# PRELIMINARY BEDROCK MAPPING OF THE KLUANE RANGES, SOUTHWEST YUKON (parts of 115G/5, 6, 12)

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## INTRODUCTION

In the summer of 2004, a new multi-year 1:50,000-scale mapping project was initiated within the Kluane Ranges, southwest Yukon. The aim of the project is to develop new geologic understanding of the entire range, from southern Kluane Lake to the Alaska-Yukon border. This area is host to several mineral occurrences including those related to the Upper Triassic Kluane maficultramafic complex, a complex with abundant Ni-Cu and PGE mineralization, and several skarn and porphyry type showings associated with the younger Kluane Ranges suite.

The Kluane Ranges are underlain by the Wrangellia Terrane which in this part of the Yukon consists of a thin sliver of Late Paleozoic to Mid-Mesozoic volcanic and sedimentary rocks bound to the southwest by the Alexander Terrane across the Duke River Fault and to the northeast by the Coast Belt across the Denali Fault (Fig. 1). Wrangellian rocks are intruded by Upper Triassic gabbros, peridotites and dunites of the Kluane mafic-ultramafic complex and Upper Triassic Maple Creek gabbro. Jurassic to Cretaceous overlap assemblages were deposited on both Wrangellia and Alexander Terranes which in turn are overlain by the Miocene Wrangell Lavas. The Cretaceous Kluane Ranges suite, the Oligocene Tkope suite and the Miocene Wrangell suite intrude Wrangellian rocks throughout the Kluane Ranges (Fig.

Mapping in 2004 focused on the area surrounding Quill Creek (Fig. 1). The rocks in this area consist of the Late Pennsylvanian to Permian Station Creek and Hasen Creek Formations of the Skolai Group, unconformably overlain by Upper Triassic Nikolai formation (Fig. 2). Sedimentary rocks of the McCarthy Formation and the Tatamagouche succession, a package of Upper Triassic to Cretaceous sedimentary rocks, locally overly the Nikolai formation. Upper Triassic gabbros and ultramfic rocks of the Maple Creek gabbro and Kluane mafic-ultramafic suites intrude rocks of the Skolai Group. The Kluane and Tkope suites are found throughout the area (Fig. 2).

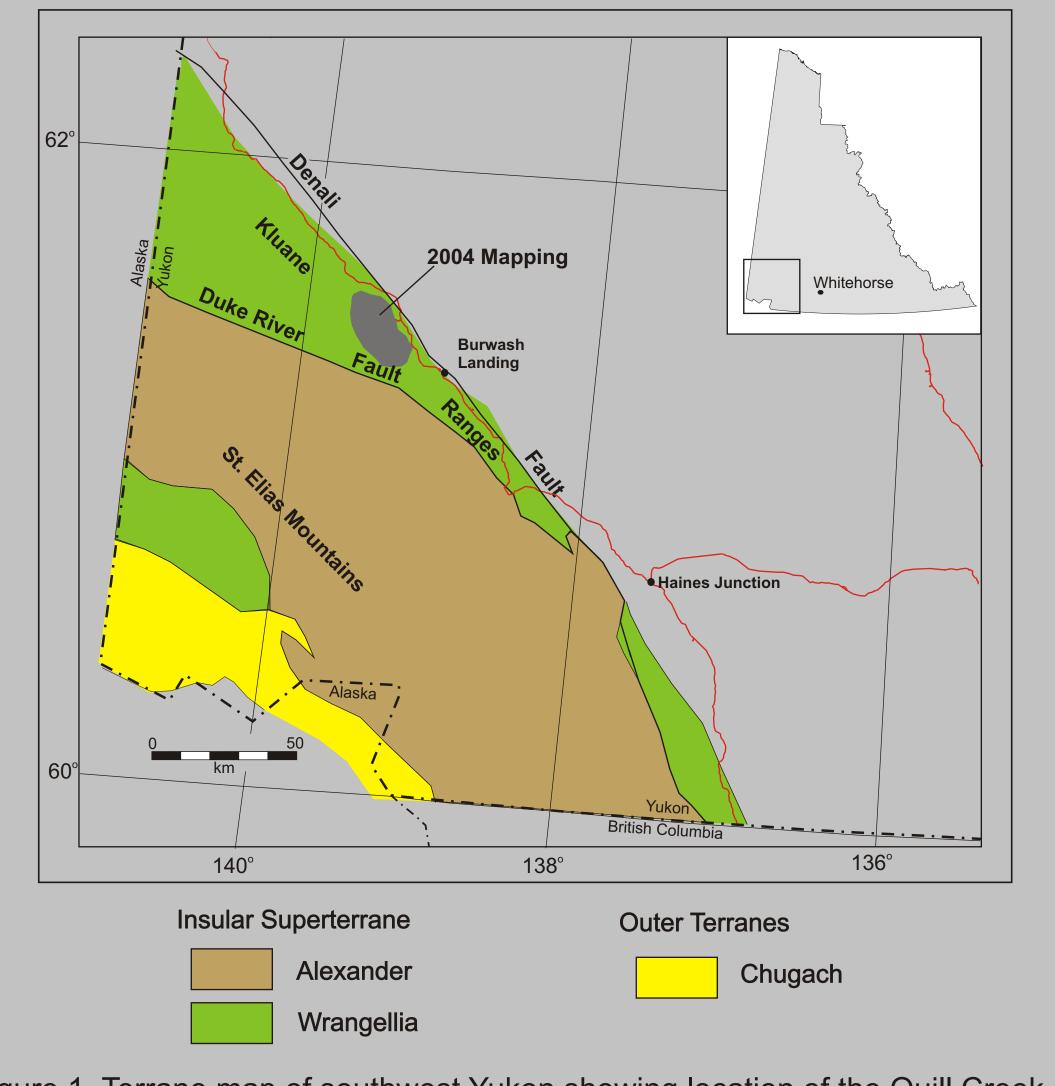


Figure 1. Terrane map of southwest Yukon showing location of the Quill Creek map

#### STRATIGRAPHY

McCarthy Formation

Distinctive striped outcrop appearance of interbedded limestone of the McCarthy recovered from within the formation have indicated a Late Norian age for the unit.

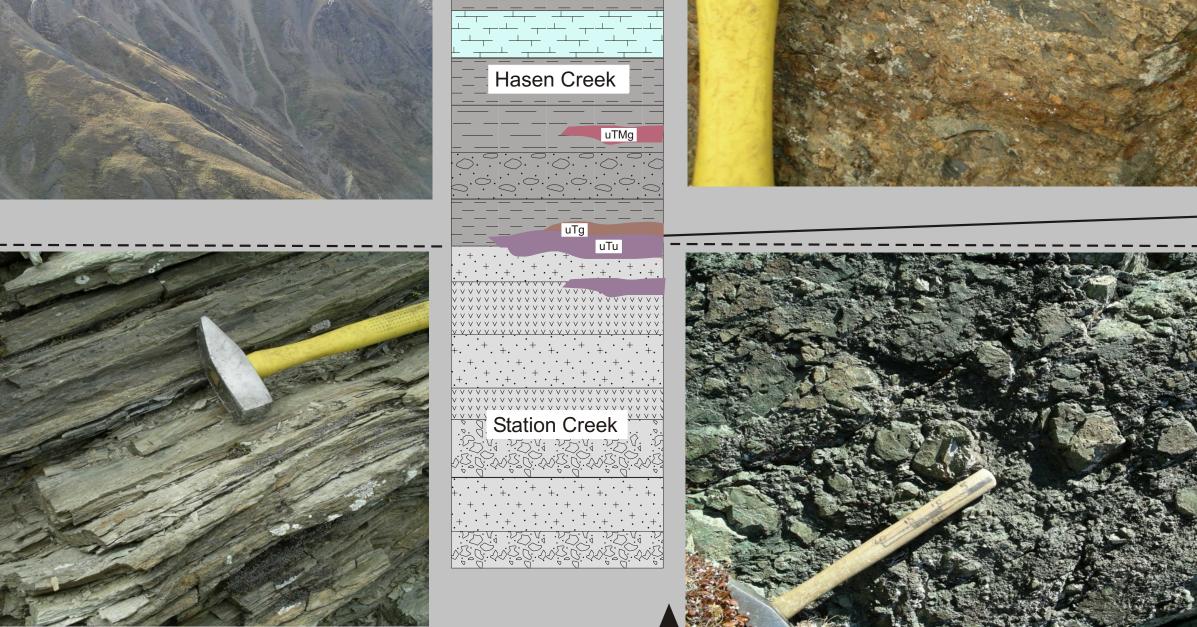


Pillowed flows at the base of the Nikolai volcanic package is believed to be part of a large oceanic flood basalt province with the lower portions subaqueously erupted and the middle and upper portions subaerially erupted.



Interbedded siltstone turbidites, conglomerates and limestone of the Hasen Creek Formation (unit PHp).

Deformed tuff breccia of the (PSv). The base of the Station Creek is either not exposed or is associated with large faults.



intrusions in several localities within the

formation (uTrNc). Fossils collected from

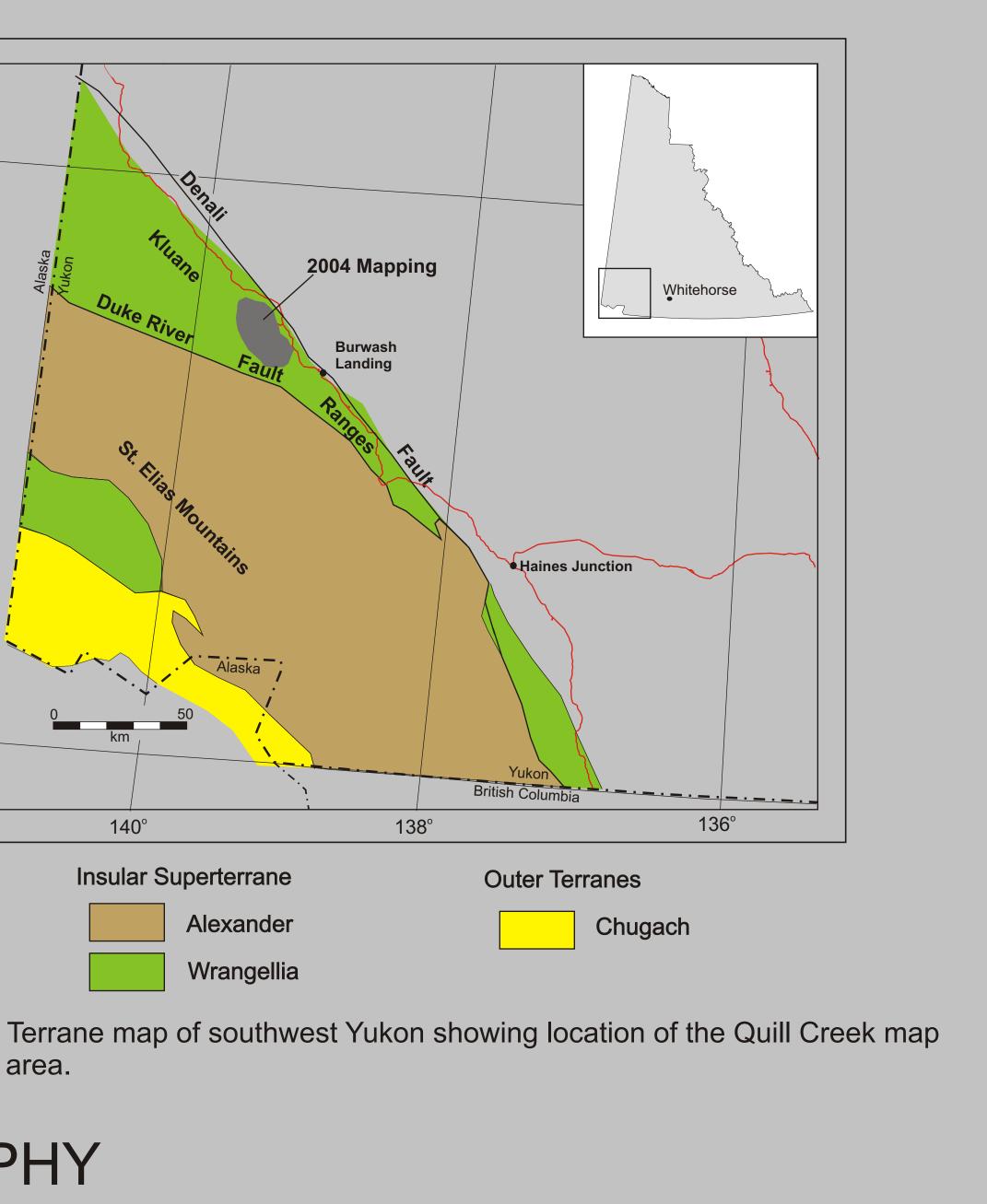
Pebble to cobble conglomerate found throughout the Hasen Creek Formation

(PHcg). Clasts consist mainly of siltstone,

chert, greywacke and minor mafic

Norian age (~220 Ma).

this unit suggest an upper Carnian to early



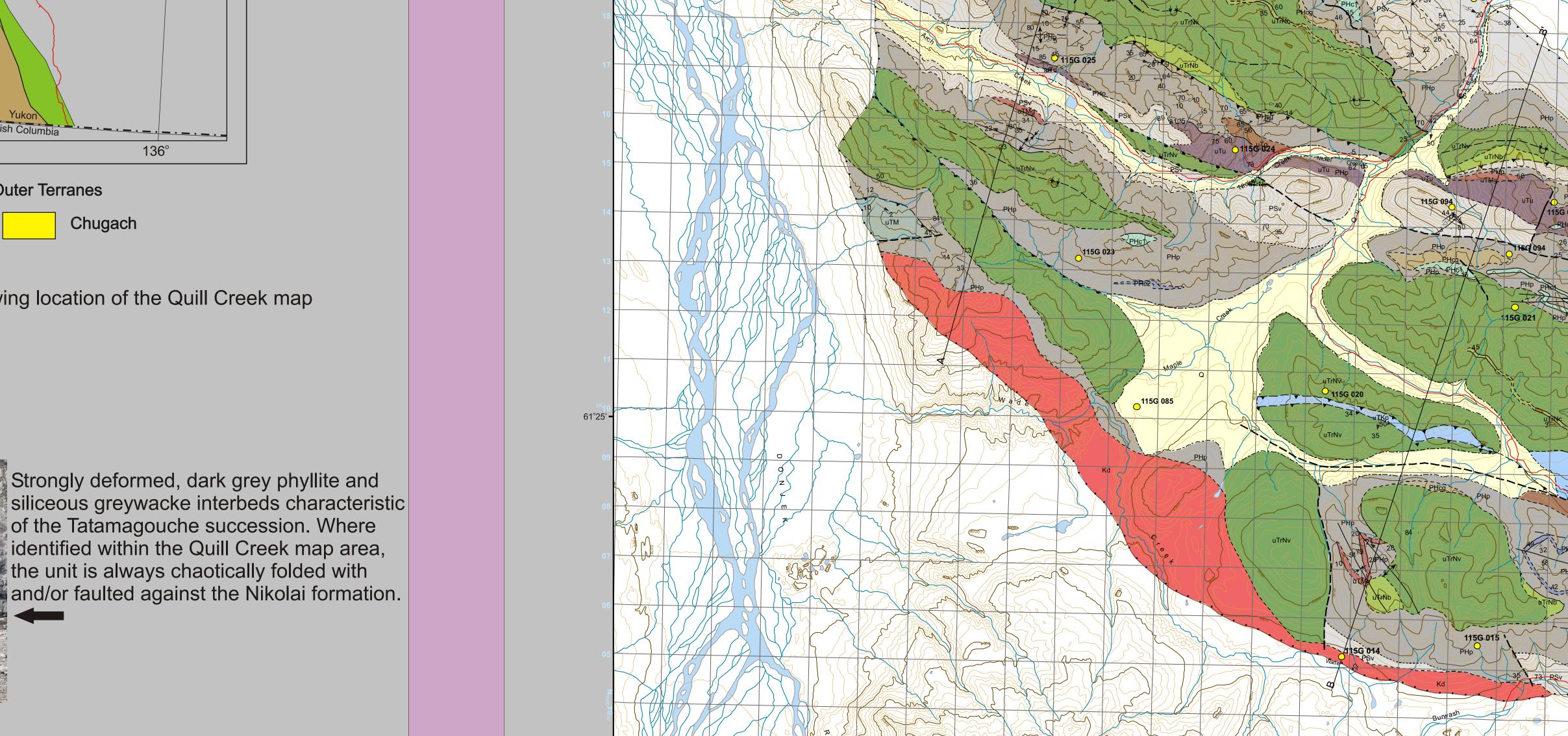
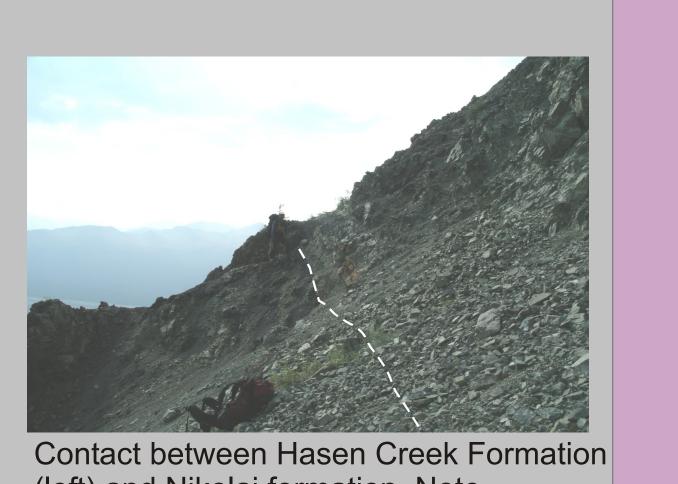




Figure 2. Bedrock geology of the Quill Creek map area.



(left) and Nikolai formation. Note mineralized zone at base of Nikolai.

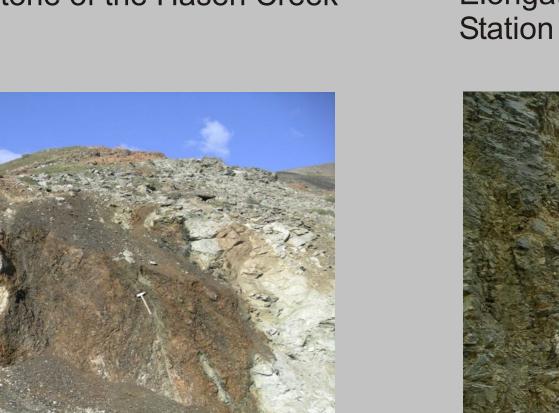


Faulted contact between the Tatamagouche

## STRUCTURE



Tight fold in limestone of the Hasen Creek



Steeply dipping fault fabrics developed within the Hasen Creek Formation and peridotite of the Kluane mafic-ultramafic complex.





Elongated clasts along a fault zone within Station Creek Formation tuff breccia.

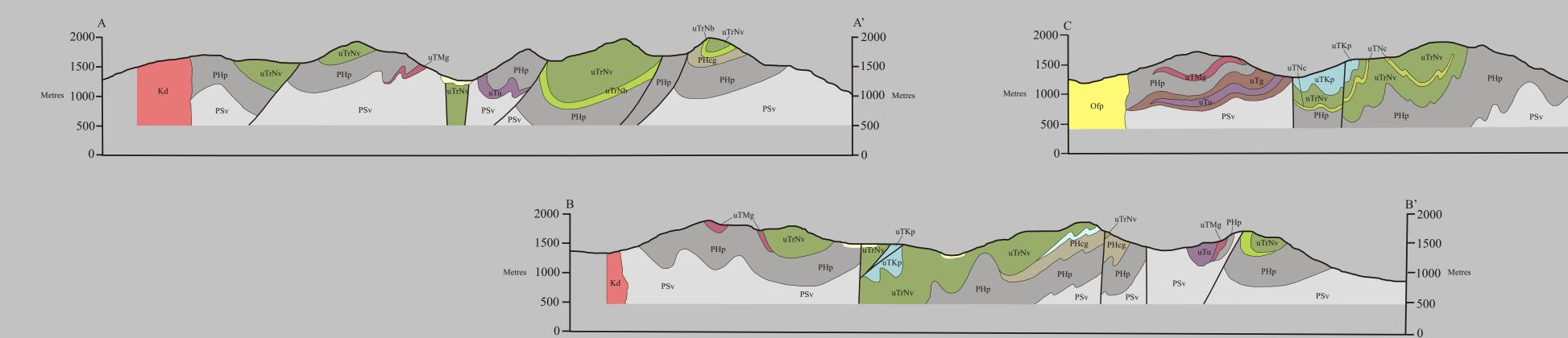




Folded and faulted sedimentary rocks within the Tatamagouche succession..



Strongly sheared volcaniclastic rocks within a large shear zone that is likely a strike-slip reactivation of a low angle thrust fault.



Schematic cross-sections across the Quill Creek area, showing the general structural style of the Kluane Ranges. The area is characterized by at least two major phases of deformation. The first phase is likely associated with northeast directed contraction that resulted in thrusting and associated folding. The second is characterized by strike-slip faulting along the Denali and associated faults that resulted in refolding of the first phase folds along northeast trending open folds and strike-slip reactivation of earlier formed low angle thrusts. Normal faulting, indicated by several stratigraphic relationships, is also likely related to strike-slip deformation.

### MINERALIZATION

MINERAL OCCURRENCE  Yukon Minfile						
Minfile	Name	Deposit Type	Status			
115G 014	Amp	Porphyry Cu-Mo-Au	Anomaly			
115G 015	Cork	Porphyry Cu-Mo-Au	Drilled Prospect			
115G 016	Glen	Gabbroid Cu-Ni	Drilled Prospect			
115G 017	Burwash	Besshi Massive Sulphide	Drilled Prospect			
115G 018	Nelms	Unknown	Unknown			
115G 019	Jaquot	Gabbroid Cu-Ni	Drilled Prospect			
115G 020	Vug	Unknown	Unknown			
115G 021	Quill	Gabbroid Cu-Ni	Drilled Prospect			
115G 022	Versluce	Gabbroid Cu-Ni	Drilled Prospect			
115G 023	Callinan	Unknown	Unknown			
115G 024	Wellgreen	Gabbroid Cu-Ni	Underground Past Producer			
115G 025	Airways	Gabbroid Cu-Ni	Drilled Prospect			
115G 026	Musketeer	Besshi Massive Sulphide	Showing			
115G 027	Swede Johnson	Gabbroid Cu-Ni	Showing			
115G 094	Linda	Alaskan Type UM	Drilled Prospect			
115G 095	Arby	Unknown	Unknown			
115G 102	Tremblay	Cu +/- Ag Quartz veins	Unknown			



formation at station 04-SIS-137 (2.9 % Cu, 43 g/t Ag).

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			94-SIS-195	115G 017
		115G 014 115G 015	115G 016	

Assay results from selected samples collected during the 2004 mapping season, see above map for locations.

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