EXPLANATION

QUATERNARY

Qya — Younger alluvium
Unconsolidated interbedded clay, silt, sand, and gravel along stream channels and on flood plains

Qac — Alluvium and colluvium
Slope-wash and alluvial fan deposits of mixed silt, sand, pebbles, cobbles, and boulders

Qls — Landslide deposits
Unstratified heterogeneous mixtures of soil mantle and angular rock fragments

Qoa — Older alluvium
Semiconsolidated deposits similar in composition and structure to younger alluvium. Includes low level terrace deposits of tributary streams

Qp — Pediment veneer
Semiconsolidated poorly sorted deposits of silt, sand, pebbles, cobbles, and boulders on pediments

UNCONFORMITY

TERTIARY

Tb — Bozeman Group (upper part)
Poorly stratified variously consolidated tuffaceous siltstone, claystone, sandstone, and conglomerate

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TKf — Fort Union Formation
Conglomerate, sandstone, and siltstone; conglomerates contain pre-Cretaceous rocks; contains fossil spores, plants, wood, fresh-water mollusks, and vertebrates

CRETACEOUS

Livingston Group

Kh — Hoppers Formation
Andesitic sandstone with interbedded claystone and siltstone; massive crossbedded yellowish-gray sandstone member at base

Kbc — Billman Creek Formation
Olive-gray, brownish-gray, and grayish-red claystone with interbedded sandstone, siltstone, and conglomerate; contains fresh-water mollusks and dinosaur bones

Km / **Kms** — Miner Creek Formation
Andesitic siltstone and sandstone with beds of tuff and bentonite in lower part; contains fossil spores, plants, wood, and dinosaur bones.
Kms, *Sulphur Flats Sandstone Member; prominent massive sandstone; distinct mottled yellowish-gray sandstone at base*

Kc — Cokedale Formation
Andesitic siltstone and sandstone with claystone, tuff, bentonite, and coal; lower part carbonaceous with some thin coal beds; sandstone units locally conglomeratic; contains fossil spores, plants, wood, dinosaur bones, and fresh-water mollusks

u / **ua** — Eagle Sandstone
Well-bedded sandstone and siltstone with intercalated coal and shale in upper part; massive indurated crossbedded sandstone with intercalated coal, siltstone, and shale in lower part. Cokedale coal bed and u, upper coal zone identified locally

Ktc — Telegraph Creek Formation
Predominantly siltstone with thin-bedded sandstone; calcareous concretions; mostly concealed

Kcu / **Kce** / **Kclf** — Cody Shale and Frontier Formation
Medium- to dark-gray and brown shale and glauconitic and calcareous arkosic sandstone containing heavy minerals and chert grains.
Kcu, *upper shale member of Cody Shale.*
Kce, *Eldridge Creek Member of Cody Shale.*
Kclf, *lower shale member of Cody Shale, and Frontier Formation.*
c, *base of chert-pebble conglomerate.*
a, *base of analcite-bearing sandstone*

Kmt — Mowry and Thermopolis Shales
Dark-brown and dark-gray shale and quartzose sandstone; basal sandstone locally a quartzite

Kk — Kootenai Formation
Red and green sandstone, mudstone, and fresh-water fossiliferous limestone; massive chert-pebble conglomerate at base

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JURASSIC

Jm — Morrison Formation
Varicolored shale, siltstone, mudstone, limestone, and massive quartzose sandstone; black shale near top

Ellis Group

Js — Swift Formation
Cliff-forming, very calcareous, glauconitic sandstone; abundant fossil trash; locally chert-pebble conglomerate at base

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Jr — Rierdon Formation
Olive-gray shale and bluish-gray limestone in upper part; cliff-forming oölitic limestone beds in lower part

Jp — Piper Formation
Olive-gray shale in upper part; flaggy, very fossiliferous argillaceous limestone beds in middle part; multicolored siltstone in lower part

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PENNSYLVANIAN (CARBONIFEROUS)

Pq — Quadrant Quartzite
Quartzite, well-sorted quartzose sandstone, and dolomite. Includes thin section of quartzose sandstone and bedded chert of the Phosphoria Formation of Permian age in sec. 24, T. 2 S., R. 6 E., and secs. 19, 29, 30, and 32, T. 2 S., R. 7 E.

MISSISSIPPIAN (CARBONIFEROUS)

PMa — Amsden Formation
Dolomite, calcareous sandstone, and siltstone in upper part; argillaceous limestone in middle part; massive sandstone and red calcareous siltstone and limestone in lower part; mostly concealed

UNCONFORMITY

Upper Mississippian

Lower Mississippian

Mm — Madison Group
Massive, cliff-forming, gray limestone and dolomite with some red, calcareous siltstone in upper part (Mission Canyon Limestone); well-bedded, cliff-forming, gray limestone and dolomite in lower part with concentration of chert at base (Lodgepole Limestone)

DEVONIAN

Upper Devonian

MDt — Three Forks Shale
Black shale and olive-gray shale with thin beds of dolomite in upper part; olive-gray and reddish-brown, calcareous, fossiliferous shale in lower part; mostly concealed

Dj — Jefferson Dolomite
Massive, cliff-forming olive-gray fetid dolomite in upper part and brownish-gray limestone and dolomite in lower part

UNCONFORMITY

CAMBRIAN

Upper Cambrian

Cgs — Grove Creek and Snowy Range Formations
Grove Creek Formation is limestone and shale distinguished by rounded limestone pebbles; Snowy Range Formation is green shale and gray limestone that is partly a flat-pebble conglomerate; bed of columnar limestone locally in lower part of Snowy Range Formation; mostly concealed

Cp — Pilgrim Limestone
Massive, cliff-forming, oölitic, mottled magnesian and dolomitic limestone with edgewise limestone-pebble conglomerates; interbedded shale and siltstone; and glauconitic limestone

Middle Cambrian

Cps — Park Shale
Multicolored shale with thin beds of argillaceous limestone, siltstone, and sandstone; mostly concealed

Cm — Meagher Limestone
Thin-bedded, silty, medium-gray limestone and yellowish-gray dolomite; locally oölitic

Cw — Wolsey Shale
Greenish-gray calcareous shale and mudstone with thin beds of limestone; mostly concealed

Cf — Flathead Quartzite
Gray to red quartzose sandstone and quartzite; conglomeratic in lower part locally

UNCONFORMITY

PRECAMBRIAN

pCg — Gneiss, schist, and granite; pegmatite dikes locally

IGNEOUS ROCKS

TERTIARY

Ti — Intrusive rocks
Diabase and basalt dikes and sills

Contact
Dashed where approximately located; dotted where concealed

U / D — Fault
Dashed where approximately located; dotted where concealed; U, upthrown side; D, downthrown side; queried where doubtful

Thrust fault
Sawteeth on side of upper plate. Dashed where approximately located; dotted where concealed; queried where doubtful

Overturned thrust fault
Sawteeth in direction of dip; bar on side of tectonically higher plate. Dashed where approximately located; dotted where concealed; queried where doubtful

Anticline
Showing crest line and plunge of fold. Dashed where approximately located; dotted where concealed

Syncline
Showing trough line and plunge of fold. Dashed where approximately located; dotted where concealed

25 — Strike and dip of beds

40 — Strike and dip of overturned beds

90 — Strike of vertical beds

Coal bed
Dashed where approximately located; dotted where concealed; queried where extension doubtful

Mine or coal prospect
Short bar indicates caved or flooded