EXPLANATION

QUATERNARY

Pleistocene and(or) Holocene

Qa | Qae — Alluvial and eolian deposits

Qa, *alluvial deposits; chiefly silt, sand, and gravel in flood plains, fans, and low terraces*
Qae, *alluvial, eolian, and lake deposits; chiefly silt and sand on ridges and mesa tops*

Qc — Colluvial deposits

Earthflow, mudflow, landslide, and talus deposits

Qt — Terrace gravel

Terrace deposits formed during earlier cycles of erosion

Pleistocene

Qag — Alluvial gravels

Terrace and fan deposits formed during several cycles of erosion

Qp — Pediment deposits

Sand and gravel veneering pediment surfaces formed during several cycles of erosion

Qpt / Qbt — Till

Stony glacial debris
Qpt, *of Pinedale(?) age*
Qbt, *of Bull Lake(?) age*

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TERTIARY

Pliocene

Tb — Basalt

Scoriaceous and vesicular lava capping Grand Mesa and Mount Callahan. Represents several flows on Grand Mesa

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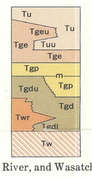
Eocene

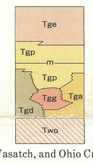
UINTA BASIN



Uinta, Green River, and Wasatch Formations

Uinta Formation:
Tu, *main body: brown, red, and green sandstone, siltstone, and shale*
Tuu, *unnamed tongue; yellow-brown sandstone and siltstone*
Green River Formation:
Tge, *Evacuation Creek Member: gray marlstone and yellow-brown siltstone and sandstone*
Tgeu, *unnamed tongue: gray marlstone and yellow-brown siltstone sandstone, and tuff*
Tgp, *Parachute Creek Member: gray marlstone and dark-gray oil shale; some yellow-brown sandstone, siltstone, and tuff*
m, *Mahogany oil-shale bed*
Tgd, *Douglas Creek Member: brown and gray sandstone and siltstone, green shale, and brown oolitic limestone*
Tgdu, *upper tongue: simplified from Cashion (1967, pl. 1) showing more details on intertonguing between Douglas Creek Member* (Tgd) *and Renegade Tongue* (Twr) *of Wasatch Formation*
Tgdl, *lower tongue: coextensive with Renegade Tongue* (Twr) *and where the lower tongue is thin it is mapped with the Renegade*
Wasatch Formation:
Twr, *Renegade Tongue: brown and gray sandstone and siltstone and red, green, and gray shale*
Tw, *main body: lithology similar to that of Renegade Tongue*

PICEANCE CREEK BASIN (EXCLUDING GRAND MESA)



Green River, Wasatch, and Ohio Creek Formations

Green River Formation:
Tge, *Evacuation Creek Member: gray and yellow-brown marlstone, siltstone, sandstone, and tuff*
Tgp, *Parachute Creek Member: gray and yellow-brown marlstone and tuff and dark-gray and blue-gray oil shale*
m, *Mahogany oil-shale bed: dark-gray and blue-gray ledge-forming oil shale*
Tgg, *Garden Gulch Member: dark-brown and gray flaky shale and brown sandstone and limestone*
Tgd, *Douglas Creek Member: gray and brown sandstone, siltstone, and limestone and gray and green shale*
Tga, *Anvil Points Member: gray and brown sandstone, siltstone, and limestone and gray and green shale*
Two, *Wasatch and Ohio Creek Formations: red, gray, and brown sandstone and siltstone and red, gray, and green shale. Basal conglomerate (Ohio Creek Formation) present locally*

GRAND MESA

Green River, Wasatch, and Ohio Creek Formations

Green River Formation:
Tgru, *upper member: principally yellow-brown sandstone and siltstone; interbeds of marlstone and some oil shale. Mahogany oilshale bed is 25–100 feet above base*
Tgrl, *lower member: brown and gray sandstone and siltstone, and green and gray shale*
Two, *Wasatch and Ohio Creek Formations: red, gray and brown sandstone and siltstone and red, gray, and green shale; conglomerate (Ohio Creek Formation) at base*

Paleocene

CENTRAL BOOK CLIFFS

Tnu — Upper part of North Horn Formation

Gray and brown sandstone, variegated shale, and some conglomerate. Boundaries from Spieker (1946, pl. 23A)[1]. Equivalent to lower part of Wasatch Formation (Tw) *in Uinta Basin*

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CRETACEOUS

Upper Cretaceous

Mesaverde Group

Kt — Tuscher Formation

Light-gray massive sandstone separated by thin beds of gray and greenish-gray shale. Contains some conglomerate. Thickness 130–600 feet

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Kf — Farrer Formation

Sandstone and greenish-tinged gray shale. Thickness 410–1,095 feet

Kns — Neslen Formation and Sego Sandstone

Neslen Formation: principally gray and buff sandstone and shale. Contains four coal zones. Upper boundary is gradational. Thickness 250–410 feet
Sego Sandstone: gray and buff cliff-forming sandstone; some gray shale. Thickness 115–200 feet

Kmb — Buck Tongue of Mancos Shale

Gray shale and sandy shale and a few thin lenticular beds of limestone

Mesaverde Group

Kc — Castlegate Sandstone

Buff and gray very fine to fine grained massive predominantly crossbedded cliff-forming sandstone; some gray shale. Thickness 0–130 feet; thins eastward

Kb — Blackhawk Formation

Gray and grayish-brown fine-grained thin-bedded to massive sandstone and gray shale. Locally contains thin coal beds. Westward the formation can be divided into three members but only upper two members extend into this quadrangle. Formation is equivalent to part of the upper shale member (Kmu) *of the Mancos Shale of the eastern Book Cliffs. Present only in southwestern part of quadrangle. Thickness 0–325 feet*

EASTERN BOOK CLIFFS AND GRAND MESA

Kh — Hunter Canyon Formation

Buff and gray medium- to coarse-grained massive cliff-forming sandstone and gray to greenish-gray shale. Thickness 375 to 1,400 feet

Kmgs — Mount Garfield Formation and Sego Sandstone

Mount Garfield Formation: buff and gray fine- to medium-grained sandstone and gray shale. Upper part contains very little coal. Lower part contains thick persistent coal beds. Rollins Sandstone Member (not mapped separately) occurs in coal-bearing sequence
Sego Sandstone: buff and light-gray fine-grained sandstone and gray shale. Consists of upper and lower units that are principally sandstone separated by Anchor Mine Tongue of the Mancos Shale (mapped with the Sego Sandstone). Thickness a few feet-300 feet; thins eastward

Kmu / Kmf / Kml — Mancos Shale

Dark-gray to black soft shale; thin sandstone beds at various horizons. Upper beds intertongue with, and grade vertically into, the Castlegate Sandstone (Kc) *and Blackhawk Formation* (Kb). *Maximum thickness about 4,000 feet*
Km, *Mancos Shale undifferentiated*
Kmu, *upper shale member*
Kmf, *Ferron Sandstone Member: fine-grained thin-bedded sandstone and sandy shale; occurs near base of Mancos Shale; mapped with Mancos Shale undifferentiated* (Km) *along northeastern flank of Uncompahgre uplift*
Kml, *lower shale member*

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DOUGLAS CREEK AREA

Kmvu / Kmvl — Mesaverde Group

Kmvu, *upper part: brown and yellowish-gray massive sandstone and gray shale. Lower part contains principal coal beds of the Douglas Creek area. Near base is a zone that has been reddened by burning of coal beds*
Kmvl, *lower part: light-gray and brown massive sandstone, gray shale, and some coal. Upper boundary is approximately same horizon as top of Trout Creek Sandstone Member (Rollins Sandstone Member equivalent) of the Iles Formation*

Kmb — Buck Tongue of Mancos Shale

Dark-gray soft shale; some gray and brown sandstone

Lower(?) and Upper Cretaceous

Kd — Dakota Sandstone

Yellowish-brown and gray friable to quartzitic sandstone and conglomeratic sandstone and interbedded gray to black carbonaceous shale. Contains a few thin very lenticular coal beds. Plant impressions common; basal conglomerate is locally present. Thickness 100–200 feet

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Lower Cretaceous

Kbc — Burro Canyon Formation

White, gray, and buff fine- to coarse-grained sandstone interbedded with green and purplish siltstone, shale, and mudstone, and thin beds of impure limestone. Sandstone is locally conglomeratic, particularly at base. Thickness a few feet–125 feet

Kdb — Dakota Sandstone and Burro Canyon Formation

JURASSIC

Upper Jurassic

Jmb / Jms — Morrison Formation

Jmb, *Brushy Basin Shale Member: gray, pale-green, red, and light-purple mudstone and siltstone; a few lenses of gray sandstone, limestone, and conglomerate. Thickness 200–300 feet*
Jms, *Salt Wash Sandstone Member: white, gray, rusty-red, and buff sandstone interbedded with red, gray, and green mudstone; thin limestone beds near base. Thickness 100–300 feet*

San Rafael Group

Jse — Summerville Formation and Entrada Sandstone

Summerville Formation: alternating thin beds of gray, green, and red siltstone, gray, greenish-gray, and reddish-brown fine-grained sandstone, and red and greenish-gray shale. Thickness 40–60 feet
Entrada Sandstone: buff, white, and pink medium-grained massive crossbedded sandstone. Thickness 100–300 feet

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TRIASSIC(?)

Upper Triassic(?)

Glen Canyon Group

Ꞧkw — Kayenta Formation

Irregularly interbedded red, buff, and gray fine- to coarse-grained sandstone and lavender shale and siltstone. Thin beds of limestone-pebble and shale-pellet conglomerate locally present. Thickness 0 to 200 feet

Ꞧkw — Kayenta Formation and Wingate Sandstone

TRIASSIC

Upper Triassic

Ꞧw — Wingate Sandstone

Buff, reddish-brown, and grayish-orange fine-grained massive prominently crossbedded sandstone. In most exposures forms vertical cliffs and exhibits dark-brown desert varnish on weathered surfaces. Thickness 300–400 feet

Ꞧc — Chinle Formation

Red and reddish-brown siltstone interbedded with lenses of red sandstone and shale, limestone-pebble and shale-pellet conglomerate; lenses of grit and quartz-pebble conglomerate near base. Thickness 80–120 feet

UNCONFORMITY

PRECAMBRIAN

pCr — Complex of gneisses and schists

Intruded by silicic to intermediate igneous rocks

[1]Spieker, E. M., 1946, Late Mesozoic and early Cenozoic history of central Utah: U.S. Geol. Survey Prof. Paper 205-D.

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