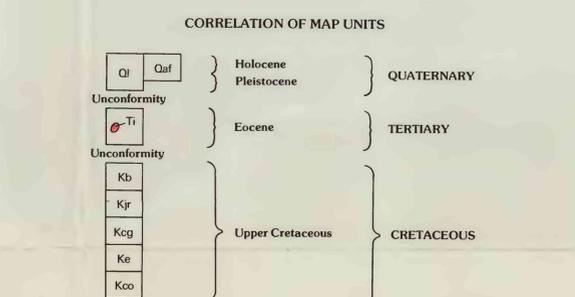


**EXPLANATION OF IDENTIFIED RESOURCES AND MINERAL RESOURCE POTENTIAL**

- Areas of identified coal resources—Areas underlain by Judith River Formation (Kjr) and Eagle Sandstone (Ke) also have high mineral resource potential for natural gas, with certainty level B
- H/B** Geologic terrane having high mineral resource potential for natural gas, with certainty level B—Applies to areas underlain by Judith River Formation (Kjr) and Eagle Sandstone (Ke)
- M/B** Geologic terrane having moderate mineral resource potential for diamonds in diatremes, with certainty level B—Applies to areas underlain by intrusive igneous rocks (Ti)
- L/C** Geologic terrane having low mineral resource potential for all metallic minerals, diamonds, coal, bentonite, and zeolites, with certainty level C—With exception of diamonds in diatremes (Ti), applies to all of both study areas
- L/B** Geologic terrane having low mineral resource potential for oil, with certainty level B—Applies to all of both study areas



**DESCRIPTION OF MAP UNITS**

**Qaf Alluvium and fan deposits (Holocene and upper(?) Pleistocene)**—Undifferentiated alluvium, colluvium, and alluvial-fan deposits. Alluvium: unconsolidated, crudely to well-stratified clay, silt, sand, and gravel deposited along streams as channel fill and flood-plain deposits, as much as 30 ft thick. Colluvium: unconsolidated, unstratified angular debris mantling valley side and hillslopes; a few inches to 50 ft thick. Alluvial fan deposits: unconsolidated, crudely stratified alluvium and colluvium forming well-defined fan-shaped deposits at stream mouths. Thickness variable, commonly more than 25 ft

**Ql Landslide deposits (Holocene and Pleistocene)**—Consists generally of shale, silty shale, and bentonitic clays. Common occurrence in the Cretaceous formations, along rivers and streams, adjacent to faults, and on dip slopes. Thickness estimated to be as much as 100 ft or more in large landslides

**Ti Intrusive igneous rocks (Eocene)**—Undifferentiated ultramafic rocks

**Kb Bearpaw Shale (Upper Cretaceous)**—Exposed upper 50–200 ft is transitional marine lithology, from offshore to nearshore marine, of brown to brownish-gray, thin-bedded sandstone, siltstone, and shale. Prominent in lower one-third are gray to brownish-gray marine shale and silty shale, containing light-gray to cream bentonite beds. Unit as a whole contains numerous horizons of ovoid, massive or septarian, gray limestone concretions; marine fossils common (*Baculites* sp.). Total thickness approximately 900–1,000 ft, but uncertain because of lack of complete undisturbed section

**Kjr Judith River Formation (Upper Cretaceous)**—Predominantly fresh and brackish water deposits: light-brown to yellow sandstone; white, light-yellow, and light-greenish-gray siltstone, claystone, and shale; concretionary sandstone and siltstone; commonly a mass rich in oyster shells occur in the top part; carbonaceous shale and sporadic lenses of sub-bituminous coal. Thickness about 500 ft locally, thinning eastward into predominantly marine shale

**Kcg Claggett Shale (Upper Cretaceous)**—Brownish-gray to brown marine shale, a triple bed of bentonite prominent in lower 80 ft; several horizons of ovoid, orange-yellow, septarian limestone concretions in upper half that weather out as yellow slabs; a tan sandstone near the top, 10–20 ft thick, contains marine fossils; thickness ranges from 450 to about 550 ft

**Ke Eagle Sandstone (Upper Cretaceous)**—Light brown to white marine and brackish-water sandstone and interbedded gray shale, siltstone, and carbonaceous mudstone and shale; basal 50–150 ft is massive sandstone (Virgelle(?) Sandstone Member) forming vertical cliffs along faults and prominent hogbacks along thrusts. Thickness about 50–200 ft

**Kco Upper part of Colorado Shale (Upper Cretaceous)**—Gray to brownish-gray marine shale, minor brownish-gray siltstone, gray bentonite beds, septarian calcareous concretions and concretionary limestone lens. Total thickness 750–900 ft

**Contact**—Dashed where approximately located, dotted where concealed, queried where location uncertain

**Fault**—Dashed where approximately located, dotted where concealed, queried where uncertain. U indicates upthrown side; D indicates downthrown side

**Thrust fault**—Dashed where approximately located; dotted where concealed, queried where uncertain. Sawtooth on upper plate

**Landslide mass**—Hachures indicate approximate location of scarp

**Strike and dip of bedding**—Dashed symbol indicates data from plate 13 of Reeves (1924)

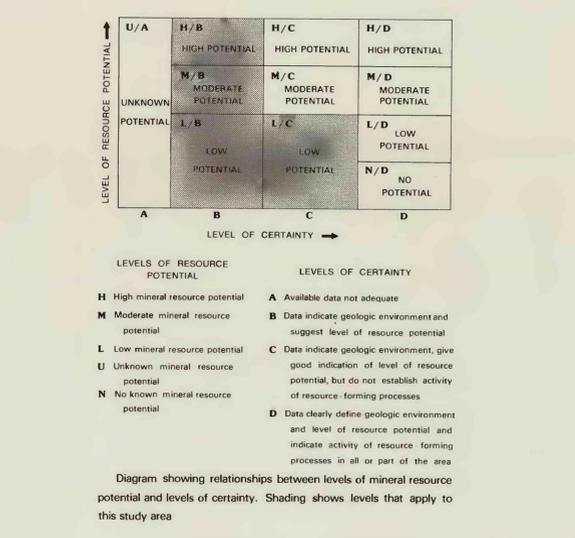
**Inclined**  
Vertical

**Adit**  
Open  
Caved

**Coal mine**

**Mines and mining claims**—Claim lines cannot be plotted at scale of this map; numbers shown on map refer to list below

1. HAL 21 and 22 claims
2. HAL 23 and 24 claims
3. HAL 18 and 19 claims
4. HAL 1 claim
5. HAL 40 claim
6. HAL 2 and 3 claims
7. Shellenberger coal mine
8. Russell coal mine
9. Phillips Powerplant coal mine



**MAP SHOWING MINERAL RESOURCE POTENTIAL AND GEOLOGY OF THE COW CREEK AND ANTELOPE CREEK WILDERNESS STUDY AREAS, BLAINE AND PHILLIPS COUNTIES, MONTANA**