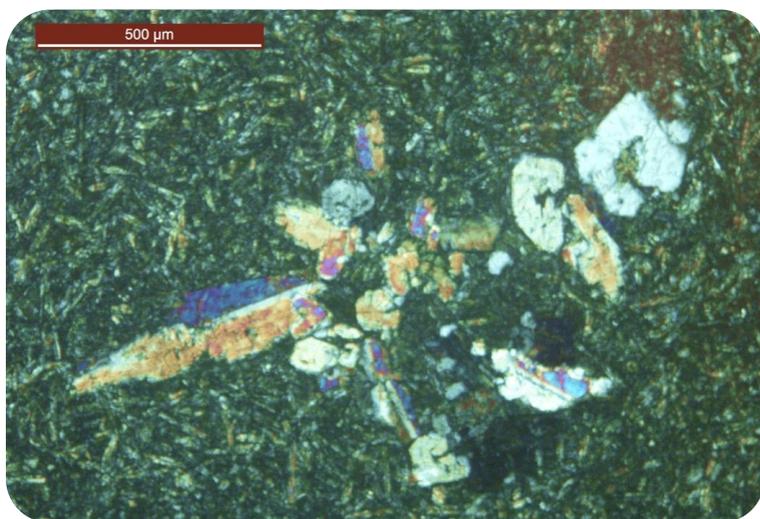


Mineral Resources Tasmania

Laboratory Report

LJN2018-106

MINERALOGICAL ANALYSES, ROSS DDH



An unpublished Mineral
Resources Tasmania
Report for:

MRT

By: R S Bottrill
L Unwin

Date: 8 May 2020

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SUMMARY

One rock sample is probably a chilled dolerite margin, with fine pyroxene porphyroblasts and glomerocrysts, and some amygdules. The other is a quartz-laumontite – calcite hornfels, probably formed by the Jurassic dolerite intrusion into limey sediments.

INTRODUCTION

Two drillcore samples were collected from the Ross BH1 for mineralogical and petrological analysis and identification. Details are shown in Table 1.

Table 1: Sample Details

Reg No.	Field Number	Location	Sample Description	Treatment
C113267	BH1/215.3	Ross BH1	dolerite?	XRD, TS
C113268	BH1/218.2	Ross BH1	sandstone?	XRD, TS

The samples were cut and prepared as thin sections. Some sample was also extracted for XRD analysis.

SAMPLE DESCRIPTIONS

C113267 BH1/215.3 Ross BH1 dolerite?

Under the stereomicroscope the sample C113267 is a fine grained, khaki-grey mafic rock with abundant fine black spotting, probably due to mafic phenocrysts (Fig. 1). These are about 0.5-2mm long and tabular. There are also sparse rounded white spots (amygdules?).

In thin section the sample C113267 is mostly composed of cryptocrystalline mesostasis or glass (~50%), with abundant microlites of pyroxene and plagioclase plus spots of quartz (5%) clinopyroxene (~5%), plagioclase feldspar (5%), and chlorite/serpentine/clay (5%), (Figs 2-4).

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Fig. 1. Sample C113267. FOV: about 50 mm.

The quartz occurs in rounded aggregates to about 250 microns long and appear to be amygdules (Figs 2). The quartz is colourless, stressed, recrystallized and sutured (Fig. 2).

The clinopyroxene forms colourless, skeletal prismatic crystals to about 0.8mm long, mostly as glomerocrysts (Fig. 3, 4).

The chlorite/serpentine/clay pseudomorphs replace euhedral blocky to prismatic crystals to 0.8mm long and 0.4mm diameter (Fig. 3, 4).

The plagioclase feldspar occurs as coarse blocky, colourless grains to about 0.8mm long.

The microlites of pyroxene and plagioclase occur as crystals to about 50 microns long and 50 microns wide.

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The textures and mineralogy suggest the rock was a quenched Jurassic dolerite.

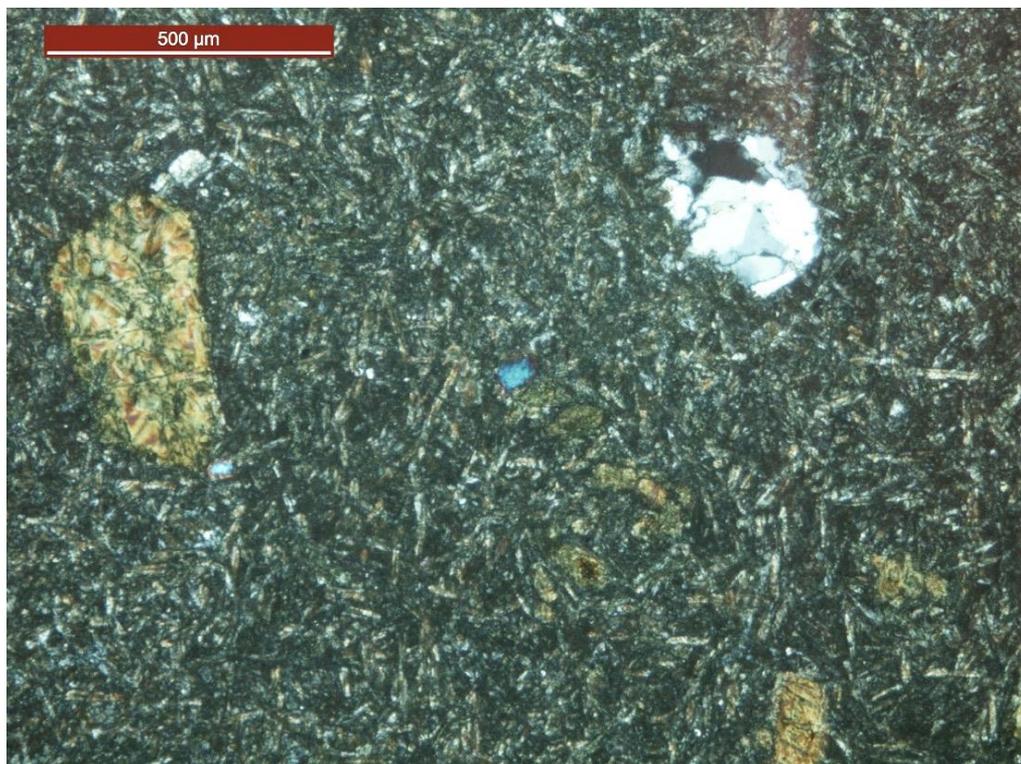


Fig. 2 Sample C113267. Polarised light, crossed polars, showing a chlorite+- smectite pseudomorph after olivine (left) and a quartz amygdule (right) in a fine glassy matrix with plagioclase and pyroxene microlites.

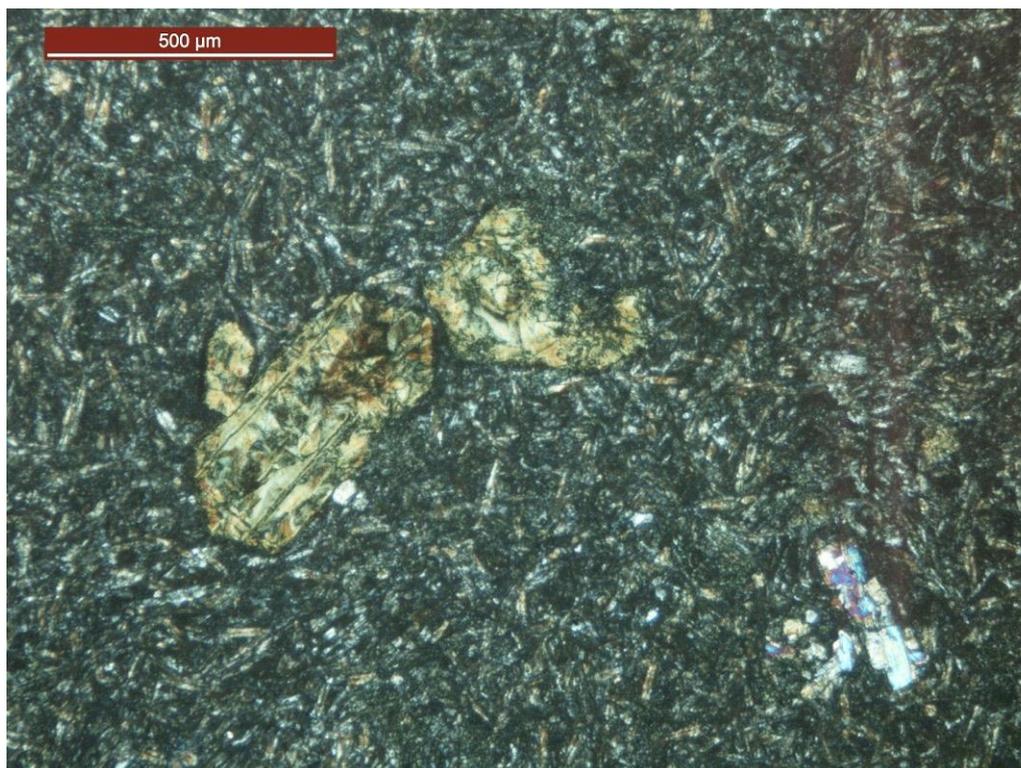


Fig. 3. Sample C113267. Polarised light, crossed polars, showing two chlorite+- smectite pseudomorphs after olivine (centre) and pyroxene phenocrysts (lower right) in a fine glassy matrix with plagioclase and pyroxene microlites.

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Fig. 4 Sample C113267. Polarised light, crossed polars, showing a skeletal glomerocryst of clinopyroxenes in a fine glassy matrix with plagioclase and pyroxene microlites.

C113268 BH1/218.2 Ross BH1 sandstone? XRD, TS

Under the stereomicroscope the sample C113268 is a fine grained, pale grey, siliceous rock, possibly a hornfels (Fig. 5). There is some white –pale pink veining, probably laumontite, to ~1mm thick.



Fig. 5: Sample C113268, FOV: about 50 mm.

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In thin section the sample C113268 is mostly composed of coarse, radiating laumontite (~50%), in a fine grained hornfelsed matrix of quartz, chlorite and feldspar.

Laumontite occurs as coarse sieve-textured radiating aggregates and in small veinlets, with calcite (Fig 6, 7). It appears to have fine quartz inclusions.

The textures and mineralogy suggest the rock was a Permian limey hornfels formed by contact metamorphism from an adjacent Jurassic dolerite.

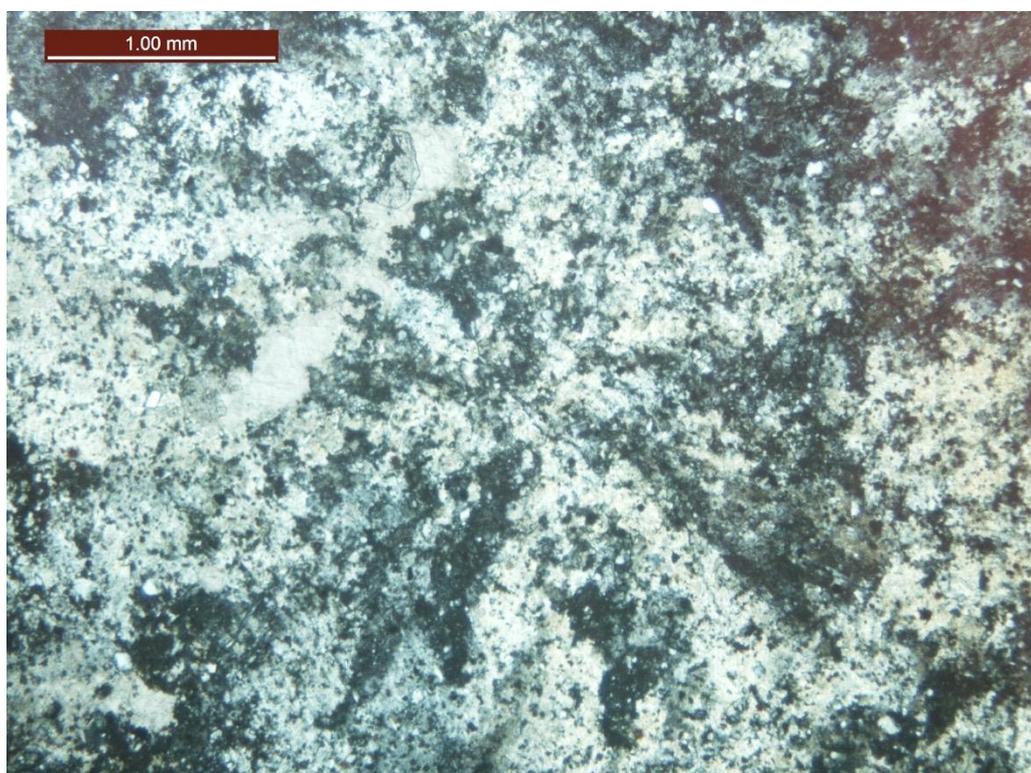


Fig. 6 Sample C113268. Polarised light, crossed polars, showing “snowflake”-texture of poikiloblastic laumontite (cream) with fine inclusions of quartz and some later laumontite veins.

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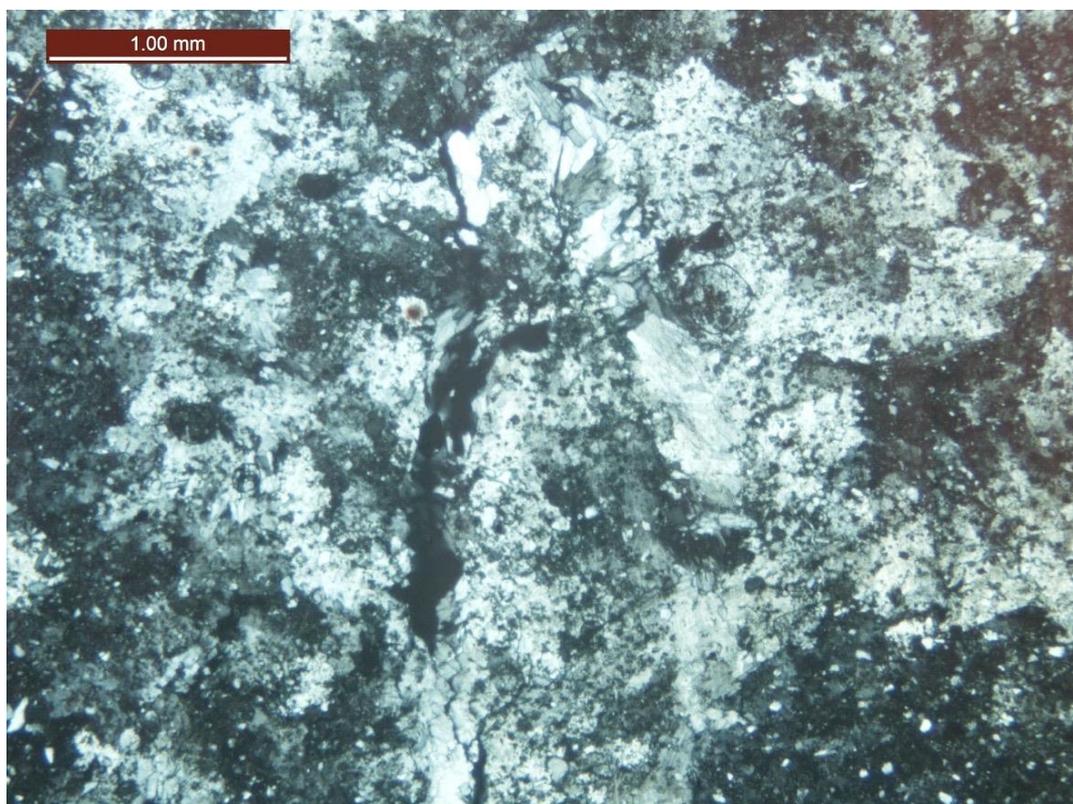


Fig. 7. Sample C113268. Polarised light, crossed polars, showing “snowflake”-texture of poikiloblastic laumontite (cream) with fine inclusions of quartz and some later laumontite veins.

XRD ANALYSES

The samples were prepared, examined and analysed in the MRT laboratories, Rosny Park, Tasmania. They were run on a Rigaku Miniflex 600 X-Ray Diffractometer system: a 600W generator 150mm goniometer with a Cu tube; 40kV/15mA, sample spinner and a D/teX Ultra High Speed 1D Detector with Be window, -3° to $145^{\circ} 2\theta$ scanning range and 2° - $140^{\circ} 2\theta$ measuring range, with a scanning speed of 0.01 to $100^{\circ}/\text{min}$, A graphite monochromator and a $K\beta$ Ni- filter, The analysis software used is the PDXL2 using the ICCD database.

The results are shown in Appendix 1 and summarised in Table 2. C113267 comprises mostly quartz, plagioclase, kaolinite, clinopyroxene and smectite. C113268 comprises mostly quartz, calcite, laumontite and chlorite (chamosite?).

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Table 2: XRD Summary (approx. wt.%)

Phase Name	C113267	C113268
Quartz	13(5)	63(10)
Plagioclase	16(5)	
Kaolinite	23(5)	
Clinopyroxene	45(10)	
Smectite	4(2)	
Calcite		6(3)
Laumontite		23(5)
Chlorite		8(3)

DISCUSSION

The sample C113267 is quartz-plagioclase-clinopyroxene rock, probably a quenched Jurassic dolerite, rather than a Tertiary basalt, due to presence of quartz rather than olivine.

The sample C113268 is quartz-calcite-laumontite hornfels, probably formed by thermal metamorphism at the contact of a Permian limey mudstone with the Jurassic dolerite.

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TECHNICAL OFFICER

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This and other data collected in MRT laboratories may enter the MRT databases but every attempt will be made to ensure it remains closed file and not be available externally, unless at your request.

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Appendix 1: XRD Results

Sample Source: Ross
MRT Job Number: LJN2018-106
Analysis: Approximate Mineralogy
Method: X-Ray Diffraction
Analyst: L Unwin
Lab Manager: R Bottrill
Date: 14/5/2020

XRD Report – C113267

General information

Measurement date:	22/8/2020	Analysis date:	14/5/2020
Job Number:	LJN2018-106	XRD	Rigaku Miniflex 600
Registration Number:	C113267	Analyst:	L.Unwin
Quantitative Method:	XPlot	Process Medium:	Wholerock
Comment:	Shifted -0.05		

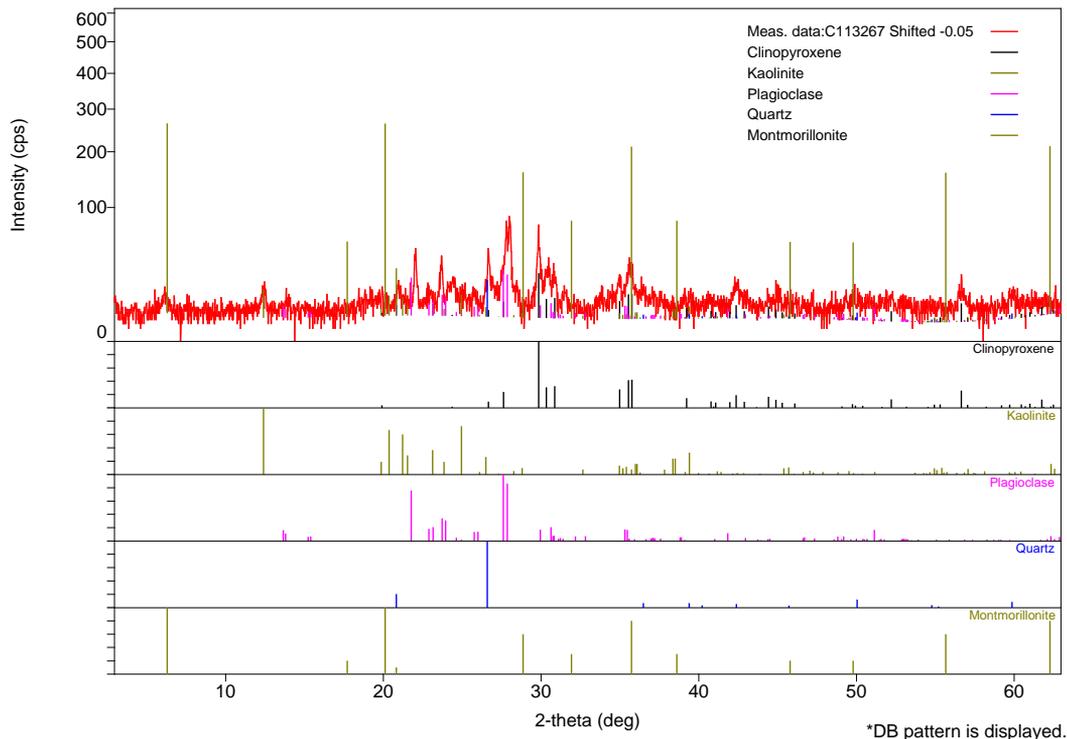
Analysis results

Phase name	Content wt%(± error)	Formula
Clinopyroxene	45(10)	$\text{Ca}_x\text{Mg}_y\text{Fe}_z(\text{Mg}_{y1}\text{Fe}_{z1})\text{Si}_2\text{O}_6$
Kaolinite	23(5)	$\text{Al}_2(\text{Si}_2\text{O}_5)(\text{OH})_4$
Plagioclase	16(5)	$(\text{Ca},\text{Na})\text{Al}(\text{Al},\text{Si})\text{Si}_2\text{O}_8$
Quartz	13(5)	SiO_2
Montmorillonite	4(2)	

Notes

Peak overlap may interfere with identifications and quantitative calculations.
Amorphous minerals and minerals present in trace amounts may not be detected.

Phase data pattern



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XRD Report – C113268

General information

Measurement date:	3/9/2018	Analysis date:	14/5/2020
Job Number:	LJN2020	XRD	Rigaku Miniflex 600
Registration Number:	C113268	Analyst:	L.Unwin
Quantitative Method:	XPlot	Process Medium:	Whole Rock
Comment:	Shifted -0.09		

Analysis results

Phase name	Content wt%(± error)	Formula
Quartz	63(10)	SiO ₂
Calcite	6(3)	CaCO ₃
Laumontite	23(5)	CaAl ₂ Si ₄ O ₁₂ · 4H ₂ O
Chlorite	8(3)	Mg ₅ Al(AlSi ₃ O ₁₀)(OH) ₈

Notes

Peak overlap may interfere with identifications and quantitative calculations.
Amorphous minerals and minerals present in trace amounts may not be detected.

Phase data pattern

