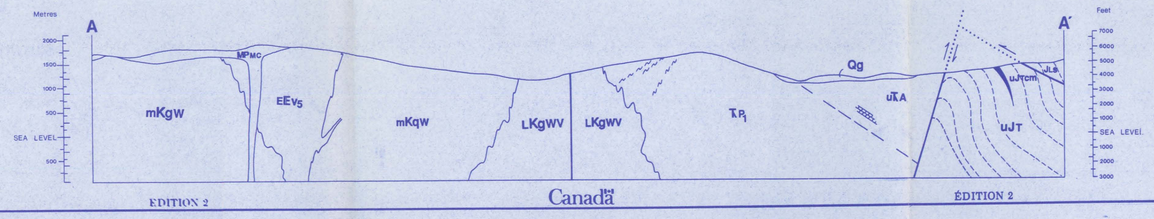
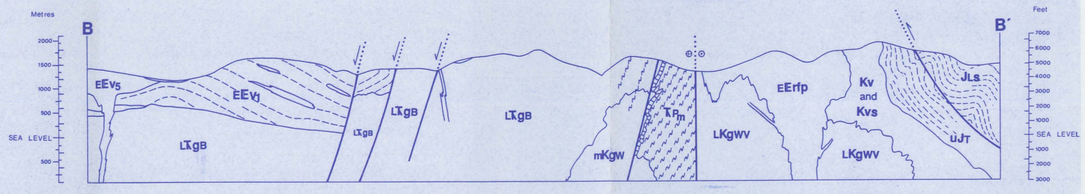
Canada

canada/yukon economic development agreement

Yukon





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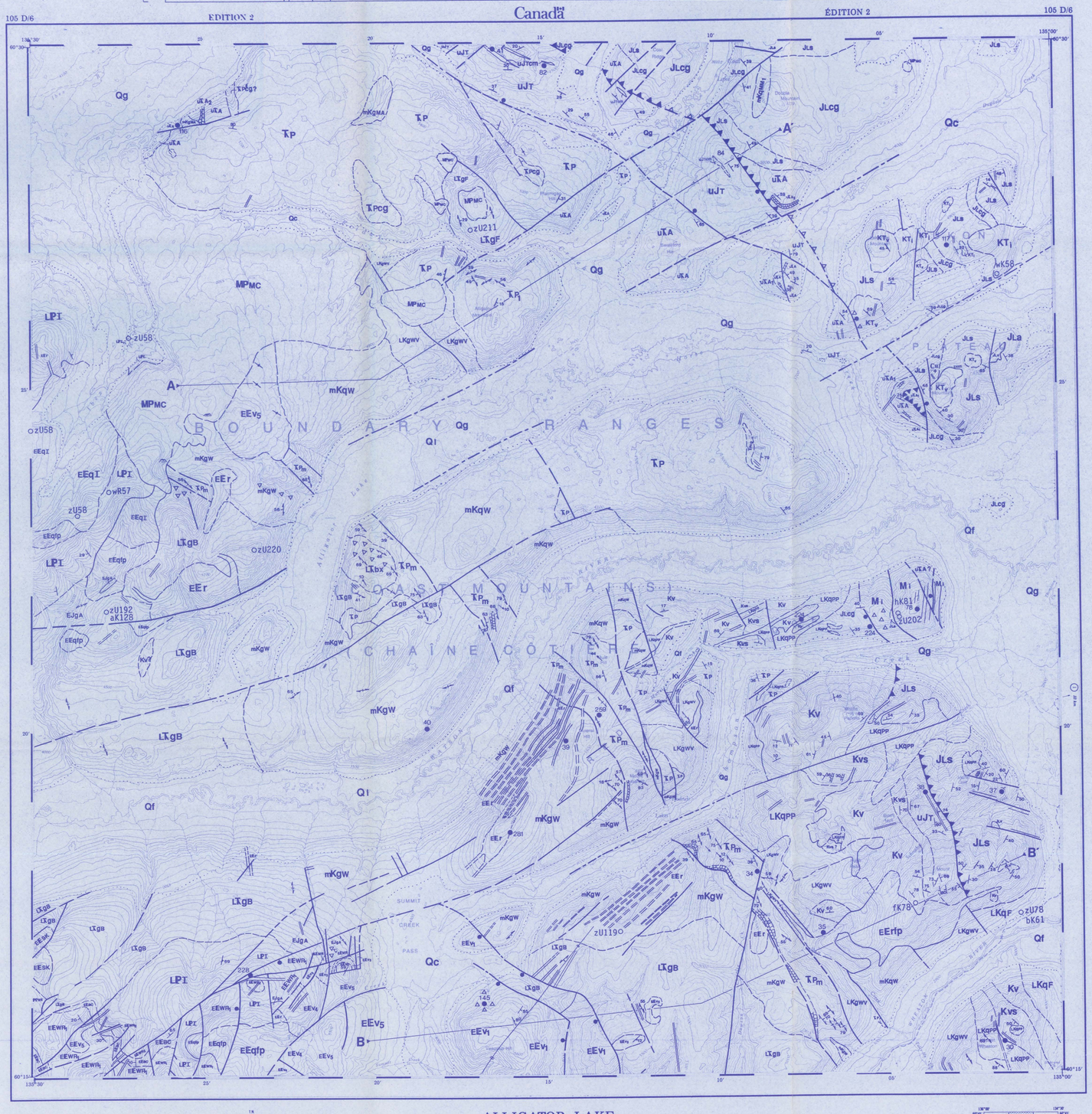


LEGEND

QUATERNARY

Qf	Unconsolidated gravel, sand and silt of fluvial or glaciofluvial origin
Ql	Unconsolidated gravel, sand, silt and varved clay of lacustrine or glaciolacustrine origin
Qg	Unconsolidated glacial moraine, kame, esker and drift material
Qc	Unconsolidated, locally derived colluvium and felsenmeer

TERTIARY

MIOCENE-PLIOCENE

MPMC	**Miles Canyon Basalt:** Dark red to brown weathering, columnar jointed olivine basalt flows commonly amygdaloidal and vesicular with ultramafic xenoliths (8.8 Ma; 2.4 Ma, both K-Ar)[1]

EARLY EOCENE

SKUKUM GROUP

EEqfp	Pale to rusty orange weathering,coarse grained quartz-feldspar rhyolite porphyry with accessory fluorite; occurs as small plugs and ring dykes (Bennett Lake Complex); may be equivalent to Nisling Range Alaskite (51 Ma K-Ar)[2]

MOUNT SKUKUM VOLCANIC COMPLEX

EErfp	Buff weathering domes, plugs and laccoliths of coarse-grained rhyolite feldspar porphyry; may be equivalent to Nisling Range Alaskite (53 Ma Rb-Sr)[4]
EEr	Flaggy, orange, rusty orange, to white orange, mauve or tan, fine-grained rhyolite dykes, dyke swarms, and flow domes; composite dykes are common
EEsk	Undifferentiated Skukum Group volcanic rocks

UPPER VESUVIUS FORMATION

EEv_6	Light tan-brown, well-bedded airfall tuff, epiclastic sandstone and siltstone
EEv_5	Flaggy, dark red, purple to grey, white to pale green flow banded, auto-brecciated and spherulitic rhyolite flows
EEv_4	Well-bedded, purple and grey rhyolite tuff and lithic tuff; probably equivalent to EE_{V2} or EE_{V5}

LOWER VESUVIUS FORMATION

EEv_2	Dark reddish brown, columnar jointed densely welded tuff, includes unwelded tuff on Vesuvius Hill
EEv_1	Massive to well-bedded, pastel coloured, slightly altered rhyolite to intermediate tuff, lithic tuff and welded tuff

UPPER WATSON RIVER FORMATION

$EEwR_3$	Massive, dark green and brown monolithic andesite breccia, composed of andesite porphyry fragments

LOWER WATSON RIVER FORMATION

$EEwR_2$	Massive to poorly-bedded, dark brown and purple to pale green, commonly columnar-jointed andesite and andesite porphyry flows and associated tuff; exposures on Carbon Hill are lithologically similar and assumed to be equivalent
$EEwR_1$	Pale green dacitic to andesitic lithic tuff, commonly densely welded

BUTTE CREEK FORMATION

EEbc	Undivided tuff and epiclastic rocks
$EEbc_1$	Moderately well-bedded, pastel coloured felsic and altered felsic pyroclastic rocks, commonly interbedded with associated grey, green, and purple epiclastic rocks

MOUNT REID FORMATION

EEMR	Massive, hematitic, clast-supported, cobble and boulder conglomerate, contains locally derived basement fragments

EARLY EOCENE TO LATE PALEOCENE

NISLING RANGE PLUTONIC SUITE

EEqI	Ibex Alaskite: light pink to buff weathering, miarolitic, fine-to medium-grained alaskite (58 Ma U-Pb)[1]

IBEX FORMATION

LPI	Dark, vitreous flow-banded rhyo-dacite flows with sparse feldspar phenocrysts and welded tuff, commonly contains granitic fragments; older than Ibex Alaskite and unconformably (?) below Butte Creek Formation; may be part of Skukum Group
Pgc	**Carcross Pluton:** Fine- to medium-grained, biotite-hornblende granite to leucocratic granodiorite with sparse, white, alkali feldspar phenocrysts (64 Ma K-Ar)[4]

CRETACEOUS AND TERTIARY

KT_i	Undifferentiated intrusive rocks of uncertain age and affinity, may be plutonic roots to volcanics on Lakeview Mountain
KT_v	Undifferentiated, intermediate to felsic, subaerial volcanic rocks, maybe equivalent to Carmacks or Skukum Groups

MESOZOIC

Mi	Undifferentiated, protracted intrusive complex containing Late Triassic and mid- and Late Cretaceous aged hornblende-rich granodiorite and diorite

CRETACEOUS

LATE CRETACEOUS

LKqF	**Folle Mountain Stock:** pale pink weathering, medium- to coarse-grained, biotite, quartz-rich granite (78 Ma U-Pb)[1]
LKgwv	**Wheaton Valley Granodiorite:** dark grey weathering light grey, medium-grained, hornblende diorite, quartz diorite and lesser granodiorite; locally foliated (78 Ma U-Pb)[1]
LKqPP	**Perkins Peak Plug:** pale pink weathering, white porphyritic alaskite and granite with plagioclase and quartz-eye phenocrysts in fine-grained mafic matrix; coarse-grained and mafic phases (70-97 Ma Rb-Sr)[1]

CARMACKS (?) GROUP

Kv	**Wheaton River Volcanics:** dark grey to green and maroon, aphanitic and porphyritic andesite to dacite flows, heterolithic breccia, agglomerate and associated epiclastic rocks (62-78 Ma K-Ar)[1]
Kvs	**Intercalated Epiclastic Rocks:** Light grey and buff weathering, well-bedded tuff and epiclastic greywacke with minor sandy tuff and limestone

MID-CRETACEOUS

MT. MCINTYRE PLUTONIC SUITE

mKqMM	**Mt. McIntyre Pluton:** pale orange weathering, fine- to medium-grained, pink granophyric with phases of quartz monzonite, granite and monzodiorite; xenoliths common along margins (109 Ma U-Pb)[1]
$mKqMM_1$	**Granite Phase:** medium-grained, euhedral biotite granite to granodiorite border phase

WHITEHORSE PLUTONIC SUITE

mKgW	**Whitehorse Pluton:** dark grey weathering, medium-grained biotite-hornblende granodiorite, tonalite, and diorite with common mafic xenoliths and local weak foliation (116 Ma K-Ar)[3]
mKqW	**Leucocratic phase:** similar to and assumed to be equivalent with Whitehorse Pluton but with few mafic minerals
mKgMA	**Mt. Anderson Pluton:** Euhedral biotite and porphyritic hornblende granodiorite; local white crumbly weathering areas indicative of argillic alteration (119 Ma U-Pb)[2]

JURASSIC

UPPER JURASSIC

TANTALUS FORMATION (OXFORDIAN-KIMMERIDGIAN)

uJT	Massive to thickly bedded chert pebble conglomerate with recessive, poorly indurated, gritty sandstone and quartz sandstone with interbedded dark grey shale
uJTcm	Recessive weathering, highly fractured, high ash anthracite to low volatile bituminous coal

LOWER AND MIDDLE JURASSIC

LABERGE GROUP (HETTANGIAN? TO BAJOCIAN)

JLv	Competent, massive, drab olive to dark green, feldspar-hornblende andesite porphyry in pillowed flows, dykes, and small plugs; interbedded with upper Laberge sedimentary rocks
JLs	Dark red-brown weathering, rhythmically and thinly bedded, tawny to dark green and grey, silty argillite, shale and siltstone; local hornfels; contains amminoid fossils and rare coaly plant fragments; minor interbedded massive sandstone and conglomerate
JLs	Pale to dark orange weathering, dark grey, massive and thickly to medium bedded, medium to coarse-grained feldspathic and lithic greywacke with lesser arkose, arenite, and grit; uncommon argillite and
JLcg	Rust-orange weathering, resistant, thickly bedded to massive, clast- and matrix-supported polymict cobble conglomerate; clasts of granitic rock and Lewes River Group volcanics with lesser schist, metamorphic quartz, limestone, and other sedimentary clasts; granitic clasts dominant higher in section; interbedded greywacke, arenite and argillite

EARLY JURASSIC

EJgA	**Alligator Quartz Monzonite:** foliated hornblende quartz monzonite to granodiorite; white K-feldspar makes it appear like a quartz diorite (190 Ma U-Pb)[1]

LATE TRIASSIC

LŦbx	**Intrusion (?) Breccia:** Cataclastically deformed , heterolithic breccia containing fragments of Bennett Granite, hornblende granodiorite, foliated augite porphyry and rare metamorphic clasts
LŦgF	**Friday Creek Diorite:** foliated, fine- to medium-grained hornblende quartz diorite to diorite with minor biotite (211 Ma U-Pb)[1]
LŦgB	**Bennett Granite:** pink, potassium feldspar megacrystic, hornblende granite to granodiorite; associated easterly trending mafic dyke swarms (220 Ma U-Pb)[2]

UPPER TRIASSIC

LEWES RIVER GROUP (CARNIAN TO SINEMURIAN)

AKSALA FORMATION

uŦH	**Hancock Member** (Norian): resistant, white to light grey weathering massive and thickly bedded limestone, bioclastic horizons and marble; minor sooty black limestone and tan dolostone;
$uŦH_1$	Resistant, thin, well-bedded, white limestone interlaminated with tan weathering, dark grey siltstone
uŦA	**Annie Member** (Karnian to Norian): Resistant, massive to moderately well-bedded, red, purple, and green matrix (and clast) supported agglomerate, pebble conglomerate, and lahaaric debris flows; clasts of augite porphyry and subvolcanic dacite porphyry with crystal-rich wacke matrix; interbedded arenite and minor tuff;
$uŦA_1$	Andesite feldspar (and augite) porphyry flows, agglomerate and breccia; minor red siltstone;
$uŦA_2$	Massive, grey, white to pink (commonly sheared or recrystallized) limestone and bioclastic limestone breccia; located near the base of this member

POVOAS FORMATION (CARNIAN AND OLDER?)

ŦPcg	Well rounded, clast supported, polymict cobble conglomerate containing granitic, sedimentary and metamorphic clasts
ŦP	Resistant, massive light to dark green weathering, dark green to black, augite phyric basalt and basaltic andesite flows and breccia; minor well-indurated dark grey greywacke, agglomerate, tuff, and associated epiclastic rocks with thin carbonate beds.
$ŦP_1$	Resistant, massive dark green to black, variably altered, coarse-grained augite porphyritic basalt and breccia, commonly with coeval (?) hornblendite
$ŦP_m$	**Metamorphosed equivalent:** Foliated to massive pale to dark green plagioclase-hornblende amphibolite; laminated pale green quartzofeldspathic gneiss and massive amphibolite with relict augite phenocrysts; marble and rare quartzite

REFERENCES

[1] ARMSTRONG, R.L., 1990. Written communications.

[2] DOHERTY, R.A. and HART, C.J.R., 1988. Preliminary geology of Fenwick Creek (105D/3) and Alligator Lake (105D/6) map areas; Indian and Northern Affairs Canada: Yukon Region, Open File 1988-2.

[3] MORRISON, G.W., GODWIN, C.I., ARMSTRONG, R.L., 1979. Interpretation of isotopic ages and $^{87}Sr/^{86}Sr$ initial ratios for plutonic rocks in the Whitehorse map area, Yukon; Can. Jour. Earth Sci., Vol. 16, p. 1988-1997.

[4] PRIDE, M.J. and CLARK, G.S. 1985. An Eocene Rb-Sr isochron for rhyolite plugs, Skukum area, Yukon Territory; Can. Jour. Earth Sci., Vol. 22, p. 1747-1753.

SYMBOLS

- Limit of outcrop
- Geological boundary (defined, approximate, assumed)
- Bedding (top known, tops unknown)
- Primary igneous flow banding
- Dyke (inclined, vertical)
- Schistosity (foliation, cleavage or gneissosity)
- Mineral lineation
- Shear band
- Fault (defined, approximate, covered; ball on down dropped side)
- Thrust fault (defined, approximate, covered; teeth on upper plate)
- Fault (transcurrent)
- Mafic dike swarm
- Adit, caved
- Locality of isotopic age determination — aK106
  - Igneous, metamorphic, sedimentary rock
  - Material: amphibole, biotite, zircon, whole rock — a,b,z,w
  - Method: U-Pb, K-Ar, Rb-Sr — U,K,R
- Cross section line — A A′
- Fossil, microfossil locality — F, f
- Mineral occurrence (Numbers refer to INAC Yukon Exploration volume) — 259
- Volcano
- Lineament
- Gossan — G
- Breccia

MINERAL OCCURRENCES

YEX Number	NAME	Commodity
30	MT. WHEATON	Au,Ag,Cu,Pb
35	DAIL	Au,Ag,Te
36	GOLDREEF	Au,Ag,Te
37	UNION MINE	Ag,Pb,Zn
38	MT. BUSH	COAL
39	LEGAL TENDER	Ag,Pb,Zn
40	ALLIGATOR	Cu,Mo
41	WHITEHORSE COAL	COAL
78	INCO	Cu,Mo
82	PTARMIGAN	COAL
83	COAL RIDGE	COAL
84	BERESFORD	COAL
116	DAYIR	Cu,Fe,Zn,Ag
117	EVIEW	Ag,Pb,Zn
145	BEAR	Au,Ag
224	RED RIDGE	Au,Ag,Pb,Cu
228	SAID/THE	Au,Ag
259	LUCKY BOY/MINERAL HILL	Cu,Pb
281	VIN	Au

COMPILATION SOURCES

CAIRNES, D.D., 1912. Wheaton River District, Yukon Territory Geol. Surv. Can., Memoir 31, 153 p.

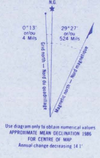
COCKFIELD, W.E. and BELL, A.H., 1944. Whitehorse District, Yukon. Geol. Surv. Can., Paper 44-14

DOHERTY, R.A. and HART, C.J.R., 1988. Preliminary geology of Fenwick Creek (105 D/3) and Alligator Lake (105 D/6) map areas. Indian and Northern Affairs Canada: Yukon Region, Open File 1988-2.

LOVE, D. A., 1989. Geology of the epithermal Mount Skukum gold deposit, Yukon Territory. Geol. Surv. Can., Open File 2123, 51 p.

PRIDE, M.J., 1985. Preliminary geological map of the Mount Skukum Volcanic Complex, 105 D/2, 3, 4, 5. Exploration and Geological Services Division, Yukon, Open File 1985.

WHEELER, J.O., 1961. Whitehorse map-area, Yukon Territory, 105 D. Geol. Surv. Can. Memoir 312 (includes Map 1053), 156 p.



ALLIGATOR LAKE

YUKON TERRITORY TERRITOIRE DU YUKON

Scale 1:50 000 Échelle

Miles 1 0 1 2 3 Miles

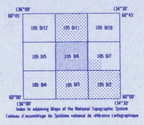
Metres 1000 0 1000 2000 3000 4000 Mètres

CONVERSION SCALE FOR ELEVATIONS — ÉCHELLE DE CONVERSION DES ALTITUDES

Metres 30 20 10 0 50 100 150 200 250 300 Mètres

Feet 100 50 0 100 200 300 400 500 600 700 800 900 1000 Pieds

CONTOUR INTERVAL 100 FEET
Elevations in Feet above Mean Sea Level
North American Datum 1927
Transverse Mercator Projection



Indian and Northern Affairs Canada
Exploration and Geological Services Division
Yukon Region

GEOLOGICAL MAP OF ALLIGATOR LAKE (105D/6) MAP AREA

Geology by C.J.R. Hart, R.A. Doherty, J.K. Radloff, J.A. Hunt, and M.P. Fingland and J. Wegenast

to accompany

OPEN FILE REPORT 1990-4

Geology of Whitehorse, Alligator Lake, Fenwick Creek, Carcross and part of Robinson map areas (105D/11,6,3,2,7); C.J.R. Hart and J.K. Radloff of Aurum Geological Consultants, Inc.

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