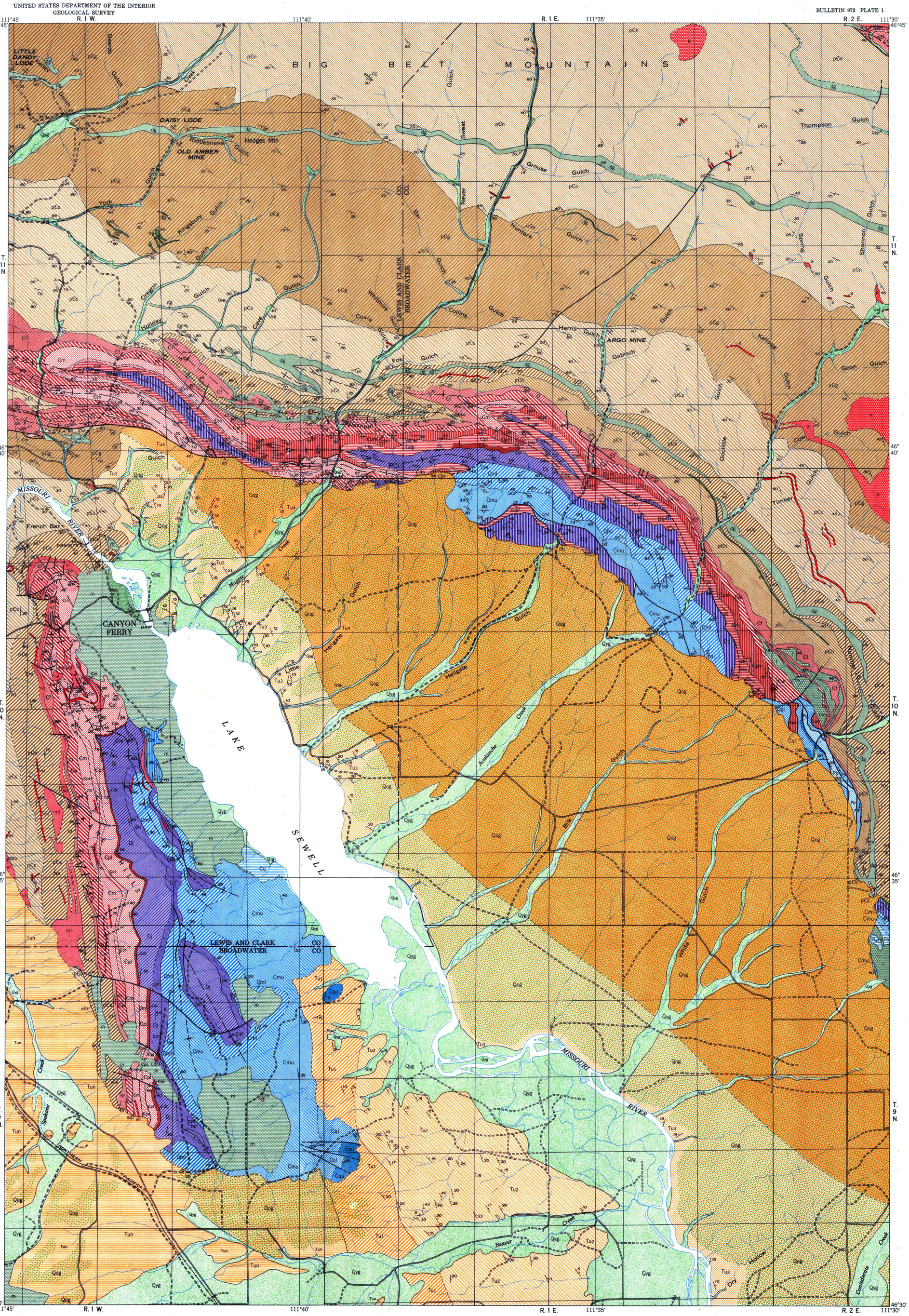


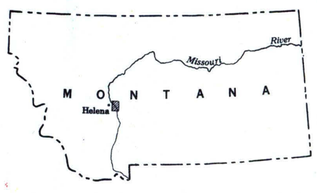
Base compiled from photographs by A. A. A. and U. S. Forest Service

Geology by R. P. Fischer, S. W. Hobbs, and J. B. Mertie, Jr.

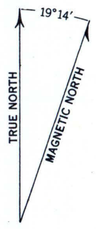
GEOLOGIC MAP OF THE CANYON FERRY QUADRANGLE, MONTANA

Scale 1:48000

1 0 5 Miles



INDEX MAP SHOWING LOCATION OF CANYON FERRY QUADRANGLE



EXPLANATION

SEDIMENTARY ROCKS

QUATERNARY

Recent

Qyg — Younger gravels
Gravel, sand, and silt, in valley floors of the Missouri River and its tributaries

Pleistocene

Qog — Older gravels
Gravel and sand, of fluviatile and eluvial origin. Pedimentary mantle, and high and low terrace deposits

TERTIARY

Oligocene

Tu4 — Unit 4
Conglomerate, with some grit and sandstone, of fluviatile origin. Matrix cemented by calcite

Tu3 — Unit 3
Impure and pure tuffs, of aerial, fluviatile, and lacustrine origin. Some limestone beds near top

Tu2 — Unit 2
Volcanic debris of aerial, fluviatile, and lacustrine origin. Beds of bentonite near base

Tu1 — Unit 1
Conglomerate and red shale, of fluviatile origin. Some of the shale is partially bentonized

Tun — Tertiary Undifferentiated

PERMIAN

Pp — Phosphoria (?) formation
Limestone and shale, with some fine-grained sandstone and chert

CARBONIFEROUS

Pennsylvanian

Cqu, Cq, Cql — Quadrant formation
Undivided, Cq; upper unit, Cqu, mainly vitreous quartzite; lower unit, Cql, mainly red shale and sandstone, with some limestone having chert laminae

Mississippian

Cmu, Cm, Cml — Madison limestone
Undivided, Cm; upper unit, Cmu, massive limestone altered to marble in Spokane Hills; lower unit, Cml, thin-bedded limestone partially altered to marble in Spokane Hills

DEVONIAN

Dtf — Three Forks shale
Poorly bedded shale, with some sandy and calcareous shale. Altered to siliceous shale in Spokane Hills

Dj — Jefferson limestone
Dolomitic limestone with a fetid odor. Alternating bands of black and gray dolomite in Spokane Hills

Dtf, Dj — Three Forks shale Jefferson limestone Undifferentiated

CAMBRIAN

Cdc — Dry Creek shale
Soft, brown, sandy shale. Exposed only at a few localities

Cpl — Pilgrim limestone
Massive dolomitic limestone, underlain by thin-bedded limestone with beds of limestone conglomerate

Cdp — Dry Creek shale Pilgrim limestone Undifferentiated

Cpk — Park shale
Greenish to olive-drab shale, with some beds of fine-grained sandstone. Thermally altered in Spokane Hills

Cm — Meagher limestone
Thinly laminated but massive limestone, with beds of limestone conglomerate near top and base

Cpk, Cm — Park shale Meagher limestone Undifferentiated

Cw — Wolsey shale
Sandy shale with thin beds of sandstone. Thermally altered to hornfels in Spokane Hills

Cf — Flathead quartzite
Massive quartzite, with beds of grit and fine conglomerate

PRE-CAMBRIAN

Belt series

pCh — Helena limestone
Thin-bedded gray dolomitic limestone

pCe — Empire shale
Thin-bedded greenish-gray siliceous shale and argillite

pCs — Spokane shale
Poorly bedded soft reddish shale, with some siltstone near base of formation

pCg — Greyson shale
Thin-bedded gray shale, siltstone, and fine-grained sandstone

pCn — Newland limestone
Thin-bedded dark gray dolomitic limestone

IGNEOUS ROCKS

Miocene (?)

b — Basalt
Crystalline to glassy basaltic lava. Massive, vesicular, and amygdaloidal varieties

TERTIARY

ml — Monzonitic lamprophyres
Dark-colored intrusives of medium granularity, genetically related to the quartz monzonite

m — Latitic intrusives
Light-colored porphyritic intrusives, probably related to the quartz monzonite

m — Monzonitic and granitic intrusives
Quartz monzonite of medium granularity, and coarse-grained porphyritic granite

PRE-TERTIARY

m — Andesitic intrusives
Mainly andesitic greenstone. Some younger andesite is also included

dg — Diorite and gabbro
Dark greenish to greenish-black intrusives, of medium granularity and poikilitic habit

Contact, dashed where approximately located

Fault, dashed where approximately located, dotted where concealed

Axis of anticline

Axis of syncline

35 Strike and dip of beds

50 Strike and dip of overturned beds

90 Strike of vertical beds

Horizontal beds

Mine