DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

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SHEET 2 OF 2

MASTER EXPLANATION FOR PRELIMINARY GEOLOGIC MAPS OF THE HYANNIS PEAK AND RAND QUADRANGLES, NORTH AND MIDDLE PARKS, JACKSON AND GRAND COUNTIES, COLORADO

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

SCALE 1:48,000

QUATERNARY

Holocene

Qa

Alluvium

Flood-plain deposits along present streams. Includes reworked outwash gravels of glaciation 3 along major streams

Qls

Landslide, talus, and colluvium deposits

Major landslide deposits probably contemporaneous with pluvial conditions of glaciations 2 and 3

Qp

Pediment gravels

In part developed from or related to landslide deposits

Pleistocene

Qt_3 | Qm_3 | Qgm_3

Deposits of glaciation 3
(Silver Creek glaciation of Eschman, 1965)

Qt_3, 20 ft terrace deposit, outwash gravel of glaciation 3 (L-H surface of Eschman, 1965)

Qm_3, terminal and lateral moraines

Qgm_3, ground moraine

Qt_2 | Qm_2

Deposits of glaciation 2
(Gould glaciation of Eschman, 1965)

Qt_2, 40-60 ft terrace deposit, outwash gravel of glaciation 2 (Walden surface of Eschman, 1965)

Qm_2, terminal and lateral moraines

Qm_1

Deposits of glaciation 1
(Owl Mountain till of Eschman, 1965)

Poorly sorted unconsolidated sand and gravel without morainal form that contain boulders of granitic Precambrian rocks to 5-6 ft in diameter on Owl Mountain

Qot_1 | Qot_2 | Qot_3

Older terrace deposits

Numbered in order of age; Qot_1 is oldest.
Qot_1, 60-80 ft terrace; May be outwash gravel of pre-Wisconsin glaciation 1
Qot_2, 90-120 ft terrace deposits
Qot_3, 200-240 ft terrace deposits

UNCONFORMITY

Pliocene or Pleistocene

Tg

Boulder conglomerate of Gravel Mt.

Poorly sorted, unconsolidated sand and gravel that contain boulders of granitic Precambrian rocks to 15 ft in diameter.
May correlate with Drift of glaciation 1 of Hail, (1965) and deposits of glaciation 1 on Owl Mt.

UNCONFORMITY

TERTIARY

Oligocene, Miocene, and Pliocene(?)

Intrusive igneous rocks

Ttb, olivine trachybasalt
Ttb, trachybasalt
Tta, trachyandesite
Tl, latite
Tql, quartz latite
Tlr, rhyolite
Tpf, fine grained porphyry
Tpfb, fine grained biotite porphyry
Tpfh, fine grained hornblende porphyry
Tpfbh, fine grained biotite-hornblende porphyry
Tpc, coarse grained porphyry
Tpcb, coarse grained biotite porphyry
Tpgd granodiorite porphyry
Tpqm, quartz monzonite porphyry
Tp, porphyry

Tvta | Tv | Tvb | Tvs

Extrusive igneous rocks

Rabbit Ears Volcanics and younger extrusive rocks in Rabbit Ears Range and volcanics on Owl Mountain (Tv)

Tvb, volcanic breccia, ash tuff, lapilli tuff, flow breccia, thin flows, and volcanic conglomerate

Tvta, trachyandesite, thick flows or intrusive sills

Tvs, fine-to coarse-grained micaceous sandstone. May be upper member of Coalmont Formation in fault contact

Tmp

North Park Formation

Calcareous nodular ashy sandstone and siltstone, volcanic pebble conglomerate; and volcanic ash

UNCONFORMITY

Paleocene and Eocene

Tcm | Tcm | Tcmu | Tc

Coalmont Formation

Tcmu, upper member, fine grained micaceous sandstone, tuffaceous siltstone, sandstone, conglomerate, and carbonaceous claystone or mudstone. Contains lower Eocene pollen and spores of zones 2 and 3 of E.P. Leopold (Hail, 1965, p. 70-71)

Tcm, middle member, brown to gray arkosic sandstone, conglomerate, and conglomeratic sandstone; sandy claystone or mudstone; brown

Tcml, Middle Park Member: brown to gray interbedded arkosic sandstone, conglomerate, sandy claystone or mudstone, and porphyritic volcanic-rock pebble conglomerate. Mapped only in Hyannis Peak quadrangle. Probably upper Paleocene in age (zone 1 of E.P. Leopold in Hail, 1965, p.70-71)

Tc, undivided upper and middle members, predominantly upper member

Tmp

Middle Park Formation

Arkosic sandstone and grit intercalated with micaceous mudstone and porphyritic volcanic-rock pebble conglomerate. In southeast quarter of Rand quadrangle upper part is predominantly coarse arkosic sandstone with few Precambrian granite clasts

UNCONFORMITY

CRETACEOUS

Upper Cretaceous

Kpsm | Kpsh

Pierre Shale

Kpsm, sandy member: interbedded brown to gray calcareous sandstone, siltstone, and shale; minor clay pebble conglomerate

Kpsh, shaly member: gray shale, silty to sandy in upper part, noncalcareous except near base

Km

Niobrara Shale

Mostly dark-gray calcareous shale; weathers light gray to yellow; shaly limestone in upper part; basal 20 ft is light-gray fissile silty limestone

Kb

Benton Shale

Interbedded brown calcareous sandstone, sandy limestone, and dark calcareous shale in upper part, dark calcareous to noncalcareous shale in middle part, and gray siliceous platy shale with abundant fish scales in lower part. Codell Sandstone Member at top on Buffalo Creek

Lower Cretaceous

Kd

Dakota Sandstone

Light-gray to light-brown sandstone and minor siltstone and dark-gray shale in upper part; sandstone conglomerate on Buffalo Creek

JURASSIC

Upper Jurassic

Jm

Morrison Formation

Variicolored claystone and shale with beds of brownish calcareous sandstone. Poorly exposed on Buffalo Creek

REFERENCES

Eschman, D.F. 1955, Glaciation of the Michigan River basin, North Park, Colorado: The Journal of Geology, v. 63, p.197-213.

Hail, W.J. Jr., 1965, Geology of northwestern North Park, Colo.: U.S. Geol. Survey Bull. 1188, p. 1-133.

Hail, W.J. Jr., 1968, Geology of southwestern North Park and vicinity, Colo.: U. S. Geol. Survey Bull. 1257, p. 1-119

SYMBOLS

Contact
Short dashed where inferred

Fault
Dashed where approximately located. Bar and ball on downthrown side

Syncline
Marked by sudden change in strike and dip. May be a fault

Monocline
Shorter arrow on side of steeper dip. May be a fault

Strike and dip of beds

Strike and dip of overturned beds

Strike of vertical beds

Shaft

Adit

Coal mine or prospect, abandoned

Drill hole for oil, abandoned

Oil well

Oil well, abandoned

Gas well, abandoned

Drill hole, show of gas