PETROGRAPHIC REPORT

1 Rock from the Cluster Target, Lake Mackay Project, NT

for

Independence Group

(attn. Matt McGloin, Doug Winzar)

3/12/2020

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SUMMARY PETROGRAPHY REPORT

Introduction

A single sample of 2cm-sized chips of a medium-grained mafic rock from an aircore hole on IGO's Cluster prospect were submitted for petrographic study to diagnose the rocktype. A single polished thin section was prepared of the two largest chips, and this and the offcut chip billets were scanned to provide some visual detail beyond the six microphotographs provided herein.

Petrographic Summary

Both chips are identical, medium- to rather coarse-grained gabbroic rocks characterized by the notably potassic mineral assemblage Kspar-phlogopite-augite, with subordinate plagioclase (~10%), apatite, Ti-magnetite, and a significant amount (~15-20%) of interstitial quartz and granophyre. The colourless augite crystals (15-20%) are partly replaced by fibrous actinolite bundles, and all augite crystals show broad rims of green late magmatic hornblende. Brown to khaki phlogopite crystals (35-40%) are fresh, tabular crystals <2mm long. Dominant Kspar shows patchy microcline twinning and local areas of cloudy, extremely fine-grained sericite alteration, although most is fresh. Sub-mm plagioclase prisms are common inclusions within Kspar, but most are partly to entirely replaced by turbid, ultrafine-grained epidote-sericite intergrowths.

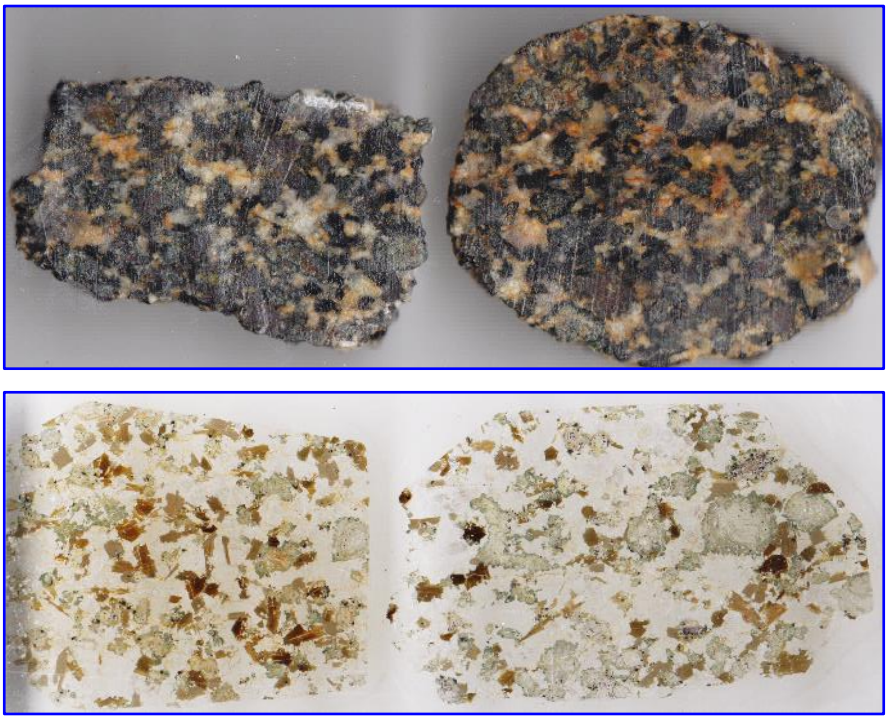
The distinct mineral assemblage suggest a calc-alkaline lamprophyric parent magma for this rock, with the Kspar-augite-phlogopite assemblage being typical of the lamprophyre variety minette. A shoshonitic lamprophyre composition is indicated by the abundant Kspar and phlogopite, and low greenschist grade regional metamorphic degradation is reflected by the actinolite-epidote-sericite alteration assemblage. The relatively coarse grainsize of this lamprophyric rock contrasts with typical fine-grained, augite+phlogopite-phyric minette dykes (usually 0.5-5m thick), implying that the rock sampled crystallized in a quite large plug or robust dyke. Without evidence to the contrary, I see nothing that precludes this rock being linked with the shoshonitic Andrew Young Igneous Complex.

SAMPLE NUMBER LM15319 Hole 20LMAC046@80-81m

PETROGRAPHIC DESCRIPTION

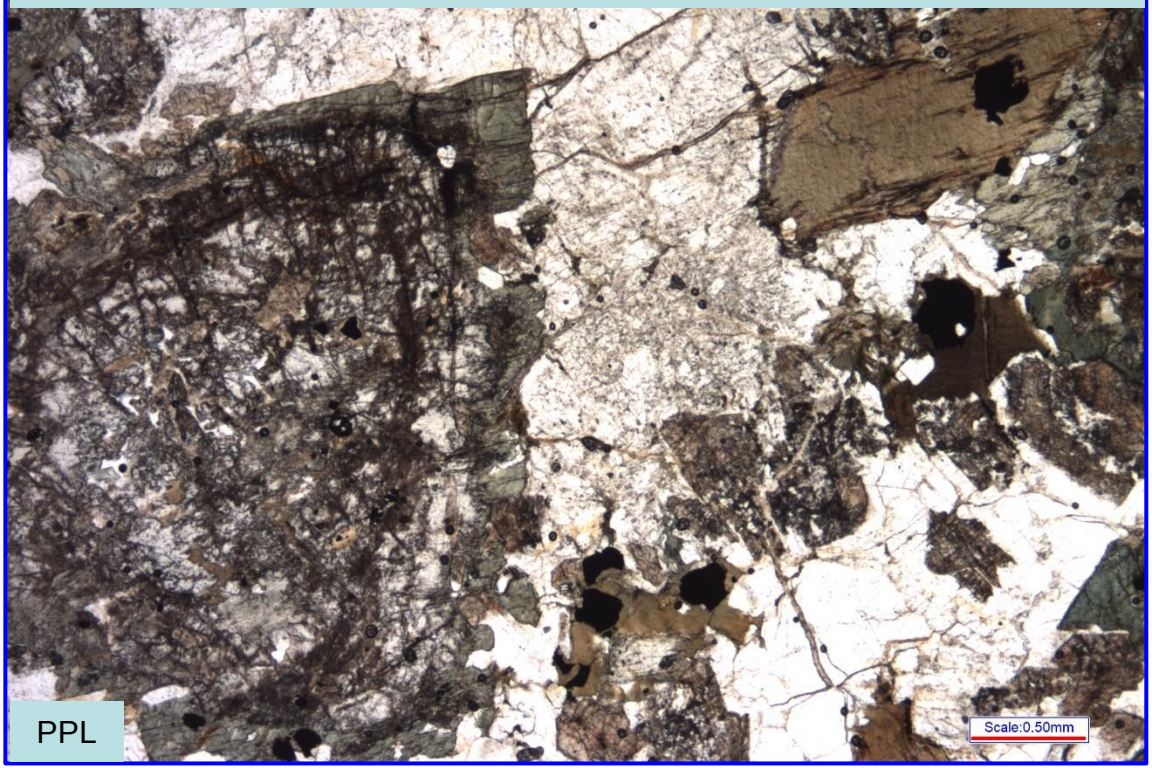
Both chips are petrographically identical, medium- to rather coarse-grained gabbros in which the mafic minerals are augite and phlogopite in subequal proportions (~15-20% each). The rock is dominated by Kspar (~45-50%), occurring as anhedral grains to ~3mm across often with patchy microcline twinning. The phlogopite occurs as fresh, brown to khaki platy crystals rarely >2mm long, whereas colourless augite crystals to 4mm are often partly altered to fibrous actinolite, and always rimmed by green late magmatic hornblende. Growing within the Kspar are common (~10%), euhedral plagioclase prisms <1mm long, and now altered to murky microcrystalline epidote-sericite mixtures. Small, equant Ti-magnetite crystals are disseminated through the rock, and interstitial quartz and occasional interstitial granophyre spots are present, making up 3-5% of the sample. Small, stout apatite crystals are well represented.

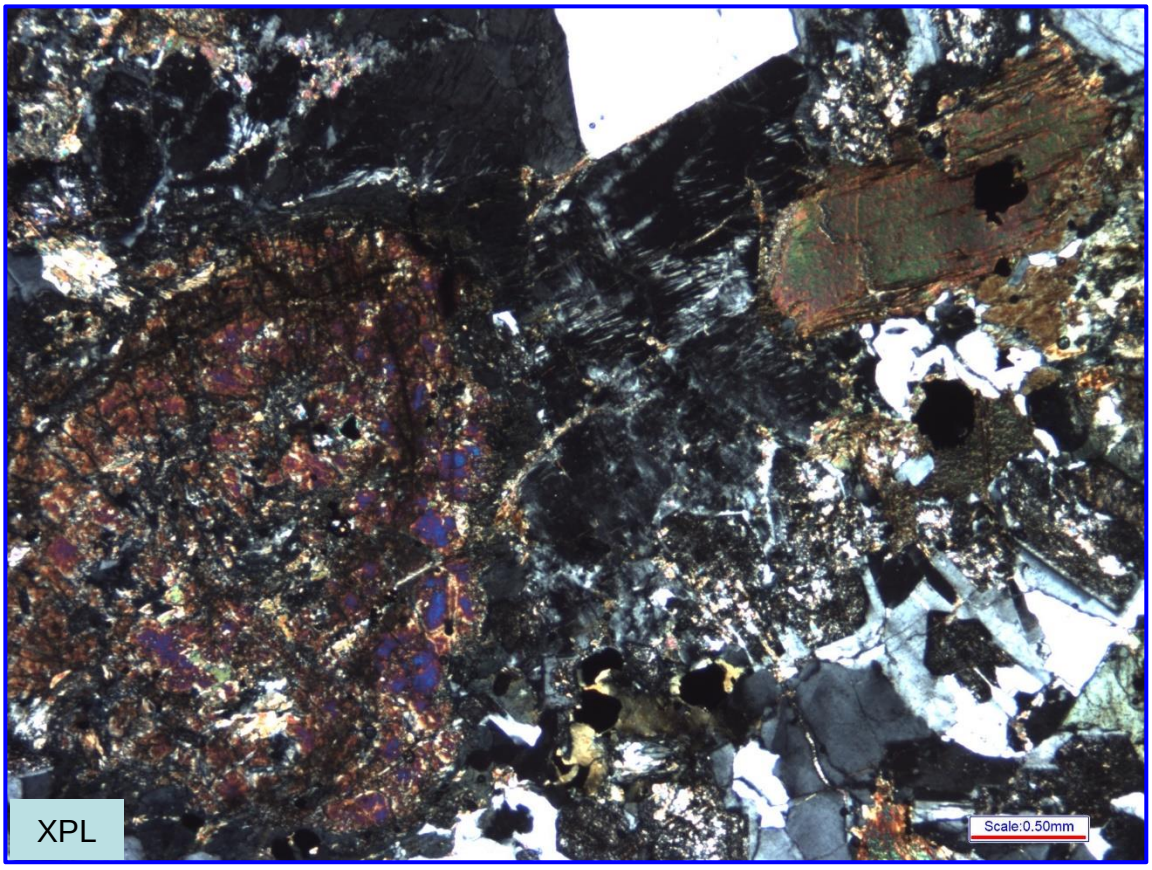
The augite-phlogopite-Kspar dominant, relatively plagioclase-poor mineral assemblage suggests lamprophyric affinities for this gabbro, suggesting that it is from a robust dyke or plug. The actinolite-epidote-sericite alteration indicates low greenschist grade metamorphism has affected the rock.



SAMPLE NUMBER LM15319

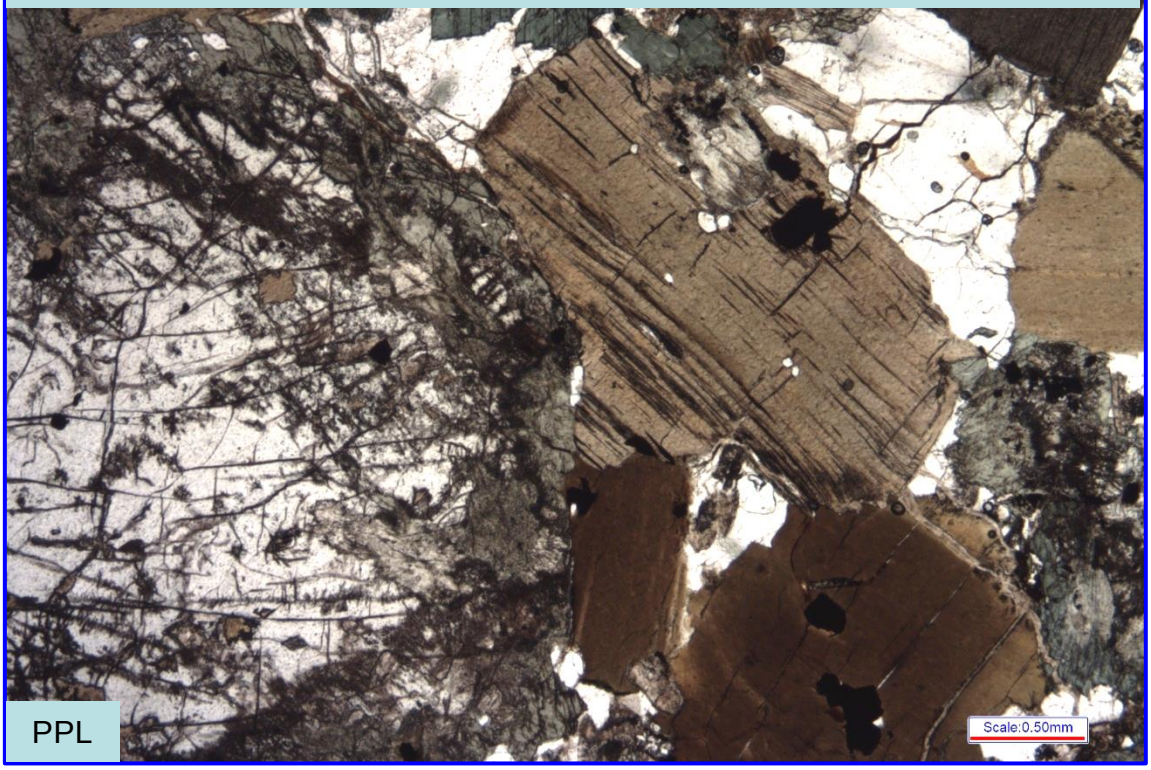
Cracked and slightly altered augite crystal at left overgrown by green late magmatic hornblende, with common Kspar, quartz and khaki phlogopite.

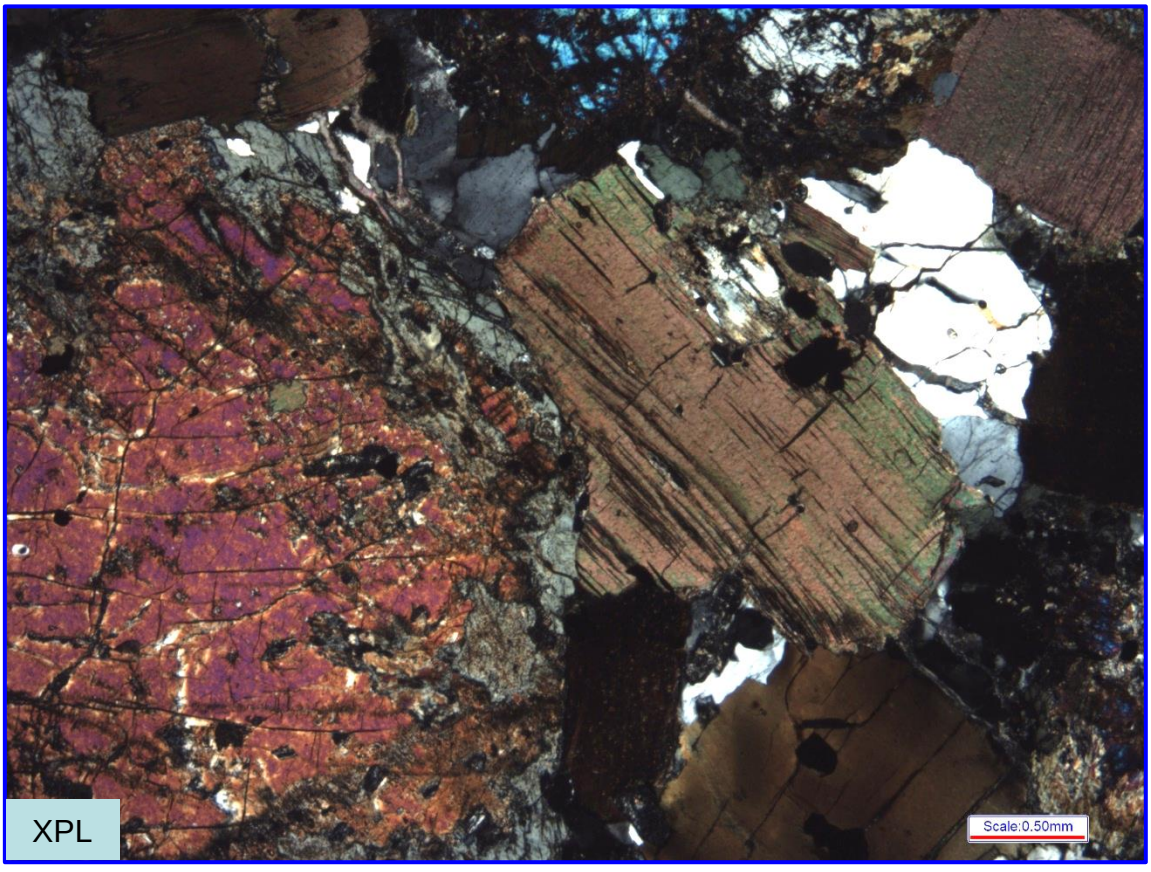




SAMPLE NUMBER LM15319

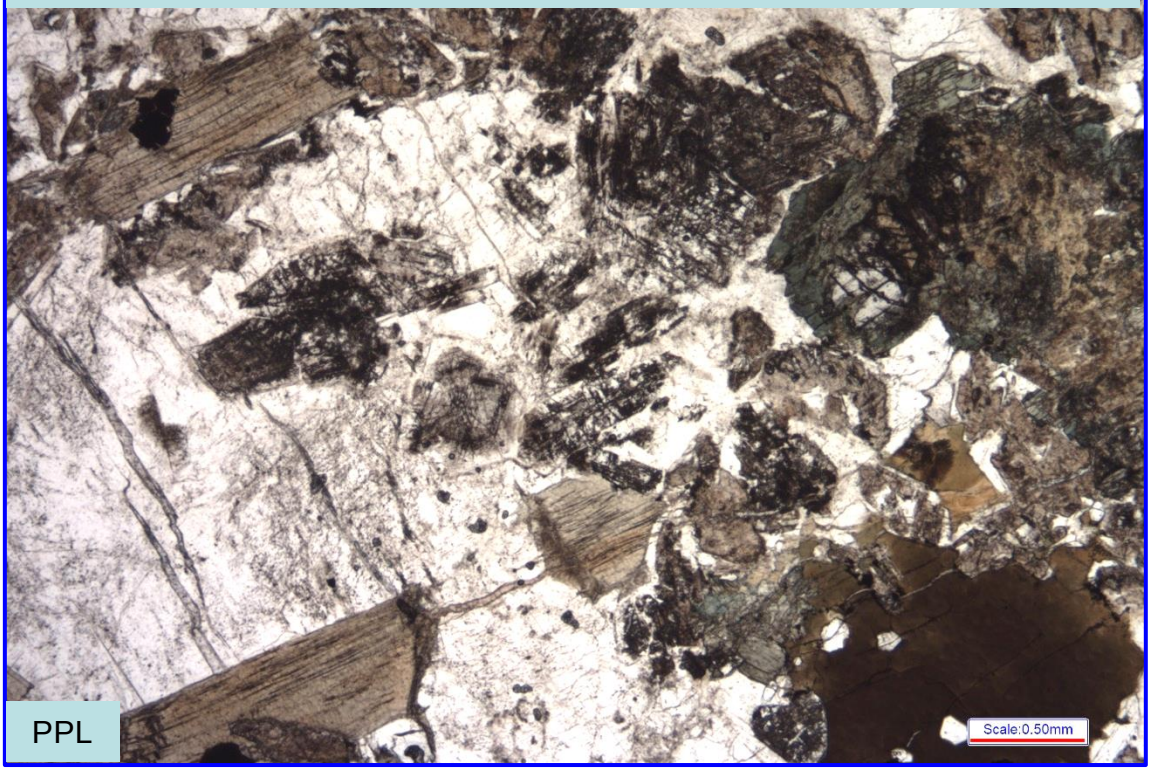
Augite rimmed by greenish brown late magmatic hornblende, with khaki-brown phlogopite plates, murky altered plagioclase, and interstitial quartz.





SAMPLE NUMBER LM15319

Turbid euhedral plagioclase crystals now replaced by messy, microcrystalline epidote-sericite mixtures, hosted within Kspar



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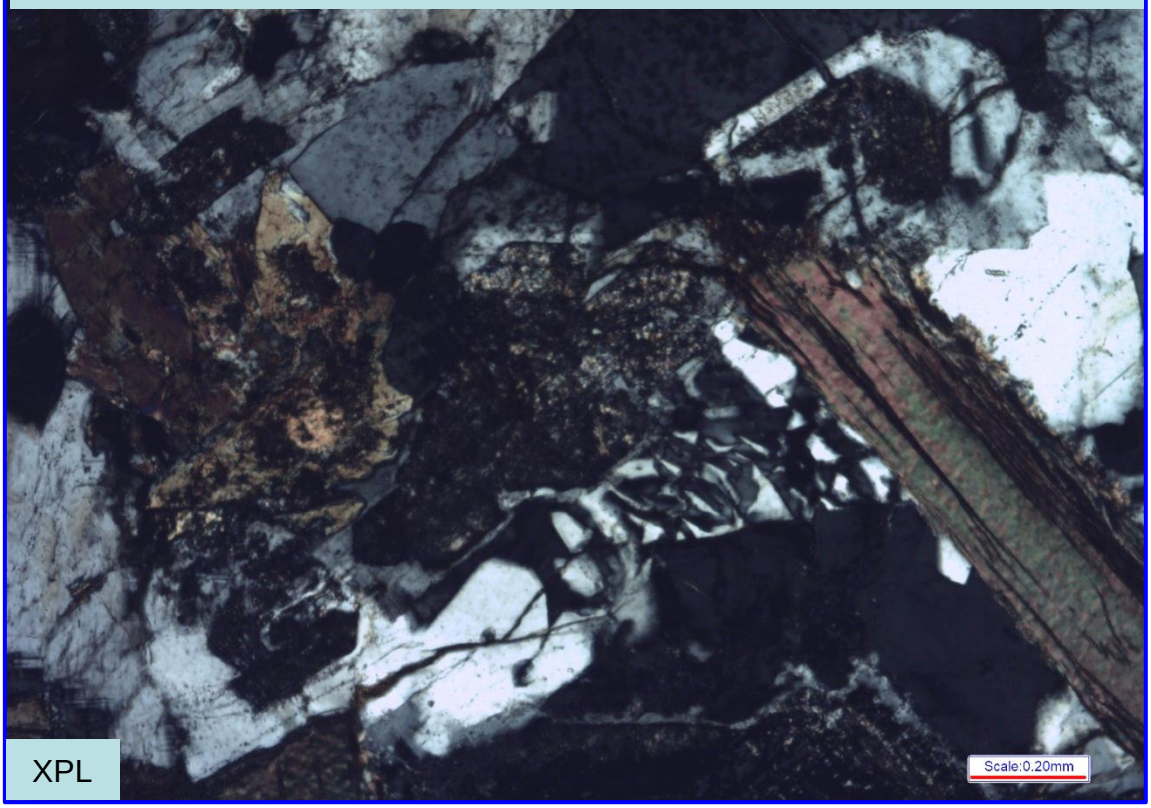
Interstitial granophyre patch



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