

163049 **Massive cryptocrystalline calcrete as a matrix/cement crowded with abundant (50%) random, unsorted single grains, granules and small pebbles of (residual quartz > K-spar, minor limonite). Possibly calcrete cap over deeply weathered granitoid.**

Hand Specimen

This sample is microporous and bone-coloured with a limonitised fragment visible on the cut surface as well as quartz fragments. Most of the material is apparently calcite as it 'fizzes' rapidly with dilute HCl.

Thin Section

Abundant (50%) single and some composite grains of quartz > K-spar, unsorted from 0.2mm to 6mm long (i.e. sand, granules and small pebbles) are randomly disposed throughout massive calcretes forming the other 50% of this sample. The grains are commonly partly fractured and fragmented K-spar (microcline and orthoclase). The sparse limonitised fragments include oxidised fine-grained possible hematite or magnetite. The fragments are commonly rimmed and veined by micro-columnar or granular carbonate.

This material is superficial gravel cemented by supergene calcite and apparently derived from a basement containing granitoids.

There is no evidence of derived kimberlitic material.

163048

Massive to vaguely (?supergene) layered, fine porous silica. Includes colloform opal, abundant interstitial chalcedony, minor microsparry quartz and small crystal-lined cavities, also diffuse limonitic clays. Accessory very small relicts of silicified possible fossils (as seen to be far more abundant and larger in 163047).

Hand Specimen

This sample has massive brown and cream zones and a brownish microporous rim and seems to be siliceous.

Thin Section

A large proportion of this thin section is occupied by sub-millimetre to centimetre-scale masses of colloform-banded opal possibly accompanied by clay and limonite. Rare single-crystal quartz grains and fine patchy partly shredded diffuse/structureless limonitic-clays are incorporated within the opal. Small interstitial areas are occupied by chalcedony and larger interstitial areas have colloform banded, variously length-fast and length-slow chalcedony, with lesser microsparry quartz compared to the previous sample. Some areas also have crystal-lined cavities to 3mm long faced by chalcedony or microsparry quartz.

INDIVIDUAL DESCRIPTIONS

163047 **Crudely microlayered mass of fine porous siliceous material including cherty chalcedonic and microsparry quartz. Crowded with numerous small platy possible plant-shred-like fossils (now silicified). Interpreted as supergene, silicified possible former limestone.**

Hand Specimen

This sample is pale and has abundant limonite-lined voids but is hard and possibly siliceous.

Thin Section

This weakly layered porous mass essentially entirely of silica, includes cherty, axiolitic, chalcedonic and microsparry quartz as well as partly limonite-rimmed voids to 6mm long. The axiolitic quartz outlines abundant (40%) layered (?bedded) loose-packed relict "forms" mostly about 0.2mm thick and up to 5mm long, variously platy, curved and amoeboid patterns, locally with limonite ± clay. These forms are somewhat obscure but could possibly represent plant (or animal?) fossil debris.

Interstitial matrix areas are variably cherty textured or microsparry quartz with some length-slow chalcedony in addition to that in the axiolitic aggregates. Some areas of microsparry quartz have small crystal-lined cavities and some areas of fine-grained quartz have interstitial limonite.

No evidence of any recognisable precursor rock-type (including no relicts of possible lamprophyric material).

SUMMARY COMMENTS

The three rock samples described in this report from normal thin sections are from the Sandover River area 400km northeast of Alice Springs in the Northern Territory. They were submitted for examination particularly to check for possible kimberlitic characteristics.

Samples 163047 and 163048 are irregularly massive to vaguely (?supergene) layered, microporous and siliceous. Sample 160347 contains up to 30% apparent silicified fossil fragments. The host quartz rock is variably fine cherty, axiolic, chalcedonic and microsparry \pm limonite. This may represent silicified limestone.

The silica in sample 163048 consists of opal, chalcedony and microsparry quartz, which incorporates ultrafine skeletal 'limonitic-clay'. Sparse small relict (silicified) forms seem to be smaller equivalents of the abundant 'fossils' in sample 16307. Otherwise most textures within the silica are low temperature (colloform) and this may also be silicified limestone. Silicification in both of these samples is low temperature/ migratory/cumulative, almost certainly supergene.

Sample 163049 is calcrete (cement) incorporating abundant scattered unconsolidated grains of sand, also of gravel, mostly of single-crystal quartz, some polycrystalline quartz, also of K-spar and sparse limonite fragments. This seems to have formed above weathered granite.

The petrology did not identify any actual (or possible relict) grains or rock fragments or diagnostic heavy mineral grains which could be construed as kimberlitic-derived. [A heavy mineral concentrate of bulk material may reveal indicator mineral grains.]

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MINERALOGICAL REPORT No. 9415

by Alan C. Purvis, PhD

September 30th, 2008

TO : Mr Nick Byrne
Acacia Minerals Pty Ltd
PO Box 4156
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YOUR REFERENCE : Your letter 20/8/08

MATERIAL : Rock samples 163047, 163048, 163049
From Sandover River area (Ooratippra Diamond
Project)

WORK REQUESTED : Thin section preparation, description and report
with comments as specified.

SAMPLES & SECTIONS : Returned to you with this report.

DIGITAL COPY : Emailed 1/10/08 to:
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