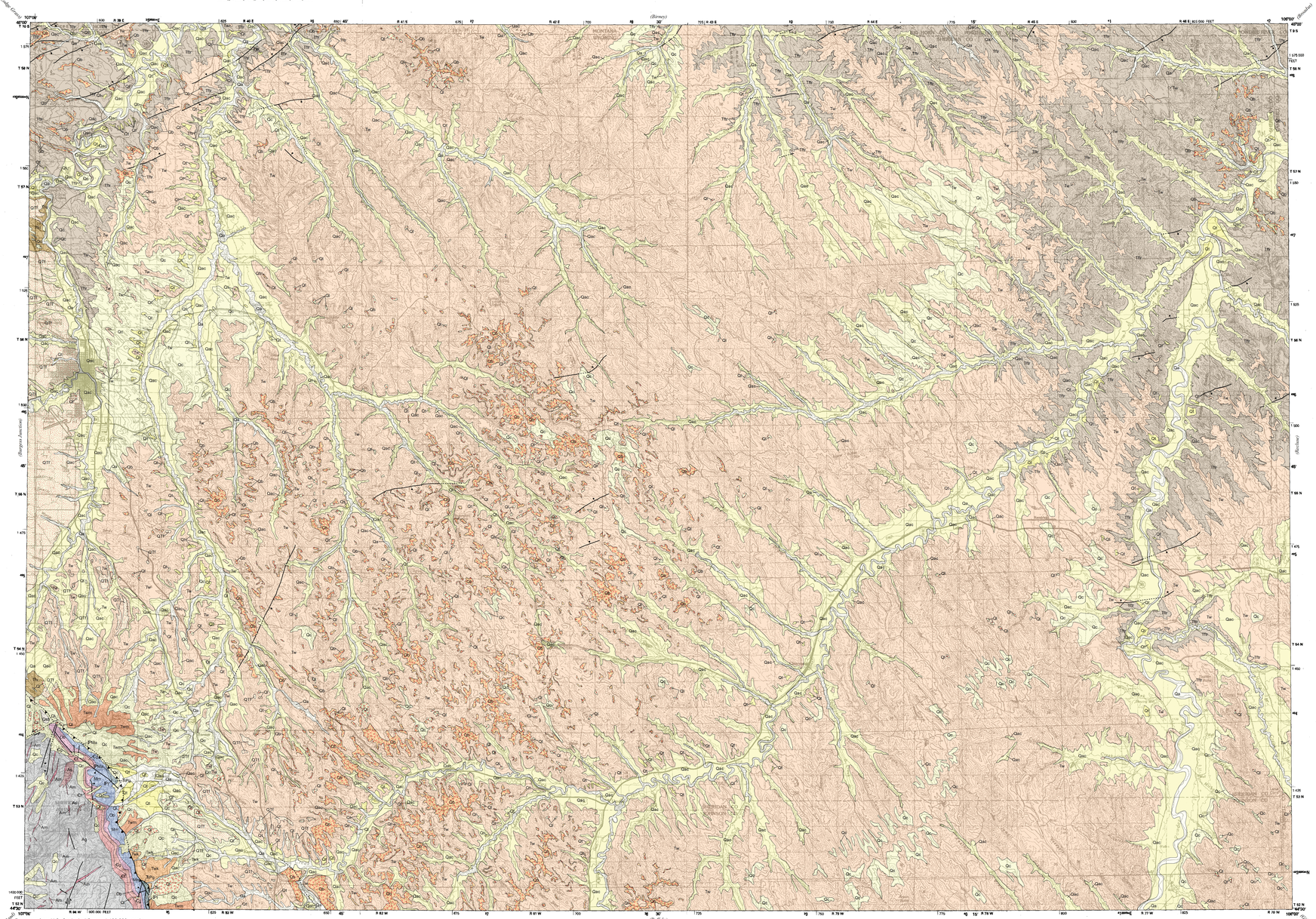
WYOMING STATE GEOLOGICAL SURVEY
Ronald C. Surdam, State Geologist
Laramie Wyoming

Geology - Interpreting the past to provide for the future

USGS science for a changing world — **Prepared in cooperation with the U.S. GEOLOGICAL SURVEY**



Base map from U.S. Geological Survey 1:100,000 - scale metric topographic map of the Sheridan, Wyoming 30' x 60' Quadrangle, 1979

Projection: Universal Transverse Mercator (UTM), zone 13
North American Datum of 1927 (NAD 27)
10,000-meter grid ticks: UTM, zone 13
25,000-foot grid ticks: Wyoming State Plane Coordinate System, East zone

MN
GN
0°21'
6 MILS
11°9'
204 MILS

UTM GRID CONVERGENCE (GN)
1982 MAGNETIC DECLINATION (MN) AT CENTER OF SHEET
DIAGRAM IS APPROXIMATE

SCALE 1:100,000
Contour Interval 20 meters

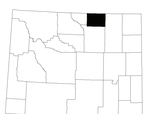
0 1 2 4 6 8 10 12 14 16 18 20 Kilometers
0 1 2 3 4 5 6 7 8 9 10 11 12 Miles
0 2,000 4,000 6,000 8,000 10,000 12,000 14,000 16,000 18,000 20,000 Meters
0 5,000 10,000 15,000 20,000 25,000 30,000 35,000 40,000 45,000 50,000 55,000 60,000 65,000 Feet

GEOLOGIC MAP OF THE SHERIDAN 30' x 60' QUADRANGLE, SHERIDAN, JOHNSON AND CAMPBELL COUNTIES, WYOMING, AND SOUTHEASTERN MONTANA

Compiled and mapped by

Alan J. Ver Ploeg and Cynthia S. Boyd

2005



QUADRANGLE LOCATION

Prepared in cooperation with the U.S. Geological Survey, National Cooperative Geologic Mapping Program, under Cooperative Agreements 03HQAG0097 and 04HQAG0045.

Digital cartography by Bret L. Noeker and Alice J. Vogelmann

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Wyoming State Geological Survey
P.O. Box 3008 Laramie, WY 82071-3008
Phone: (307) 766-2286 Fax: (307) 766 - 2605
Email: isales@wsga.uwyo.edu

REFERENCES CITED AND SOURCES OF GEOLOGIC DATA

(Number is that shown on Index to geologic mapping)

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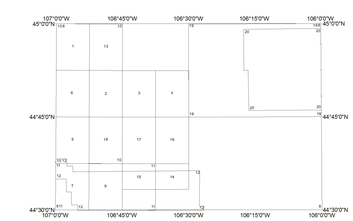
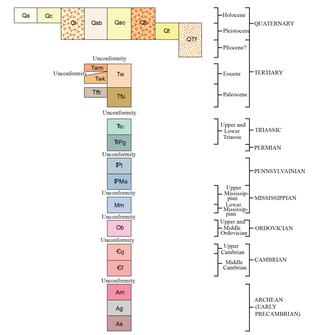
INDEX TO GEOLOGIC MAPPING

(numbers are those listed in the Sources of geologic data)



EXPLANATION

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Holocene and Pleistocene surficial deposits

Qa **Alluvial deposits (Holocene)**—Unconsolidated and poorly consolidated clay, silt, sand, and gravel, mainly in channel or meander belt of creeks and rivers. Mapped with older alluvium in the upper parts of valleys. Estimated maximum thickness 50 feet (15 meters); description modified from Hinrichs (1988)

Qc **Colluvium (Holocene)**—Unconsolidated, non-sorted to poorly sorted sand, silt, clay, sparse gravel, and masses of rock fragments derived locally through mass wasting; slope wash and talus. Only larger and thicker masses mapped; at sides and heads of valleys mapped with older alluvium. Estimated maximum thickness 10 feet (3 meters); description modified from Hinrichs (1988)

Qsb **Landslide deposits (Holocene/Pleistocene)**—Blocks of bedrock, surficial materials, or loose slope debris that have fallen, slumped, or flowed down moderate to steep slopes, especially those weakened by water and undercutting; description modified from Hinrichs (1988). Only landslides of approximately 10 acres or larger are shown due to map scale limitations; for more detail on landslides see Hinrichs (1988)

Qsb **Slump blocks (Holocene/Pleistocene)**—Relatively coherent masses of bedrock, mostly Bighorn Dolomite and Madison Limestone (Mapel, 1959), that have slid downslope tens to hundreds of feet

Qsc **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 and youngest low-level terrace deposits. Estimated maximum thickness 85 feet (26 meters); description modified from Hinrichs (1988)

Qk **Baked and fused rock (clinker)(Holocene/Pleistocene)**—Hard, dense, red to orange baked shale and siltstone, and black bubbly, sometimes glassy, rock formed as overlying strata was altered by burning coal beds in the Wasatch and Fort Union formations. Talus forms locally where blocks have detached from scarps of baked and fused rock and moved downslope. Occurrences shown on the map are taken from Culbertson and Klett (1975a), Culbertson and Klett (1975b), Kanizay (1978), Kanizay and others (1976), Mapel (1959), Mapel and Dean (1976a), Mapel and Dean (1976b), Molnia and Orrell (1988), and Ed Heffern (personal communication, 2004). Only outcrops of approximately 10 acres or larger are shown due to map scale limitations; for more detail on clinker occurrences refer to the above listed maps

Qt **Terrace deposits (Pleistocene)**—Beds of pebble and cobble gravels and lenses of silt and sand locally cemented by calcium carbonate. Consist of uncorrelated terraces along present drainages, a few feet (0.6 meters) to over 427 feet (130 meters) above modern flood plains. Estimated maximum thickness 23 feet (7 meters); description modified from Hinrichs (1988)

Quaternary and Tertiary surficial deposits

QTf **Older alluvial fan deposits (Pleistocene/Pliocene?)**—Boulder gravels in a coarse matrix which is yellowish-brown from hydrous iron oxides at most localities; subrounded and rounded pebbles, cobbles, and boulders of igneous, metamorphic, and resistant sedimentary rocks on beveled bedrock surfaces 100 to 590 feet (30 to 180 meters) above current drainages. Grades into older mixed alluvium and colluvium deposits on the west side of Goose Creek. Estimated maximum thickness 50 feet (15 meters); description modified from Hinrichs (1988)

Tertiary sedimentary rocks

Tw **Wasatch Formation (Eocene and Paleocene?)**—Lenticular interbeds of gray to light-brown, fine- to coarse-grained, locally conglomeratic, feldspathic to arkosic, crossbedded sandstone; dark- to light-gray or brown or greenish-gray shale, claystone, and siltstone; and subbituminous and lignitic coal beds which grade laterally into carbonaceous shales. Locally coal beds have burned, altering the overlying units into distinctive resistant clinker beds. Base of formation overlies the Roland coal of Baker (1929) in the western part of the rang and is mapped at the base of the Arvada coal bed in the northeastern part of the map (Molnia and Orrell, 1988). Based on palynological data, the age of the lower portion of the Wasatch in the northeastern part of the map is Paleocene (Molnia and Orrell, 1988). However this Paleocene age may not exterd to Wasatch outcrops mapped on the western part of the map. Exposed thickness of 1000 feet (305 meters); description based on Kanizay (1978) and Molnia and Orrell (1988)

Twm **Moncrief Member**—Poorly stratified pale-gray and pale-brown poorly indurated conglomerate consisting of rounded and subrounded pebbles, cobbles, and boulders of Precambrian granite, gneiss, pegmatite, schist, and diabase, with sparse pebbles and cobbles of quartzite, sandstone, limestone, dolomitic, and chert near the base. Thins to the east becoming finer grained as it merges into the main body of the Wasatch Formation. Type locality on north face of Moncreiffe Ridge. Incomplete exposed thickness of 900 feet (274 meters); description and thickness modified from Hinrichs (1983a)

Twk **Kingsbury Member**—Lenticular beds of rounded pebbles and cobbles of limestone, dolomite, quartzite, sandstone, and chert in a matrix of sand and silt; interstratified with beds of light-gray and light greenish-gray shale and sandy shale. Unconformably overlies the Fort Union Formation in the southwestern corner of the map. Grades laterally south and east into finer grained units of the main body of the Fort Union Formation. Exposed thickness ranges from 100 to 800 feet (30 to 244 meters) along the flanks of the Bighorn Mountains with the greater thicknesses located south of the map area; description and thickness modified from Hinrichs (1983a) and Kanizay and others (1976)

Tfu **Fort Union Formation undivided (Paleocene)**—Yellowish-gray sandstone and siltstone; coals and carbonaceous shales; and, locally, thin lenses of conglomerate. Mapped only along western edge of the map northwest of Moncreiffe Ridge and south of the Tongue River where coals are interbedded with carbonaceous shale and are not well exposed. Exposed thickness of 400 feet (122 meters) as described by Hinrichs (1983a and 1983b)

Tfr **Tongue River Member**—Top of this member is mapped at the top of the Roland coal of Baker (1929) in the western part of the map and at the base of the Arvada coal bed in the northeastern part of the map (Molnia and Orrell, 1988). Pale yellowish-gray sandstone, fine- to medium-grained, lenticular, and crossbedded with light-gray shale and mudstone. Coal and carbonaceous shale are common. Locally coal beds have burned, altering the overlying units into distinctive resistant clinker beds. Exposed thickness ranges from 700 feet (213 meters) in the northeastern corner of the map to nearly 1000 feet (305 meters) in the northwestern part of the map; description and thickness modified from Molnia and Orrell (1988) and Kanizay (1978)

Tcc **Chugwater Formation (Upper and Lower Triassic)**—Orange-red silty sandstone, poorly indurated. Incomplete section poorly exposed in the leading edge of the Piney Creek thrust block in the southwestern corner of the map; description modified from Hinrichs (1988)

TrPg **Goose Egg Formation (Triassic and Permian)**—Pale-gray and pale-pink very finely crystalline viuggy limestone; gray sandstone and siltstone; and thin beds of red shale. Incomplete section poorly exposed in the leading edge of the Piney Creek thrust block in the southwestern corner of the map; description modified from Hinrichs (1988)

IPs **Tensleep Sandstone (Pennsylvanian)**—Pale-brown very fine-grained quartz sandstone , mainly calcareous and crossbedded. Thin beds of pink to gray-ish-yellow dolomite with thin chert beds near the base of the formation. Thickness ranges from 300 to 400 feet (91 to 122 meters). Poorly exposed in the leading edge of the Piney Creek thrust block in the southwestern corner of the map; description modified from Hinrichs (1988) and Kanizay (1978)

IPMa **Amsden Formation (Pennsylvanian and Upper Mississippian)**—Thin interbeds of yellowish-gray dolomite, limestone, pink chert, red and gray siltstone, and brown fine-grained sandstone. Thickness about 250 feet (76 meters). Poorly exposed in the leading edge of the Piney Creek thrust block in the southwestern corner of the map; description modified from Hinrichs (1988)

Mm **Madison Limestone (Upper and Lower Mississippian)**—Yellowish-gray thick-bedded limestone; dolomitic limestone, and dolomite. Weathers to pale bluish-gray. Minor red clay in some cavernous zones in the middle part of the formation from the overlying basal Amsden Formation shales. Pale-brown and gray chert in irregular nodules. Forms prominent cliffs and flatirons on leading edge of the Piney Creek thrust block. Thickness about 600 feet (183 meters); description modified from Hinrichs (1988)

Ob **Bighorn Dolomite (Upper and Middle Ordovician)**—Pale-gray dolomitic limestone and pale-gray and brown massive dolomite in beds as much as 20 feet (6 meters) thick, thinner beds at top. Weathers to rough pitted surface. Sparse nodules and lenses of pale-brown chert on bedding planes, most abundant in middle part. Lower part of formation consists of pale-gray to pale-brown weathering sandstone, fine- to medium-grained, noncalcareous, about 50 feet (15 meters) thick. Forms prominent cliffs and flatirons on leading edge of the Piney Creek thrust block. Total thickness of 350 feet (107 meters); description modified from Hinrichs (1988)

Cg **Gallatin and Gros Ventre formations undivided (Upper and Middle Cambrian)**—Thin interbeds of gray and greenish-gray silty shale, limestone, gray and brown sandstone, siltstone, and conglomerate of flat limestone pebbles. Forms grass-covered gentle to moderate slopes with sparse outcrops on leading edge of the Piney Creek thrust block. Landslides are common on these outcrops. Thickness ranges from 450 to 650 feet (137 to 198 meters); description modified from Hinrichs (1988)

Cf **Flathead Sandstone (Middle Cambrian)**—Gray and brown very fine- to medium-grained sandstone in beds as much as 3 feet (1 meter) thick; locally conglomeratic and crossbedded. Thin interbeds of greenish-gray shale and siltstone. Basal unit is an arkosic conglomerate. Thickness 450 to 700 feet (137 to 213 meters); description modified from Hinrichs (1988)

Archean (Early Precambrian) rocks

Am **Mafic rocks**—Dikes and small plugs of dark-green to black fine- and medium-crystalline diabase, diorite, gabbro, and peridotite, mostly altered to clay minerals including sericite, chlorite, and serpentine. Generally more resistant to erosion than the surrounding granite, forming rounded ridges and hills. Occur in Piney Creek thrust block west of the overturned or steeply dipping Paleozoic rocks on the leading edge of the block; description modified from Hinrichs (1988)

Ag **Granitic rocks**—Gray and pinkish-orange granite, quartz monzonite, and quartz diorite, greissoid in many places. Numerous thin dikes of aplite and unzoned pegmatite. Description modified from Hinrichs (1988)

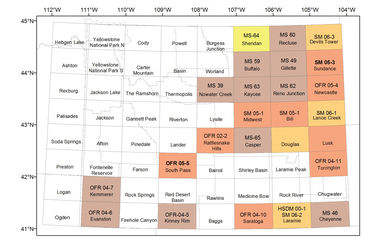
As **Metasedimentary rocks**—Very pale gray and white quartzite; gray and orange-brown quartz-microcline gneiss; and green and white chlorite schist. Description modified from Hinrichs (1988)

MAP SYMBOLS

Formation contact—Dashed where approximately located

Fault—Dashed where approximately located, dotted where concealed. Bar and ball on downthrown block; arrows indicate relative direction of oblique-slip movement. No indication on fault trace indicates undetermined motion

Thrust fault—Dashed where approximately located, dotted where concealed; sawteeth on uptrown block



Current map
Published maps
Maps in progress
Proposed maps

KEY TO ABBREVIATIONS

Wyoming State Geological Survey maps: Map Series (MS), Open File Report (OFR), Hazards Section Digital Map (HSDM), and unpublished STATEMAP project (SM).

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