

LEGEND
(continued)

IGNEOUS ROCKS

(Areas of igneous rocks are shown by patterns of triangles and rhombs.)

hs
Highwood
syenite
(in part syenite-gneiss)

mz
Monzonite
(basic gneiss)

sh
Shonkinite
(including microcline)

Basaltic sheets
and dikes
(trachyte, mica, and andesite
basalts in Highwood Mts.,
microcline in Little Belt Mts.,
microcline in Missouri River)

bbr
Basaltic breccia,
flows, and scoria

Trachytic dikes
and sheets
(trachyte and phonolite
porphyries in Highwood Mts.,
trachyte, syenite, and
phonolite porphyries in
Little Belt Mts.)

abr
Andesitic breccia
and tufts

sp
Syenite-
porphyry

sy
Syenite

wp
Wolf
porphyry
(granite porphyry)

bp
Barker
porphyry
(granite porphyry)

dp
Diorite-
porphyry

Sections
A B
C D E

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

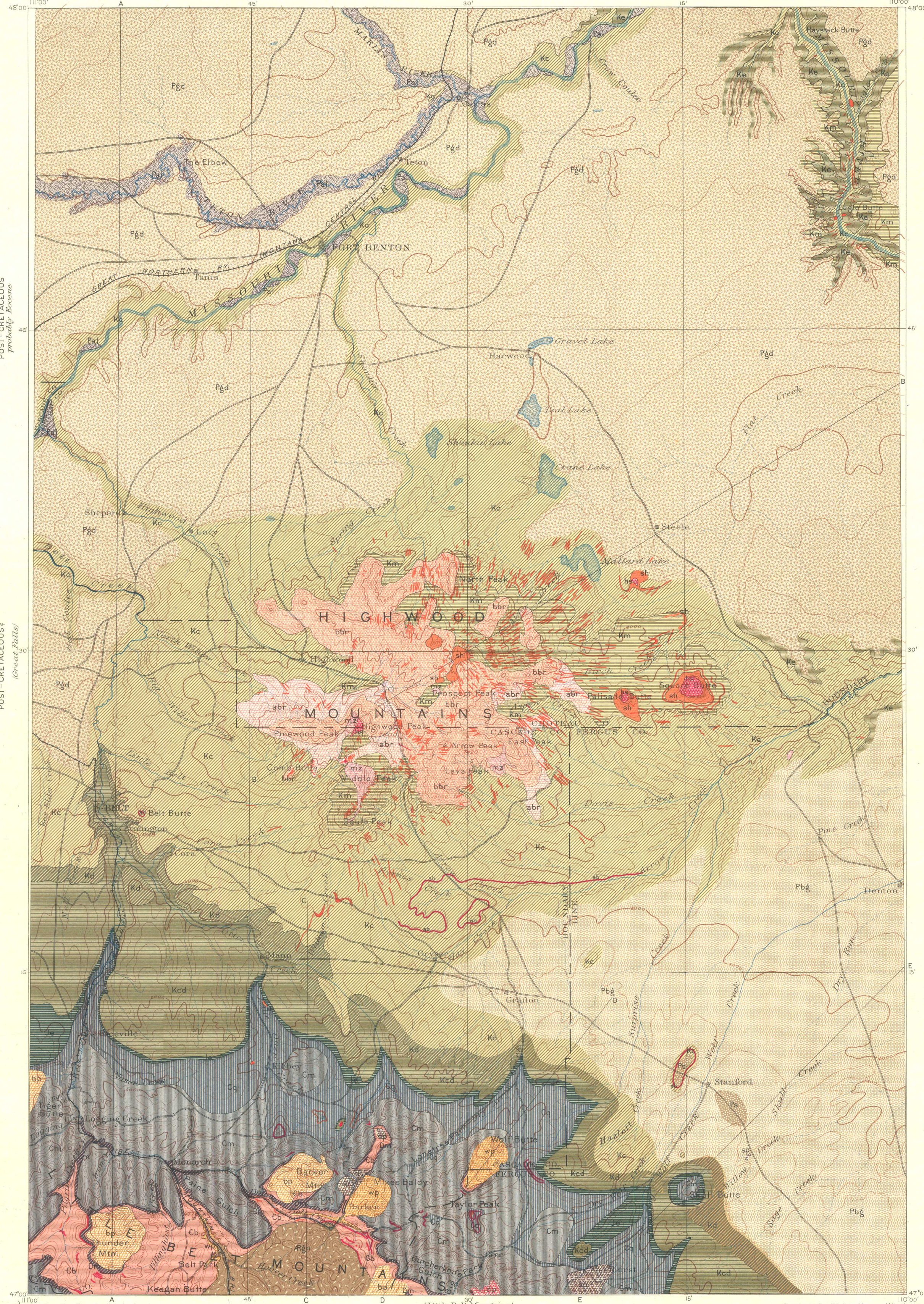
POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

POST-CRETACEOUS
(Great Falls)

HISTORICAL GEOLOGY SHEET

MONTANA
FORT BENTON QUADRANGLE



LEGEND

SURFICIAL ROCKS

(Areas of surficial rocks are shown by patterns of dots and circles.)

Pa
Alluvium
(stream bottoms)

Pbg
Bench gravels

Pgd
Glacial drift
and till

Ps
Stanford
conglomerate
(sand and gravel locally
covered by time)

Sedimentary rocks are shown by patterns of parallel lines.

Km
Montana
formation
(clay shale with sandstone
interbedded at the top)

Ke
Eagle
formation
(white sandstone with
lignite seams and clay)

Kc
Colorado
formation
(black shale at the base,
gray shale above, and
sandstone interbedded;
contains an ash bed, ab)

Kd
Dakota
formation
(sandstone and inter-
bedded clay shale)

Kcd
Cascade
formation
(sandstone and shale with
coal seams at the top)

Je
Ellis
formation
(limestone grading upward
into sandstone and locally
sandstone at the base)

Qu
Quadrant
formation
(sandstone, green, and red
shale, and white limestone)

Md
Madison
limestone
(thinly bedded limestone)

Dm
Monarch
formation
(brown and black granular
limestone capped by shale)

Ob
Barker
formation
(limestone and micaceous
shale containing beds of
limestone conglomerate,
and quartzite at the base)

Unclassified crys-
talline rocks

(Areas of ancient crys-
talline rocks and
metamorphic rocks of
unknown origin are
shown by patterns of
short dashes)

Ag
Gneiss
and schist

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

Legend is continued
on the left margin.

(Port Logan)

E.M. Douglas, Topographer in charge.
Triangulation by E.M. Douglas.
Topography by Northern Transcontinental Survey,
E.M. Douglas, and R.H. Chapman.
Surveyed in 1883, 87, and 96.

Douglas
N.T. Survey
R.H.C.

Scale 250,000
Contour interval 200 feet.
Datum is mean sea level.
Edition of Jan. 1899.

Geology by Walter Harvey Weed.
Assisted by Louis V. Pirsson.
Surveyed in 1894 and 1897.

Geology by Walter Harvey Weed.
Assisted by Louis V. Pirsson.
Surveyed in 1894 and 1897.