

Mineral Resources Tasmania

Mineralogical/Petrology Report

MPR2015/041

PETROLOGY AND MINERAGRAPHY: ROGER RIVER DRILLHOLES

An unpublished Mineral Resources Tasmania report for

Ken Morrison & Associates

by R S Bottrill & R N Woolley

13 January 2016

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SUMMARY

The samples studied comprised six sections of drill core from the Roger River drillholes. They are all sedimentary dolostones or dolomitic cherts and show no significant indication of any metasomatism or mineralisation.

INTRODUCTION

The objective of this study is to determine the nature (mineralogy, petrology and origin, plus any observations on any mineralisation) of six samples of cherty and dolomitic rocks from the Roger River Drillholes. The sample details are given in Table 1.

The samples were all prepared in the Mineral Resources Tasmania (MRT) Laboratories, Mornington, Tasmania. They were also examined microscopically (stereomicroscope and Polarised transmitted light microscopy (PTLM)) and some were also analysed by X-ray diffraction (XRD) to check the mineralogy in the Mineral Resources Tasmania Laboratories, Rosny Park.

Table 1: Sample details: Samples submitted

Registration Number	Field No.	Location	Sample Description
G406322	1	Roger R DH RRD-03/136m	grey fawn partly silicified massive dolomite
G406323	3	Roger R DH RRD-03/86.6m	cream fawn dolomite with fine "porphyritic" texture
G406324	7	Roger R DH RRD-02/96m	dark blue- grey white coarsely banded chert with coarse granular texture
G406325	10	Roger R DH RRD-02/114.5m	cream-fawn dolomite with speckled texture
G406326	12	Roger R DH RRD-02/76.5m	dark blue-grey, white stockworked chert
G406327	13	Roger R DH RRD-02/166.8m	dark blue- grey, white coarsely banded chert

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SAMPLE DESCRIPTIONS

The samples were examined and described using a variety of stereomicroscopes and transmitted polarised light microscopes in MRT.

G406322 Roger R DH RRD-03/136m Dolomitic chert

In hand specimen this is a massive, homogeneous, unfoliated carbonate rock, with a pale fawn/creamy colour and fine greyish spots to a few mm in size (Fig. 1). There are some very thin carbonate veinlets. Acid and XRD tests suggest dolomite is the main carbonate, but quartz is dominant.

In thin section the rock is a finely nodular, cherty carbonate or dolomitic chert with abundant interstitial quartz (Fig. 2). The nodules (about 75%) are about 0.5-1mm in size and are partly micritic (submicron) dolomite, variably recrystallised to fine to medium grained sparry dolomite. Most have a core of very fine cherty quartz, which appears to be altering to dolomite, but may indicate early silicification of original calcitic cores? Intra-nodular spaces (about 25%) have been mostly infilled with cherty to macro-crystalline quartz to about 0.1mm, coarser in the centres. Some lamellar textures may represent remnant cryptalgal or stromatolitic laminations (Fig. 3), partly altered by layer-parallel diagenetic formation of sparry dolomite and reworked into an intraformational conglomerate?

There is no foliation or indication of any deformation, except a little microveining.

Textures appear to be diagenetic; there is no indication of hydrothermal alteration or of any sulphides or any other mineralisation.

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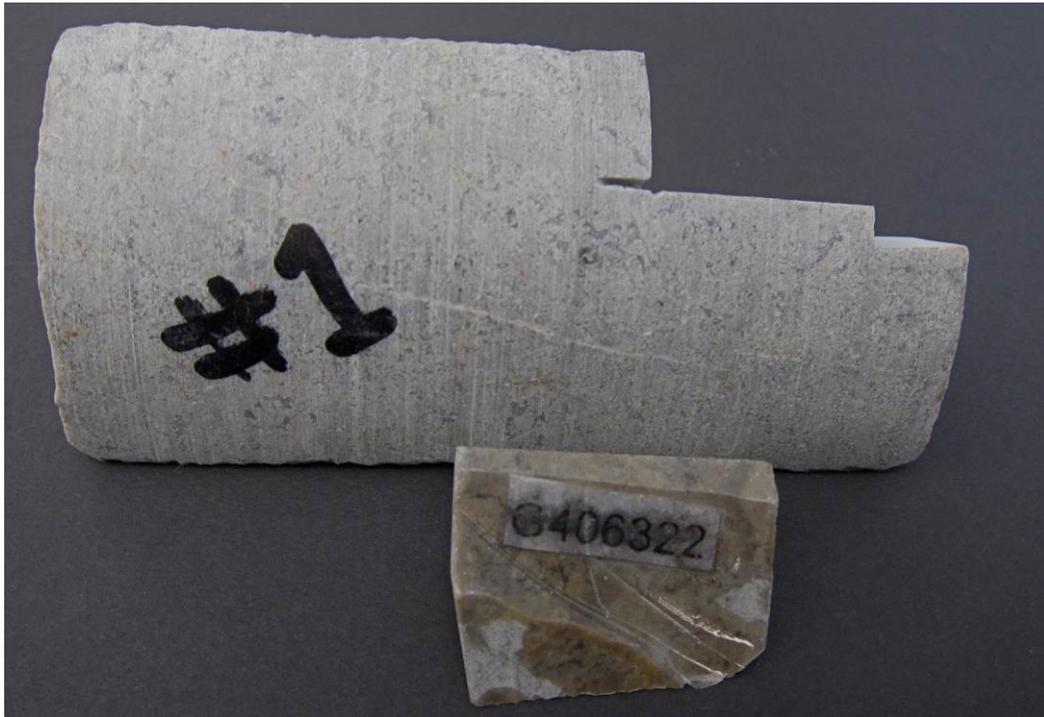


Fig. 1. G406322: Massive dolostone with cherty spotting and fine veining. FOV 40x60mm.

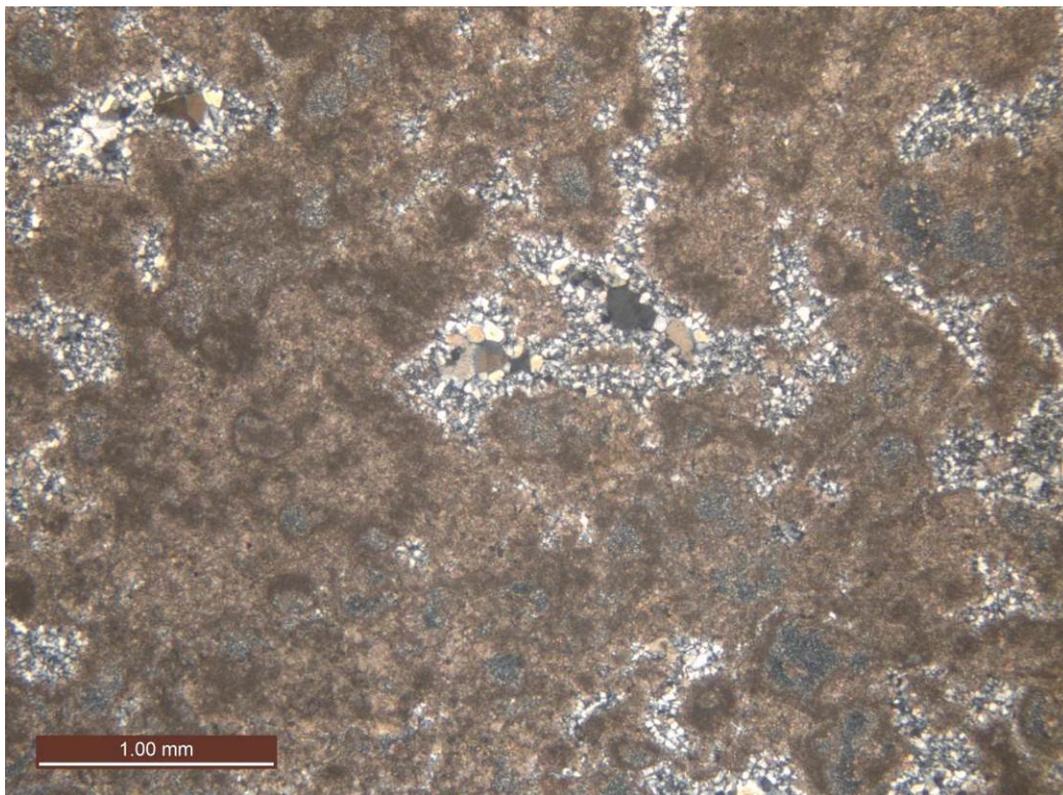


Fig. 2. G406322: Mottled micritic to finely sparry nodular dolomite (brownish) with early chert nodules (grey) and inter-nodular pore-filling chert and macroquartz (white, grey, yellow). XPTL

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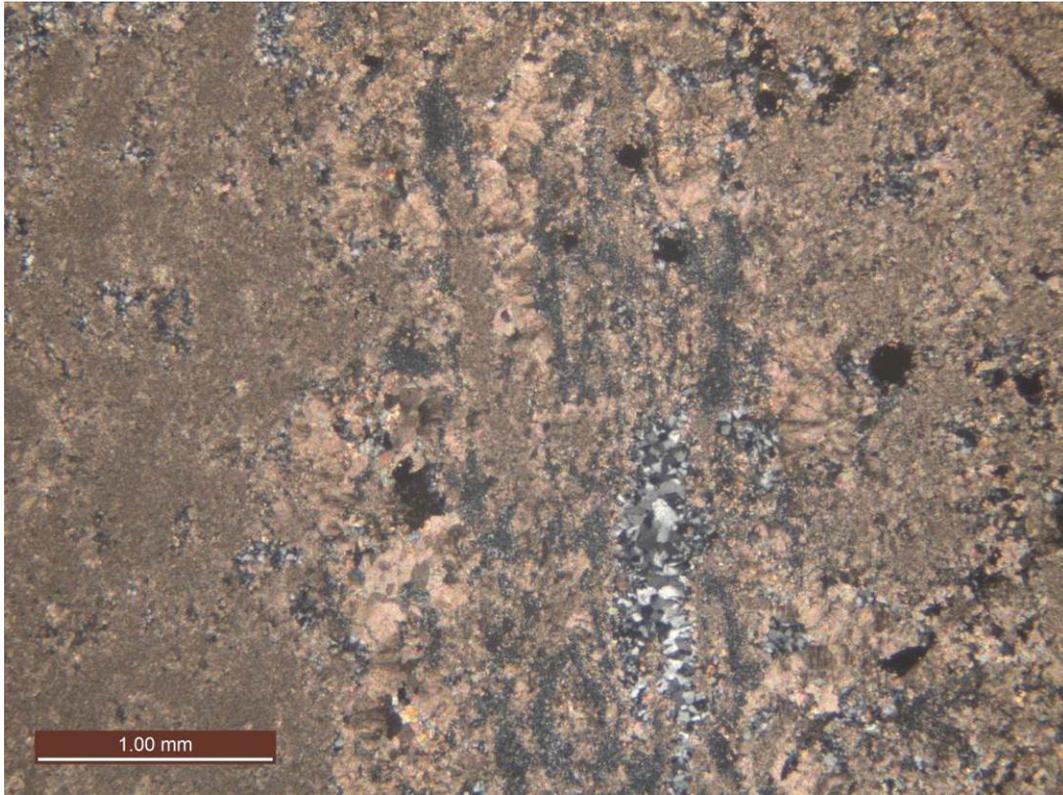


Fig. 3. G406322: Mottled micritic to finely sparry nodular dolomite (brownish) with early chert layers (grey) and irregular segregations of sparry dolomite, chert and macroquartz. XPTL

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G406323 **Roger R DH RRD-03/86.6m** **Dolostone**

In hand specimen this is a massive, homogeneous, unfoliated carbonate rock, with a creamy colour and fine paler spots to a few mm in size (Fig. 4). There are some very thin carbonate veinlets. Acid and XRD tests suggest dolomite is the main carbonate, but minor quartz is present.

In thin section the rock is a brecciated, mottled dolomite (Fig. 5). There are indications of early nodules of micritic (submicron) dolomite (about 25%), brecciated and largely recrystallised to sparry dolomite (to about 50 microns in size). The breccia is infilled with coarser dolomite to about 0.5mm in size in the center. Indications of chert are sparse but some small clots can be seen, possibly biogenic?, and some probable sponge spicules (Fig. 6).

There is no foliation, other than a weak suggestion of bedding, and no indication of any deformation.

Textures appear to be diagenetic; there is no indication of hydrothermal alteration or of any sulphides or any mineralisation.



Fig. 4. G406323: Massive spotty dolostone. FOV 40x60mm.

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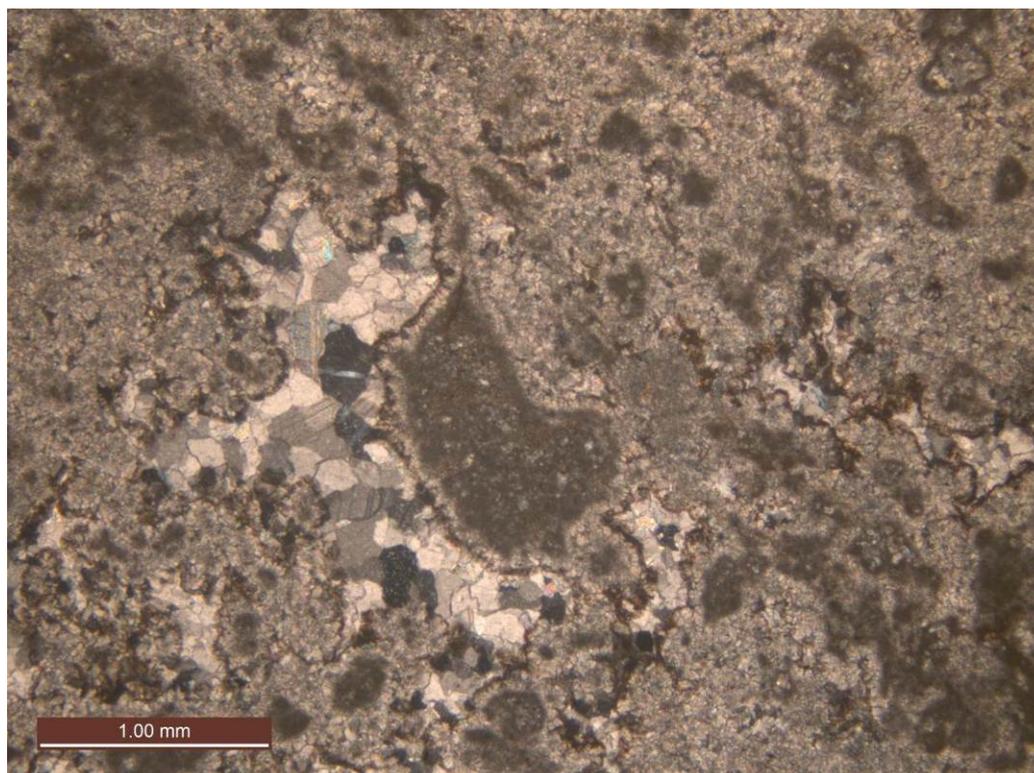


Fig. 5. G406323: Mottled micritic to finely sparry nodular dolomite (brownish) with early micritic dolomite nodules overgrown and replaced by finely sparry dolomite, with later infilling by more sparry dolomite. XPTL.

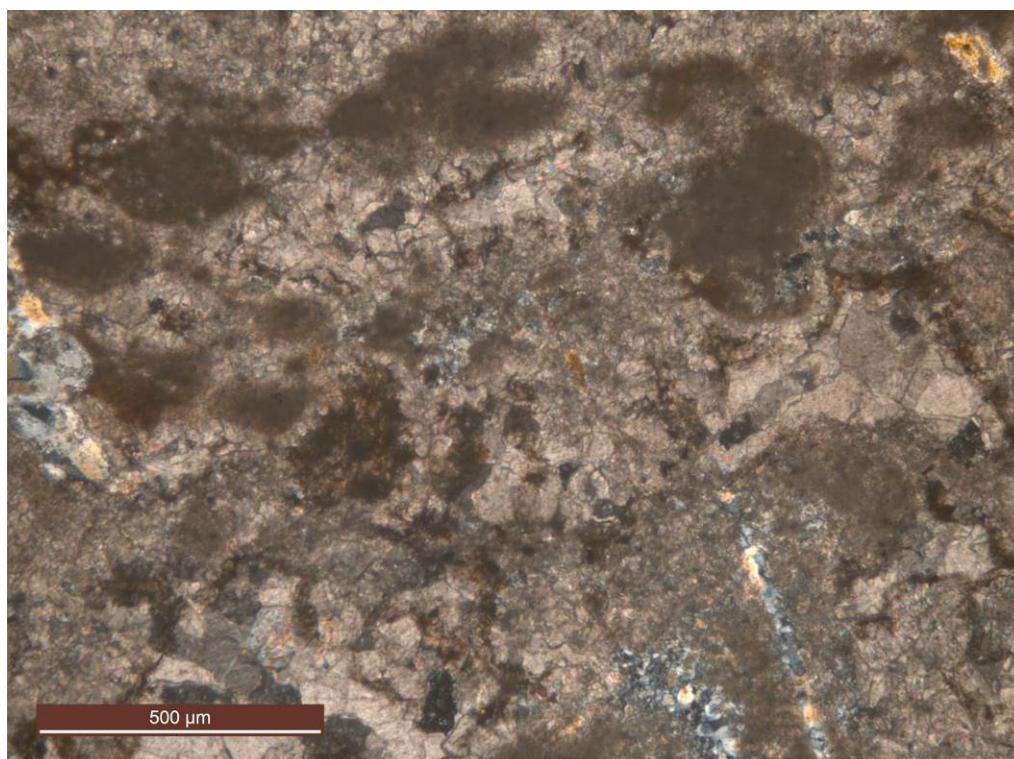


Fig. 6. G406323: Mottled micritic to finely sparry nodular dolomite (brownish) with early micritic dolomite nodules overgrown and replaced by finely sparry dolomite, with later infilling by more sparry dolomite. Some cherty to fine macroquartz aggregates are shown, one appearing to be a sponge spicule. XPTL.

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G406324

Roger R DH RRD-02/96m

Dolostone

In hand specimen this is a sheared, veined and brecciated carbonate rock, with a medium grey colour and white to creamy coloured carbonate veins and fine paler spots to a few mm in size (Fig. 7). Acid tests suggest dolomite is the main carbonate.

In thin section the rock is a brecciated, veined dolostone, with micritic to finely sparry dolomite (neomorphic pseudospar?) and clasts of cherty to coarse quartz (Fig. 8). There are indications of early banded structures, which look a little like deformed cryptalgal or stromatolitic laminations (Fig. 9), partly altered by layer-parallel diagenetic formation of sparry dolomite. Coarser quartz clots probably infilled tectonic breccias.

There is a moderate foliation and possible conjugate veining, and indications of multiple stages of brecciation and veining.

Textures appear to be diagenetic and deformational; there is no indication of hydrothermal alteration or of any sulphides or any mineralisation.



Fig. 7. G406324: Brecciated and veined carbonate rock.. FOV 40x60mm.

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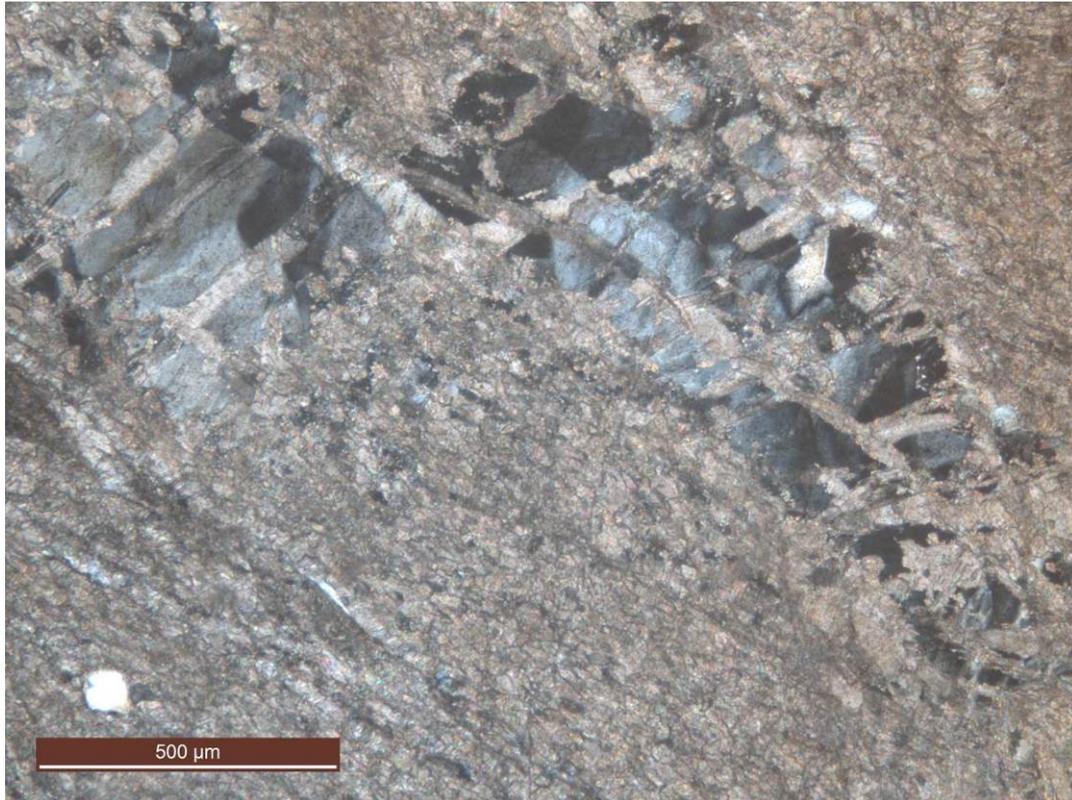


Fig. 8. G406324: Brecciated and veined quartz (grey) clasts in a finely sparry dolostone matrix. XPTL

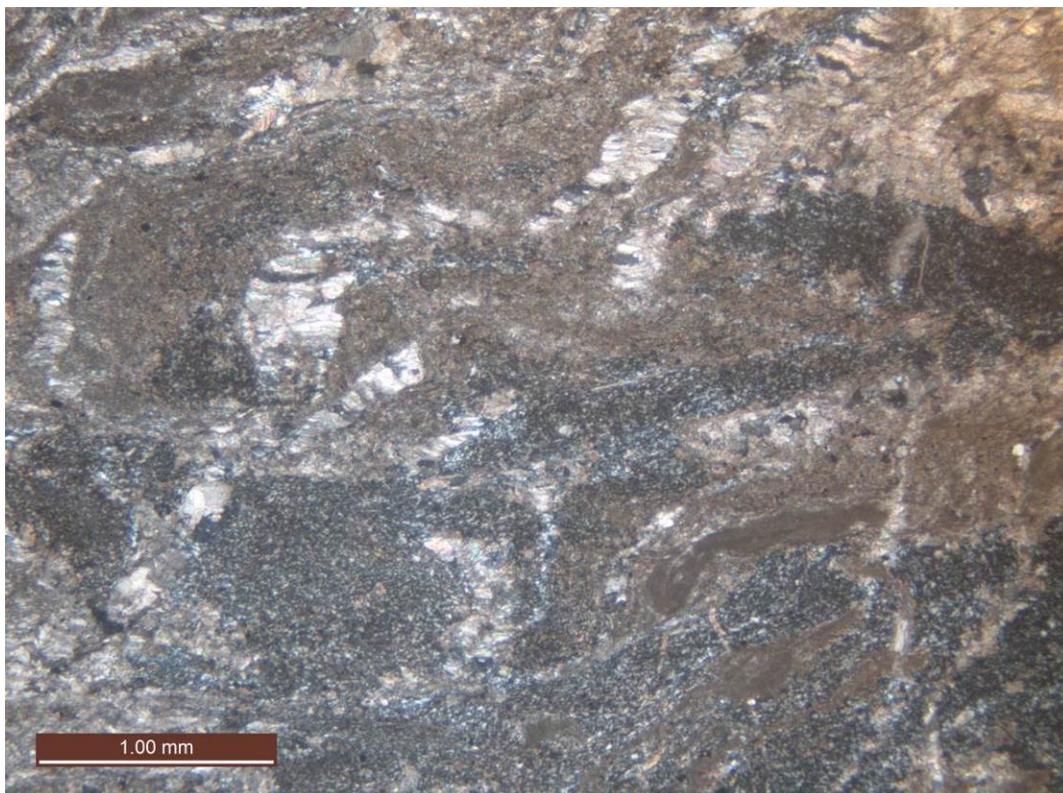


Fig. 9. G406324: Brecciated and carbonate veined chert (grey) and dolomite (brown) bands in a finely sparry dolostone matrix. XPTL

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G406325

Roger R DH RRD-02/114.5m

Dolostone

In hand specimen this is a massive, fine grained, spotty carbonate rock, with a pale fawn colour and grey spots to a few mm in size (Fig. 10). There are some very thin carbonate veinlets. Acid tests suggest dolomite is the main carbonate.

In thin section the rock is a weakly veined dolostone, with very finely sparry dolomite (neomorphic pseudospar?) matrix, containing poikiloblastic, subhedral, subrounded, bipyramidal quartz crystals (Fig. 11, 12). The quartz crystals are clouded with finely dolomite, indicating an early diagenetic or authigenic origin within a carbonate matrix. They resemble a porphyritic volcanic texture but there are no accessory minerals or textures that would suggest such an origin. There are some chert and carbonate veinlets (Fig. 12), which appear to have only slightly remobilized the surrounding minerals.

There is no foliation and only weak veining.

Textures appear to be diagenetic and deformational; there is no indication of hydrothermal alteration or of any sulphides or any mineralisation.

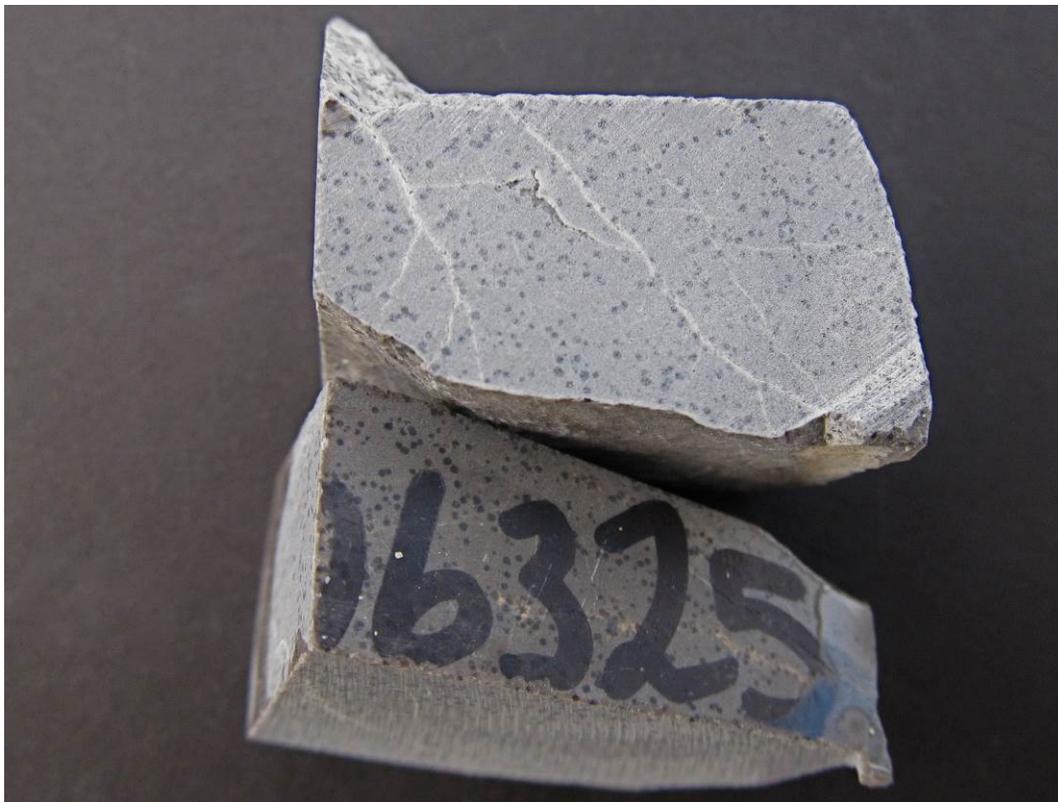


Fig. 10. G406325: Spotted carbonate rock.. FOV 40x60mm.

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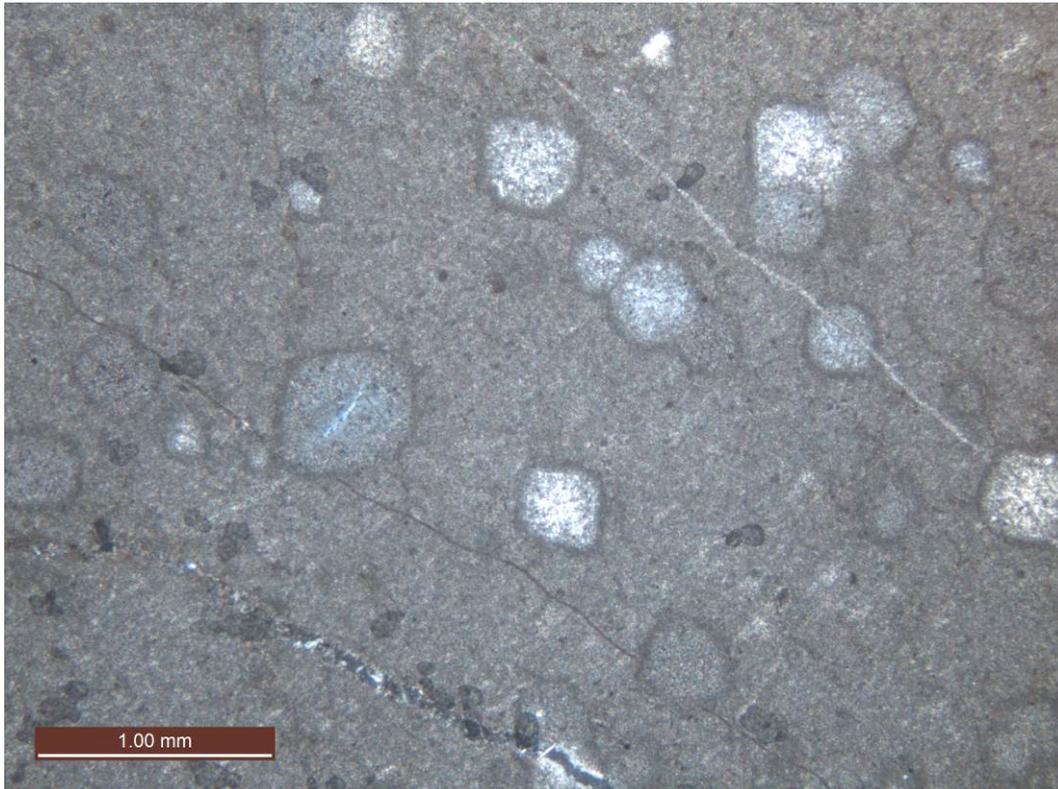


Fig. 11. G406325: Poikiloblastic, subhedral, subrounded, bipyramidal quartz crystals in a micritic to very finely sparry dolostone matrix, with some chert and carbonate veinlets. XPTL

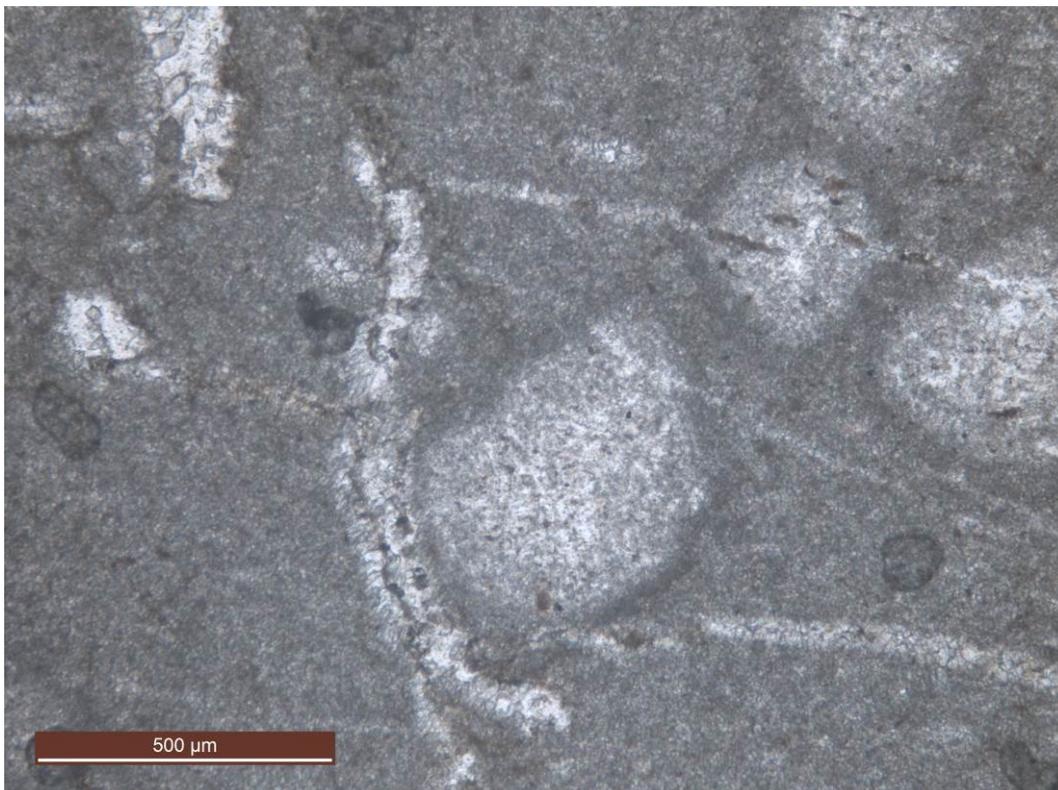


Fig. 12. G406325: Poikiloblastic, subhedral, subrounded, bipyramidal quartz crystals in a micritic to very finely sparry dolostone matrix, with some chert and carbonate veinlets. PPTL

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G406326

Roger R DH RRD-02/76.5m

Dolomitic chert

In hand specimen this is a sheared, veined and brecciated chert-carbonate rock, with a medium grey colour and white to creamy coloured carbonate veins (Fig. 13). Acid tests suggest dolomite is the main carbonate.

In thin section the rock is a brecciated, veined rock containing clots of dolostone, with micritic to finely sparry dolomite (neomorphic pseudospar?) in a matrix of dolomitic chert with clots of chalcedony and macroquartz (Fig. 14-16). There are few indications of early textures or structures. The chalcedony and coarser quartz clots probably infilled cavities in tectonic breccias (Fig. 14, 17). Late dolomite veinlets cut the chert, chalcedony and quartz infillings.

There is no foliation but extensive brecciation and veining.

Textures appear to be diagenetic and deformational; there is no indication of hydrothermal alteration or of any sulphides or any mineralisation. The rock resembles a quartz porphyry but there is no feldspar, mafic minerals, zircon, Fe-Ti minerals or other opaques, etc., that you would expect in even a highly altered altered volcanic rock.



Fig. 13. G406326: Brecciated, veined chert-dolomite rock.. FOV 40x60mm.

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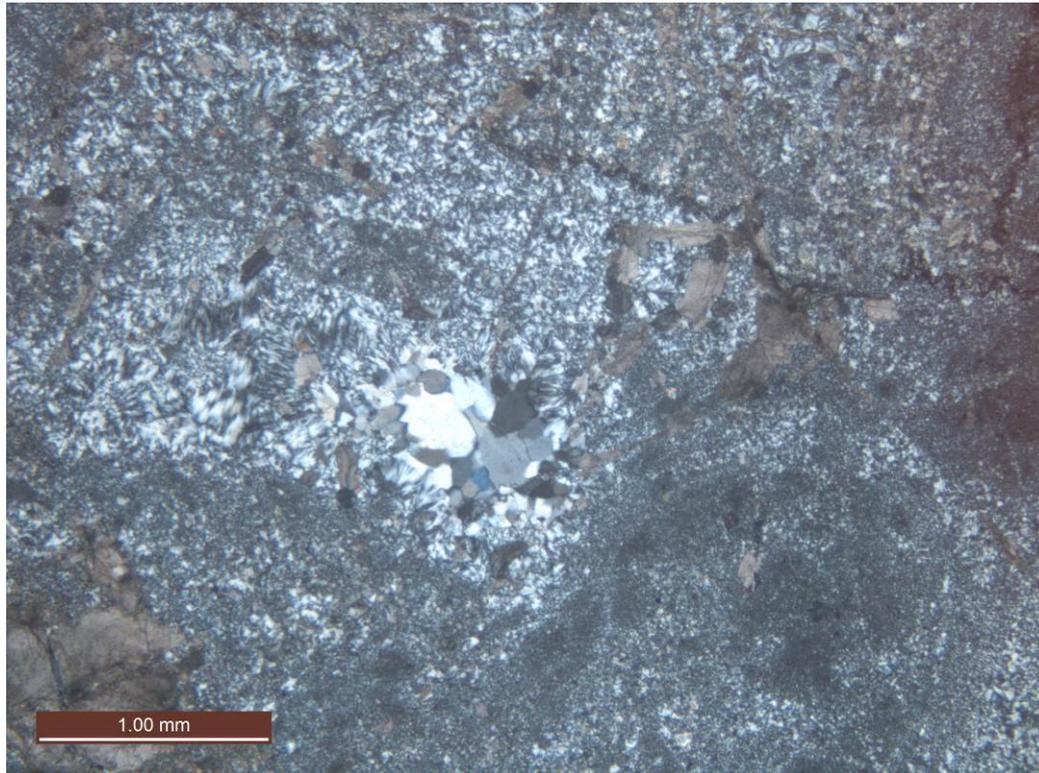


Fig. 14. G406326: Macroquartz and fibrous chalcedony, infilling cavities in a chert-dolomite breccia, with irregular clasts of dolomite.. XPTL

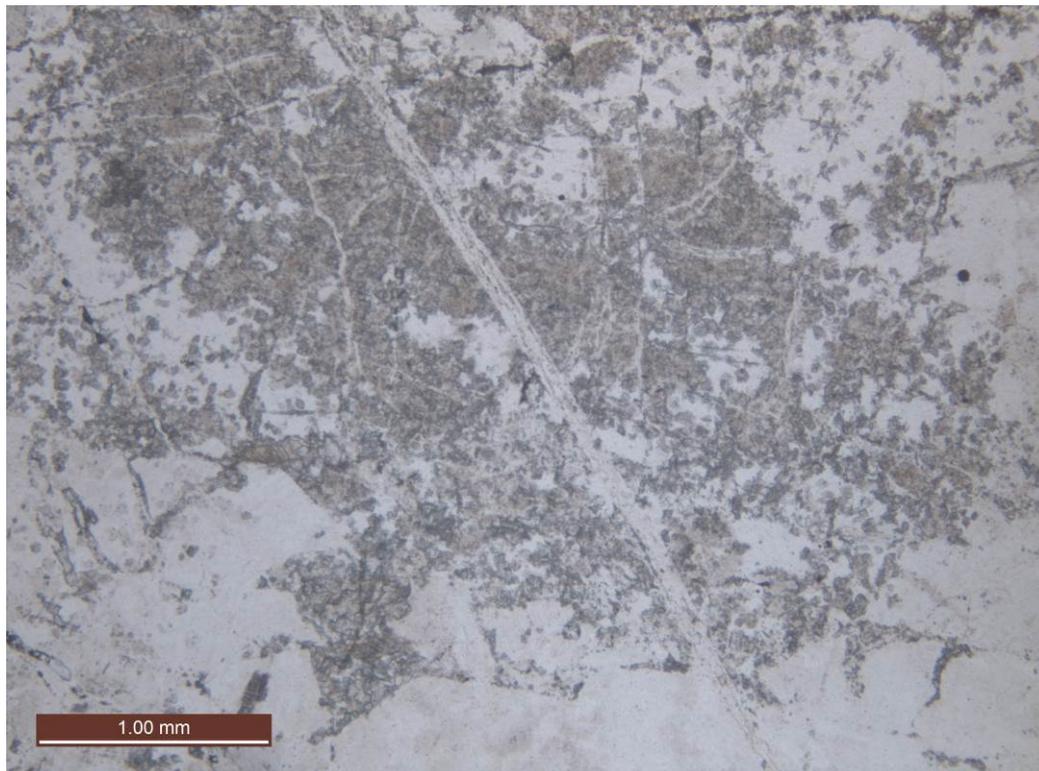


Fig. 15. G406326: Fine grained dolomite (dark), veined and partly replaced by chert and quartz. PPTL

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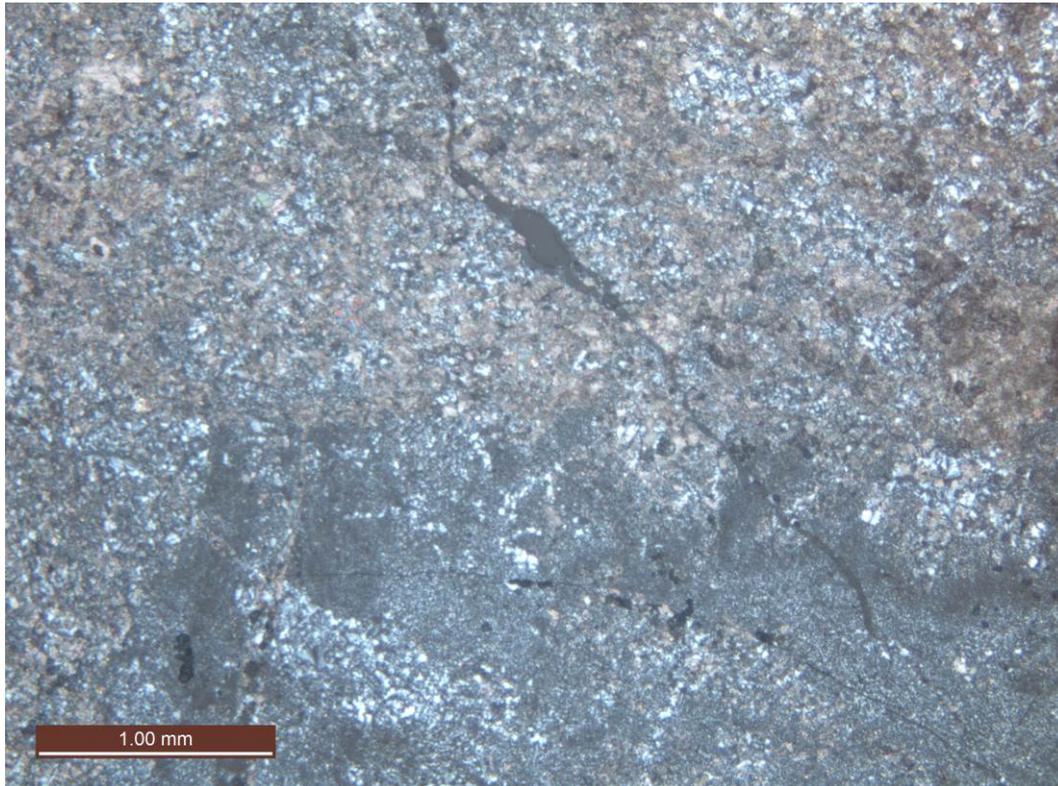


Fig. 16. G406326: Fine grained dolomite (brown), chert (grey) and quartz (white-grey). PPTL

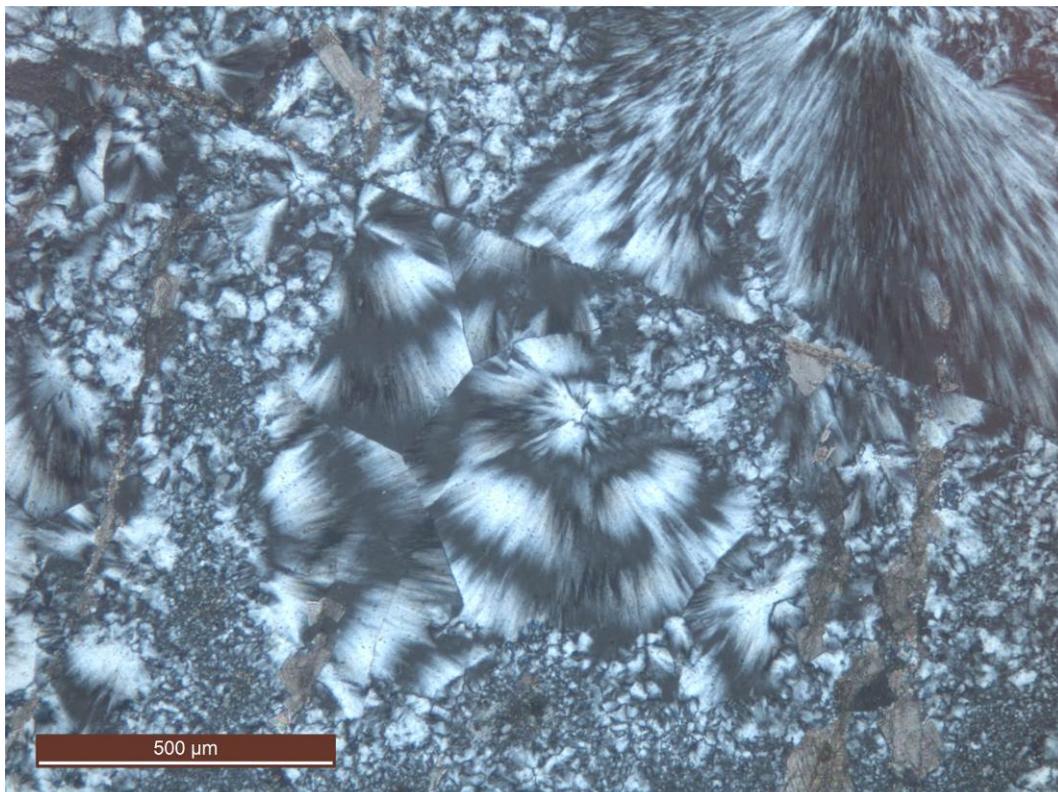


Fig. 17. G406326: Radiating chalcedony infilling breccia cavities in chert (grey), cut by late dolomite veins (brown). PPTL

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G406327 **Roger R DH RRD-02/166.8m** **Chert/Dolostone**

In hand specimen this is a mottled chert-carbonate rock, with medium grey cherty clasts in an off-white coloured carbonate matrix (Fig. 18). Acid tests suggest dolomite is the main carbonate.

In thin section the rock is a brecciated, veined rock containing clasts of macroquartz, probably recrystallised and veined chert (Fig. 19, 20). The dolostone is brecciated by micritic dolomite veinlets (Fig 20) and there are also rounded dolostone clasts suggesting a rudaceous origin, perhaps as an intraformational conglomerate (Fig. 21).

There is no foliation but extensive brecciation and veining.

Textures appear to be diagenetic and deformational; there is no indication of hydrothermal alteration or of any sulphides or any mineralisation.

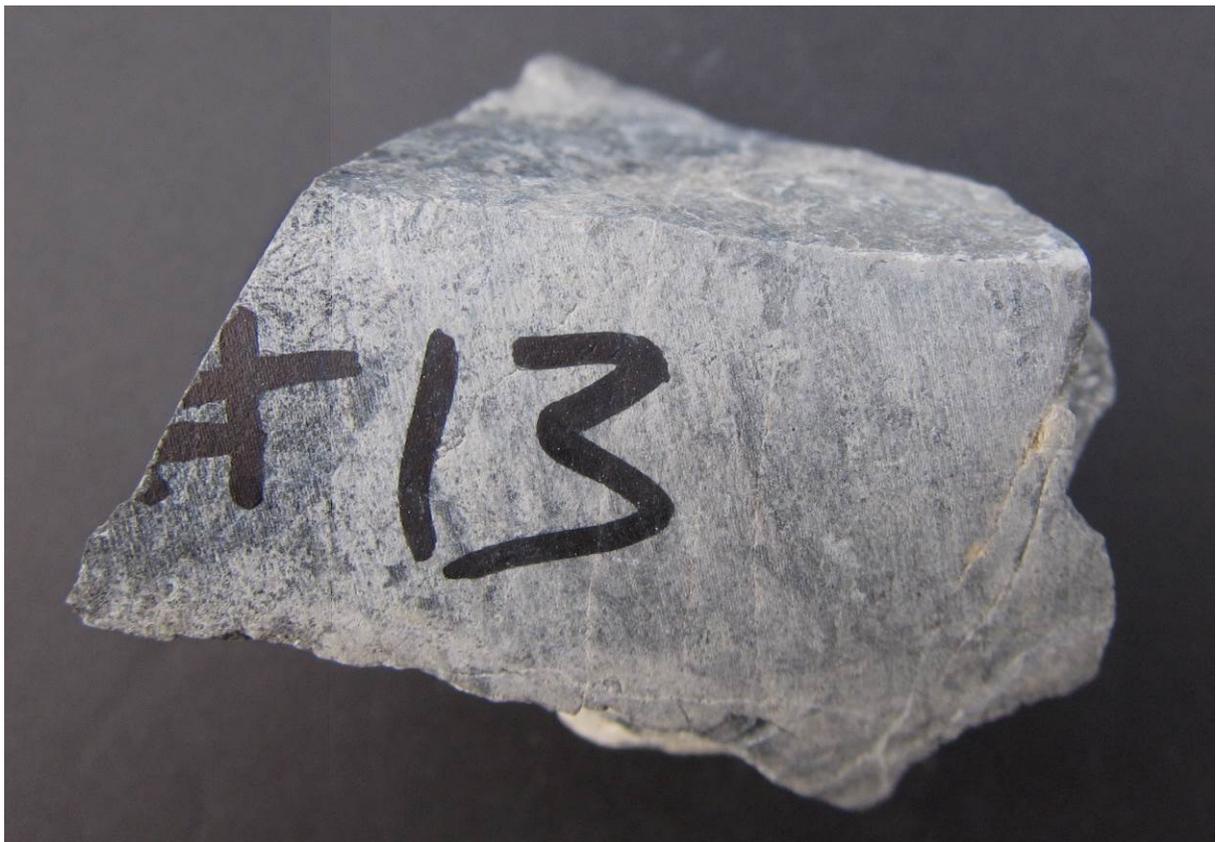


Fig. 18. G406326: Brecciated, veined chert-dolomite rock.. FOV 40x60mm.

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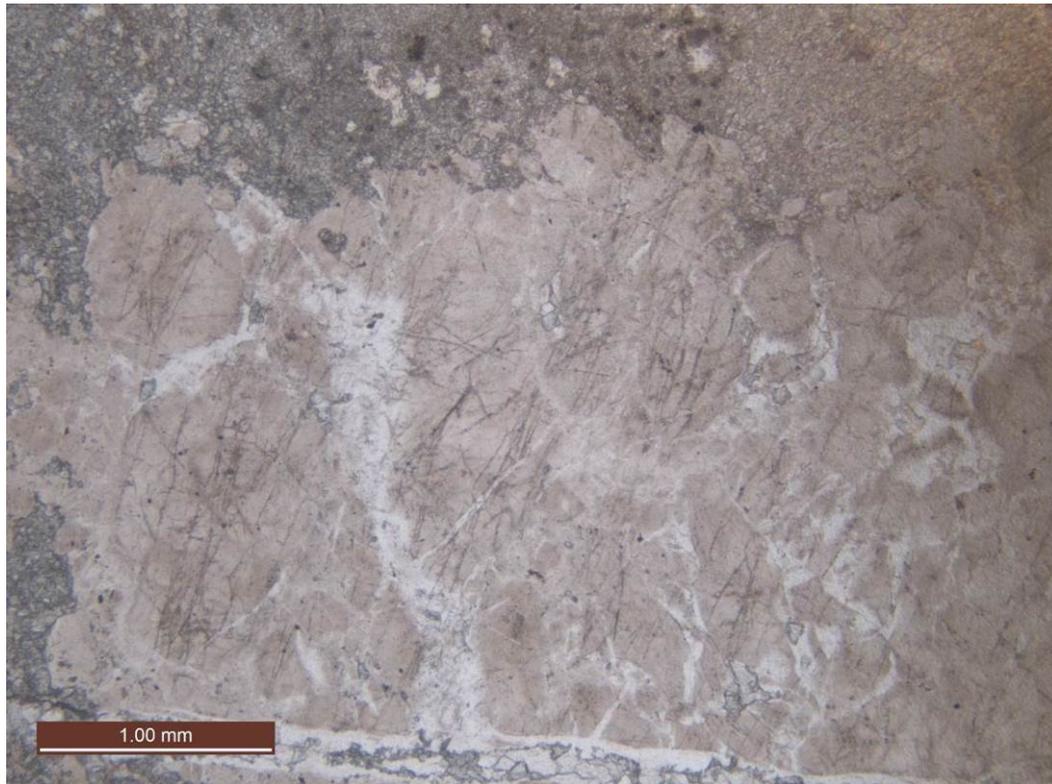


Fig. 19. G406326: Recrystallised, veined chert clast (pale fawn) in sparry dolomite (brown-grey). PPTL

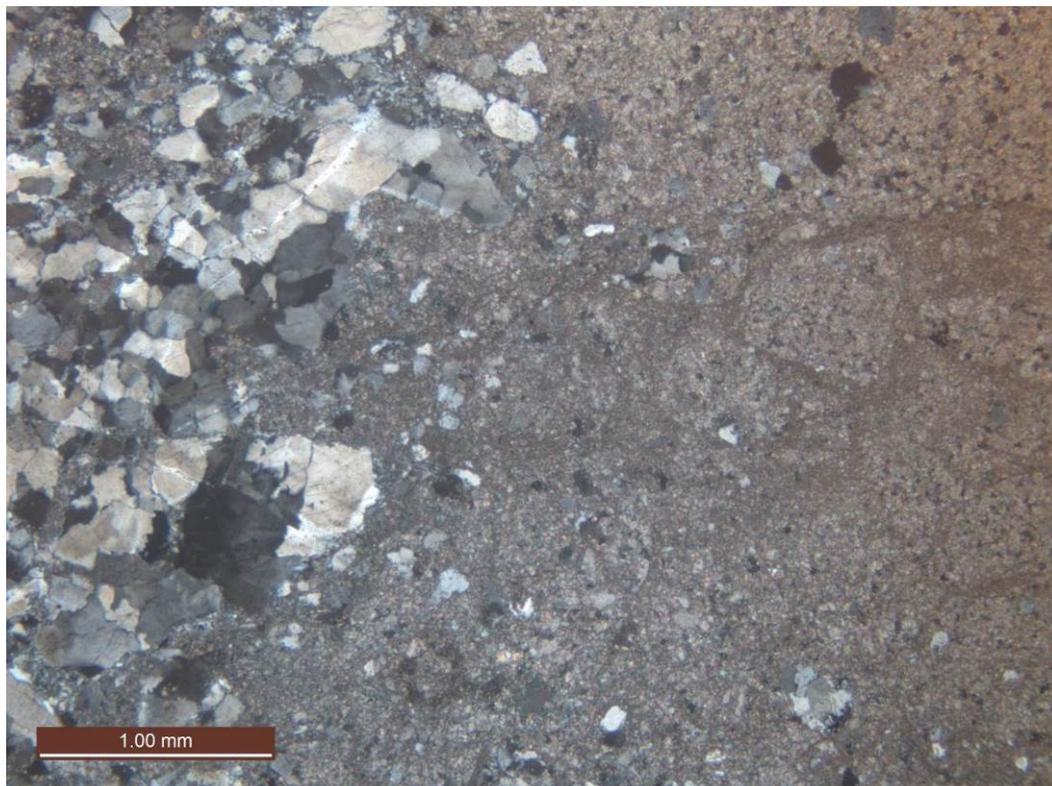


Fig. 20. G406326: Recrystallised, veined chert clast (white-grey-cream, LHS) and finely sparry, brecciated dolomite (brown-grey) with disseminated macroquartz grains. XPTL

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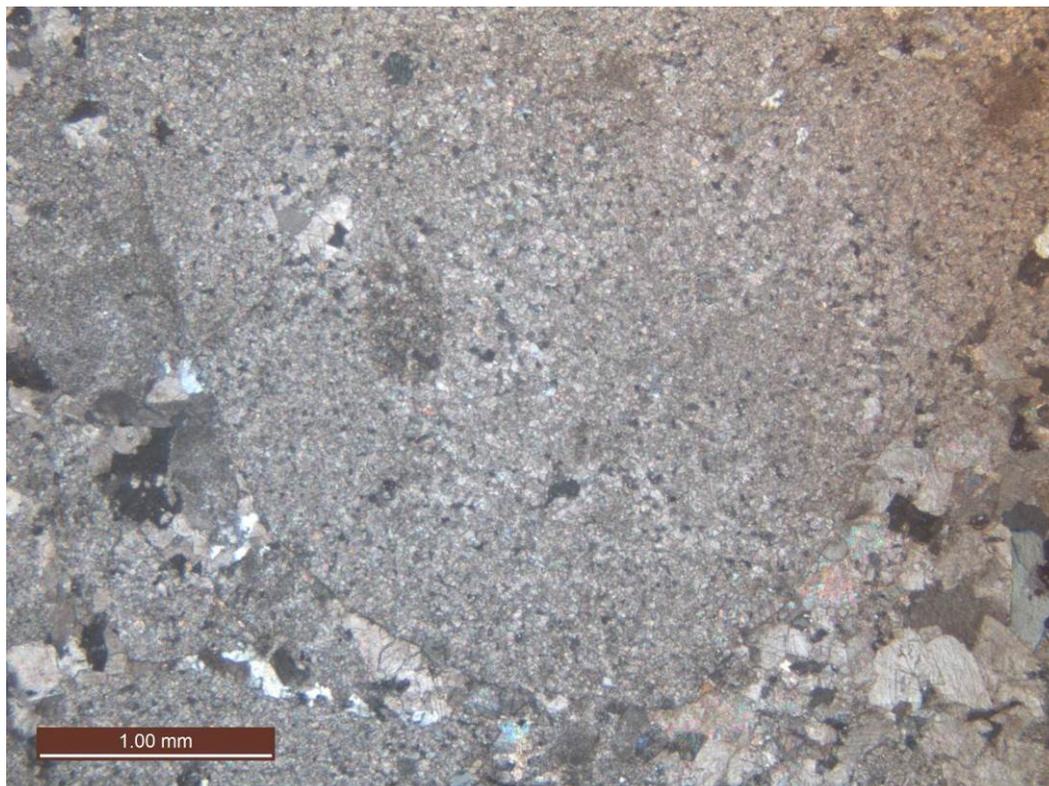


Fig. 21. G406326: Rounded clasts of dolostone with a very variably sparry to micritic texture, in a more sparry matrix, with minor quartz. XPTL

XRD

The samples were all prepared, examined and analysed in the MRT laboratories, Rosny. They were run on an automated Philips X-Ray diffractometer system: PW 1729 generator, PW 1050 goniometer and PW 1710 microprocessor with nickel-filtered copper radiation at 40kV/30mA, a graphite monochromator (PW1752), sample spinner and a proportional detector (sealed gas filled PW1711). The PW1710 system is presently driven by the CSIRO XRD software: "PW1710 for Windows" and "XPLOT for Windows". Interpretation and quantification is manual using a series of prepared standards of the more common minerals to enable some semi-quantitative analysis. The results are shown in Appendix 1, and discussed in the text above.

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SUMMARY AND DISCUSSION

These samples are all dolostones, cherty dolostones and dolomitic cherts. The compositions and textures all appear to be consistent with an origin as sedimentary/biogenic dolomite with locally strong diagenetic and deformational modification; there is no definitive indication of any hydrothermal alteration or of any sulphides or any mineralisation. One sample contains bipyramidal quartzes similar to those found in quartz porphyries, but the lack of any other minerals from such rocks makes this origin very unlikely. Bipyramidal quartzes can form from low to high temperatures and various conditions, and is quartz in carbonate rocks often lacks prisms.

R. Bottrill

R. Woolley

MINERALOGIST/PETROLOGIST

TECHNICAL OFFICER

Abbreviations:

PPRL: Plane polarised reflected light

XPTL: Cross polarised transmitted light

PPTL: Plane polarised transmitted light

Disclaimers

While every care has been taken in the preparation of this report, no warranty is given as to the correctness of the information and no liability is accepted for any statement or opinion or for any error or omission. No reader should act or fail to act on the basis of any material contained herein. Readers should consult professional advisers. As a result the Crown in Right of the State of Tasmania and its employees, contractors and agents expressly disclaim all and any liability (including all liability from or attributable to any negligent or wrongful act or omission) to any persons whatsoever in respect of anything done or omitted to be done by any such person in reliance whether in whole or in part upon any of the material in this report.

These analyses collected in the MRT laboratories, along with some other data on the samples submitted, may enter the MRT databases but every attempt will be made to ensure the data remains closed file and not be available externally, except at your request.

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Appendix 1: XRD Analysis

Mineral Resources Tasmania Laboratory Report

Client: K. Morrison

Sample Source: Roger River

MRT Job Number: LJN2015/041

Analysis: Approximate Mineralogy

Method: X-Ray Diffraction

Results (approx. wt. %)

Sample	1	3	10
Reg. No.	G406322	G406323	G406325
>80%		Dolomite	
65%-80%			Dolomite
50%-65%	Quartz		
35%-50%	Dolomite		
25%-35%			
15%-25%			Quartz
10%-15%			
5%-10%		Quartz	
2%-5%			Kaolinite
<2%			

Peak overlap may interfere with identifications (e.g. Kaolinite and Dickite) and quantitative calculations.

Amorphous material (e.g. organic matter) and minerals present in trace amounts may not be detected.

Analyst: R.N. Woolley

Date: 27 March 2015