Explanatory Notes

Our field observations vary greatly in density across the map, and interpretation of geological elements beneath cover and areas of difficult access is greatly aided by aeromagnetic data (Fig. 1). Other pertinent information about the map area, including descriptive notes about the geology and references, are included in the Map Information Document in the downloadable data package that accompanies this map.

The Klaza River area is underlain by rocks that form broad upland ridges that are dominated by extensive frost-shattered felsenmeer. Bedrock geology of the Klaza River area consists primarily of a central domain of metamorphosed and poly-deformed Paleozoic Yukon-Tanana terrane (YTT) basement, intruded and overlapped by relatively little-deformed Mesozoic and Cenozoic successions. The central domain of YTT rocks mainly comprises the pre-Late Devonian Snowcap assemblage, which is characterized by amphibolite-facies quartzite, micaceous quartzite, and psammitic quartz-muscovite-biotite (±garnet) schist, large domains of amphibolite, and rare lenses of marble. The north- and south areas of the map are dominated by large batholithic intrusions of the mid-Cretaceous Whitehorse plutonic suite, represented by the Dawson Range–phase granodiorite in the north and the Mahoney Creek–phase monzogranite to granodiorite in the south. Mesozoic to Cenozoic volcanic successions in the map area include the mid-Cretaceous Mount Nansen Group, the Late Cretaceous Carmacks Group, and the Paleocene Rhyolite Creek Complex. The main mineral occurrences in the Klaza River and surrounding area are porphyry to epithermal style that are concentrated around Mount Nansen, located just to the east of the map area, and appear to be most strongly linked to the late Cretaceous Casino suite magmatism.

Acknowledgments

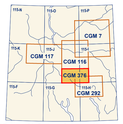
We thank M. Friend, M. Coleman, and Y. Morneau for contributing to the bedrock mapping in the Klaza River area. Geochronological support was provided by N. Joyce (GSC-Ottawa) and B. McClelland (University of Iowa). We thank Rockhaven Resources and Archer Cathro for accommodation at the Klaza camp, allowing its use as our field base camp, and for logistical assistance. We thank Capital Helicopters (1995) Inc. and pilot M. Lagnerson for excellent flight services in the Klaza River area. We thank A. Okulitch for a thoughtful review of the map.

Abstract

The Klaza River area is underlain dominantly by Paleozoic rocks of Yukon Tanana terrane, and mid-Cretaceous to Paleogene rocks. The geology of the central map area is dominated by metasedimentary rocks and lesser amphibolite layers of the pre-Late Devonian Snowcap assemblage, with Stevenson Ridge schist to the west. Permian Sulphur Creek suite forms sparse intrusions of K-feldspar augen- and non-porphyritic granite. The eastern map area is underlain by the mid-Cretaceous Dawson Range batholith and Mount Nansen Group volcanic rocks, which are overlain by upper Cretaceous Carmacks Group volcanic rocks. Mid-Cretaceous Mahoney Creek batholith dominates the southeast part of the map area. Late Cretaceous Casino suite hypabyssal rocks occur sparsely to the east, and have known porphyry and epithermal mineral potential (e.g. Klaza deposit). Paleogene volcanic and hypabyssal rocks are scattered across the map, predominantly in the west.

Résumé

La région cartographique de Klaza River renferme surtout des roches paléozoïques du terrane de Yukon-Tanana, ainsi que des roches s'échelonnant du Crétacé moyen au Paléogène. La géologie de la partie centrale est caractérisée par la présence prépondérante de roches métasédimentaires. On y trouve aussi, en moindres quantités, des couches d'amphibolite de l'assemblage de Snowcap (pré-Dévonien tardif) et, à l'ouest, du schiste de la formation de Stevenson Ridge. La suite de Sulphur Creek du Permien se manifeste par des intrusions clairsemées de granite oeillé à feldspath potassique et de granite non porphyrique. La géologie de la partie nord est dominée par le batholithe de Dawson Range et les roches volcaniques du Groupe de Mount Nansen du Crétacé moyen, lesquelles sont surmontées par les roches volcaniques du Groupe de Carmacks du Crétacé supérieur. Le batholithe de Mahoney Creek du Crétacé moyen constitue l'unité dominante de la partie sud-est de la région cartographique. Les roches de la suite Casino du Crétacé tardif sont présentes de manière éparse à l'est et recèlent un potentiel en minéralisations porphyriques et épithermales (p. ex. gisement de Klaza). Des roches volcaniques et hypabyssales du Paléogène sont présentes un peu partout dans la carte, mais sont plus fréquentes dans le secteur ouest.



National Topographic System reference and index to adjoining published Geological Survey of Canada maps

Catalogue No. M183-1/376-2018E-PDF
ISBN 978-0-660-26967-2
https://doi.org/10.4095/311301

Natural Resources Canada | Ressources naturelles Canada

CANADIAN GEOSCIENCE MAP 376

BEDROCK GEOLOGY

KLAZA RIVER AREA

Yukon

1:100 000

Table 1. Data from Yukon MINFILE database of mineral occurrences (Yukon Geological Survey, 2018).

MINERAL OCCURRENCES

Number	Name	Type	Status	Commodity
115I 009	Schist	Ultramafic Mafic Gabbroid Cu-Ni-PGE	Anomaly	Ash, Ni, Cu
115I 070	Maloney	Porphyry Cu-Mo-Au	Drilled Prospect	Cu, W, Ag, Mo, Au
115I 071	Chart	Unknown	Anomaly	Cu
115J 001	Bract	Unknown	Unknown	
115J 002	Klot	Porphyry Cu-Mo-Au	Showing	Cu, Ur, Mo
115J 003	Mim	Porphyry Cu-Mo-Au	Prospect	Cu, Au
115J 100	Shadow	Porphyry-related Au	Anomaly	Au
115J 102	Nowhere	Vein Au-Quartz	Showing	Au, Ag

PALEOGENE

Rhyolite Creek complex (PrlC2–PrlC1)

PrlC1 — Felsic rocks; tan to cream, rhyolite to rhyodacite dykes, flows, and breccia; and ash tuff; smoky quartz±feldspar porphyritic; locally flow-banded.

PrlC2 — Dyke complex dominated by rhyolite.

Ruby Range suite: light grey to pinkish, fine- to medium-grained, unfoliated biotite±hornblende granodiorite; with distinctive smoky grey quartz; correlative with Rhyolite Creek, has a distinct hypabyssal appearance in this area.

Prl — Ruby Range suite: light grey to pinkish, fine- to medium-grained, unfoliated biotite±hornblende granodiorite; with distinctive smoky grey quartz; correlative with Rhyolite Creek, has a distinct hypabyssal appearance in this area.

CRETACEOUS

UPPER CRETACEOUS

Carmacks Group: dark green to dun, basalt, basaltic andesite, tuffy-andesite, and andesite flows, sills, and tuff; breccia; clinopyroxene-, orthopyroxene-, olivine- and/or clinopyroxene-porphyritic; fairly characteristic of the upper Carmacks Group.

uKC — Carmacks Group: dark green to dun, basalt, basaltic andesite, tuffy-andesite, and andesite flows, sills, and tuff; breccia; clinopyroxene-, orthopyroxene-, olivine- and/or clinopyroxene-porphyritic; fairly characteristic of the upper Carmacks Group.

LATE CRETACEOUS

Casino suite: porphyry, dominantly dacite to quartz monzonite to rhyodacite, with lesser rhyolite; fine- to medium-grained; alkali feldspar-, plagioclase-, biotite-, and quartz-porphyritic; more hypabyssal than volcanic in character.

lKC — Casino suite: porphyry, dominantly dacite to quartz monzonite to rhyodacite, with lesser rhyolite; fine- to medium-grained; alkali feldspar-, plagioclase-, biotite-, and quartz-porphyritic; more hypabyssal than volcanic in character.

MIDDLE CRETACEOUS

Mount Nansen Group: massive aphyric and feldspar-phyric andesite to dacite breccias, flows, and tuff; massive heterolithic quartz- and feldspar-phyric felsic lapilli tuff; flow banded feldspar-phyric rhyolite.

mKN — Mount Nansen Group: massive aphyric and feldspar-phyric andesite to dacite breccias, flows, and tuff; massive heterolithic quartz- and feldspar-phyric felsic lapilli tuff; flow banded feldspar-phyric rhyolite.

Whitehorse suite (mKW3–mKW1)

Maloney Creek phase: grey to beige, biotite-hornblende monzogranite to granodiorite; medium- to coarse-grained, characteristically smoky quartz–bearing; locally can be confused with Ruby Range granodiorite (Prl).

mKW1 — Maloney Creek phase: grey to beige, biotite-hornblende monzogranite to granodiorite; medium- to coarse-grained, characteristically smoky quartz–bearing; locally can be confused with Ruby Range granodiorite (Prl).

Dawson Range phase: white to beige, hornblende-biotite granodiorite, lesser granite, tonalite, quartz diorite, and diorite; blocky hornblende-phyric; medium- to coarse-grained; unfoliated to weakly foliated.

mKW2 — Dawson Range phase: white to beige, hornblende-biotite granodiorite, lesser granite, tonalite, quartz diorite, and diorite; blocky hornblende-phyric; medium- to coarse-grained; unfoliated to weakly foliated.

mKW3 — Gabbro to anorthositic gabbro; hornblende after pyroxene; undeformed to very weakly deformed.

JURASSIC

EARLY JURASSIC

Long Lake suite: white to beige, hornblende-biotite granodiorite, monzogranite, quartz monzonite, and quartz monzodiorite; commonly very pink on the weathered surface; generally massive to weakly foliated; notably less foliated than unit ŁSt; late-phase granitic pegmatite and aplitic dikes are prominent in the plutons and in the country rocks.

EJL — Long Lake suite: white to beige, hornblende-biotite granodiorite, monzogranite, quartz monzonite, and quartz monzodiorite; commonly very pink on the weathered surface; generally massive to weakly foliated; notably less foliated than unit ŁSt; late-phase granitic pegmatite and aplitic dikes are prominent in the plutons and in the country rocks.

TRIASSIC

LATE TRIASSIC

Stikine suite: white to beige, hornblende-biotite granodiorite, diorite, and quartz monzodiorite; weakly to moderately foliated; commonly alkali-feldspar porphyritic.

ŁSt — Stikine suite: white to beige, hornblende-biotite granodiorite, diorite, and quartz monzodiorite; weakly to moderately foliated; commonly alkali-feldspar porphyritic.

Gabbro and diabase; brown to dark green; greenschist to amphibolite facies; undeformed to strongly foliated; similar in appearance to the Snag Creek suite of Ryan et al. (2013a).

ŁSg — Gabbro and diabase; brown to dark green; greenschist to amphibolite facies; undeformed to strongly foliated; similar in appearance to the Snag Creek suite of Ryan et al. (2013a).

MESOZOIC–CENOZOIC ROCKS

STRYKHNA QUESNELIA

PERMIAN

MIDDLE PERMIAN

Schist Creek mafic-ultramafic complex (PlSc₂–PlSc₁)

PlSc1 — Gabbro to metagabbro; weakly metamorphosed plagioclase porphyritic gabbro to gabbronorite; spatially associated with unit PlSc₂.

PlSc2 — Undivided ultramafic rocks; harzburgite, dunite, orthopyroxenite, serpentinite, talc-tremolite schist, and hybaenite; variably serpentinized, silicified, or carbonatized; occur as 10 to 100 m wide tectonic slivers.

Sulphur Creek suite (Ps2–Ps1)

Ps1 — Grey to pink, monzogranite, syenogranite, and granodiorite; alkali feldspar and quartz porphyritic; moderately foliated to gneissic; porphyroblastic augen monzogranite.

Ps2 — Monzogranite to syenogranite; non-porphyritic; mildly to strongly foliated.

DEVONIAN AND MISSISSIPPIAN

UPPER DEVONIAN AND LOWER MISSISSIPPIAN

Stevenson Ridge schist (MStrS2–MStrS1)

MStrS1 — Quartz-mica schist and phyllite; strongly laminated; strongly foliated and complexly folded.

MStrS2 — Black to grey, quartzite to psammite.

PALEOZOIC AND DEVONIAN

LOWER PALEOZOIC AND UPPER DEVONIAN

Snowcap assemblage (PDs3–PDs1)

PDs1 — Grey to white quartzite, micaceous quartzite and psammitic quartz-muscovite-biotite (±garnet) schist; strongly foliated; highly layered, generally exhibits recognizable transposed bedding; minor metaconglomerate. Locally forms a quartzofeldspathic gneiss difficult to distinguish from metagranitoid.

PDs2 — Light grey to white marble; interlayered with siliciclastic rocks; locally calc-silicate schist; the extent of small marble bodies is slightly exaggerated.

PDs3 — Amphibolite; strongly granoblastic, equigranular, and foliated; probably metamorphosed gabbroic to diabasic sills rather than metavolcanic in origin.

MAFIC–ULTRAMAFIC COMPLEXES

YUKON TANANA TERRANE

Geological contact:
Defined
Approximate
Inferred

Fault, offset uncertain:
Approximate
Inferred

Bedding

Flow and compositional layering

Dyke and sill

Joint and fracture

Fault plane, normal

Axial plane:
Transpositional
Crenulation
Minor Z fold

Cleavage, crenulation

Schistosity and foliation

Gneissosity

Foliation:
Mylonitic
Transposed bedding

Fold axis:
General
Minor Z

Crenulation

Lineation:
Intersection
Mineral
Stretching

Visited location

115J 001 — Mineral occurrence (see Table 1)

Geochronology (Ma):
U/Pb
U/Pb detrital zircon
Ar/Ar

Note:
For point structure features (planar and linear), the dip and plunge value (±) is closest to the symbol, followed by the structural generation in Roman numerals (*I*).

Some structural measurements have been moved from their actual location for visual clarity.

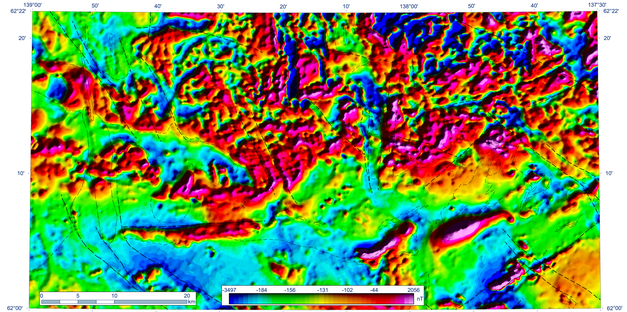


Figure 1. Total field aeromagnetic data of the Klaza River area. The geology contacts and structures from the current map are overlain in black to demonstrate how well some of the structures are imaged in this data.

Recommended citation
Ryan, J.J., Israel, S., Williams, S.P., Parsons, A.J., and Hayward, N., 2018. Bedrock geology, Klaza River area, Yukon; Geological Survey of Canada, Canadian Geoscience Map 376, scale 1:100 000. https://doi.org/10.4095/311301

Geological Survey of Canada
Canadian Geoscience Maps

Canada

Authors: J.J. Ryan, S. Israel, S.P. Williams, A.J. Parsons, and N. Hayward

Geology by J.J. Ryan, A.J. Parsons, and Y. Morneau; Geological Survey of Canada; S. Israel and M. Friend, Yukon Geological Survey, 2016

Geological compilation by J.J. Ryan and S. Israel, 2017

Geology conforms to Bedrock Data Model v. 2.9

Geomatics and cartography by S.P. Williams and J.J. Ryan

Scientific editing by A.Weatherston

Initiative of the Geological Survey of Canada, conducted under the auspices of the Cordilleran Project as part of Natural Resources Canada's Geo-mapping for Energy and Minerals (GEM) program, with support from the Yukon Geological Survey

Map projection Universal Transverse Mercator, zone 7 North American Datum 1983

Base map at the scale of 1:50 000 from Natural Resources Canada, with modifications
Elevations in metres above mean sea level

Mean magnetic declination 2018, 19°27'E, decreasing 22.5' annually
Readings vary from 19°37'E in the NE corner to 19°16'E in the SW corner of the map.

This map is not to be used for navigational purposes.

Title photograph: Sparsely vegetated landscape on the north side of the Schist Creek complex in the southeast part of the Klaza River area, Yukon, looking northeast. Photograph by J.J. Ryan, 2018-021

The Geological Survey of Canada welcomes corrections or additional information from users.

Data may include additional observations not portrayed on this map. See map info document accompanying the downloaded data for more information about this publication.

This publication is available for free download through GEOSCAN (https://geoscan.nrcan.gc.ca).

CANADIAN GEOSCIENCE MAP 376
BEDROCK GEOLOGY
KLAZA RIVER AREA
Yukon