

Sections along lines A-B, C-D, E-F and G-H  
Scale: 1 inch to 2 miles

SHEET 104 P

LEGEND

- PLEISTOCENE AND RECENT**  
14 Glacial and glacio-fluvial deposits, stream deposits, felsenmeer, talus, soil
- TERTIARY OR PLEISTOCENE**  
13 Basalt
- TERTIARY AND (?) EARLIER**  
12 Conglomerate, sandstone, shale, minor coal; 12a, may be older
- JURASSIC AND/OR CRETACEOUS**  
11 Quartz monzonite, granodiorite; granite, pegmatite, apatite, porphyritic granite; 11a, granite porphyry; may be late Cretaceous or Tertiary; 11b, contains limestone inclusions; 11c, contains gneissic inclusions
- MISSISSIPPIAN**  
MIDDLE MISSISSIPPIAN  
10 NIZI FORMATION: limestone, cherty limestone; dolomite, greywacke, pebble-conglomerate
- LOWER MISSISSIPPIAN (?)  
9 Serpentine, peridotite, dunite, pyroxenite; minor metamorphosed volcanic rocks; 9a, mainly serpentine
- DEVONIAN AND MISSISSIPPIAN**  
UPPER DEVONIAN AND LOWER MISSISSIPPIAN  
8 Greenstone, chert-quartz arenite, chert, argillite, slate, quartzite, greywacke, limestone, conglomerate; 8a, limestone; 8b, metamorphosed volcanic rocks; 8c, quartzite, limestone, slate, argillite, phyllite; may include minor 7 and 5; 8d, chert and slate
- DEVONIAN**  
MIDDLE AND (?) UPPER DEVONIAN  
7a, black, fetid dolomite; dolomite breccia, limestone; Middle Devonian; 7b, platy limestone; may be in part Upper Devonian; 7c, undivided 7a, 6b, 6c; 7d, undivided 7a, 7b, 6b
- ORDOVICIAN, SILURIAN AND (?) DEVONIAN  
6a, dolomite, cherty dolomite, dolomite breccia, sandy dolomite, dolomitic sandstone, sandstone, quartzite; Ordovician and Silurian; 6b, sandstone and quartzite, sandy dolomite, dolomite, siltstone; minor dolomite breccias; Silurian; 6c, laminated dolomite; may be in part or entirely Devonian; 6d, dolomite breccia; may be in part or entirely Devonian
- CAMBRIAN AND ORDOVICIAN**  
MIDDLE AND (?) UPPER CAMBRIAN, LOWER AND MIDDLE ORDOVICIAN  
KECHIKA GROUP  
5 Limestone, calcareous slate, phyllitic limestone, calcareous phyllite, pyritic and carbonaceous slate and shale, conglomerate; greenstone, may be in part or entirely younger; 5a, may include infolded strata as young as Mississippian age
- CAMBRIAN**  
LOWER  
4 Limestone, dolomite; minor shale; 4a, may be in part or entirely Precambrian; 4b, may be in part or entirely as young as Devonian
- 3 Quartzite, shale, slate, argillite, pebble-conglomerate, siltstone
- PROTEROZOIC**  
GOOD HOPE GROUP  
1 Limestone, dolomite, slate, argillite; sandy limestone, red and green slate, shale, limestone; minor quartzite, siltstone, phyllite, chlorite schist; 1a, may locally include some 2
- 2 Limestone, greenstone, chlorite schist, graphitic and chloritic calcareous schist
- HORSERANCH GROUP (CAMBRIAN AND/OR EARLIER)**  
A Quartzite, felspathic quartzite, quartz-mica schist, granitic gneiss; crystalline limestone, hornfels, skarn, peridotite, pegmatite; Aa, mainly crystalline limestone, may be Lower Cambrian; Ab, may include rocks equivalent to S; Ac, mainly peridotite
- Bedding (inclined, vertical, overturned) ..... /  
Schistosity, gneissosity, cleavage (inclined) ..... /  
Lamination (arrow indicates direction of plunge) ..... /  
Fault (defined, assumed) ..... /  
Anticline (defined, arrow indicates direction of plunge) ..... /  
Syncline (defined) ..... /  
Fossil locality (number referred to in text) ..... 14  
Mineral deposit ..... 4  
Mineral occurrence ..... 4u

DESCRIPTIVE NOTES

McDame map-area is accessible by motor vehicle via the Alaska Highway and the Cassiar Road; the latter runs from mile 648.5 to Cassiar, a distance of about 87 miles. The Cassiar-Stewart Road, under construction, leaves the Cassiar Road 1 mile east of McDame Lake and runs southerly along Vines Lake, Bass Creek, Cottonwood River and Dease River, to Dease Lake. A tortuous branch road, usable only by trucks and four-wheel-drive vehicles, follows McDame Creek to the old post of McDame on Dease River. Dease River is navigable throughout its course, but near its mouth Two Mile and Four Mile Rapids require careful navigation. Pack-horse trails afford access to most of the map-area and horse feed is generally obtainable. Timber-line is about 4,500 feet above sea-level. Many well distributed lakes can be reached by aircraft available at Watson Lake.

The map-area includes parts of two main physiographic units—Liard Plain and Cassiar Mountains—and a number of subdivisions of these units. Liard Plain, to the northeast, is relatively flat and heavily covered with drift. The western border of the Rocky Mountain Trench forms a distinct straight escarpment where it enters the area from the southeast, but it merges with the Liard Plain north of Red River. Dease Plateau, west of the Liard Plain, is characterized by northwesterly trending ridges of low to moderate relief. Horseshoe Range, bordered to the east by Dease Plateau and to the west by the valleys of Dease and Rapid Rivers, extends northerly from Looney Lake as a high, unbroken ridge for almost 30 miles. It forms an outlying part of the Cassiar Mountains to the southwest. The highest point in the range is 7,300 feet in elevation and about 5,000 feet above Dease River; the maximum relief in the map-area. The southwestern and southern parts of the area are occupied by the Cassiar Mountains, a rugged region with a maximum relief of about 4,000 feet.

During Pleistocene time, ice moving northeasterly and easterly, covered the entire area except possibly a few of the highest peaks.

The Horseshoe group (A), a regionally metamorphosed and locally granitized assemblage of Cambrian and/or Precambrian sedimentary rocks, as much as 7,500 feet thick, underlies Horseshoe Range. These rocks, exposed in a doubly plunging anticline, are bounded by faults and drift so that their relations to the rocks of the Cassiar Mountains are not known. A conformable sequence of Precambrian and Lower Cambrian limestone, dolomite, quartzite, and shale, the Good Hope (1, 2) and Atan (3, 4) groups respectively, occupy mainly a northwesterly trending, complex anticlinorium on the northeast flank of the Cassiar Mountains. Precambrian rocks may be as much as 4,000 feet thick but the base is not exposed. Locally fossiliferous Lower Cambrian strata are at least 3,000 feet thick.

Highly contorted Cambro-Ordovician rocks of the Kechika group (5) conformably overlie the Atan group (3, 4), in the southwestern and southern parts of the area. Cambro-Ordovician strata are mainly dark grey argillaceous rocks as much as 1,000 feet thick, whereas in the northeastern and eastern parts they are mainly light buff and grey calcareous and argillaceous rocks more than 2,500 feet thick. Bodies of greenstone, perhaps mainly or entirely intrusive, are common in the Kechika group (5).

Northeast and east of the major synclinorium in the southwest part of the map-area, the Sylvester group (6) is overlain discordably (?) by fossiliferous cherty dolomites and generally non-fossiliferous sandstones and dolomitic sandstones of the Ordovician and Silurian Sandpile group (6a, 6b). On the limbs of the synclinorium and in several places east of it, however, strata probably equivalent to the Sandpile group (6a, 6b), but lacking fossiliferous cherty dolomite, rest directly on Lower Ordovician rocks. Highly altered dykes and sills of greenstone have intruded the dolomitic rocks.

Laminated dolomite of Silurian and/or Devonian age (6c) conformably overlies Silurian strata on the limbs of the synclinorium. Dolomite breccias (6d) of Silurian or Devonian age occur in a few places.

The McDame group (7a, 7b) comprises a lower member of fossiliferous, black, fetid dolomite from 350 to 650 feet thick, and an upper member of grey platy limestone from 175 to 275 feet thick. This group unconformably overlies rocks ranging in age from Cambro-Ordovician to Silurian and/or Devonian.

An assemblage of Upper Devonian and Lower Mississippian volcanic and sedimentary rocks more than 15,000 feet thick—the Sylvester group (8)—conformably (?) overlies the McDame group (7a, 7b) on the limbs of the synclinorium in the southwest part of the map-area.

Lenses, sills, and stocks of ultramafic rocks (9) cut the Sylvester group and are believed to be of Lower Mississippian age.

A marked unconformity indicates the base of the Middle Mississippian Nizi group (10). In the south-central part of the map-area, strata of this group, as much as 1,000 feet thick, overlie the Sylvester group (8); east of Solitary Lake they overlie rocks of the Kechika group (5).

Granitic rocks of the Cassiar intrusion (11), probably emplaced in Mesozoic time, underlie the rugged region in the southwest part of the area.

The youngest consolidated sedimentary rocks in the area (12), of Tertiary and (?) earlier age, are coal-bearing along Rapid River. Basaltic extrusive rocks of Tertiary or Pleistocene age (13) form a few small outcrops along Blue River.

A thick mantle of drift of glacial, glacio-fluvial, and fluvial origin (14) covers most of the Liard Plain, parts of the Dease Plateau, and the lower slopes and valley floors throughout the area.

Rocks underlying the Liard Plain and Dease Plateau are highly folded and faulted. In particular, thin-bedded, incompetent Cambro-Ordovician strata have been intensely deformed and cleavage has been developed to a high degree. The Horseshoe group (A) is exposed in a relatively simple, doubly plunging anticline bounded on the west and southeast by major faults. The Cassiar Mountains in the southwestern and southern parts of the area embrace mainly two anticlinal areas and an intervening synclinal area. Within the anticlinorium west of Dease and Rapid Rivers the strata are complexly folded and faulted. The Cassiar batholith has been emplaced into an anticlinal area bordering the synclinorium to the southwest. The structure within the southeasterly plunging synclinorium is not well known, but the outline of the major structure is symmetrical and well defined.

Several major longitudinal faults have been recognized, along which some movement has taken place in Tertiary or post-Tertiary time. In addition to these faults, numerous northerly and northwesterly trending faults cut strata in the anticlinorium west of Dease and Rapid Rivers and in the structurally complex area southeast of Deadwood Lake.

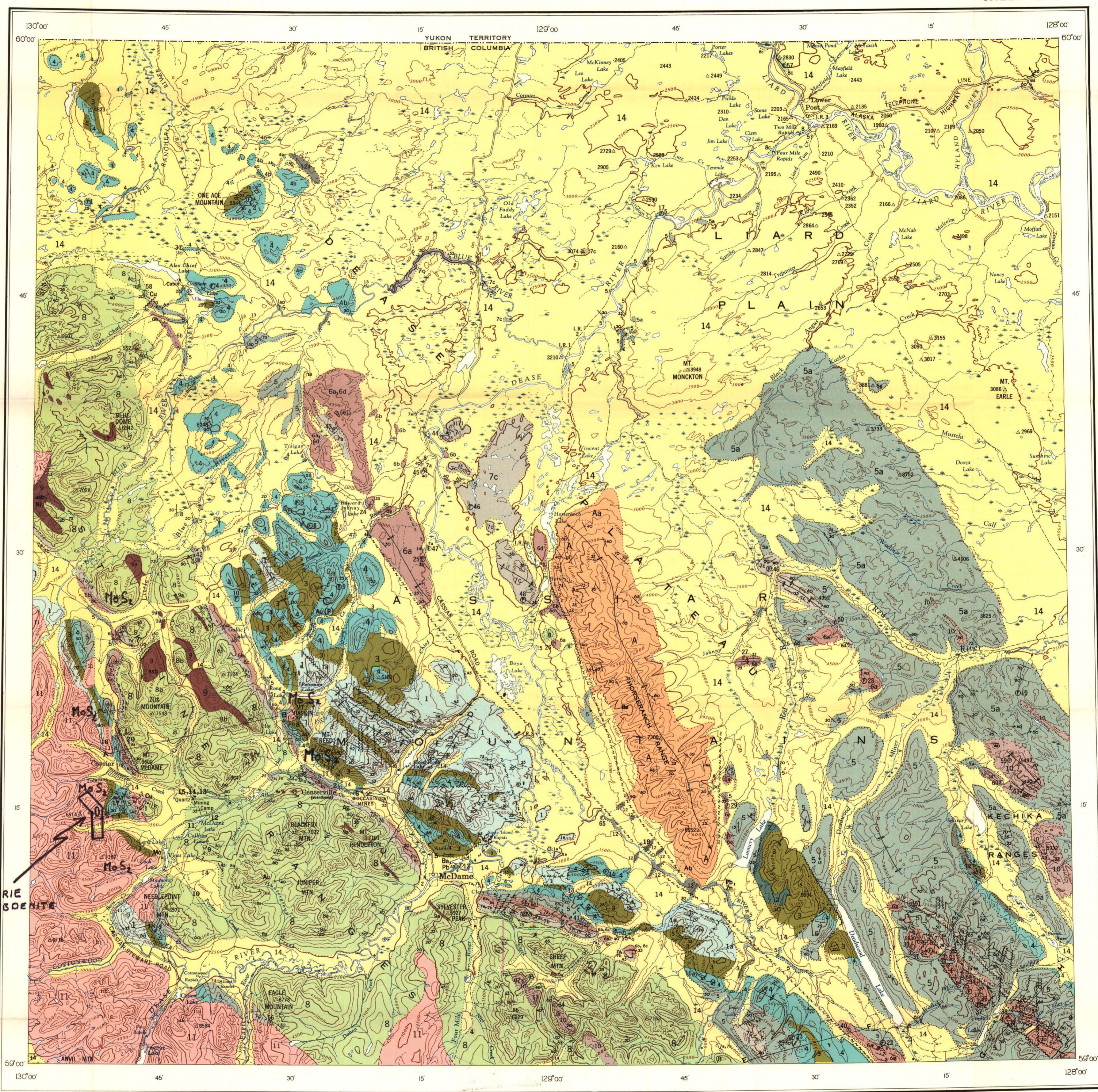
Placer gold was discovered on McDame Creek in 1874 and on Walker Creek in 1877, but since 1887 only McDame Creek has yielded important amounts of gold. Gold has also been panned on Rosella and Spring Creeks and on Dease River. The gold originated in quartz veins in the volcanic rocks of the Sylvester group (8), which carry free gold, pyrite, and tetrahedrite. These veins are particularly abundant in the area between Pooley Creek and the mouth of Quartzrock Creek.

Minor chalcocyanite was noted in five places in a narrow zone in calcareous phyllites extending for at least 12 miles northwesterly from Hidden Valley Creek. A showing containing specular hematite, chalcocyanite, and minor galena occurs 1 1/2 miles south of the mouth of Nizi Creek. Silver-lead-zinc minerals have replaced dolomitized limestone and, to a lesser degree, quartzite of the Atan group (3, 4) in a zone extending from Mt. Haskin to south of Dease River beyond Atan Lake. Near Atan Lake galena occurs with barite. Silver-lead-zinc replacement bodies, containing much manganese magnetite, occur 3 miles northwest, and 2 miles south, of Cassiar. Quartz veins 3 miles northwest of Cassiar contain significant amounts of bismuth. Pyrrhotite and magnetite replacement bodies carrying minor molybdenite and scheelite occur along the contact of the Cassiar intrusions (11) with the Good Hope (1, 2) and Atan (3, 4) groups. Beryl is found in pegmatites in the central and northern parts of Horseshoe Range, and helvite occurs in tuffite 2 miles northeast of the mouth of Bass Creek.

High-grade chrysotile asbestos is being mined from a serpentine body 3 miles north of Cassiar, and non-commercial bodies of asbestos were noted in most of the ultrabasic bodies in the map-area. Small lenses of chromite occur in igneous bodies, and from 0.1 to 0.3 per cent nickel was obtained from samples of several of the ultrabasic bodies.

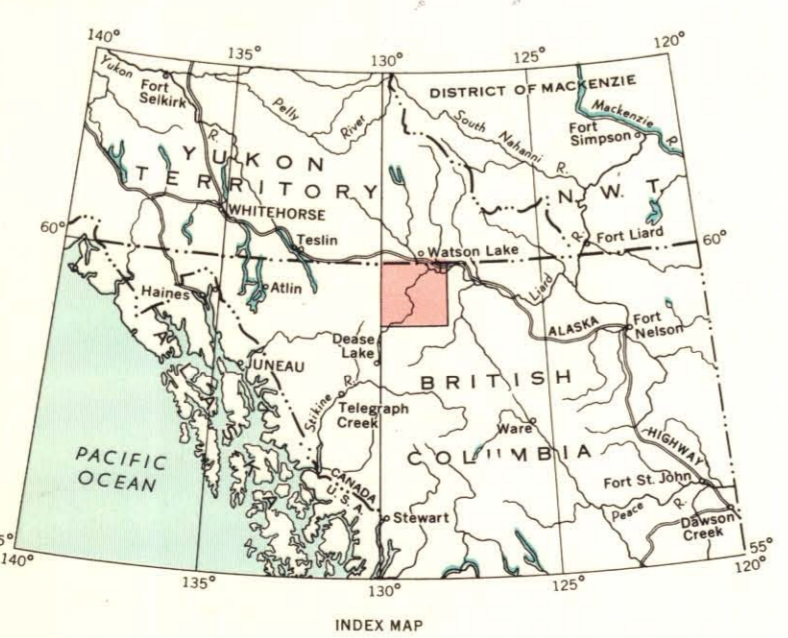
Thin, much-contorted seams of lignitic and sub-bituminous coal occur in Tertiary rocks (12) along Rapid River.

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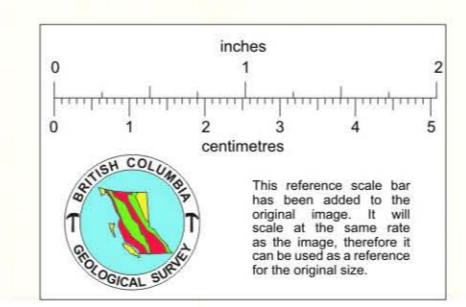


MAP 1103A  
GEOLOGY  
**McDAME**  
CASSIAR DISTRICT  
BRITISH COLUMBIA

Scale: One Inch to Four Miles = 1/283,440  
Miles 0 2 4 6 8 10 12



- REFERENCE
- Road and buildings ..... -
  - Trail ..... -
  - Provincial boundary ..... -
  - Indian Reserve boundary ..... -
  - Horizontal control point ..... -
  - Intermittent stream ..... -
  - Marsh ..... -
  - Sand ..... -
  - Cliff ..... -
  - Contours (interval 500 feet) ..... -
  - Depression contour ..... -
  - Form lines ..... -
  - Height in feet above mean sea-level ..... 6929
- Base-map prepared by the Surveys and Mapping Branch  
Approximate magnetic declination, 31° 37' East



Geology by L. L. Price, 1949 and H. Gabrielse, 1950 - 1954

To accompany Geological Survey of Canada Memoir 310 by H. Gabrielse

Cartography by the Geological Survey of Canada.