

NOTES

The Parsnip River sheet extends across almost all of the Cordilleran Orogen and includes a small part of Interior Platform in the northeast, embracing an area of about 235,000 square kilometres, or 91 000 square miles. Within the Cordilleran Orogen are parts of the Coast Plutonic Complex, the Intermontane Belt with several subordinated tectonic divisions, the Omineca Crystalline Belt, and the Rocky Mountains Thrust Belt. The Coast Mountains in the southwest are high and rugged with numerous icefields. The interior plateau is generally a low region with little relief. It includes the higher Skeena Mountains in the north and extends eastward as a broad lowland bordering the valley of the Fraser River and separating Omineca and Columbia Mountains. Two enclaves, linear valleys form Rocky Mountain Trench. To the northeast, the Rocky Mountains are relatively narrow and low, with the heavily forested ridges of the Foothills merging into the plateaux and lowlands of the interior Plains.

Coast plutonic complex is dominantly quartz diorite and granodiorite with foliated plutonic rocks, gneiss and schist forming northwesterly trending, steeply dipping penitents and screens between the plutons. Along the eastern margin, northerly and northeasterly trending, mainly normal faults occur. Within the axial part faults are few, possibly masked by the younger plutons. The Late Paleozoic penitents are strongly metamorphosed and, in places, older northeast trending structures are preserved. The highly metamorphosed, mainly volcanic, Mesozoic rocks in the south rest unconformably on older parts of the complex and are intruded by quartz monzonite. Late Tertiary and Quaternary volcanics in the east reflect the extension of erosion surfaces from Intermontane Belt.

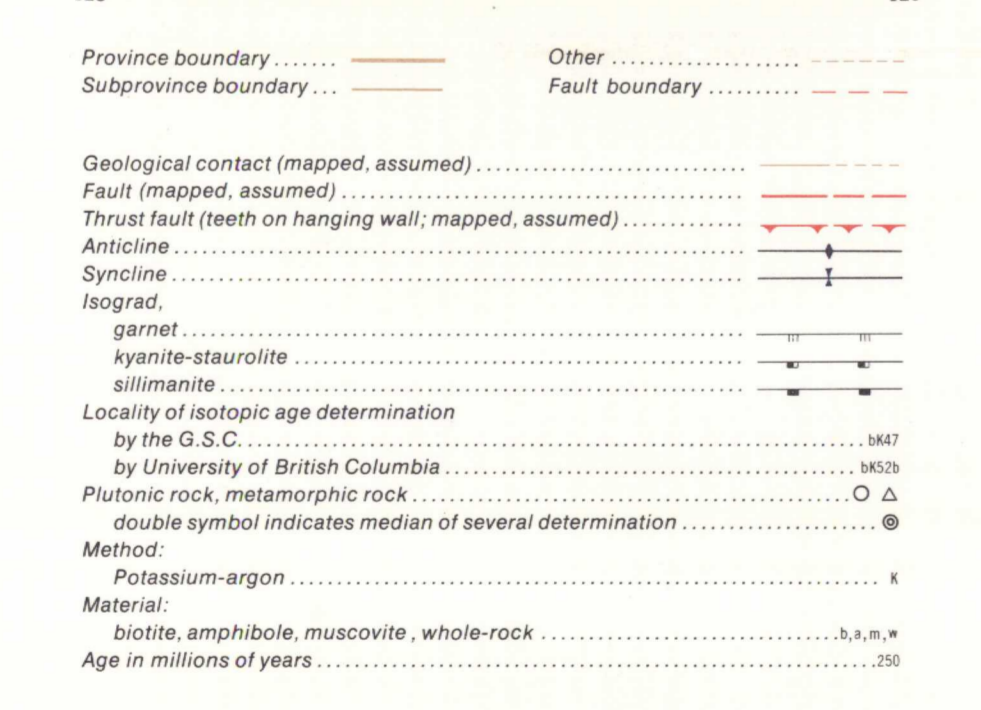
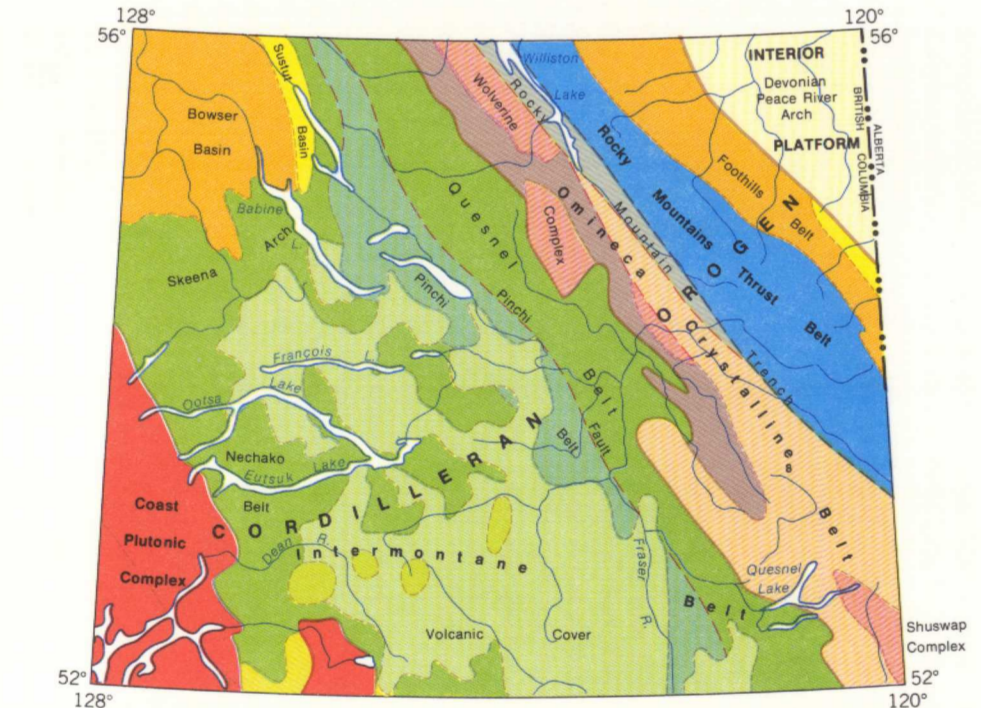
Intermontane Belt is divisible into the Hazelton, Pinchi and Quesnel Belts. The Hazelton Belt includes Lower and Middle Jurassic basaltic to rhyolitic volcanics, granitic intrusions and gneisses. A few scattered outcrops suggest that Triassic and Late Paleozoic rocks underlie the Jurassic. The belt is bisected by the northeasterly trending Skeena Arch which separates the Middle and Upper Jurassic marine sediments of Bowser Successor Basin in the north from the less extensive, late Middle Jurassic, marine Nechako Basin to the south. The older rocks are unconformably overlain by Tertiary basaltic to rhyolitic cover in the south, by the non-marine sediments of Sisset Successor Basin in the north, and by the mainly marine Lower Cretaceous Skeena volcanics and sediments in the southwest. Early Jurassic acidic plutons and Late Cretaceous to Tertiary felsic to porphyritic plugs are scattered throughout the belt and extend into adjoining belts. The dominant structural style is block faulting of Cretaceous and Tertiary age. Pinchi Belt embraces the Upper Paleozoic strata between the Pinchi and Vital Faults. Pinchi Fault is probably a long-lived feature. It contains slices of blueschist and eclogite of Late Triassic age and may have been active as a strike-slip fault in the latest Mesozoic. The Vital fault system, active in the Late Jurassic and Early Cretaceous, is a series of imbricate east-dipping thrust and reverse faults on which more metamorphosed rocks of the Pinchi Belt are displaced over the less metamorphosed, younger rocks of Hazelton Belt. Rocks of Pinchi Belt consist of radiolarian chert, argillite and massive, pod-like, shallow water carbonates, that contain mid-Pennsylvanian to Late Permian fossils and Triassic conodonts at one locality. Intercalated are basic volcanics, gabbro and alpine-type ultramafic rocks. Most rocks are at sub-greenschist to upper greenschist grade, or in blueschist facies locally associated with eclogite. The higher grade rocks exhibit two, or locally, three episodes of deformation. The earlier, associated with blueschist metamorphism, is probably Late Triassic and the later, associated with the Vital fault system, is Late Jurassic to Early Cretaceous. Cross-cutting granitic plutons are Jurassic and possibly Cretaceous in age.

In Quesnel Belt, Early Paleozoic and Precambrian rocks are exposed beneath widespread Upper Triassic, alkaline, augite porphyry basalts which interfinger easterly with black phyllite. This arc-type volcanism persisted into the Early Jurassic in the south. Coeval granitic plutons are spatially related and include porphyry copper deposits. The lower Jurassic is the last marine sequence as uplift coincident with the rise of the Omineca Crystalline Belt excluded the sea from the area. Mid-Cretaceous acidic plutons occur along the eastern side of the belt and extend into Omineca Crystalline Belt. Block faulting with northwesterly and northeasterly trends and minor folding is characteristic. Several transcurrent faults may occur but, because of extensive cover, are speculative.

The central part of Omineca Crystalline Belt is a structural and metamorphic depression lying between penetratively deformed metasedimentary rocks in upper amphibolite facies that form the infrastructure in the culminations underlain by the Shawano and Wolverine Metamorphic Complexes. Within the depression, the substructure is composed of low grade and unmetamorphosed rocks ranging from Hadrynian to Triassic in age, concentrically folded and cut by vertical faults. Similar structural and metamorphic transitions, produced during the Jura-Cretaceous Columbian Orogeny, occur between Omineca Crystalline Belt and Quesnel Belt to the west and Rocky Mountains Belt to the east.

In the Rocky Mountains Thrust Belt thick, layered, platform successions of carbonate and shale of Hadrynian and Paleozoic age form relatively north-easterly transported thrust sheets. The more easterly thrusts and folds, mainly in the Foothills Belt, also involve thick Mesozoic sequences, the upper part of which constitutes the westerly derived foredeep clastics produced and deformed during the Jura-Cretaceous Columbian and Late Cretaceous-Paleocene Laramide Orogenies. These clastics extend northeastward, undeformed, to underlie Interior Platform.

GEOLOGICAL PROVINCES



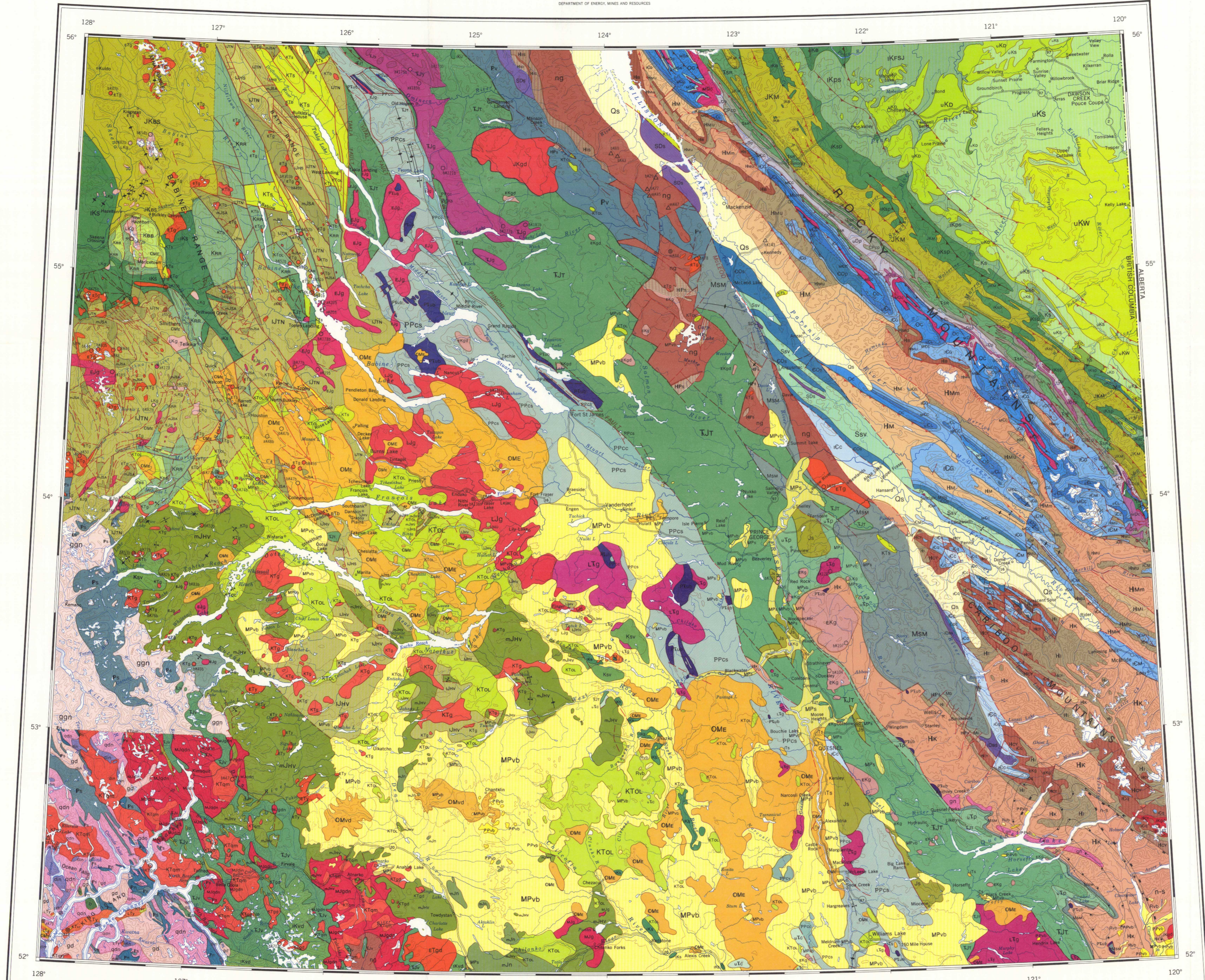
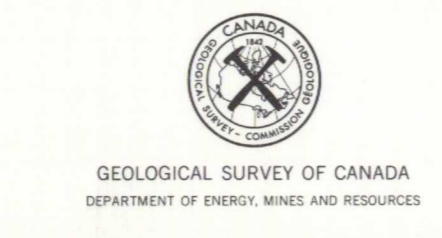
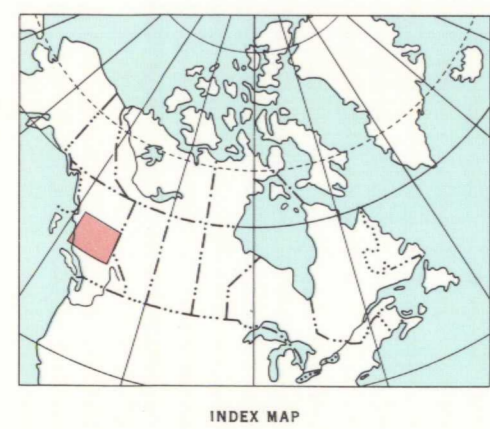
Geological compilation by H.W. Tipper, R.B. Campbell, G.C. Taylor and D.F. Stott, 1974

The geology of the southern Omineca Crystalline Belt was compiled by R.B. Campbell, the Rocky Mountains Thrust Belt by G.C. Taylor and the Foothills Belt and Interior Platform by D.F. Stott. The remainder of the sheet was compiled by H.W. Tipper

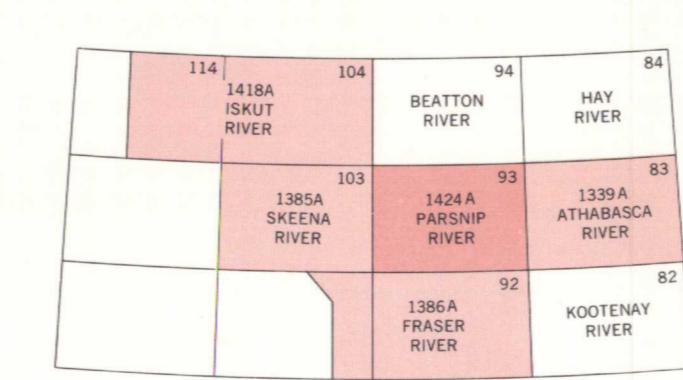
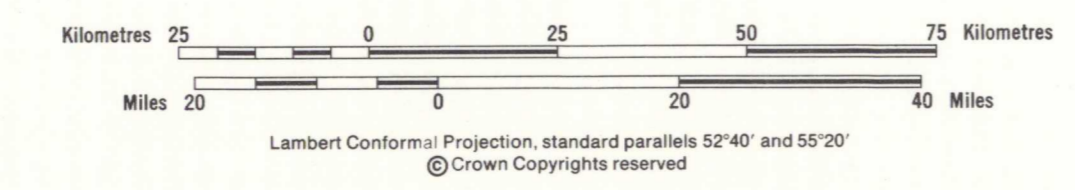
Geological cartography by M. St. Pierre, Geological Survey of Canada

Base-map assembled by the Geological Survey of Canada from the IMW maps NW-9 and NW-10 published at the same scale by the Surveys and Mapping Branch in 1969 and 1970 respectively

Closest of this map may be obtained from the Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario K1A 0B8



MAP 1424A PARSNIP RIVER BRITISH COLUMBIA 1:1,000,000 GEOLOGICAL ATLAS SHEET 93 GENERAL CO-ORDINATOR: R.J.W. DOUGLAS



QUATERNARY RECENT Rvb basalt flows, breccia, cinder cones

PLEISTOCENE AND RECENT Qs till, gravel, sand, silt, alluvium

TERTIARY AND QUATERNARY PLEISTOCENE AND PLEISTOCENE PPvb olive basalt, cinder cones, breccia

TERTIARY MIOCENE AND PLEISTOCENE MPvb olive basalt flows, breccia, tuff

MIOCENE AND PLEISTOCENE MPs sandstone, shale, conglomerate, diatomite, lignite

OLIGOCENE AND MIOCENE OMev andesite, basalt, diorite OMs andesite, agglomerate, greywacke, shale, conglomerate OMvd andesite, diorite, basalt, tuff and breccia

PALEOCENE EOCENE OPe conglomerate, sandstone, shale, tuff, breccia

PALEOCENE EOCENE PEs conglomerate, sandstone, mudstone, lignite

UPPER CRETACEOUS AND LOWER TERTIARY KTOL OOTSA LAKE GROUP: rhyolite, dacite, trachyte, sandstone, shale, conglomerate

UPPER CRETACEOUS KTvr quartz monzonite, quartz diorite, diorite, granite, rhyolite, tuff, breccia

UPPER CRETACEOUS KTs SUSTUT GROUP: conglomerate, shale, greywacke, conglomerate, breccia, sandstone, shale, coal

CRETACEOUS LATE CRETACEOUS Ks conglomerate, greywacke, argillite

CRETACEOUS Ksv andesite, tuff, breccia, argillite, arkose, conglomerate

UPPER CRETACEOUS Kkw WAPITI GROUP: sandstone, shale, conglomerate, coal

UPPER CRETACEOUS Kks SMOXY GROUP: shale, sandstone

UPPER CRETACEOUS Kko DUVEGAN: sandstone, conglomerate, shale

LATE LOWER AND EARLY UPPER CRETACEOUS Kkb BRIAN BORU: andesitic to rhyolitic tuff, breccia, flows

LOWER CRETACEOUS Kke RED ROSE: shale, greywacke, conglomerate, coal

LOWER CRETACEOUS Kkf FORT ST. JOHN GROUP: shale, sandstone

LOWER CRETACEOUS Kkg HASLER, GOODRICH, CRUISER: shale, sandstone

UPPER JURASSIC AND LOWER CRETACEOUS Kjk BOWSER LAKE AND SKEENA GROUPS: undivided

JURASSIC Kjm MINNES: sandstone, shale, coal

JURASSIC Kjn FERNIE GROUP: shale, sandstone

MIDDLE AND UPPER JURASSIC Kks SMITHERS, ASHMAN: shale, greywacke, breccia, tuff, conglomerate

MIDDLE JURASSIC Kkh HAZELTON GROUP (part): undivided: basalt, andesite, tuff, breccia, greywacke, mudstone, conglomerate

LOWER AND MIDDLE JURASSIC Kjl quartz-biotite gneiss, diorite, gneiss, granodiorite, amphibolite, migmatite, chlorite schist

LOWER JURASSIC Kjm size, argillite, conglomerate

LOWER JURASSIC Kjn size, argillite, conglomerate

LOWER JURASSIC Kkq TELKWA, NIKITKWA: basalt, andesite, breccia, tuff, shale, siltstone

UPPER TRIASSIC AND LOWER JURASSIC Kkr TAILA GROUP: andesite, basalt, tuff, breccia, conglomerate, greywacke, shale, limestone

TRIASSIC Kks SPRAY RIVER: siltstone, sandstone, dolomite, limestone

UPPER TRIASSIC Klt limestone

UPPER TRIASSIC Klv black phyllite, siltstone, limestone, quartzite

QUATERNARY RECENT Rvb basalt flows, breccia, cinder cones

PLEISTOCENE AND RECENT Qs till, gravel, sand, silt, alluvium

TERTIARY AND QUATERNARY PLEISTOCENE AND PLEISTOCENE PPvb olive basalt, cinder cones, breccia

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UPPER CRETACEOUS AND LOWER TERTIARY KTOL OOTSA LAKE GROUP: rhyolite, dacite, trachyte, sandstone, shale, conglomerate

UPPER CRETACEOUS KTvr quartz monzonite, quartz diorite, diorite, granite, rhyolite, tuff, breccia

UPPER CRETACEOUS KTs SUSTUT GROUP: conglomerate, shale, greywacke, conglomerate, breccia, sandstone, shale, coal

CRETACEOUS LATE CRETACEOUS Ks conglomerate, greywacke, argillite

CRETACEOUS Ksv andesite, tuff, breccia, argillite, arkose, conglomerate

UPPER CRETACEOUS Kkw WAPITI GROUP: sandstone, shale, conglomerate, coal

UPPER CRETACEOUS Kks SMOXY GROUP: shale, sandstone

UPPER CRETACEOUS Kko DUVEGAN: sandstone, conglomerate, shale

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LOWER CRETACEOUS Kke RED ROSE: shale, greywacke, conglomerate, coal

LOWER CRETACEOUS Kkf FORT ST. JOHN GROUP: shale, sandstone

LOWER CRETACEOUS Kkg HASLER, GOODRICH, CRUISER: shale, sandstone

UPPER JURASSIC AND LOWER CRETACEOUS Kjk BOWSER LAKE AND SKEENA GROUPS: undivided

JURASSIC Kjm MINNES: sandstone, shale, coal

JURASSIC Kjn FERNIE GROUP: shale, sandstone

MIDDLE AND UPPER JURASSIC Kks SMITHERS, ASHMAN: shale, greywacke, breccia, tuff, conglomerate

MIDDLE JURASSIC Kkh HAZELTON GROUP (part): undivided: basalt, andesite, tuff, breccia, greywacke, mudstone, conglomerate

LOWER AND MIDDLE JURASSIC Kjl quartz-biotite gneiss, diorite, gneiss, granodiorite, amphibolite, migmatite, chlorite schist

LOWER JURASSIC Kjm size, argillite, conglomerate

LOWER JURASSIC Kjn size, argillite, conglomerate

LOWER JURASSIC Kkq TELKWA, NIKITKWA: basalt, andesite, breccia, tuff, shale, siltstone

UPPER TRIASSIC AND LOWER JURASSIC Kkr TAILA GROUP: andesite, basalt, tuff, breccia, conglomerate, greywacke, shale, limestone

TRIASSIC Kks SPRAY RIVER: siltstone, sandstone, dolomite, limestone

UPPER TRIASSIC Klt limestone

UPPER TRIASSIC Klv black phyllite, siltstone, limestone, quartzite

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CRETACEOUS Ksv andesite, tuff, breccia, argillite, arkose, conglomerate

UPPER CRETACEOUS Kkw WAPITI GROUP: sandstone, shale, conglomerate, coal

UPPER CRETACEOUS Kks SMOXY GROUP: shale, sandstone

UPPER CRETACEOUS Kko DUVEGAN: sandstone, conglomerate, shale

LATE LOWER AND EARLY UPPER CRETACEOUS Kkb BRIAN BORU: andesitic to rhyolitic tuff, breccia, flows

LOWER CRETACEOUS Kke RED ROSE: shale, greywacke, conglomerate, coal

LOWER CRETACEOUS Kkf FORT ST. JOHN GROUP: shale, sandstone

LOWER CRETACEOUS Kkg HASLER, GOODRICH, CRUISER: shale, sandstone

UPPER JURASSIC AND LOWER CRETACEOUS Kjk BOWSER LAKE AND SKEENA GROUPS: undivided

JURASSIC Kjm MINNES: sandstone, shale, coal

JURASSIC Kjn FERNIE GROUP: shale, sandstone

MIDDLE AND UPPER JURASSIC Kks SMITHERS, ASHMAN: shale, greywacke, breccia, tuff, conglomerate

MIDDLE JURASSIC Kkh HAZELTON GROUP (part): undivided: basalt, andesite, tuff, breccia, greywacke, mudstone, conglomerate

LOWER AND MIDDLE JURASSIC Kjl quartz-biotite gneiss, diorite, gneiss, granodiorite, amphibolite, migmatite, chlorite schist

LOWER JURASSIC Kjm size, argillite, conglomerate

LOWER JURASSIC Kjn size, argillite, conglomerate

LOWER JURASSIC Kkq TELKWA, NIKITKWA: basalt, andesite, breccia, tuff, shale, siltstone

UPPER TRIASSIC AND LOWER JURASSIC Kkr TAILA GROUP: andesite, basalt, tuff, breccia, conglomerate, greywacke, shale, limestone

TRIASSIC Kks SPRAY RIVER: siltstone, sandstone, dolomite, limestone

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UPPER CRETACEOUS Kks SMOXY GROUP: shale, sandstone

UPPER CRETACEOUS Kko DUVEGAN: sandstone, conglomerate, shale

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LOWER CRETACEOUS Kkf FORT ST. JOHN GROUP: shale, sandstone

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MIDDLE AND UPPER JURASSIC Kks SMITHERS, ASHMAN: shale, greywacke, breccia, tuff, conglomerate

MIDDLE JURASSIC Kkh HAZELTON GROUP (part): undivided: basalt, andesite, tuff, breccia, greywacke, mudstone, conglomerate

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LOWER CRETACEOUS Kkg HASLER, GOODRICH, CRUISER: shale, sandstone

UPPER JURASSIC AND LOWER CRETACEOUS Kjk BOWSER LAKE AND SKEENA GROUPS: undivided

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JURASSIC Kjn FERNIE GROUP: shale, sandstone

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