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DESCRIPTIVE NOTES

The southern Stewart River map area is underlain by polydeformed and metamorphosed Paleozoic rocks of the Yukon-Tanana terrane, younger plutonic rocks, and minor young volcanic and sedimentary rocks (Ryan and Gordey, 2002, 2001a, 2001b). Recognition of the region from Kirkman Creek in the south, to north of Shamrock Creek in the northwest as an extensive metavolcanic terrane rather than a siliciclastic continental margin succession as previously interpreted (Wheeler and McFeeley,1991) implies a new and favourable potential for volcanic-hosted massive sulphide (Cu-Zn-Pb) deposits as seen elsewhere in the terrane (e.g. Murphy, 1998). The source of historically and currently produced placer gold along Thistle, Kirkman and Frisco creeks remains unresolved.

The only previous geological mapping was by H.S. Bostock from 1934-1936 (Bostock, 1942) who produced a 1:253 440 scale coloured map for the eastern two-thirds of the Stewart River map area (NTS 115N&O). D.D. Cairns (1917) provided descriptive notes related to the setting of placer gold deposits along Scroggie, Barker, Thistle and Kirkman Creek. As noted by Bostock, most of the Stewart River area is unglaciated (Bostock, 1942; Jackson and Huscroft, 2000; Jackson et al., 2001). Bedrock is obscured by a thick (~1 m) soil veneer, thick gravel and loess deposits in valley bottoms and by thick cover of forest, moss and lichen. Surficial geology of the Stewart River area is being mapped concurrently at 1:50 000 (Jackson et al., in prep). The best natural bedrock exposures are on the highest ridge crests (particularly south-facing slopes). Excellent manmade exposures lie along placer mining benches and their access roads. The use of float is critical in locating bedrock contacts, particularly for the younger granites which tend to be more deeply eroded than the schists and gneisses.

GEOLOGICAL UNITS

Metasedimentary rocks (units 1-5)

Unit 1 comprises a thick sequence of grey to white, banded quartzite. It is strongly recrystallized, with a metamorphic grain size in excess of 1 mm. Varieties range in colour from black to rusty brown. Although largely fault bounded, quartzite members are demonstrably interstratified with quartz-mica schist, and a metaconglomerate (unit 2); stratigraphic younging cannot be deciphered there due to structural transposition. Elsewhere the quartzite tends to be impure with between 5% and 20% content of minerals other than quartz, such as mica and feldspar, and usually grades into psammite. In high-strain zones, the quartzite can take on a highly fissile character, and more correctly termed quartz mylonite. Rhythmic …

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mineral in the metagabbro, whereas the metapyroxenite is made up almost exclusively of coarse-grained, randomly oriented (0.5–10 cm) actinolite. The bulk of the mafic-ultramafic rocks occur as boudins or flat-lying sheets at high elevation west of the Yukon River, north of Los Angeles Creek, and on the west side of Mount Stewart, south of Frisco Creek. They lie structurally above metasedimentary rocks of units 3 and 4, and their contact appears to have predated gneissosity development. The easterly sheet also contains a body of highly magnetic, brown- to bright green-weathering serpentinite. These units appear texturally and compositionally distinct from the relatively fresh-looking, coarse grained pyroxenite body exposed on Pyroxene Mountain immediately southeast of the map area. The origin of the complex is unclear, and may represent intrusions into the siliciclastic rocks, or may represent fragments of oceanic crust.

Unit 13 comprises rare metagabbro bodies. Some gabbros contain garnet porphyroblasts, indicating that they have undergone the regional metamorphism. Less-metamorphosed examples crosscut the regional foliation.

Younger granitoids (units 14-16)

Unit 14 includes a variety of monzogranite, granodiorite and quartz monzonite intrusions. These crosscut the regional gneissosity, but are themselves moderately to strongly foliated. Their lesser state of strain relative to the orthogneiss units (units 9, 10, and 11) suggests a younger age ((?)Permian to (?)Jurassic).

Unit 15 includes a variety of intrusions ranging from chlorite-altered hornblende to biotite-bearing granodiorite and monzogranite, quartz monzanite, and monzodiorite. These bodies have little to no tectonic fabric. Their age is not known with certainty, but intrusions of similar composition and character dated elsewhere in the Yukon–Tanana terrane are Jurassic (Mortensen, 1992; and J.K. Mortensen, unpub. data, 2001).

Unit 16 comprises a suite of syenogranite to monzogranite plutons, and/or dykes which are massive, unmetamorphosed, and locally cut unit 14. These may be Jurassic to Cretaceous.

Cretaceous–Eocene rocks (units 17–19)

Unit 17 comprises a conglomerate horizon exposed 1.25 km west of the west edge of NTS 115-O/4, and lies below Carmacks Group rocks (Unit 18). The conglomerate is unmetamorphosed, largely clast supported, and contains rounded to angular clasts of dominantly vein quartz and foliated quartzite. Unit 17 may correlate with the Tantalus Formation of Early Cretaceous age as described by Lowey and Hills (1988).

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STRUCTURE

Foliation and folds

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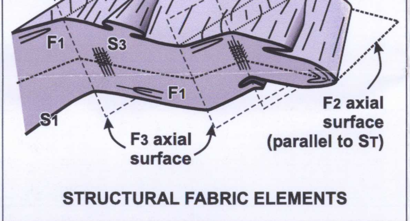

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MINERAL PROSPECTS

MINFILE #	NAME	STATUS	DEPOSIT CLASS	COMMODITIES Major; Minor	MINERALS Significant; Associated
115J055	KIRKMAN/FANNIN REEF	unknown	unknown		
115J061	BALLARAT/HAZEL	unknown	unknown		
115O004	MAISY MAE	unknown	unknown		

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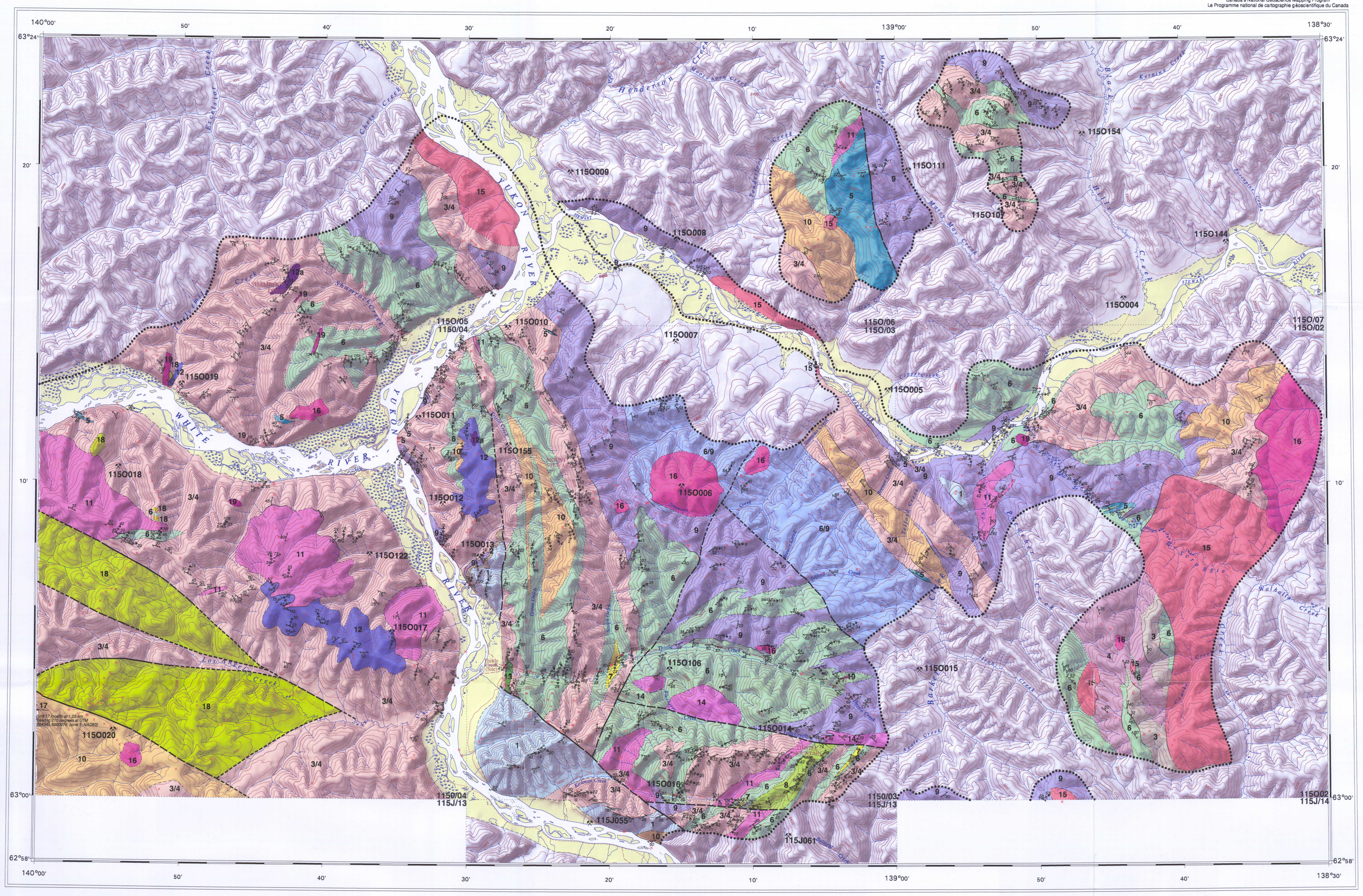

LEGEND

QUATERNARY

Fluvial silt, sand and gravel deposits

EOCENE?

19 — *PORPHYRY: quartz-K-feldspar porphyritic rhyolite to rhyodacite stocks and dykes*

UPPER CRETACEOUS

18 — *CARMACKS GROUP: rhyodacite, dacite, rhyolite, with lesser andesite and basalt*

LOWER CRETACEOUS

17 — *CONGLOMERATE: clast-supported pebble to cobble conglomerate with clasts of vein quartz and foliated quartzite (see note near southwest corner of map); may correlate with Tantalus Formation*

JURASSIC? OR CRETACEOUS

16 — *GRANITE: pink to grey, locally porphyritic, syenogranite to monzogranite plutons and dykes*

JURASSIC

15 — *GRANODIORITE: chlorite-altered hornblende and biotite-bearing granodiorite, monzogranite, quartz monzonite and quartz monzodiorite*

PALEOZOIC AND/OR MESOZOIC

14 — *FOLIATED GRANITE: deformed (foliated to gneissic), felsic to intermediate monzogranite, granodiorite, quartz monzonite*

13 — *GABBRO: metagabbro (locally garnet bearing); diabase, metabasite*

MID(?)- TO LATE PALEOZOIC

Ultramafic and Gabbroic Rocks

12, 12a — *ULTRAMAFIC-GABBRO: amphibolite facies metagabbro, metapyroxenite, serpentinite and talc-siderite schist; 12a, dominantly serpentinite*

Orthogneissic Rocks

11 — *AUGEN GNEISS: K-feldspar augen granite; exhibits various states of strain including porphyroclastic straight gneiss*

10 — *FELSIC GNEISS: pink to orange felsic orthogneiss; banded to layered; veined and/or segregated; derived from felsic granitoid sheets*

6/9 — *UNDIVIDED AMPHIBOLITE AND GREY GNEISS UNITS*

9 — *GREY GNEISS: intermediate to mafic orthogneiss; generally grey; banded to layered; commonly veined; derived from intermediate granitoid (tonalite to diorite) sheets; usually interlayered with amphibolite schist and gneiss*

Metavolcanic(?) and Volcaniclastic(?) Rocks

8 — *MAFIC SCHIST: biotite-hornblende +/-plagioclase +/-quartz metabasite?; generally associated with amphibolite; main locality on Thistle Mountain*

7 — *FELSIC SCHIST: quartz-sericite schist or metafelsite, possibly derived from felsic volcanic or hypabyssal intrusive rocks, e.g. rhyolite or quartz-feldspar porphyry*

6 — *AMPHIBOLITE: amphibolite schist and gneiss; metabasite; probably derived from mafic to intermediate volcanic or volcaniclastic rocks; locally associated with psammite or interlayered with orthogneiss*

Metasedimentary Rocks

5 — *MARBLE: marble (metacarbonate) derived from pure to impure limestone; associated calc-silicate schist derived from calcareous metapelite*

3/4 — *QUARTZ-MICA SCHIST AND MICA-QUARTZ SCHIST/PARAGNEISS UNITS UNDIVIDED*

4 — *QUARTZ-MICA SCHIST: quartz-muscovite-biotite schist possibly derived from siliceous siltstone; commonly finely interlayered with garnet metapelite; commonly contains beds of micaceous quartz arenite*

3 — *MICA-QUARTZ SCHIST/PARAGNEISS: undivided metasedimentary rocks dominated by metapsammite, semipelite and metapelite; commonly garnet-biotite-muscovite +/-plagioclase schist; generally heterogeneously layered; grades locally to paragneiss; varies to quartz-mica schist*

2 — *METACONGLOMERATE: pebble- to boulder-sized rounded clasts; mainly massive white vein quartz, but including some granitoid clasts (tonalite?); has an arkosic matrix; grades into quartzite; matrix supported*

1 — *QUARTZITE: banded to massive, grey to white quartzite; apparently clastic in origin, or in part, possibly derived from metachert; possibly correlates with Nasina Quartzite*

NOTE: Relative ages of many units are unknown; superimposed hillshade may darken colours on map from those shown on legend above

SYMBOLS

- *Geological contact (defined, approximate, assumed)*
- *Fault, sense of movement uncertain (defined, approximate, assumed)*
- *Limit of mapping*
- *Transposition foliation (ST)*
- *Foliation (S2,S3)*
- *Mineral (elongation) lineation (L2)*
- *Minor fold axis (F1, u-fold)*
- *Minor fold axis (F2, u-fold, z-fold, s-fold)*
- *Minor fold axis (F3, u-fold, s-fold)*
- *Minor fold axial plane (F2, F3)*
- *Station (observation point without structural data)*
- *Mineral Prospect*

OPEN FILE 4338

GEOLOGY

SOUTHERN STEWART RIVER AREA

YUKON TERRITORY

Scale 1:100 000/Échelle 1/100 000


Plate 1: Banded grey quartzite (unit 1), exhibiting well-preserved bedding (S_0). This unit is generally several metres thick, and interpreted as a metaclastic rock. Quartzite beds also occur in Unit 4. Pencil for scale (13.5 cm long).


Plate 2: Garnet-amphibolite in a mafic variety of Unit 6, where some garnet are altered to plagioclase. In general, garnet appears to be in disequilibrium, producing plagioclase-hornblende rims. Pencil for scale (13.5 cm long).

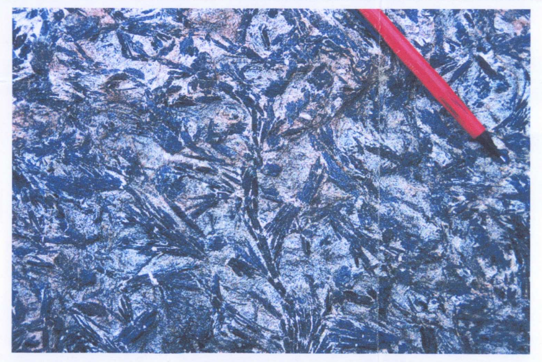
Plate 3: Large rosettes of hornblende radiating on the foliation surface of an intermediate amphibolite (unit 6). The decussate hornblende crystals sit in a matrix of plagioclase, quartz and epidote. Pencil for scale (13.5 cm long).

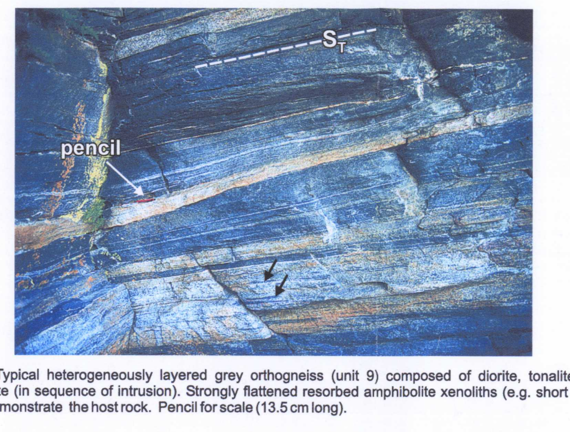
Plate 4: Typical heterogeneously layered grey orthogneiss (unit 9) composed of diorite, tonalite and granodiorite (in sequence of intrusion). Strongly flattened resorbed amphibolite xenoliths (e.g. short black arrows) demonstrate the host rock. Pencil for scale (13.5 cm long).

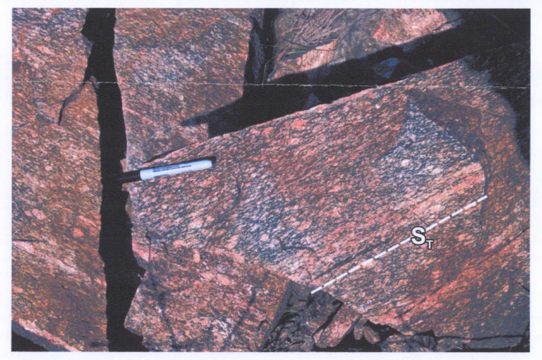
Plate 5: Red potassic feldspar augen granite of unit 11. Originally derived from a porphyritic granite. Varieties grade to porphyroclastic straight gneiss. Marker for scale (13.5 cm long).

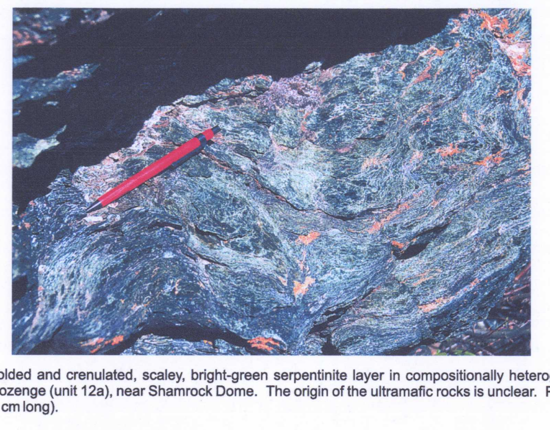
Plate 6: Folded and crenulated, scaley, bright-green serpentinite layer in compositionally heterogeneous ultramafic lozenge (unit 12a), near Shamrock Dome. The origin of the ultramafic rocks is unclear. Pencil for scale (13.5 cm long).

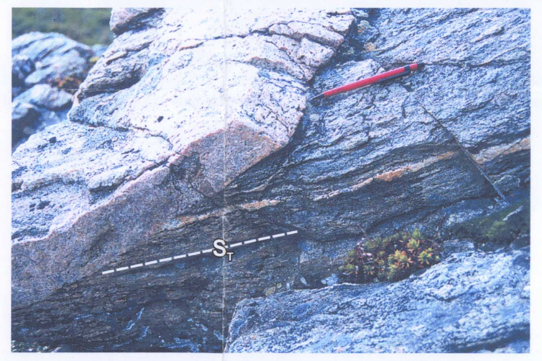
Plate 7: Syenogranite dyke at margin of larger body (unit 16) of probable Jurassic or Cretaceous age, cutting across S_T foliation in kyanite schist (unit 3) on Grizzly Dome. The granite postdates the kyanite. Pencil for scale (13.5 cm long).

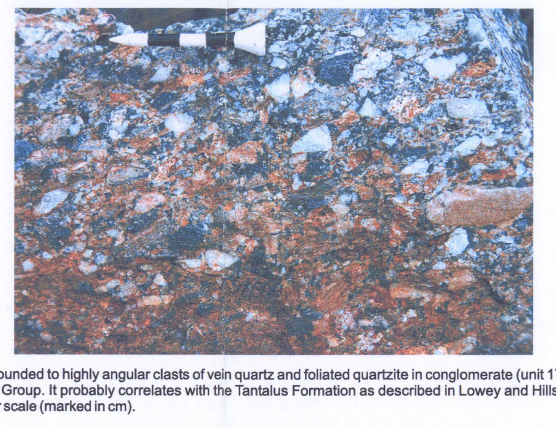
Plate 8: Rounded to highly angular clasts of vein quartz and foliated quartzite in conglomerate (unit 17) below Carmacks Group. It probably correlates with the Tantalus Formation as described in Lowey and Hills (1988). Golf tee for scale (marked in cm).

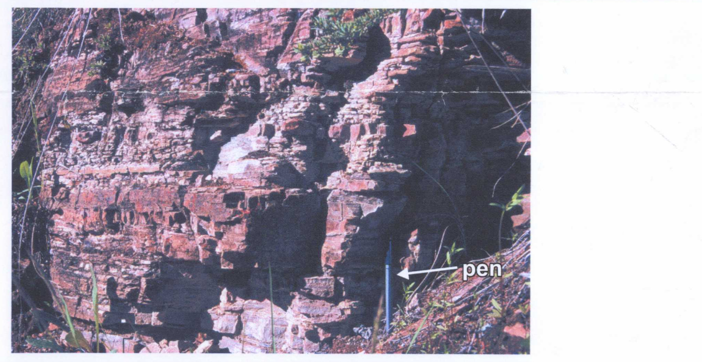
Plate 9: Subhorizontal flaggy splitting habit in aphanitic rhyodacite of the late Cretaceous Carmacks Group (unit 18), reflecting cryptic primary flow fabrics. Pen for scale (14 cm long approx.)

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