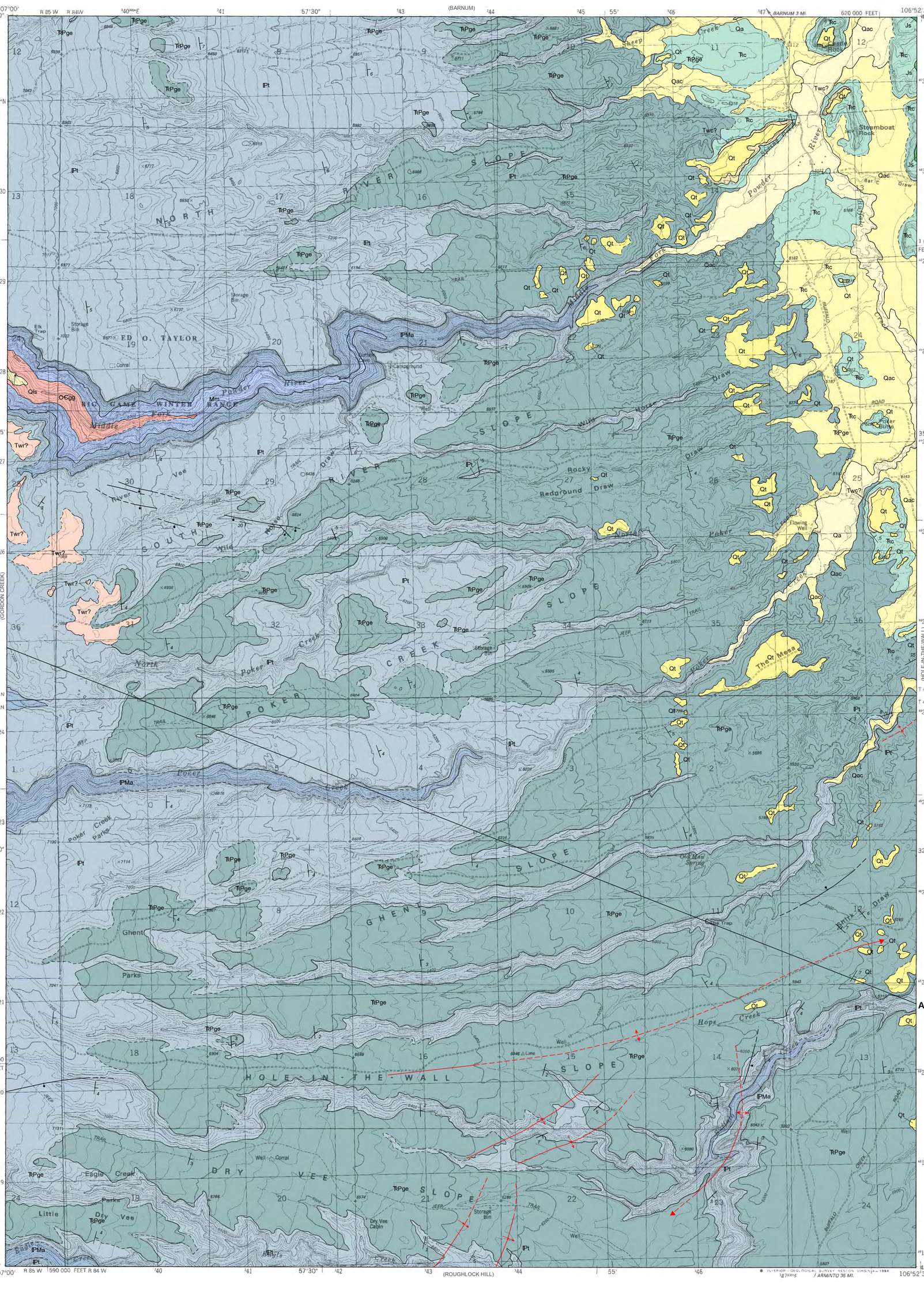
WYOMING STATE GEOLOGICAL SURVEY
Lance Cook, State Geologist
Laramie, Wyoming

Geology - Interpreting the past to provide for the future

Prepared in cooperation with the
U.S. GEOLOGICAL SURVEY

OPEN FILE REPORT 04-13
Poker Butte 1:24,000 - scale Geologic Map



Projection: Universal Transverse Mercator (UTM), zone 13
North American Datum of 1927 (NAD 27)
10,000-foot grid ticks:Wyoming State Plane Coordinate System, East zone

A digital version of this map is also available on CD-ROM.

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GN MN 1°20' 24 MILS 13½° 240 MILS
UTM GRID CONVERGENCE (GN)
1982 MAGNETIC DECLINATION (MN) AT CENTER OF SHEET
DIAGRAM IS APPROXIMATE

SCALE 1:24,000
1 0.5 0 1 Miles
1,000 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 Feet
1 0.5 0 1 Kilometers
CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

QUADRANGLE LOCATION

Digital cartography by Justin M. Mulbay and David W. Lucke

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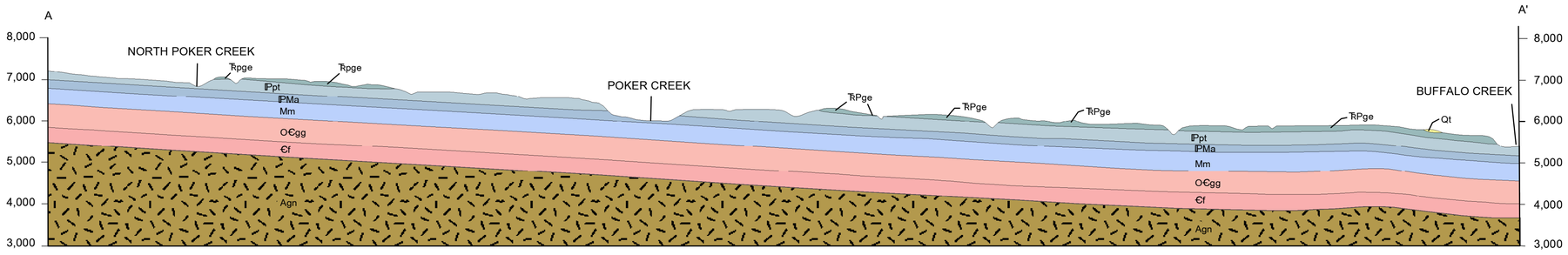

GEOLOGIC MAP OF THE POKER BUTTE QUADRANGLE, JOHNSON COUNTY, WYOMING

by
Alan J. Ver Ploeg
2004

EXPLANATION

CORRELATION OF MAP UNITS

Unit	Epoch	Period
Qa, Qac, Qls, Qt	Holocene, Pleistocene	Quaternary
Unconformity		
Twr(?)	Oligocene	Tertiary
Unconformity		
Twc(?)	Eocene	Tertiary
Unconformity		
Js	Upper and Middle Jurassic	Jurassic
Unconformity		
Rc	Upper and Lower Triassic	Triassic
TRPge		Permian
Unconformity		
IPt	Upper Pennsylvanian, Middle Pennsylvanian	Pennsylvanian
IPMa	Lower Pennsylvanian	
Unconformity		
Mm	Upper Mississippian, Lower Mississippian	Mississippian
Unconformity		
O€gg	Lower Ordovician, Upper Cambrian, Middle Cambrian	Ordovician, Cambrian

MAP SYMBOLS

Formation contact - Dashed where approximately located.

Fault - Dashed where approximately located. Bar and ball on downthrown block.

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

Monocline - Trace of axial plane as determined by field measurements and by photo interpretation. Dashed where approximately located. Arrows indicate direction of dip; short arrow denotes steeper dipping limb.

Strike and dip of beds, showing angle of dip.

A——A' **Cross section location -** Line of section.

DESCRIPTION OF MAP UNITS

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 and rivers; includes slope wash and smaller alluvial fan deposits that coalesce with alluvium. Thickness approximately 0 to 50 feet.

Qls **Landslide deposits (Holocene/Pleistocene)**—Blocks of bedrock or loose slope debris; arrows point in the inferred direction of movement. Occur in the Cambrian shales along the Middle Fork of the Powder River.

Qt **Terrace deposits (Pleistocene/Tertiary?)**—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 present drainages, 80 feet to over 750 feet above modern flood plains. Highest terraces could be Late Tertiary in age and could include erosional remnants of old alluvial fans. Thickness approximately 0 to 10 feet.

UNCONFORMITY

Twr(?) **White River Formation (?) (Oligocene)**—Lenticular gravel or conglomerate beds interbedded with white, gray, pink, and brown tuffaceous claystone. Occurs as erosional remnants toward the summit of the southern Bighorn Mountains on the west side of the map. Thickness less than 50 feet.

UNCONFORMITY

Twc(?) **Wasatch Formation (?) (Eocene)**—Consolidated lenticular conglomerate beds comprised of locally derived pebbles and cobbles of sedimentary and igneous rocks. Possibly equivalent to the Kingsbury or Moncrief Conglomerate Members of the Wasatch. Deposits occur near the confluence of the Middle Fork of the Powder River and Buffalo Creek. Thickness from 10 to 30 feet.

UNCONFORMITY

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

Rc **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 local feature known as the Red Wall. Thickness is 750 to 850 feet.

TRPge **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. Local thin conglomerate lense made up of Paleozoic limestone, chert, and sandstone cobbles noted near the base of the formation on the upper portion of the South River Slope. Formation thickness 300 to 350 feet.

UNCONFORMITY

IPt **Tensleep Sandstone (Pennsylvanian)**—White to buff, medium- to 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 350 to 400 feet.

IPma **Amsden Formation (Pennsylvanian and Upper Mississippian)**—Includes from top to bottom, Ranchester Limestone Member-gray to purplish limestone and dolomite, interbedded with shale, siltstone, and sandstone; Horseshoe Shale Member-reddish brown to maroon shale and siltstone with thin beds of sandstone and carbonates; and Darwin Sandstone Member (Upper Mississippian)-gray to buff, fine- to medium-grained, crossbedded sandstone. Thickness 250 to 300 feet.

UNCONFORMITY

Mm **Madison Limestone (Upper and Lower Mississippian)**—Limestone and dolomite. Upper portion bluish gray limestone with karst surface at top. Lower portion mainly dolomite and dolomitic limestone. Fossiliferous in most intervals; spiriferoid brachiopods and solitary tetracorals being the most common. Thickness from 300 to 350 feet.

UNCONFORMITY

O€gg **Gallatin Limestone (Lower Ordovician and Upper Cambrian) and Gros Ventre Formation (Upper and Middle Cambrian) undivided**—Uppermost unit (Gallatin Limestone) contains resistant grayish red limestone and thin beds of flat-pebble conglomerate underlain by olive green to yellowish brown, glauconic shale and siltstone. The middle unit (Gros Ventre Formation) includes light gray limestone, and silty and glauconitic, interbedded with soft gray shale and beds of flat-pebble conglomerate. The basal unit (Gros Ventre Formation) consists of yellowish brown to reddish brown medium- to coarse-grained glauconitic sandstone. The two formations are not distinguishable for mapping purposes in this area, occurring only at the upper reaches of the Middle Fork of the Powder River, on the west side of the map. Thickness up to 580 feet.

€f **FLATHEAD SANDSTONE (MIDDLE CAMBIAN)**—Reddish gray, tan, and light brown medium to coarse-grained quartz sandstone in beds as much as 3 feet thick; locally conglomeratic and crossbedded. Thin interbeds of green, maroon, and tan siltstone, mainly in the upper portion; arkosic conglomerate in the lower part. Abundant inarticulate brachiopods and less numerous specimens of the trilobite *Elrathia sp.* are found within the top 2 to 3 feet of the formation. Thickness 300 to 400 feet (only shown on cross-section, unit does not crop out on map).

UNCONFORMITY

ARCHEAN ROCKS

Agn **GRANITIC GNEISS (ARCHEAN)**—Composed of quartz, plagioclase, biotite, and microcline. Intruded with quartz diorite and amphibolite dikes (only shown on cross-section, unit does not crop out on map). This unit is Archean-3,000+ Ma in age.

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