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REPORT CMS 87/3/19

YOUR REFERENCE:	Letter dated 17.3.1987
DATE RECEIVED:	19th March, 1987
SAMPLE NOS.:	379365 - 379376
SUBMITTED BY:	A.M. Hesse
WORK REQUESTED:	Petrology

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H.W. Fander, M. Sc.

REPORT CMS 87/3/19

Twelve samples of drill core from DDH-HAT 8 in the Que-Hellyer area were received for routine petrological description. Representative thin-sections were prepared and examined together with respective offcuts, with stain tests performed as warranted. Attached tabulated descriptions summarise the microscopic data and include interpretative comments.

Summary

As sampled, the drilled sequence reflects two sequences of basaltic lavas separated by andesitic volcanics.

The "upper" basalts are represented by samples 379365 to 379370 incl. These are dominantly porphyritic lavas with subordinate breccias or tuffs and reflect "prehnite-pumpellyite" alteration assemblages with minor sulphide disseminations. Alteration is locally complexed by relatively marked vein-controlled epidotisation (sample 379367). The detectable sulphide phase is typically chalcopyrite, possibly reflecting primarily silicate-locked Cu "exsolved" during alteration.

Andesitic lavas are represented by samples 379371 to 379374 and similarly include massive lavas and flow breccias. These rocks typically exhibit albite-chlorite-epidote alteration assemblages with minor sericite, quartz, carbonate and sulphide. Epidote is generally cloudy and microcrystalline and relative abundance of this phase, in comparison with typical Que-Hellyer andesites, is thought to reflect the proximity of two prehnite-pumpellyite-altered basaltic lava sequences, with the epidote conceivably secondary after carbonate as an accessory to the primary alteration assemblage.

The "basal" basalt comprises samples 379375 and 379376. This facies is closely analogous to the "upper" basalt, but tends to exhibit a slight relative abundance of chromite and altered phenocrystal orthopyroxene. These rocks similarly exhibit prehnite-pumpellyite alteration assemblages, with clinopyroxene the only notable relic of the initial igneous assemblage.

D. Cowan, B. Sc.

Sample No.	Classification - Composition	Fabric	Accessories	Comments
379365 (T.S. 57564)	Basaltic "Breccia". Clasts of saussuritic/albitised plagioclase-, augite-porphyrific, quartz-pumpellyite-amygdaloidal basalt; microcrystalline albite-cemented with interspersed vugs and veinlets of adularia, minor prehnite, cloudy carbonate.	Random submillimetric to centimetric "basaltic" amygdaloidal clasts; mildly corrosive matrix.	Minor chlorite (amygdales, mesostasis), traces epidote, silicified orthopyroxene. Minor traces chalcopyrite (amygdales).	Albite-cemented/prehnite-pumpellyite-altered subaqueous lava breccia or agglomeratic lithic tuff. Includes minor late albite-calcite veinlets.
379366	Altered Porphyry. Frequent partly recrystallized quartz phenocrysts, vaguely feldspar-pseudomorphous pumpellyite-epidote aggregates, silicified/prehnitised spherulites. Epidote-stained quartz matrix; disseminated poikilitic carbonate.	Strongly, coarsely porphyritic, partly recrystallized spherulitic, weakly amygdaloidal.	Minor clots of pyrite, minor albitic amygdales, microscale quartz veinlets, late albite-calcite veins.	Thoroughly quartz-epidote-pumpellyite (-carbonate-prehnite)-altered quartz-feldspar porphyry. Relict intrusive characteristics; alternately a megaclast?
379367	Amygdaloidal Basalt. Frequent augite, minor albitised to locally epidote-pseudomorphed feldspar phenocrysts, sporadic quartz + epidote amygdales. Epidote- to locally pumpellyite-stained microlitic groundmass. Sporadic	Flow-structured, amygdaloidal/glomeroporphyritic, basaltic. Irregularly veined. quartz-epidote veins.	Minor calcite in quartz-epidote veins. Frequent late discontinuous calcite(-quartz) veinlets.	Relatively pyroxenic basalt lava. Exhibits vein-controlled epidotisation; elsewhere, the rock is pumpellyite-altered (dark green zones).
379368	Basalt Breccia. Clasts of strongly augite-porphyrific, variably pumpellyite-epidote-amygdaloidal, chloritic glass-mesostasised basalt. Matrix/irregular veins of quartz and epidote-clinozoisite.	Semi-moulded to quartz-epidote-cemented/irregularly veined, basaltic-lithoclastic. Weakly flow-structured.	Minor augite- and mesostasis-replacive pumpellyite. Minor traces chalcopyrite (matrix, veins).	Chlorite-epidote-pumpellyite-altered/quartz-epidote-matrixed, veined, basaltic flow-breccia. Strongly pyroxenic in common with 379367.
379369	Amygdaloidal Basalt. Frequent augite, subordinate saussuritic/albitised plagioclase phenocrysts, quartz-chlorite-calcite-prehnite amygdales in a weakly chlorite-epidote-stained augite-albite-microlitic groundmass.	Weakly flow-structured, strongly porphyritic, amygdaloidal, basaltic.	Minor pumpellyite-quartz-pseudomorphed orthopyroxene phenocrysts. Traces of chromite, ultrafine chalcopyrite.	Prehnite-pumpellyite-epidote-chlorite-altered amygdaloidal basalt; relatively plagioclase-porphyrific/pyroxene-deficient in comparison with 379367, 379368.
379370	Basalt "Breccia". Clasts of augite/saussuritic albite-porphyrific, weakly chlorite-epidote-amygdaloidal, chlorite-mesostasised basaltic lava, minor augite, altered feldspar grains. Microcrystalline quartz cement.	Psammite- to lapilli-grade, angular, lithoclastic, with disseminated crystal fragments. Mildly corrosive cement.	Sporadic vugs of prehnite and calcite, prehnite veinlets. Rare ultrafine ?chalcopyrite.	Textural similarities with 379365, but with relatively (lithic-crystal) tuffaceous characteristics. No andesitic components. Includes minor clots of pumpellyite.
379371	Andesite. Albitised plagioclase-subordinate chlorite-cloudy epidote + quartz-pseudomorphed ferromagnesian phenocrysts in a chlorite-epidote-stained albitised plagioclase-microlathic to microlitic groundmass.	Flow-structured/compositionally banded, weakly quartz-micro-amygdaloidal.	Minor fine leucoxenised opaques.	Distinctly andesitic in comparison with the 379365-379370 basalts. Secondary albite is pink/Fe-pigmented. Ultrafine epidote is whitish pigmentation.
379372	Andesite. Abundant albitised/epidote-stained plagioclase, subordinate chlorite-epidote-pseudomorphed ferromagnesian phenocrysts in a chlorite-epidote-stained/albitised microcrystalline felsic groundmass.	Massive to flow-structured/weakly banded, strongly porphyritic. Felsitic/perlitic on a microscale.	Fine leucoxenised opaques.	Close affinities with 379371 in relict compositional features and alteration pattern. Primarily subvitric in comparison.

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Sample No.	Classification - Composition	Fabric	Accessories	Comments
379373	Andesitic Breccia. Clasts of albitised plagioclase-weakly chloritised ferromagnesian-porphyratic lava, microcrystalline-albitised to semi-selectively chlorite/cloudy epidote-altered. Sparse fine-grained quartz cement.	Moulded to locally quartz-cemented, weakly flow-structured, lapilli-grade, lithoclastic.	Leucoxenised opaques (in relatively epidotised clasts); traces of pyrite, sphalerite (in quartz matrix).	Differential alteration reflects variable crystallinity of clasts (albitic types are semi-perlitic). Overall alteration is similar to 379371, matrix). 379372. Typical lava breccia characteristics.
379374	Andesite. Albitised plagioclase-, subordinate epidote-chlorite-pseudomorphed ferromagnesian phenocrysts, minor quartz-chlorite-epidote amygdaloids in an albitite-quartz-altered/epidote-chlorite-stained, weakly feldspar-microclitic felsite groundmass.	Semi-glomeroporphyritic, weakly flow-structured and flow-brecciated. Locally microfelsitic/perlitic.	Leucoxenised opaques, Traces pyrite (amygdaloids). Minor quartz (-albite-epidote-calcite-sphalerite) veinlets.	Weakly flow-brecciated, primarily subvolcanic andesitic lava. Relatively albitic/siliceous; chlorite-epidote-deficient alteration in comparison with 379371, 379372, 379373.
379375	Amygdaloidal Basalt. Frequent augite, subordinate saussuritized feldspar and chloritised orthopyroxene phenocrysts, sporadic quartz micro-amygdaloids. Epidote-chlorite-prehnite-stained, albitised plagioclase-microclathric groundmass.	Strongly porphyritic, micro-amygdaloidal, basaltic.	Traces of chromite. Minor coarse chlorite-quartz amygdaloids. Minor traces of pyrite.	Weakly amygdaloidal pyroxenic basalt, extensively epidote-chlorite-altered with prehnite-muscovite-epidote-altered plagioclase-, fresh augite phenocrysts.
379376 (T.S. 57575)	Amygdaloidal Basalt. Frequent augite, subordinate saussuritized/albitised plagioclase, minor chloritised orthopyroxene phenocrysts, sporadic chlorite-quartz amygdaloids; epidote-chlorite-prehnite-altered, albitised plagioclase-microclathric groundmass.	Similar to 379375, relatively strongly porphyritic.	Minor traces of chromite, pyrite, chalcopyrite. Minor pumpellyite (in altered feldspar, amygdaloids).	Close affinities with 379375; relatively porphyritic in comparison. Similarly altered, but with accessory pumpellyite stainings and amygdaloids.