

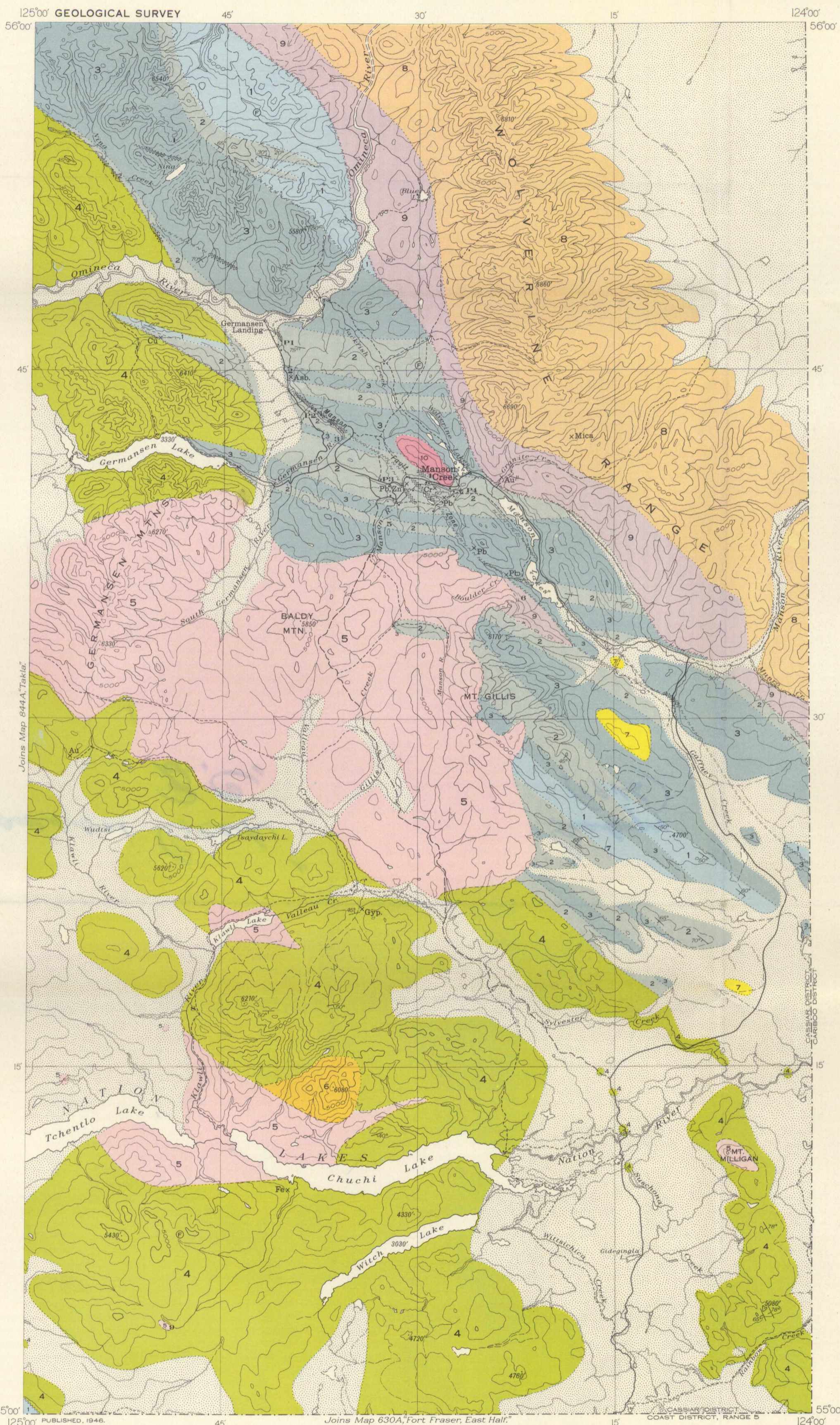
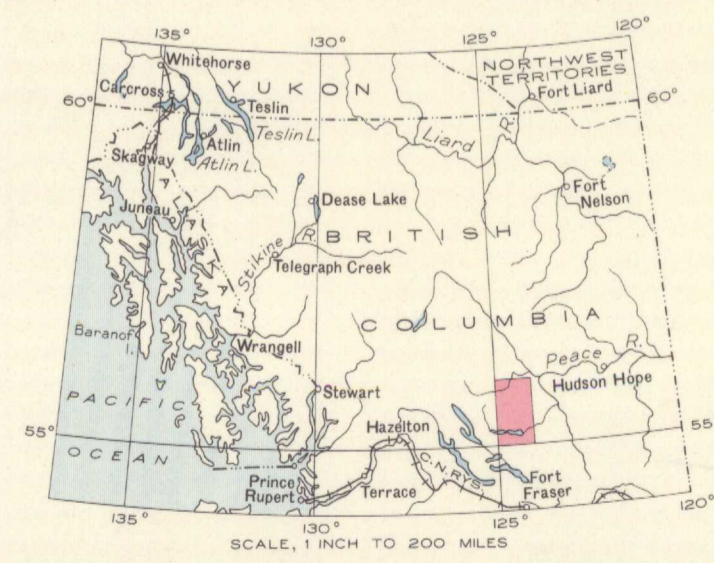
LEGEND

- CENOZOIC**
- TERTIARY (?)**
- 7** Trachytic and andesitic flows, dykes and sills
- JURASSIC OR LATER**
- 6** Syenite
- MESOZOIC**
- UPPER JURASSIC OR LOWER CRETACEOUS**
OMINECA INTRUSIONS
- 5** Granodiorite, quartz diorite, diorite, and granite
- TRIASSIC AND JURASSIC**
UPPER TRIASSIC AND LATER
TAKLA GROUP
- 4** Andesitic and basaltic flows, tuffs, breccias and agglomerates; minor argillite and conglomerate
- CARBONIFEROUS AND LATER**
PENNSYLVANIAN AND PERMIAN
CACHE CREEK GROUP
- 3** Greenstone (andesitic flows and tuffs); minor argillite, chert, limestone, and serpentine. In part older than 1 and 2
- 2** Argillite, slate; minor greenstone, chert, and limestone. In part older than 1
- 1** Massive limestone; minor argillite, slate, chert, and greenstone
- 10** Altered diorite
- WOLVERINE COMPLEX**
- 9** Micaceous, chloritic, and garnetiferous schists; quartzite, limestone; minor granitic gneiss and pegmatite
- 8** Granitoid gneiss, quartzite, pegmatite; minor schists
- PROSPECTS**
- Nina Copper Showing 1
Farrell Group 2
Flagstaff and Mother Lode 3
Fairview Group 4
Black Hawk Group 5
Berthold Property 6
Blackburn Property 7
Kohse Copper Property 8
Chuchi Tungsten Showing 9
- PLACER MINES**
- Huffman Placers P1
Germansen Mines, Limited P2
Consolidated Mining and Smelting Co., Ltd. P3
Lost Creek Placer Gold, Limited P4
- MINERAL OCCURRENCES**
- Lead Pb
Zinc Zn
Iron Fe
Gold Au
Silver Ag
Chromium Cr
Mica Mica
Asbestos Asb.
Gypsum Gyp.

- Heavily drift-covered area
Bedding (inclined, vertical)
Fault or fault zone
Carbonate rocks (along fault zones)
Fossil locality
Mineral occurrence X
- Road and buildings
Road not well travelled
Trail
Post Office
Land District boundary
Lake and stream (position approximate)
Contours (interval 500 feet)
Contours (position approximate)
Height in feet above mean sea-level 5850'

Geology by A.H. Lang, 1940, 1941; J.E. Armstrong and J.B. Thurber, 1944. Geological compilation and descriptive notes by J.E. Armstrong.

Base-map surveyed and compiled by the Topographical Survey, 1938, with additions by the Geological Survey, 1946. Cartography by the Drafting and Reproducing Division, 1946.



MAP 876A
MANSON CREEK
CASSIAR DISTRICT
BRITISH COLUMBIA
Scale, 1/4 inch to 4 Miles
Approximate magnetic declination, 30° East.

DESCRIPTIVE NOTES

The map-area is accessible by a fair motor road that extends from Vanderhoof on the Canadian National Railways, about 90 miles south of the map-area, to Germansen Landing on Omineca River, which is navigable for small boats above the Landing and with difficulty below. The Nation Lakes and River are also navigable, and small boats can be taken to Chuchi Lake by truck.

That part of the map-area south of the Nation Lakes lies within the northern border of the Nechako or Central Plateau. It is an area of relatively low relief with only an occasional mountain rising 1,500 to 2,500 feet above general plateau level. North of the Nation Lakes the terrain is much more rugged, and includes several ranges of mountains separated by valleys of moderate width. Many of the peaks rise 3,500 feet or more above the valleys. Part of the broad valley of the Rocky Mountain trench crosses the northeast corner of the map-area; to the southwest the Wolverine Range rises to an elevation of nearly 6,900 feet.

Bedrock is well exposed above timberline, at about 5,000 feet, and in cliffs and stream canyons. Elsewhere it is largely concealed by glacial and stream deposits, these being thickest along valley bottoms and in wide terraces flanking the principal valleys.

The metamorphic rocks (9) comprising part of the Wolverine complex are lithologically similar to the pre-Permian strata of the Aiken Lake map-area to the northwest. They are also similar to, and lie along a northwestern extension of, the belt of Proterozoic rocks of the Cariboo district. The granitoid gneisses and feldspathized quartzites (8) comprising the bulk of the complex are believed to be mainly granitized equivalents of Proterozoic strata, although younger formations may be included. Small, irregular pegmatite bodies and small stocks of granodiorite are associated with the granitoid gneisses, which may be in part of intrusive origin.

The Cache Creek group (1, 2, 3) appears to represent a conformable succession, not less than 10,000 feet thick, of interbedded sedimentary and volcanic rocks and their derived schists. The constituent formations are closely folded in a general northwesterly direction, but in places the folds trend nearly due west. Limestone strata (1) pinch and swell along their strike and at depth, and are discontinuous; maximum thicknesses probably reach 3,000 feet. Non-calcareous strata (2) appear to be much more closely folded than the limestones. The argillites and slates are grey to black, rusty weathering, carbonaceous rocks in beds that are rarely more than 6 inches thick. The greenstones (3) include altered andesitic and basaltic flows, tuffs, breccias, and agglomerates, with minor related basic intrusive rocks. Fragments of limestone up to 8 feet in diameter are contained in bodies of greenstone. No diagnostic fossils were collected from the Cache Creek rocks of this map-area, but *Lithostrotion* of possible Carboniferous or Permian age was found in limestone east of Nina Lake, and in limestone north of Wolverine Lakes. The group has been correlated with similar strata to the south and west containing fossils of Middle Permian age.

Formations of the Takla group (4) comprise more than 5,000 feet of interbedded lava, tuff, breccia, agglomerate, and minor sedimentary rocks. North and south of the Nation Lakes the strata trend nearly east and west, but north of Germansen Lake and Omineca River the general trend is northwesterly. The diagnostic, Upper Triassic fossil *Halobia* was identified from argillite outcropping south of the east end of Tchentlo Lake. No other fossils were found in the map-area, but marine shells of Upper Triassic and Lower and Middle Jurassic age have been collected from the Takla group of Takla map-area to the west, and others, of Middle and Upper Jurassic age, were obtained in the McConnell Creek map-area to the northwest.

The larger bodies of Omineca intrusions (5) are composed chiefly of granodiorite, quartz-diorite, and diorite. In addition there are many unmapped acidic to basic dykes and sills up to 100 feet wide. The Omineca intrusions cut formations of the Takla group, and, in Takla map-area, to the west, they are apparently overlain by Upper Cretaceous strata.

The syenite stock (6) north of Chuchi Lake intrudes the diorite to the south. It may represent a late phase of the Omineca intrusions, or it may be much younger, possibly of Tertiary age.

The Manson fault zone has been traced from Gaffney Creek 40 miles northwest to Nina Creek. From Omineca River north it forms the contact between stratified Cache Creek rocks on the east and Takla rocks on the west. Drag-folding of the beds along Manson River and Nina Creek indicates that the east wall of the fault zone moved north relative to the west wall. Wherever the fault zone was observed the wall-rocks across an average width of 200 feet are partly to completely altered to a buff-colored aggregate of carbonate, quartz, chlorite, and mariposite. Many of the branch faults along the main fault zone are also marked by carbonatized wall-rocks.

The large fault indicated along the western front of the Wolverine Range is not exposed, but its occurrence and position are inferred from a marked discordance of the strata on either side of a line along which formations of the Wolverine complex strike into those of the Cache Creek group.

Placer gold was discovered on Germansen River in 1870, and on Manson River in 1871. Since then some gold has been produced each year, the total value probably exceeding \$1,500,000.

The placer deposits of the area have been found both in Recent stream gravels and in stream channels underlying glacial drift which in places is as much as 80 feet thick. The deposits of Germansen and Manson Rivers and their tributaries exhibit a linear arrangement along the Manson fault zone, and apparently most of the gold in them resulted from erosion of carbonatized and less altered rocks and quartz veins.

Quartz veins and stringers, as well as other types of lode deposits, occur at many places in the map-area, mainly along the Manson fault zone and its subsidiary fractures, or in shear or fracture zones along igneous contacts. These structures apparently provided abundant channelways for mineralizing solutions, and deposition occurred wherever conditions were favourable.

On the basis of mineral association these lode deposits along the Manson fault zone include a tetrahedrite type, a galena-sphalerite type, and a pyrite-galena type. Veins of the tetrahedrite type occur in carbonatized rocks on the Fairview, Flagstaff, and Mother Lode properties, and in sheared andesite on the Farrell property. They consist of grey, vitreous, and white, sugary quartz sparingly mineralized with tetrahedrite, chalcocite, and minor pyrite, malachite, azurite, and native gold. The sphalerite-galena deposits are quartz veins and quartz-rich zones mineralized with small patches of galena, sphalerite, and minor pyrite. Such a zone, on Manson River near Discovery Bar, occurs in sheared andesite along a subsidiary fault. A silicified fracture zone on the Berthold property is in argillaceous quartzite, sparingly mineralized with galena and pyrite.

Several deposits occur along shear or fracture zones near or in intrusive bodies, and have, presumably, originated from solutions related to the Omineca intrusions. The Kohse copper deposit comprises several mineralized zones in sheared andesite. These consist of quartz-carbonate veins separated by bands of altered and mineralized andesite. Both veins and wall-rock carry chalcocite and pyrite, and minor azurite and malachite. On the Black Hawk property several quartz veins have been prospected within a belt of fractured andesite 650 feet wide. The veins are mineralized with galena, sphalerite, pyrrhotite, and pyrite, and the wall-rocks are silicified and pyritized. The Chuchi tungsten deposit carries minor amounts of scheelite, powellite, molybdenite, and chalcocite disseminated through a fracture zone at the contact of a granitic stock with silicified andesite.

Among other lode occurrences in the area is the Nina copper showing, a mineralized zone, several feet wide, containing malachite and azurite. It occurs in a wide band of carbonatized, silicified, and pyritized argillite and andesite.

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