

GEOLOGIC LEGEND OF THE PHILIPSBURG AND DEER LODGE RANGER DISTRICTS

Wallace, C. A., et al. 1987 (original scale = 1:250,000)

- MAN-MADE DEPOSITS
Pleice tailings, mill tailings, mine-dump material, and slag piles
SEDMENTARY AND VOLCANIC ROCKS AND DEPOSITS
Quaternary deposits
Alluvium (Holocene)
Fan, pediment, terrace, and colluvial gravel (Pleistocene and Pleistocene)
Landscape (Holocene and Pleistocene)
Glacial lake deposits (Pleistocene)
Tertiary rocks and deposits
Fan deposits and gravel deposits on pediment surfaces ('Pleocene')

- ROCKS OF ANACONDA BATHOLITHIC SUITE
Early Tertiary Rocks
Biotite monzogranodiorite of M8 Creek stock
ROCKS OF THE FLINT CREEK BATHOLITHIC SUITE
Early Tertiary or Late Cretaceous Rocks
Porphyritic muscovite-biotite monzogranite of Mt. Powell batholith
Late Cretaceous Rocks
Locally isolated hornblende-biotite granodiorite of Royal stock
Hornblende-biotite granodiorite of Cable stock
ROCKS OF THE SHOULDER BATHOLITH
Late Cretaceous Rocks
Medium-grained granite porphyry
Aplitic, aplitic, and porphyritic dikes, sills, and plugs
Porphyritic biotite-hornblende monzogranite and granodiorite of Knight Boulder batholith
Diorite of Snodgrass (1968)
STOCKS, DYES, AND SILLS
Early Tertiary Rocks
Gabbro, microgabbro, and diorite plugs, dikes, and sills
Biotite monogranite stock of Lost Creek
Early Tertiary of Late Cretaceous Rocks
Biotite monogranite, biotite-muscovite monogranite, monogranite, and granodiorite plugs, dikes, and sills
Gabbro, microgabbro, and diorite plugs, sills, and dikes
Tonolite, quartz diorite, and granodiorite of Owl Park stock
Biotite monogranite of Wallace Creek stock
Late Cretaceous Rocks
Porphyritic hornblende-biotite granodiorite and muscovite-biotite monogranite of Big Spring Creek stock
Hornblende-biotite granodiorite of Henderson Creek stock
Hornblende-biotite granodiorite of Moses Gulch stock
Early Cretaceous Rocks
systemic, Leucosyenite, and hornblende syenite of Shalsho Mountain diorite
Late or Middle Proterozoic Rocks
Gabbro, microgabbro, and diorite dikes and sills—Occur mainly in the northeastern part of quadrangle

- ALLUVIAL DEPOSITS (QUATERNARY)—Along major rivers and streams, and in isolated alluvial fans
LANDSIDES (QUATERNARY)
ALLUVIAL FAN DEPOSITS (QUATERNARY)—And pediment veneer grades
TILL (QUATERNARY)—Glacial moraines commonly representing at least two episodes of glaciation, and in some places three
OUTWASH DEPOSITS (QUATERNARY)
TUFFACEOUS SANDSTONE, SILTSTONE, AND CONGLOMERATE (MIOCENE TO EOCENE)—TO EOCENE—And related rocks in valley fill deposits
MASALITIC, RHYOLITIC, LATTIC, and VOLCANIC ROCKS (TERTIARY)—Unlinked
GRANITIC INTRUSIVE ROCKS (TERTIARY and CRETACEOUS)—Unlinked
SHANITIC INTRUSIVE ROCKS (CRETACEOUS)—Unlinked
SHALO BATHOLITH (TERTIARY and CRETACEOUS)
Quartz Monzonite
Two-Mica Diorite
Granodiorite
Granodiorite
PIONEER BATHOLITH (TERTIARY and CRETACEOUS)
Tonolite, Quartz Diorite and Gabbro
Foliated Metagranite Rocks
UPPER CRETACEOUS VOLCANIC ROCKS
Volcanic Rocks—Unlinked
KOOTENAI FORMATION (LOWER CRETACEOUS)
PHOSPHORIA (PERMIAN), and QUADRANT (PENNSYLVANIAN) FORMATIONS—Include Anselmo Formation where separated from underlying Big Snowy Formation in places separated P (Permian) and # (Pennsylvanian)
FLATHEAD, WOLSEY, MEADHER, PARK, PILGRIM, and SNOWY RANGE FORMATION (CAMBRIAN)—Includes Silver Hill, Hamann, and Red Lion Formations and conglomerate of Black Lion Zn. (1976) in northeast east of Pioneer Mountains

- MAP SOURCES
Ruppel, E. T., O'Neil, J. M., and Lopez, D. A., 1983. Preliminary Geologic Map of the Silver Hill and Red Lion and Hamann Formations (Upper Devonian) of the Deer Lodge National Forest, Montana. USGS Open File Report OF-83-169
Wallace, C. A., et al. 1987. Preliminary Geologic Map of the Butte 1 degree by 2 degree Quadrangle, Western Montana. USGS Open File Report OF-87-232
EXPLANATION OF MAP SYMBOLS
Contact: Dashed where approximately located
Fault: Dashed where approximately located, solid where contact; bar and ball on down thrown side; arrows show relative horizontal movement
Thrust fault: Used on map area 1) southeast on upper plate; open southeast indicate location of fault determined by trace on air photo; dashed open southeast where determined by younger deposits
Reverse fault: Used on map area 2) southeast on upper plate
Shear zone
Anticline
Overturned anticline
Syncline
Overturned syncline
Igneous dike
Zone of intracase thrusting
Dike hole for oil and gas, geothermal or mineral exploration; number indicates depth in feet
Sedimentary breccia in middle member of Wallace formation

- Mesonota Group
Picher Quartzite
Garnet Range Formation
Metchama Formation
Borner Quartzite
Mount Shasta Formation
Member Three
Member Two
Member One
Sheep Formation
Snowship Formation
Middle Group: Includes Picher Quartzite, Garnet Range and Metchama Formations, Borner Quartzite, Mount Shasta, Sheep, or Snowship Formations; all formations not present at any locality
Rocks of the middle Belt carbonate
Helena Formation
Upper Member—Occurs in northeastern part of quadrangle
Middle Member—Occurs in western and southwestern parts of quadrangle
HIGH-GRADE METAMORPHIC ROCKS OF UNCERTAIN BELT SUPERGROUP PROTOHOLY
Metamorphosed during Late Cretaceous or Tertiary time
Biotite-muscovite schist and interbedded quartzite and lesser amounts of quartzofeldspathic gneiss
Quartzofeldspathic gneiss and migmatite, and lesser amounts of biotite-muscovite schist
Calc-silicate gneiss and migmatite, and lesser amounts of quartzofeldspathic and biotite-muscovite schist
INTRUSIVE ROCKS
ROCKS OF THE SHALO BATHOLITH, BITTERROOT LOBE
Tertiary or Late Cretaceous Rocks
Biotite-muscovite monogranite and muscovite-biotite granodiorite
Hornblende-biotite granodiorite
Late Cretaceous Rocks
Biotite granodiorite and hornblende-biotite granodiorite
Foliated biotite granodiorite and hornblende-biotite biotite
ROCKS OF THE SAPPHIRE BATHOLITH
Late Cretaceous Rocks
Porphyritic and equigranular hornblende-biotite granodiorite of outer zone
Kings
Porphyritic and equigranular muscovite-biotite monogranite of inner zone

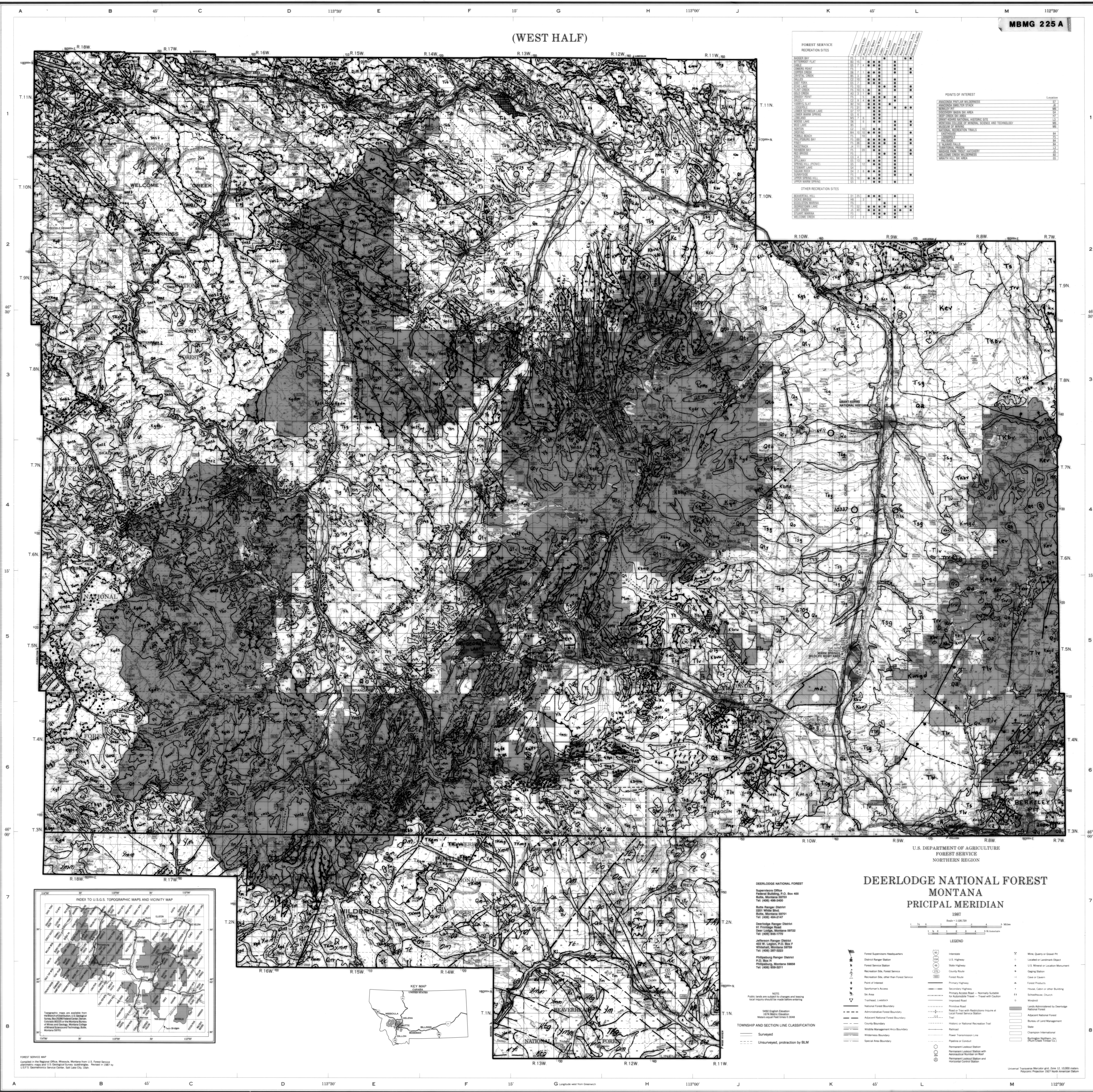
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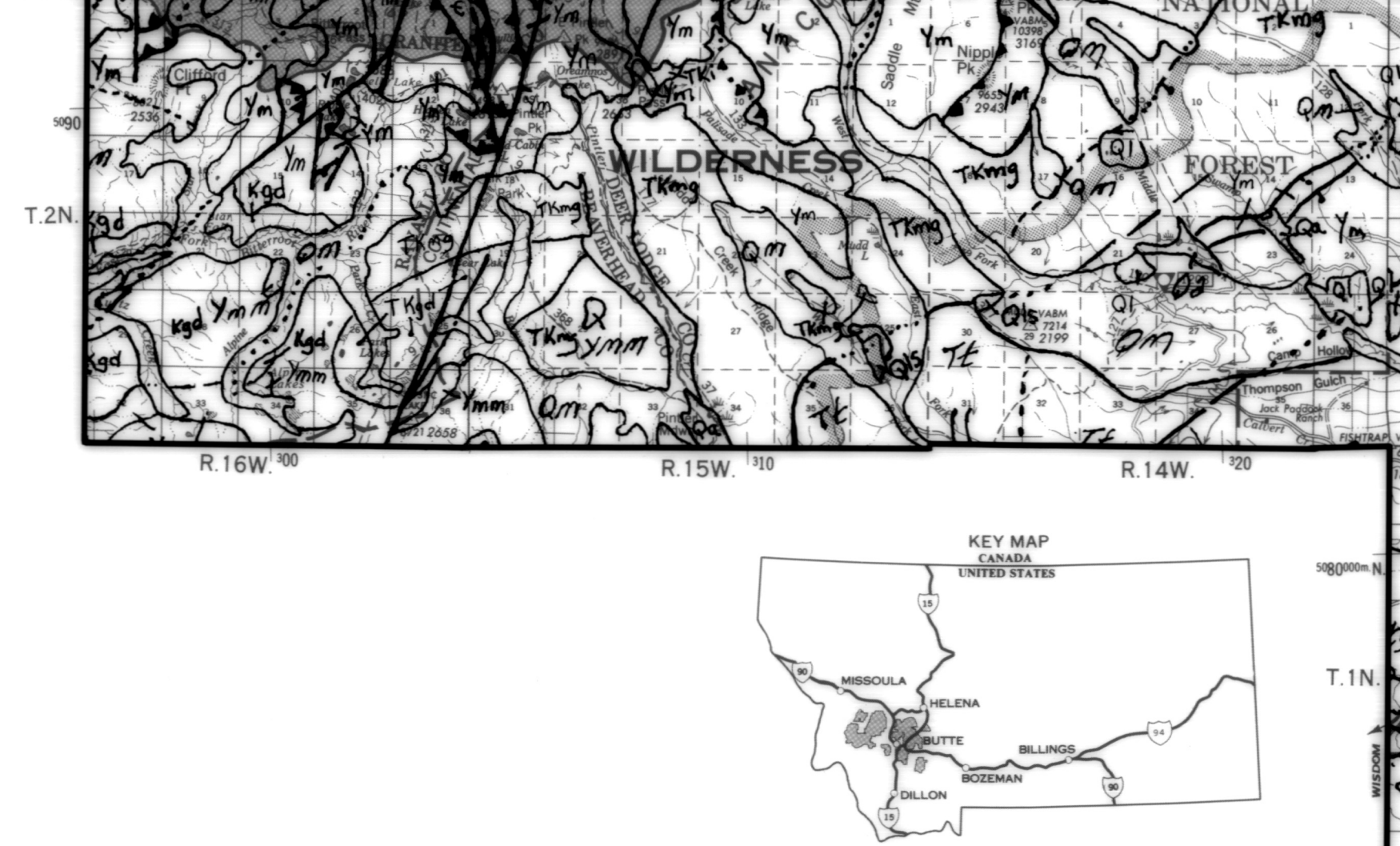
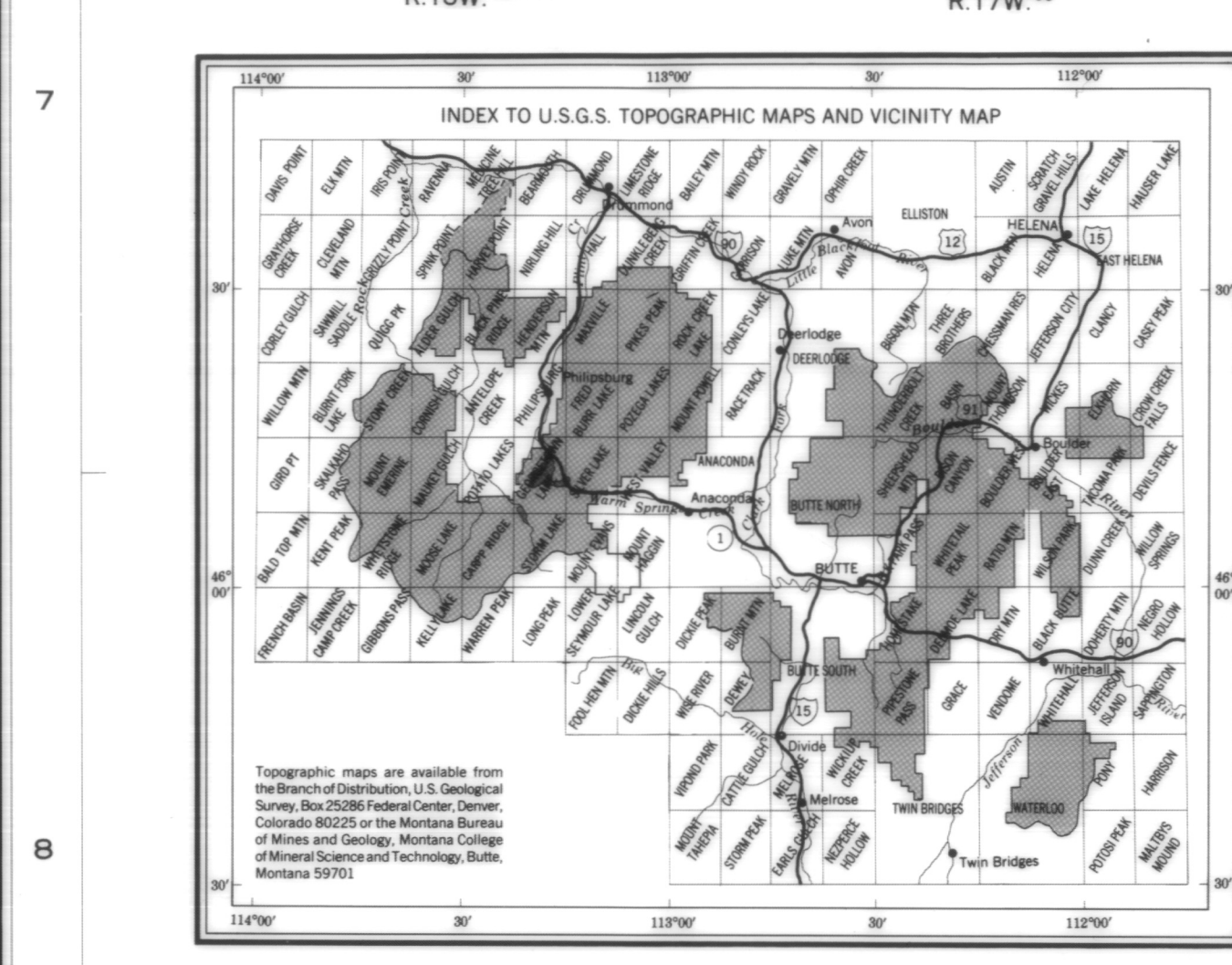
Note: The individual maps used in this photo-composite were enlarged or reduced as necessary in order to obtain a consistent scale. As a consequence, the accuracy of the geologic information depicted will differ.

Prepared by Lynne Dickson and Don Schrock, 1989



FOREST SERVICE RECREATION SITES table with columns for site name, location, and other details.

OTHER RECREATION SITES table with columns for site name, location, and other details.



DEER LODGE NATIONAL FOREST MONTANA PRICIPAL MERIDIAN 1987. Includes contact information for the Forest Service, a legend for symbols, and a scale bar.