



**CORRELATION OF MAP UNITS**

Map Unit	Holocene	Quaternary	Pleistocene	Quaternary or Tertiary	Miocene	Eocene or Paleocene	Upper Cretaceous	Lower Cretaceous	Upper Jurassic	Middle Jurassic	Jurassic (?) and Triassic (?)	Triassic	Lower Triassic	Permian	Pennsylvanian	Mississippian	Devonian	Upper Ordovician	Upper and Middle Cambrian	Precambrian
Qa	Qa	Qa	Qa	Qa	Ted	Ted	Kc	Kc	Jus	Jus	Jus	Tedc	Ma	Ma	Ma	Ms	Ds	Os	Cc	Pc

**DESCRIPTION OF MAP UNITS**

**HOLOCENE SURFICIAL DEPOSITS**

- Qa Alluvium--Valley and stream deposits of gravel with lesser amounts of sand, silt, and clay.
- T<sup>1</sup> Dots mark outer boundary of terrace surface 3-4.5 m (10-15 ft) above Snake River; surface consists of thin discontinuous deposits of sand and silt underlain by gravel.
- T<sup>2</sup> Dots mark outer boundary of terrace surface 4.6-7.6 m (15-25 ft) above T<sup>1</sup> and 1.0-4.6 m (3-15 ft) below T<sup>1</sup>.
- Qfp Floodplain deposits--Sand, silt, clay, and minor lenses of gravel; lesser amount of gravel at surface distinguishes these deposits from alluvium along topographically lower stream valleys.
- T<sup>3</sup> Dots mark outer boundary of local alluvial surface 9-12 m (30-40 ft) above Snake River and 3.0-4.6 m (10-15 ft) above T<sup>1</sup>; 1-2 m (3-7 ft) of fine material overlies gravel.
- Qc Colluvium--Slopes of silt- to sand-sized fragments derived from underlying and adjacent units.
- Qsw Swamp deposits--Clay, silt, and fine sand, dark gray and brown, rich in vegetal debris.
- Ql Loess--Light-gray structureless homogeneous wind-deposited silt; gastropods from several localities in alluvium guano to the north and northeast have a C<sup>1</sup> age ranging from 11,300 to 19,000 years.
- Qaf Alluvial fan deposits--Crudely stratified deposits of gravel, sand, silt, and clay that spread outward from mouths of ravines and canyons; show linear sorting along distributaries; finer debris is progressively more abundant toward downstream margins of fan.
- Qt Talus deposits (including rock glaciers)--Locally derived coarse, angular rock fragments that accumulated on steep slopes and at the base of cliffs; merge in places with the "youngest" talus moraine.
- Qld Landslide debris--Locally mixed boulders and finer rock debris displaced by mass movement.
- Qli Landslide and glacial debris--Intermixed.

**PLEISTOCENE DEPOSITS**

Qa<sup>2</sup> Glacial debris of fourth (and youngest) major glacial advance in this area--Moraine debris with sharp rough unmodified surface topography, little weathering of rock fragments, and sparse soil development.

Qa<sup>1</sup> Glacial debris of third major glaciation. In this area--Moraine debris with subdued surface topography; moderately weathered rock fragments; capped by loess and soil in many places.

Qa<sup>2</sup> Glacial debris of second major glaciation in this area--Very old formless piles and lag deposits of large and small erratics, in places mixed with outwash gravel, sand, and silt; most erratics are not locally derived and the softer ones are deeply weathered; extensive soil development in some places.

Qa<sup>3</sup> Glacial debris of second major glaciation in this area, intermixed with locally derived colluvium.

Qw<sup>1</sup> White lacustrine deposits--Fine white silt and clay, thinly laminated in part, interbedded with river gravel; accumulated near upstream end of lake impounded behind Bailey Creek slide that temporarily blocked the Snake River about 22 km (14 mi) downstream.

Ql<sup>1</sup> Lithified talus breccia--Angular fragments of Paleozoic rocks, chiefly Madison Limestone, in matrix of white to pink lime cement. Debris is locally derived from bedrock outcrops east of Hoback fault and is involved in later eastward tilting and faulting. Thickness varies; maximum thickness more than 150 m (500 ft).

Ql<sup>2</sup> Glacial debris of first (oldest) major glaciation in this area--Tightly cemented (with gray lime cement) as well as unlithified formless unstratified gray deposits of unsorted and unsorted rounded to angular fragments of Mesozoic Paleozoic, and sparse Precambrian granitic rocks; most are not locally derived and some were brought long distances at a time when present drainage systems either were nonexistent or were buried by ice.

**QUATERNARY OR TERTIARY SEDIMENTARY ROCKS**

Q<sup>1</sup> Unwashed conglomerate--Partly lithified gray limestone conglomerate that accumulated in Cache Creek valley to a depth of 122 m (400 ft); remnants of a possibly correlative conglomerate cap hills in southwest part of quadrangle; contains sparse Precambrian clasts of an unknown source; may be related to Q<sup>2</sup> glaciation.

Ted<sup>1</sup> CAMP DAVIS FORMATION (UPPER MIOCENE)--Upper unit consists of red conglomerate containing Paleozoic clasts in the upper part and Triassic clasts in the lower part; because much of the upper part of the formation is overlain by detachment masses of Mesozoic rocks, only 300 m (1,000 ft) of the 1,270 m (4,200 ft) consisting of upper conglomerate unit 2.4 km (1.5 mi) to the south is present in this quadrangle. Below the upper conglomerate unit is about 300 m (1,000 ft) of red soft claystone, red soft sandstone and siltstone, and red conglomerate in about equal amounts, overlying about 60 m (200 ft) of white limestone, juniperite, siltstone, and gray soft claystone, which overlies a basal conglomerate, mapped separately and described below.

Ted<sup>2</sup> Gray cliff-forming conglomerate--Thickness 75-90 m (250-300 ft); composed chiefly of Paleozoic rock fragments.

**HOBACK FORMATION**

Ths Skyline Trail Conglomerate Member of Doerr, Spearman, and Steidtmann, 1977 (lower success of Falsongee)--Tightly cemented red conglomerate of angular to subrounded clasts of Mesozoic and Paleozoic rocks derived from the Gros Ventre Range. Only a partial section of about 300 m (1,000 ft) is present, with top and bottom cut off by faults.

Ms Lenticular sandstone and shale sequence and coaly sequence (UPPER CRETACEOUS)--Gray and tan lenticular fine-grained sandstone, gray shale, and shaly sandstone, carbonaceous shale, marlstone, and some beds of coal of minable thickness, chiefly in middle. Upper part cut off by faults. Thickness at least 1,325 m (5,000 ft).

Md<sup>1</sup> BACON RIDGE SANDSTONE (UPPER CRETACEOUS)--Light-gray to tan fine- to medium-grained massive to thick-bedded fossiliferous sandstone with abundant black grains. Contains coal of minable thickness at Jackson Mine (abandoned). Bentonite and plastic gray shale in middle part are sites of large landslides. Thickness about 230 m (750 ft).

Kc<sup>1</sup> CODY SHALE (UPPER CRETACEOUS)--Gray to dark-gray shale and a few thin hard fine-grained glauconitic sandstones; sparse marine fossils. Thickness uncertain because of tectonic squeezing; it could be as little as 300 m (1,000 ft) or as much as 600 m (2,010 ft).

Kf<sup>1</sup> FRONTIER FORMATION (UPPER CRETACEOUS)--Gray to tan fine- to medium-grained sandstone, gray to black shale, thin coaly partings, thin bentonites, and porcellanites. Thickness uncertain because of tectonic squeezing; in normal sections it is about 300 m (1,000 ft).

Km<sup>1</sup> MONY SHALE (LOWER CRETACEOUS)--Dark-gray to black siliceous shale, dense hard silicified speckled sandstone, and thin bentonites; many shales weather silvery gray and are characterized by abundant fish scales. Thickness uncertain but probably between 150 and 215 m (500-700 ft).

Ka<sup>1</sup> ASPEN SHALE (LOWER CRETACEOUS)--Gray to greenish-gray siliceous shale and brittle siltstone, siliceous hard fine-grained sandstone, thin porcellanite and bentonite beds. No complete section is present in area.

Kt<sup>1</sup> THEMPOPSIS SHALE (LOWER CRETACEOUS)--Black very fine-grained highly fissile soft shale 9-61 m (30-200 ft) thick; thin beds of bentonite and rusty fine-grained sandstone.

Kbl<sup>1</sup> Saddy Sandstone Member--Gray medium-grained soft cross-bedded sandstone; at top of formation; thickness 15-30 m (50-100 ft).

Kln<sup>1</sup> CLOVELLY AND MORRISON(?) FORMATIONS UNDIVIDED (LOWER CRETACEOUS AND UPPER JURASSIC)--Three units are present, the upper and middle mapped separately in some places and described below. The lowermost unit is buff and gray chloritic, in part grayish sandstone interbedded with red, green, and gray siltstone and claystone; thickness 94-76 m (310-250 ft).

Kc<sup>2</sup> Uppermost unit (commonly known as the "rusty beds member" of Clovelly)--Olive-green, gray, and buff thin-bedded sandstones that weather with a conspicuous rusty color; in the southwestern corner of the quadrangle, contain a unique allicolifid mollusc fauna; thickness 100-76 m (330-250 ft).

Kc<sup>3</sup> Middle unit--Variegated red, gray, lilac-colored, and pink claystone containing thin beds of hard nodular dense cream-colored limestone; thickness 80-160 m (260-530 ft).

**SUNBURST FORMATION (UPPER AND MIDDLE JURASSIC)**

Jus<sup>1</sup> Upper Sundance--Glauconitic gray, buff, and green very limy sandstone and a few thin shale and limestone beds; thickness 2-43 m (7-14 ft).

Jus<sup>2</sup> Lower Sundance--Gray limy (partly to silty) shale, clay limestone, hard oolitic limestone, and one or more zones of red soft plastic shaly (17-168 m (450-550 ft) thick north of the Jackson thrust fault and nearly 245 m (800 ft) thick in the overthrust facies south of this fault.

- CONTACT**
- NORMAL FAULT--Dotted where concealed or inferred.
  - Bar and ball or downthrown side.
  - THRUST OR REVERSE FAULT--Dotted where concealed or inferred. Sawtooth on upper plate of thrust fault; bar and ball on downthrown side of normal fault.
  - ANTICLINE--Showing crestline. Dotted where concealed or inferred.
  - SYNCLINE--Showing troughline. Dotted where concealed or inferred.
  - STRIKE AND DIP OF BEDS
  - Inclined
  - Vertical
  - Overturned
  - Horizontal
  - Generalized direction of dip without strike

- OTHER FEATURES**
- Water well--Shaded light in feet
  - Mine or prospect
  - U.S. Geological Survey phosphate tract and contract
  - Selected spring
  - Proposed site of oil test
  - Lag gravels, too sparse to map
  - Coal bed
  - J. C. Reed, Jr., station in Precambrian rocks

REFERENCE  
Doerr, J. A., Jr., Spearman, D. R., and Steidtmann, J. R., 1977, Deformation and deposition between a foreland uplift and an imbricate thrust belt, Hoback Basin, Wyoming. Geol. Soc. America Special Paper 177, 82 p.

Base from U.S. Geological Survey unedited advance print  
SCALE 1:24,000  
CONTOUR INTERVAL 40 FEET  
CONTOUR INTERVAL 10 FEET  
OUTLINE OF MAIN SEA LEVEL

Geology by J. D. Love, 1951-76, and  
C. M. Love, 1967 and 1969

U.S. Geological Survey  
This map is preliminary and has not been  
edited or reviewed for conformity  
with Geological Survey standards or  
nomenclature.

**GEOLOGIC MAP OF THE CACHE CREEK QUADRANGLE, TETON COUNTY, WYOMING**  
By  
J. D. Love and Charles M. Love  
1978