681413

Vancouver Petrographics Ltd.

JAMES VINNELL, Manager
JOHN G. PAYNE, Ph. D. Geologist

P.O. BOX 39
8887 NASH STREET
FORT LANGLEY, B.C.
V0X 1J0

PHONE (604) 888-1323

Report for: Colin Campbell,
Plateau Log Homes,
Site 480, R.R. 4,
Courtenay, B.C. V9N 7J3

Invoice 4670
August 1984

Samples: 2 rocks: JT-52-R, JT-71-R

Summary:

JT-52-R is an andesitic rock which was strongly foliated and possibly strongly sheared. The most probable origin is a crystal tuff, but if the deformation was more intense, the parent could have been an andesite flow or intrusion. The rock is cut by a small dike or sill parallel to foliation, and probably post-deformation; the dike is also of andesitic composition, and has a diabasic texture.

Alteration is to carbonate (probably both calcite and ankeritic dolomite), chlorite, sericite, and Ti-oxide.

JT-71-R is mainly a strongly altered tuff of andesitic? composition. It contains a few relic crystal fragments of plagioclase (and quartz) in a groundmass dominated by carbonate with much less plagioclase and sericite. It is cut by a dike similar in texture to that in JT-52-R.

The rock is cut by two sets of veins. The first contains quartz, pyrite, sericite, and minor calcite. Pyrite grains contain moderately abundant inclusions of hematite, and a moderate number of grains contain inclusions from 0.005-0.02 mm in size of native gold. The latter are associated with, but not contiguous with inclusions of pyrrhotite and lesser chalcopyrite.

The rock is cut by a later vein dominated by albite with much less calcite and one grain of chalcopyrite.

The abundance of native gold is very significant, and despite the extreme fine grain size and occurrence within pyrite, makes this a good exploration target.

John G. Payne

John G. Payne

JT-71-R Altered Tuff, cut by Andesite Dike
Veins: 1) quartz-pyrite-sericite-(Native Gold-calcite)
2) albite-carbonate-(chalcopyrite)

The sample is mainly a very fine grained altered tuff dominated by carbonate with lesser sericite and plagioclase. It is cut in one corner of the section by an andesite dike similar to that in JT-52-R. The rock is cut by an irregular set of early veins containing abundant pyrite and quartz, with lesser sericite and minor calcite. Native gold, pyrrhotite, and chalcopyrite, along with hematite occur in irregular inclusions in pyrite. A late vein is dominated by albite with lesser calcite and minor chalcopyrite.

altered tuff

carbonate	60-65%		
plagioclase	15-17		
sericite	15-17		
Ti-oxide	1- 1½	hematite	0.2%
quartz	minor		

The rock contains a few coarser grains of plagioclase up to 0.25 mm in size, and a few of quartz up to 0.5 mm long. These are set in a variable groundmass dominated by very fine to extremely fine grained carbonate (probably calcite and dolomite), with patches and disseminations of extremely to very fine grained plagioclase and/or sericite; it may be that sericite forms by replacement of plagioclase. Ti-oxide (and possibly hematite) occurs as extremely fine grained disseminations. Hematite? forms elongate plates up to 0.15 mm in size.

dikes

The andesite dike is dominated by lathy to anhedral plagioclase averaging 0.1-0.2 mm in length, with moderately to very abundant carbonate and lesser sericite and minor Ti-oxide. The texture of plagioclase is similar to that of the dike in JT-52-R. In another corner of the rock is a smaller dikelet dominated by unoriented lathy plagioclase intergrown with anhedral, equant plagioclase, with very abundant disseminated hematite-Tioxide. It is rimmed by zones of carbonate averaging 0.1 mm in width. Beyond this on one side is the altered tuff, and on the other side a medium grained quartz vein.

early veins

Early veins average 0.5-1 mm in width, and are dominated by one or more of quartz, pyrite, sericite, and locally calcite. Quartz grains are somewhat recrystallized perpendicular to vein walls. In quartz-rich zones, carbonate and sericite form irregular disseminations and patches of extremely fine grain size. Pyrite forms subhedral to euhedral grains up to 1.2 mm in size, and aggregates of finer grains of similar habit. These generally contain moderately abundant extremely fine grained inclusions of hematite. A moderate number of grains contain irregular inclusions of native gold, chalcopyrite and/or pyrrhotite, averaging 0.01 mm in size. Some pyrite grains have outer zones free of inclusions surrounding cores containing more abundant inclusions. A few clusters of pyrite are very fine grained, with moderately abundant non-reflective inclusions; these may be secondary after marcasite. Around some pyrite grains, quartz is recrystallized in pressure shadows up to 0.15 mm wide; grains are in subparallel orientation perpendicular to pyrite crystal faces. Locally associated with this quartz is minor muscovite.

(continued)

JT-52-R Andesite Crystal Tuff or Cataclasite cut by Andesite Dike

The main rock type contains fragments of plagioclase crystals (phenocrysts?) in a well foliated groundmass of plagioclase, chlorite, and lesser dolomite-calcite and muscovite, with disseminated Ti-oxide. Interpretation as a crystal tuff is more probable, but the deformation and irregular outlines of some plagioclase as well as the strongly foliated texture indicate abundant shearing.

The rock is cut by a 1-cm thick dike of diabasic andesite with abundant carbonate. A late calcite veinlet cuts both rock types.

Limonite is developed during weathering in part of the sample, and is concentrated in carbonate, suggesting an ankeritic component in the carbonate.

crystal tuff

phenocrysts	
plagioclase	25-30%
groundmass	
plagioclase	20-25
chlorite	25-30
sericite	5-10
carbonate	7-10
Ti-oxide	1½-2

Plagioclase forms ragged crystal fragments averaging 0.1-0.5 mm in size. Some show slightly deformed or fractured albite twins. The abundance of crystal fragments varies between thin layers, with some layers containing well over 50% fragments and others less than 15%.

The groundmass contains extremely fine grained plagioclase in lensy patches intergrown with very fine grained chlorite-sericite. The latter are oriented parallel to foliation. A few lenses up to 1 mm in length and 0.4 mm in width consist of slightly greener (pale green) chlorite with anomalous bright blue interference color (normal interference color is grey).

Carbonate forms extremely fine grained patches and lenses, generally irregular in outline. Both calcite and dolomite-ankerite are present, as suggested by the variability in R.I.

Ti-oxide forms extremely fine grained spots and clusters of grains disseminated throughout the rock.

andesite dike

plagioclase	65-70%
carbonate	15-20
chlorite	12-15
Ti-oxide	1- 1½

Plagioclase forms an unoriented aggregate of mainly lathy grains averaging 0.1-0.3 mm in length, with a few up to 0.8 mm long. A few patches consist of anhedral, equant grains averaging 0.1-0.3 mm in size. The texture is typical of diabase.

Carbonate (dolomite-calcite) occurs as irregular lenses, patches, and disseminations of very fine to extremely fine grain size. Lenses commonly are elongated parallel to the walls of the dike.

Chlorite forms extremely fine grained aggregates in irregular patches interstitial to plagioclase, and a very few coarser lenses up to 1 mm long (as in the crystal tuff). Ti-oxide is disseminated as in the crystal tuff.

Both units are cut by a calcite veinlet 0.03-0.05 mm in width, which cuts irregularly across the section. The crystal tuff is cut by an irregular calcite vein parallel to foliation. The vein is 0.5 mm wide.

List of Photographs

(Numbers refer to numbers of negatives)

9. JT-52-R diabasic andesite dike showing lathy plagioclase and patches of carbonate. Crossed nicols. Length of photo: 2.0 mm

10. JT-52-R andesite crystal tuff: fragments of plagioclase in a groundmass of plagioclase-chlorite-sericite-carbonate. Crossed nicols. Length of photograph 2.0 mm

11. JT-71-R altered andesite? tuff: dominated by carbonate with a few plagioclase grains, patches of sericite. X-nicols. LoPh. 2.0m

12. JT-71-R pyrite grain with inclusions of native gold. Reflected light. Length of photo: 0.24 mm

13. JT-71-R pyrite grain with inclusions of native gold, pyrrhotite?. Reflected light. Length of photo: 0.24 mm.

John G. Payne