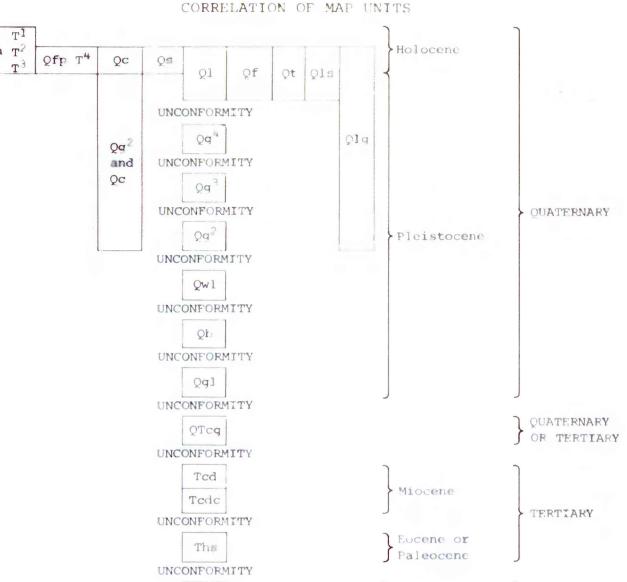
CONTOUR INTERVAL 40 FEET

DATUM IS MEAN SEA LEVEL

GEOLOGIC MAP OF THE CACHE CREEK QUADRANGLE, TETON COUNTY, WYOMING

Base from U.S. Geological Survey unedited advance print



ROCK UNITS SOUTH OF Upper JACKSON THRUST FAULT Cretaceous NOMENCLATURE IS USED Cretaceous

WHERE THRUST BELT

Ka Upper Jurassic Jls Middle Jurassic UNCONFORMITY Jgs UNCONFORMITY

JURASSIC (?) TRIASSIC (?) TRIASSIC Lower Triassic

CRETACEOUS

JURASSIC

JNCONFORMITY Pt PENNSYLVANIAN PMa PMta Mississippian | MISSISSIPPIAN Mississippian Middle Devonian DEVONIAN UNCONFORMITY ORDOVICIAN Ordovician UNCONFORMITY

-Cgv

DESCRIPTION OF MAP UNITS

Qa Alluvium--Valley and stream deposits of gravel with

Gravel and sand at and slightly above Snake River

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

Dots mark outer boundary of terrace surface 4.6-

lenses of gravel; lesser amount of gravel at

along topographically lower stream valleys

7.6 m (15-25 ft) above T and 3.05-4.6 m (10-15 ft)

surface distinguishes these deposits from alluvium

Dots mark outer boundary of broad alluvial surface

(10-15 ft) above T; 1-2 m (3-6 ft) of fine mate-

Colluvium -- Slopewash of silt - to boulder-sized frag-

Swamp deposits -- Clay, silt, and fine sand, dark gray

deposited silt. Gastropods from several locali-

ties in adjoining quadrangles to the north and

northwest have a C1 age ranging from 13,000 to

of gravel, sand, silt, and clay that spread out-

linear sorting along distributaries; finer debris

is progressively more abundant toward downstream

derived coarse, angular rock fragments that accum-

ulated on steep slopes and at the base of cliffs;

ward from mouths of ravines and canyons; show

Talus deposits (including rock glaciers) -- Locally

finer rock debris emplaced by mass movement

ments derived from underlying and adjacent units

9-12 m (30-40 ft) above Snake Fiver and 3.05-4.6 m

lesser amounts of sand, silt, and clay

Qfp Flood-plain deposits--Sand, silt, clay, and minor

and brown; rich in vegetal debris

HOLOCENE AND PLEISTOCENE SUPFICIAL DEPOSITS

Ol Loess--Light-gray structureless homogeneous wind-

Qf Alluvial fan deposits--Crudely stratified deposits

Qls Landslide debris--Chaotically mixed boulders and

Qlq Landslide and glacial debris intermixed

-Cf

UNCONFORMITY

HOLOCENE SURFICIAL DEPOSITS

underlain by gravel

rial overlies gravel

19,000 years

margins of fans

Geology by J. D. Love, 1951-76, and

U.S. Geological Survey

OPEN FILE REPORT

been edited or reviewed for conformity

This map is preliminary and has not

with Geological Survey standards or

nomenclature.

C. M. Love, 1967 and 1969

below T4

Upper and

Middle Cambrian CAMBRIAN

PRECAMBRIAN

ness at least 1,525 m (5,000 ft) Kb BACON RIDGE SANDSTONE (UPPER CRETACEOUS) -- Light-gray bedded fossiliferous sandstone with abundant at Jackson Mine (abandoned). Bentonite and KC CODY SHALE (UPPER CRETACEOUS) -- Gray to dark-gray shale

fine- to medium-grained sandstone, gray to black shale, thin coaly partings, thin bentonites and porcellanites. Thickness uncertain because of 300 m (1,000 ft)

siliceous shale, dense hard silicified speckled scales. Thickness uncertain but probably between 150 and 215 m (500-700 ft) Ka ASPEN SHALE (LOWER CRETACEOUS) -- Gray to greenish-gray

hard fine-grained sandstone, thin porcellanite and bentonite beds. No complete section is present in

ft) thick; thin beds of bentonite and rusty finegrained sandstone Muddy Sandstone Member--Gray medium-grained soft

ness 15-30 m (50-100 ft) KJm CLOVERLY AND MORRISON(?) FORMATIONS UNDIVIDED (LOWER CRETACEOUS AND UPPER JURASSIC) -- Three units are present, the upper and middle mapped separately

sparkly, sandstone interbedded with red, green, and gray siltstone and claystone; thickness 56-76 m (185-250 ft)thin-bedded sandstones that weather with a conspicuous rusty color; in the southwestern corner

Kcvv Middle unit--Variegated red, gray, lilac-colored,

88-166 m (290-545 ft) SUNDANCE FORMATION (UPPER AND MIDDLE JUPASSIC)

very limy sandstone and a few thin shale and limestone beds: thickness 23-43 m (75-140 ft) shale, clayey limestones, hard colitic limestone,

and one or more zones of red sof plastic shale; 137-168 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

In conformity with the European and marine time scales which place the Miocene-Pliocene boundary at about million years, the Camp Davis Formation, previously considered to be of early Pliocene age, is now placed in the late Miocene.

PLEISTOCENE DEPOSITS Qq Glacial debris of fourth (and youngest) major glaciation in this area--Morainal debris with sharp rough unmodified surface topography, little weathering of rock fragments, and sparse soil

Glacial debris of third major glaciation in this area--Morainal debris with subdued surface topography; moderately weathered rock fragments;

capped by loess and soil in many places Og 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

Glacial debris of second major glaciation in this and Qc area, intermixed with locally derived colluvium Qwl 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 Lithified talus breccia--Angular fragments of Paleozoic rocks, chiefly Madison Limestone, in matrix of white to pink limy 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

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 unsized 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

more than 150 m (500 ft)

QTcq Unnamed 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 from an unknown source; may be related to Qg1 glaciation

QUATERNARY OR TERTIARY SEDIMENTARY ROCKS

Tcd CAMP DAVIS FORMATION (UPPER MIOCENE) 1--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 overridden by detachment masses of Mesozoic rocks, only 300 m (1,000 ft) of the 1,220 m (4,000 ft) comprising the 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, pumicite, diatomite, and gray soft claystone, which overlies a basal conglomerate mapped separately and described below

Tcdc Gray cliff-forming conglomerate--Thickness 75-90 m (250-294 ft); composed chiefly of Paleozoic rock

HOBACK FORMATION Ths Skyline Trail Conglomerate Member of Dorr, Spearing and Steidtmann, 1977 (lowest Eocene or Paleocene) -- 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 Ks LENTICULAR SANDSTONE AND SHALE SEQUENCE AND COALY SEQUENCE (UPPER CRETACEOUS) -- Gray and tan lenticular fine-grained sandstone, gray shale and shaly sandstone, carbonaceous shale, markstone, and some beds of coal of minable thickness, chiefly in middle. Upper part cut off by faults. Thick-

to tan fine- to medium-grained massive to thickblack grains. Contains coal of minable thickness plastic gray shale in middle part are sites of large landslides. Thickness about 230 m (750 ft) 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) FRONTIER FORMATION (UPPER CRETACEOUS) -- Gray to tan tectonic squeezing; in normal sections it is about

Kmr MOWRY SHALE (LOWER CRETACEOUS) -- Dark-grav to black sandstone, and thin bentonites; many shales weather silvery gray and are characterized by abundant fish

siliceous shale and brittle siltstone, siliceous

Kt THERMOPOLIS SHALE (LOWER CRETACEOUS) -- Black very fine grained highly fissile soft shale 30-61 m (100-200

crossbedded sandstone; at top of formation; thick-

in some places and described below. The lowermost unit is buff and gray chloritic, in part

Kcvr Uppermost unit (commonly known as the "rusty beds member" of Cloverly) -- Olive-green, gray, and buff of the quadrangle, contains a unique silicified molluscan fauna; thickness 30-76 m (100-250 ft)

and pink claystone containing thin beds of hard nodular dense cream-colored limestone; thickness

"Upper Sundance" -- Glauconitic gray, buff, and green

Jls "Lower Sundance" -- Gray limy plastic to splintery

JSP STUMP AND PREUSS SANDSTONES (UPPER AND MIDDLE JURASSIC) --Lithology and thickness same as for the "upper Sundance" except that the thin Preuss Sandstone at the base is red, shaly, and nonglauconitic. Terminology used only in the thrust belt facies Jt TWIN CREEK LIMESTONE (MIDDLE JURASSIC) -- Lithology and

thickness same as for the "lower Sundance." Terminology used only in the thrust belt facies Jqs GYPSUM SPRING FORMATION (MIDDLE JURASSIC) -- Red shale, slabby gray dolomite, and white gypsum. In most outcrops the gypsum has been leached out, leaving a lithified carbonate breccia that forms rounded cliffs. Thickness 15-46 m (50-150 ft), depending

on amount of leaching of gypsum J'An NUGGET SANDSTONE (JURASSIC? AND TRIASSIC?) -- Light-tan to salmon-pink fine-grained crossbedded hard brittle cliff-forming sandstone characterized by large frosted rounded quartz grains in a finer matrix. Thickness about 115 m (375 ft)

CHUGWATER FORMATION (TRIASSIC) Bc Popo Agie Member--Ocher and purple claystone, red shale, lenticular purple limestone-pellet conglomerates, and red siltstone; 61-91 m (200-300 ft)

Crow Mountain Sandstone Member -- Red to salmon-pink soft porous sandstone containing large frosted rounded quartz grains in a finer matrix; 15-30 m (50-100 ft) thick Rcm Alcova Limestone Member--Gray and purple thin-bedded

hard limestone and dolomite with interbeds of white gypsum; 3-18 m (15-60 ft) thick Red Peak Member -- Red gypsiferous siltstone and very fine grained sandstone with some red shale partings; 260-390 m (850-1,275 ft) thick. Beds of gray silty limestone and gray quartzitic sandstone thicken

southwestward in the thrust belt facies Ad DINWOODY FORMATION (LOWER TRIASSIC) -- Siltstone, brownishgray to olive-drab, hard, slabby, thin-bedded, dolomitic; contains thin partings of fine-grained dolomitic sandstone and silty limestone. Thickness 61-140 m (200-450 ft)

Pp PHOSPHORIA FORMATION (PERMIAN) -- Dolomite chert, phosphorite, and black shale. Dolomite and chert are dark gray to brown, sandy, chiefly in upper part; phosphorite and black shale at top and in lower

part. Thickness 55-72 m (180-235 ft) Pt TENSLEEP SANDSTONE (PENNSYLVANIAN) -- Sandstone, light gray, weathering yellowish brown, fine grained, hard, brittle, quartzitic in part. Middle and lower parts contain many beds of gray fine-grained limestone and dolomite. Contact with underlying Amsden Formation transitional. Thickness 122-137 m (400-450 ft)

PMa AMSDEN FORMATION (PENNSYLVANIAN AND UPPER MISSISSIPPIAN) -- Shale and siltstone, brick red, red brown, and green, interbedded with white dolomite and limestone. Several zones contain ocher-colored and carnelian-red chert nodules. Thickness exclusive of Darwin Sandstone Member (Mad) about 137 m (450 ft)

Mad Darwin Sandstone Member (Upper Mississippian) -- Gray to brownish-pink fine- to medium-grained sandstone with some large rounded frosted quartz grains; crossbedded, moderately soft and porous; red shale partings near top. Thickness 23-30 m (75-100 ft) WELLS FORMATION AND ASSOCIATED ROCKS

PPw Upper unit (Permian and Pennsylvanian) -- Sandstone, light gray, hard, fine grained; contains gray limestone beds which are more abundant in lower part. In places, uppermost part contains chalkywhite brittle very fine grained dolomite and gray chert. Thickness 137-152 m (450-500 ft). Terminology used only in thrust belt facies south of the Jackson thrust fault

HMw Lower unit (Pennsylvanian and Upper Mississippian) --Limestone, bluish-gray, hard, interbedded with red and green shale and tan to white fine-grained sandstone. Carnelian-red and mustard yellow chert nodules and thin lenses are conspicuous. Thickness about 140 m (450 ft). Terminology used only in thrust belt facies south of the Jackson thrust

PIPMW WELLS FORMATION AND ASSOCIATED ROCKS UNDIVIDED (PERMIAN, PENNSYLVANIAN, AND UPPER MISSISSIPPIAN) PMta TENSLEEP AND AMSDEN FORMATIONS UNDIVIDED (PENNSYLVANIAN AND UPPER MISSISSIPPIAN) -- Includes Darwin Sandstone

(Mad) in some places MADISON LIMESTONE Mb Bull Ridge Member (Upper Mississippian) -- Shale and siltstone, red, interbedded with orange-red to tan sandstone, tan to pink dolomite breccia, and blue-gray ledge-forming limestone containing highly distinctive red and "zebra-striped" gray and black chert nodules. Not mapped separately

Thickness 15-30 m (50-100 ft) Mm Main part (Upper and Lower Mississippian) -- Limestone, light to dark gray, thick bedded to massive in upper part, thin bedded and dolomitic in lower part; vuggy brown dolomite near base; many layers and lenses of black chert. Thickness about 335-460 m (1,100-1,500 ft), with thickest sections

on cliff faces or in areas of intense deformation.

south of the Jackson thrust fault Dd DARBY FORMATION (UPPER AND MIDDLE DEVONIAN) -- Upper part is dolomitic siltstone and shale, dull yellow, thin bedded; lower part is brown fetid vuggy siliceous brittle dolomite containing sparse thin limestone beds. Thickness is 91-150 m (300-500 ft), with thickest sections south of the Jackson thrust

Ob BIGHORN DOLOMITE (UPPER ORDOVICIAN) -- Dolomite, with light- and dark-gray mottling, siliceous, cliffforming. Leigh Dolomite Member at top of cliffs (not mapped separately), about 15 m (50 ft) thick, forms slope and consists of chalky-white very fine grained brittle dolomite. Thickness ranges from 61 m (200 ft) north of the Jackson thrust fault to 150 m (500 ft) south of the fault in the thrust

GALLATIN LIMESTONE (UPPER CAMBRIAN) -- Limestone, bluishgray, mottled, with irregular granular yellow patches; irregularly bedded, hard; forms ragged cliffs. Thickness 55-73 m (180-240 ft)

Cgv GROS VENTRE FORMATION (UPPER AND MIDDLE CAMBRIAN) *Cdc Park Shale and Death Canyon Limestone Members undivided--Park Shale Member is green to gray highly fissile micaceous shale containing numerous algal heads at base; 45-105 m (150-350 ft) thick. Death Canyon Limestone Member is hard blue-gray to dark-gray fine-grained thin-bedded limestone, mottled with brown and tan irregular limestone blotches; conspicuous cliff-former. At base is a distinctive bed of brown-weathering dolomite. Thickness 90-115 m (300-370 ft)

Wolsey Shale Member -- Green to gray-green highly fissile micaceous shale; about 30 m (100 ft) thick **Ef FLATHEAD SANDSTONF (MIDDLE CAMBRIAN) -- Sandstone, white, tan, brown, and maroon, crossbedded, locally conglomeratic near base; locally quartzitic. Thir partings of green micaceous shale are in upper

part; contact with overlying Wolsey Shale Member is transitional. Thickness 60-90 m (200-300 ft) PCbmq BIOTITE-MUSCOVITE GRANITE (PRECAMBRIAN) -- Gray mediumgrained equigranular to porphyritic rock composed of quartz, plagioclase, microcline, biotite, and

OPEN-FILE REPORT CACHE CREEK QUAD., WYO.

CONTACT

NORMAL FAULT -- Dotted where concealed or inferred. Bar and ball or lownthrown side THRUST OR REVERSE FAULT--Dotted where concealed or inferred. Sawteeth are on upper plate

THRUST FAULT WITH YOUNGER NORMAL PAULT ALONG SARE TRACE--Dotted where concealed or inferred. Sawteeth on upper plate of thrust fault. Bar and ball on downthrown side of normal fault

or inferred ---*-- SYNCLINE--Showing troughline. Dotted where concealed

or inferred STRIKE AND DIE DE BEDS

Vertical Overturne Horizontal Generalized direction of dip without strike

Inclined

OTHER FEATURES ---- Mappable bed

Water well--Showing depth in feet Mine or prospect U.S. Geological Survey phosphate trench and number

Selected spring Proposed site of oil test

Lag orratics, too sparse to may

+++++++++ Coal bed

X¹³⁰⁴ J. C. Recel, Jr., station in Precambrian rocks

REFERENCE

Dorr, J. A., Jr., Spearing, D. R., and Steidtmann, J. R., 1977, Deformation and deposition between a foreland uplift and an impinging thrust belt. Hoback Basin, Wyoming: Geol. Soc. America Special Paper 177, 82 p.