LEGEND

Geology, Laberge (105E) and Carmacks (115I), Yukon Territory

by

D.J. Tempelman-Kluit

AUTOCHTHONOUS ROCKS
OMINECA CRYSTALLINE BELT

MID CRETACEOUS

Kqm — Moderately resistant, light grey weathering, biotite granite; medium- to coarse- grained equigranular; generally lacks xenoliths but locally includes large screens of metamorphic rocks. Laberge map area.

SILURIAN AND DEVONIAN
ASKIN GROUP
Hogg Formation

SD_H — Resistant, medium grey to buff weathering, medium to thick bedded dolomite, sandy dolomite and dolomitic sandstone; gradational to OD_N. Laberge map area.

ORDOVICIAN TO DEVONIAN
Nasina Formation

OD_N — Recessive, dark grey to black, "sooty" limey or dolomitic, thin bedded to platy graphitic siltstone and fine grained impure quartzite with interbedded graphitic silty shale; gradational to SD_H and to other units of the Askin Group. Laberge map area.

CAMBRIAN TO SILURIAN
KECHIKA GROUP

OS_K — Recessive grey chlorite-muscovite-quartz phyllite and calcareous phyllite with lenses of "greenstone". Laberge map area.

PROTEROZOIC AND LOWER CAMBRIAN
KETZA GROUP

lC_K — White weathering, resistant marble; recrystallized lime mudstone and bioclastic limestone. Laberge map area.

PlCs — Buff weathering muscovite-biotite schist; garnet-mica-quartz schist and micaceous quartzite with minor amphibolite; minor marble; stratigraphically equivalent to, and gradational with Pns and Pn. Laberge map area.

Pn — Buff weathering, black lichen-covered, resistant, muscovite-biotite granodiorite gneiss and augen gneiss, gradational to Pns and PlCs. Laberge map area.

Pns — Buff weathering, muscovite-biotite granodiorite gneiss with abundant interfoliated muscovite-biotite quartz schist; gradational to PlCs and Pn. Laberge map area.

ALLOCHTHONOUS ROCKS
TESLIN SUTURE ZONE AND YUKON CATACLASTIC TERRANE

PALEOZOIC OR MESOZOIC?
SIMPSON ALLOCHTHONOUS ASSEMBLAGE
?PERMIAN?
"SELWYN GNEISS"

P_{pn} Resistant, dark grey weathering, strongly foliated, medium grained, homogeneous hornblende-biotite- chlorite gneiss. Carmacks map area.

P_{pn1} Resistant, light grey weathering, strongly foliated medium grained, homogeneous biotite granite gneiss to biotite granodiorite gneiss; gradational to, and interfoliated with, P_{pn}. Carmacks map area.

CARBONIFEROUS AND/OR PERMIAN?
ANVIL ALLOCHTHONOUS ASSEMBLAGE

CP_{Av} Resistant, dark grey weathering, dark green, fine grained amphibolite and amphibolitic greenstone; minor sheared and altered gabbro; strong flaser fabric. Carmacks map area and Laberge map area.

CP_{Au} Resistant, dun brown weathering, partly or wholly serpentinized dunite, peridote and pyroxenite. Laberge map area.

CP_{Ag} Resistant, dark grey weathering, massive, melanocratic, dioritic to quartz dioritic augen amphibole gneiss; gradational to CP_{Av}. Laberge map area.

PALEOZOIC OR MESOZOIC
NISUTLIN ALLOCHTHONOUS ASSEMBLAGE

PM_N Light buff weathering, pale green, strongly foliated, flaggy, muscovite-quartz mylonite and blastomylonite, muscovite-quartz schist and muscovite quartzite; minor sheared quartz feldspar granule grit; includes chlorite schist and sheared volcaniclastic andesite; may include CP_{Av} undifferentiated. Laberge map area and Carmacks map area.

PM_{Nc} Resistant, light grey weathering flaser marble; age and relations unknown. Laberge map area and Carmacks map area.

JURASSIC OR OLDER
TATLMAIN BATHOLITH

TRJ_g Recessive weathering, homogeneous, coarse grained, equigranular to porphyritic, unfoliated, leucocratic biotite granite to granodiorite. Carmacks map area.

JURASSIC
TATCHUN AND LOKKEN BATHOLITHS

J_{gd} Recessive weathering, coarse grained, locally porphyritic, mesocratic, foliated biotite hornblende granodiorite to gneissic granodiorite; resembles TR_{gdm} of Minto and Granite Mountain Batholiths. Laberge map area and Carmacks map area.

UPPER TRIASSIC
MINTO PLUTON AND GRANITE MOUNTAIN BATHOLITH

TR_{gdm} Massive, medium- to coarse- grained, heterogeneous, equigranular, mesocratic, foliated biotite-hornblende granodiorite; locally strongly foliated (Tr_{gdm1}); locally contains biotite rich screens and gneiss schlieren and screens, probably P_{pn}; locally porphyritic with pink K-feldspar phenocrysts (TR_{gdm2}). Carmacks map area.

SEMENOF HILLS BLOCK

UPPER CRETACEOUS
Open Creek Volcanics

uK_O Reddish, white, green and bluish dacite flows and flow breccia; brown basalt flows on Solitary Mountain. Laberge map area.

PLIOCENE
Walsh Creek Formation

pT_W Resistant, thick bedded to massive, well-indurated conglomerate with minor interbedded sandstone. Laberge map area.
pT_{W1}- Recessive, white claystone to mudstone with interbedded gritty sandstone and minor coal.
pT_{Wv}- Resistant, white weathering, massive rhyolite.

MIDDLE TRIASSIC
Headless Plug

TRgd Massive, fresh , medium grained, equigranular, unsheared and unfoliated, hornblende-quartz diorite; few xenoliths and partly digested dark schlieren. Laberge map area.

LOWER AND MIDDLE PENNSYLVANIAN
Semenof Formation

P_S Resistant, massive, dark green, altered basalt, volcanic breccia, tuff and greenstone; includes minor undifferentiated P_B; includes undifferentiated P_{Bg}. Laberge map area.

Boswell Formation

P_{Bs} Recessive, dark weathering, slate, phyllite, greywacke, chert, chert conglomerate and breccia, volcanic breccia, greenstone and limestone. Laberge map area.

P_{Bc} White weathering, massive to thick bedded, resistant, grey, micritic limestone. Laberge map area.

P_{Bv} Resistant, massive, dark green, altered basalt, volcanic breccia and greenstone; distinguished from P_S by stratigraphic context. Laberge map area.

P_{Bg} Massive, dark weathering, coarse to medium grained, hornblendite-gabbro. Laberge map area.

WHITEHORSE TROUGH

UPPER JURASSIC AND/OR CRETACEOUS
Tantalus Formation

JK_T Thickbedded, resistant, chert-pebble conglomerate, minor interbedded gritty chert-grain sandstone: JK_{T_1}- Massive to thickbedded, gritty sandstone with quartz, chert and feldspar grains: JK_{T_V}- Red weathering, dacite to andesite flows beneath Tantalus strata near Hootalinqua. Laberge map area and Carmacks map area.

MIDDLE JURASSIC (BAJOCIAN TO BATHONIAN)
Teslin Crossing Stock and Dykes

Jpp Medium to fine grained, equigranular, leucocratic monzonite, syenite and granite (Teslin Crossing Stock); dykes of dacite to andesite porphyry with euhedral andesine, hornblende and locally quartz in aphanitic greenish, or grey groundmass. Laberge map area.

LOWER AND MIDDLE JURASSIC
LABERGE GROUP

J_L Undifferentiated Laberge and Lewes River Group shale, greywacke and conglomerate between Open Creek and Teslin River; J_{Lcg}- conglomerate, like that of the Conglomerate Formation, but with some chert clasts; TR_H?- limestone, probably part of the Lewes River Group. Laberge map area.

TOARCIAN AND BAJOCIAN
Tanglefoot Formation

J_T Moderately resistant, pale yellow to buff weathering, thick to medium bedded gritty, coarse grained arkose and feldspathic sandstone; interbedded granite-pebble conglomerate; interbedded brown shale. Carmacks map area and Laberge map area.

SINEMURIAN TO TOARCIAN
Nordenskiold Dacite

J_N Resistant, reddish brown weathering, massive, medium blue grey, mauve, green or reddish dacite, dacite tuff and breccia with fresh plagioclase, hornblende and biotite; interbedded conglomerate. Laberge map area.

J_{N1} Resistant, reddish brown weathering, massive, khaki-green dacite tuff with fresh plagioclase, hornblende and biotite; grades locally to pale green, punky weathering, salt and pepper textured, massive sandstone, the weathered equivalent; interbedded conglomerate and shale. Laberge map area and Carmacks map area.

SINEMURIAN TO TOARCIAN
Conglomerate Formation

J_C Resistant, massive to very thick bedded, red brown weathering, well-indurated, matrix- and clast-supported, boulder, cobble and pebble conglomerate; clasts of andesite-basalt, subvolcanic dacite porphyry and granodiorite; minor interbedded greywacke and shale. Laberge map area and Carmacks map area.

HETTANGIAN TO PLIENSBACHIAN
Richthofen Formation

J_R Recessive, dark brown weathering, thin bedded, dark brown to greenish, silty shale; minor interbedded conglomerate; gradational to, and interbedded with, massive dacite (J_{N1}). Laberge map area and Carmacks map area.

UPPER TRIASSIC TO JURASSIC
LEWES RIVER GROUP
KARNIAN TO SINEMURIAN
Aksala Formation
Mandanna Member (Norian to Sinemurian)

TR_M Red weathering, moderately resistant, medium bedded, green and red greywacke and pebble conglomerate; red shale partings, minor interbedded red shale and siltstone. Laberge map area.

Casca Member (Carnian to Norian)

TR_C Recessive, brown and rusty weathering, brown shale and greenish, calcareous greywacke and sandstone; interbedded bioclastic limestone and argillaceous limestone; minor conglomerate and agglomerate. Laberge map area.

Hancock Member (Carnian to Norian)

TR_H Resistant, white weathering, massive limestone and thick bedded limestone; minor thin bedded argillaceous limestone. Laberge map area and Carmacks map area.

CARNIAN (AND OLDER?)
Povoas Formation

TR_P Massive, resistant, dark weathering, dark green andestic basalt, volcanic breccia, tuff and agglomerate; minor augite porphyry and massive flow rocks. Laberge map area.
TR_{P_1}- massive, resistant, dark green, volcanic breccia, tuff, agglomerate and augite porphyry in Tatchun Belt; includes TR_{P_m}- chlorite-amphibole schist, the sheared and metamorphosed equivalents in Carmacks map area.
TR_{P_2}- massive, red weathering, dacitic volcanic breccia and tuff; includes minor limestone; resembles Nordenskiold Dacite. Carmacks map area and Laberge map area.

YUKON CRYSTALLINE TERRANE

PLEISTOCENE AND RECENT
Selkirk Volcanics

Q_S Resistant, brown weathering, columnar jointed, vesicular to massive basalt flows; minor pillow basalt; Q_{S_1}- basaltic tuff and breccia at Volcano Mountain and opposite the mouth of Wolverine Creek; Q_{S_a}-oldest to youngest-Q_{S_d} lava flows from Selkirk volcano. Carmacks map area.

UPPER CRETACEOUS
CARMACKS GROUP

uK_{Cb} Brown weathering, resistant, brown basalt flows. Carmacks map area.

uK_{Ct} On Prospector Mountain, green, recessive, medium bedded, sandy tuff with interbedded andesitic basalt flows in the top, minor red tuff; north of Big Creek, andesitic basalt flows with minor tuff; includes granite boulder conglomerate west of Minto. Carmacks map area.

uK_{Ct1} Moderately resistant, light weathering, thick bedded, immature volcanic sandstone and conglomerate; minor volcanic flows and dacitic ash flow tuff. Carmacks map area.

uK_{Cy} Resistant, homogeneous, massive, pale mauve, medium grained, equigranular, hornblende syenite to granite commonly with crowded porphyry texture; forms a laccolith on Prospector Mountain and a plug on Mount Pitts. Carmacks map area.

uK_{Cr} Pink to white flow banded rhyolite to dacite and felsic breccia, forms small plugs or domes near Braeburn; includes pink welded felsic tuff under uK_{Ca} north of Victoria Mountain. Carmacks map area.

uk_{Cg} Coarsely crystalline gabbro and diorite; forms a small plug in the Carmacks Group east of Victoria Mountain. Carmacks map area.

uk_{Ca} Lower part: thick, green, hornblende feldspar porphyry andesite flows with interbedded greywacke and breccia; Upper part: brownish purple, thick, vesicular, porphyritic augite andesite and trachyte, minor sandy airfall tuff. Laberge map area.

uK_{Ca1} Resistant, dark grey to black weathering, thick feldspar porphyry andesite flows. Laberge map area.

uK_{Cy1} Resistant, dark weathering, massive, homogeneous, coarse grained porphyritic hornblende syenite; a small plug. Laberge map area.

uK_{Cp} Resistant, homogeneous, fine grained, biotite hornblende granodiorite to quartz diorite; small plugs in the Laberge Group east of the Miners Range. Laberge map area.

MID-CRETACEOUS

MOUNT NANSEN GROUP

K_{MN} Resistant, dark weathering, dark green, massive andesitic plagioclase porphyry and andesite breccia: forms plugs, pipes and dykes. Carmacks map area.

K_{MNb} Resistant, dark weathering, massive, dark green andesite breccia of pipes and plugs; minor porphyry. Carmacks map area.

K_{MNr} Orange weathering, rhyolite to dacite quartz feldspar porphyry; forms innumerable dykes and small plugs; includes K_{gd}, J_y, P_n, K_{MN} undifferentiated. Carmacks map area.

K_{MN1} (Packers Mountain)- Recessive, rusty weathering, aphanitic, flow banded dacite and rhyolite; minor porphyritic dacite. Laberge map area.

K_{MN2} (Teslin Mountain)- Resistant, dark green, massive andesite, greenstone and volcanic breccia. Laberge map area.

K_{gdp} Homogeneous, massive, fine grained, pale mauve porphyritic hornblende biotite granodiorite to syenite; subvolcanic to Mount Nansen Group on Teslin Mountain; gradational to K_{gd}. Laberge map area.

CASINO GRANODIORITE

K_{gd} Resistant, massive, dark weathering, medium grained, equigranular, unfoliated, mesocratic biotite-hornblende granodiorite: plutonic phase of Mount Nansen Group. Carmacks map area.

COFFEE CREEK GRANITE

K_g Recessive, rusty weathering, strongly altered, decomposed, coarse grained, equigranular, unfoliated, porphyritic biotite leucogranite; coeval with K_{gd}. Carmacks map area.

K_y Resistant, massive, fine grained, mauve hornblende syenite, grades to granite or granodiorite; subvolcanic to Mount Nansen Group on Victoria Mountain. Carmacks map area.

JURASSIC

BIG CREEK SYENITE

J_y Resistant, dark weathering, massive, coarse- to very coarse- grained and porphyritic, mesocratic hornblende syenite; locally sheared, commonly fractured and saussuritized; locally has well developed layering of aligned pink K-feldspar tablets; contains screens of undifferentiated gneiss. Carmacks map area.

CARMACKS BATHOLITH

Jg — Recessive, light weathering, porphyritic (pink K-feldspars), coarse grained, unfoliated biotite leucogranite. Carmacks map area.

PALEOZOIC?-?DEVONIAN?
?PELLY GNEISS?

P_n — Moderately resistant, pale buff weathering, medium- to light- grey, muscovite biotite granite to granodiorite gneiss. Carmacks map area.

P_g — Moderately resistant, light weathering, foliated biotite leucogranite; gradational to P_n. Carmacks map area.

P_{n1} — Recessive weathering, mesocratic, biotite or hornblende granodiorite gneiss: the equivalent of P_n or P_{pn}. Carmacks map area.

P_s — Resistant, brownish grey weathering, coarsely schistose quartz mica schist and micaceous quartzite; minor amphibolite. Carmacks map area.

P_c — Resistant, white weathering, white sugary marble with a ductile flow fabric. Carmacks map area.

P_m — Resistant, black weathering amphibolite, amphibolitic gneiss and biotite-amphibole granodiorite gneiss; includes undifferentiated quartz-mica schist; may include minor serpentinite. Carmacks map area.

P_u — Dun brown weathering, green to black serpentinite, and serpentinized peridotite and pyroxenite. Carmacks map area.

SYMBOLS

Limit of outcrop.....
Geological boundary (defined, approximate, assumed).....

Fault, existence assumed (position approximate, assumed)...
Fault with normal movement (circle on downthrown side.....
Fault with lateral displacement (arrows indicate sense)....
Thrust or steep reverse fault (teeth down dip).....

Anticline or antiform.....
Syncline or synform.....

Bedding orientation (inclined, vertical, horizontal)..... 30
Foliation orientation (inclined , vertical, horizontal).... 30
Rodding, crinkle or mineral lineation..... 30
Joints (incline, vertical)..... 70

Fossil locality (refers to unpublished fossil list)..... •72
Age determination sample locality..... •87±2.5
K/Ar date on biotite-b, hornblende-h and rock-w in Ma..... •W112
U/Pb date on zircon in Ma..... •zr192
Locality where limestone weathers bright red..... Ⓚ

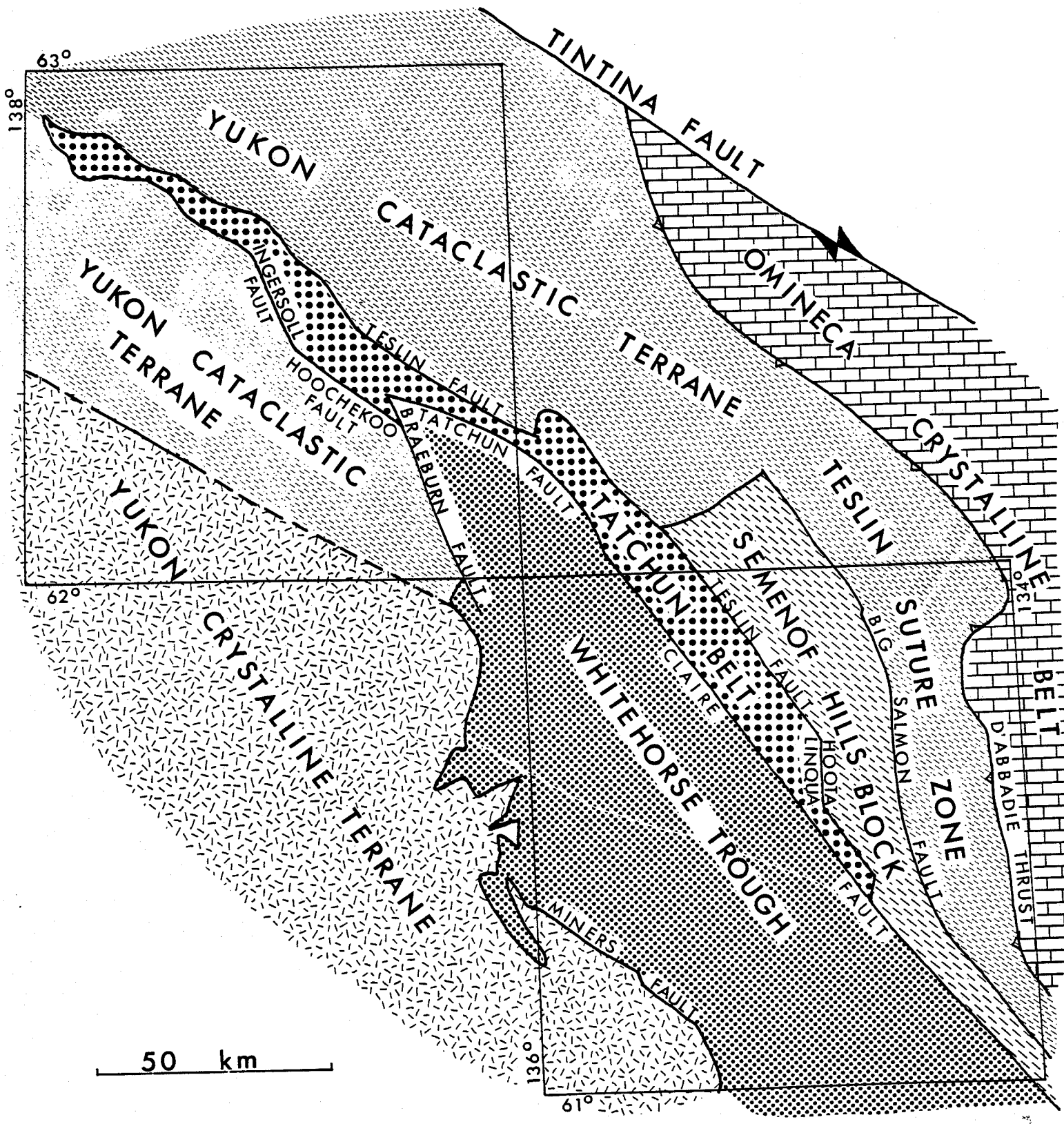
Geology from fieldwork during 1974, 1977, 1979 and 1982 and from earlier mapping of Bostock (1936) and Bostock and Lees (1938). This compilation supersedes earlier Open File maps 200 and 578 for Carmacks and Laberge map areas respectively. For mineral occurrence locations the reader is referred to the annual reports of DIAND's Geology Section, which detail this information with references to the most recent descriptions.

REFERENCES

Bostock, H.S. (1936): Carmacks District, Yukon; Geol. Surv. Can. Memoir 189 (includes Map 340 A)

Bostock, H.S. and Lees, E.J (1938): Laberge map area, Yukon; Geol. Surv. Can. Memoir 217 (includes Map 372 A)

Geology by D.Tempelman-Kluit, 1984.


63°
138°
62°
61°
136°
134°
TINTINA FAULT
YUKON CATACLASTIC TERRANE
OMINECA CRYSTALLINE BELT
TESLIN SUTURE ZONE
INGERSOLL FAULT
HOOCHEKOO FAULT
TESLIN FAULT
TATCHUN FAULT
BRAEBURN FAULT
YUKON CATACLASTIC TERRANE
YUKON CRYSTALLINE TERRANE
TATCHUN BELT
SEMENOF HILLS BLOCK
WHITEHORSE TROUGH
CLAIRE
TESLIN FAULT
LINQUA FAULT
HOOTA
BIG SALMON FAULT
D'ABBADIE THRUST
MINERS FAULT
50 km