MINERALOGICAL REPORT No. 8784

by Alan C. Purvis, PhD.

December, 28th 2005

TO :	David 'Rowdy' Rawlings Cameco Australia Pty Ltd PO Box 35921 WINNELLIE NT 0820
YOUR REFERENCE :	Order No 04241
MATERIAL & **IDENTIFICATION :**	Outcrop Samples, aircorechips, drill core Arrarra Project. Various sample numbers AAD and AAB prefix; Canada 1 and 2.
WORK REQUESTED :	Thin section preparation, description and report with comments as specified.
SAMPLES & SECTIONS :	Returned to you with this report.
DIGITAL COPY :	Enclosed with hard copy of this report.

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SUMMARY COMMENTS

Thirteen samples from the Arrarra Project covered by your order 04241, are described in this report from normal thin sections. Your spreadsheet accompanying these samples list various data for each sample including sort (consecutive numbers 110 to 124), hole ID, sample numbers AAD001-2404 to AAB0522-0220. Location, Formation, Field Descriptions and comments required of the petrology were also provided. Two additional outcrop samples are labelled Canada 1 and 2.

In this report, the author, Alan Purvis briefly describes hand specimen characteristics, followed by individual petrographic descriptions documenting visually estimated modal abundances, textures, ± comment on genesis and/or on your specific queries. A header to each description condenses this information.

Broadly, the suite as a whole consists of fresh to altered schists, amphibolites and one basaltic dyke rock sample, (sort 113). Alteration variously involves sericite, chlorite and clays, ± albite and/or hematite.

The Canadian samples represent quartz-albite-biotite gneiss of granitic composition with partly mylonitic shears rich in sericite and biotite. These two samples also contain rare epidote and epidote-allanite, but do not seem to consist of pseudotachylite, or represent impact melts as questioned in your covering note.

A summary of the samples is presented in Table 1 below, showing your sort number, sample numbers, also location columns, together with essential petrology basically as in the individual description headers.

[Sample Canada #2 is prepared as a 50mm long slide to fit into a universal stage, as requested].

Table 1: Samples described in Report No 8784, with summaries of essential petrology.

Sort	Sample No.	Location	Essential Petrology
110	AAD001-2404	Mamurri Hill	Sericite-chlorite-leucoxene-altered quartz-feldspar-biotite schist possibly derived from quartz-feldspar-porphyritic acid volcanic, with accessory zircon and apatite.
111	AAD001-2485	Mamurri Hill	Laminated quartz-sericite-K-spar-chlorite schist derived from quartz-plagioclase-K-spar-biotite schist with zircon and apatite: possibly metamorphosed acid volcanic with veins containing sericite, chlorite, quartz and unidentified grains
112	AAD001-0571	Mamurri Hill	Extremely altered foliated rock with lamellae and separate patches of altered pyroxene or scapolite (?), rare altered biotite and lenses of leucoxene in a sericite-clouded matrix. Parallel veins with quartz, chlorite and reddish adularia are present. This may represent severely altered metadolerite.
113	AAD001-0203	Mamurri Hill	Chloritised mafic dyke rock (texturally basalt) with diffuse leucoxene and irregularly disseminated hematite, partly related to chlorite-filled fractures.
114	AAD001-2573	Mamurri Hill	Altered quartz-bearing amphibolite with albite-sericite ex-plagioclase, disseminated and in quartzofeldspathic veins. Minor microplaty hematite is disseminated.
115	AAD001-2333	Mamurri Hill	Sericite-chlorite-clay-altered interbedded metasandstone and metasiltstone with quartz-chlorite-biotite veins ± pyrite and chlorite veins with epidote and pyrite. Biotite shows clay-chlorite and chlorite-prehnite alteration.
116	AAD001-0246	Mamurri Hill	Sericitised massive rock, apparently rich in granular feldspar but quartz-free, with minor hematite and very minor leucoxene.
117	AAB0419-0360	Pisolite	Two fragments of variously chlorite-smectite-sericite-leucoxene/titanite-altered laminated amphibolite derived from quartz dolerite with an adularia vein in one chip and smectite-lined fractures in the other.
118	AAB0405-0160	Pisolite	Hornblende-quartz schist with lenses of titanite and altered biotite; the hornblende has been partly altered to smectite but this seems to represent metamorphosed altered dolerite.
119	AAB0503-0040	Redstar	Altered amphibolite with pale amphibole and albite-sericite-chlorite ± clinozoisite-altered plagioclase as well as titanite and opaque oxide: metamorphosed plagioclase-rich gabbro?
120	AAB0512-0080	Redstar	Quartz-sericite phyllite derived from probable siltstone, with sericite also in veins and crosscutting limonite-filled fractures.
121	AAB0513-0200	Redstar	Laminated quartz-sericite phyllite: metasiltstone?
122	AAB0522-0220	Redstar	Actinolite-rich schistose amphibolite, probably derived from dolerite, and albite-epidote chip derived from a plagioclase-rich layer or vein: not particularly weathered.
123 124	Canada1, 2	Athabasca Basin periphery	Albite-quartz-biotite gneiss of granitic origin with mylonitic shear zones richer in sericite and biotite, with epidote and possibly transitional epidote-allanite as well as rare carbonate. Do not seem to represent impact melts or pseudotachylite.

INDIVIDUAL DESCRIPTIONS

MAMURRI HILL DAMPLES

SAMPLE AAD011-2404

ROCK NAME (from TS) Sericite-chlorite-leucoxene-altered quartz-feldspar-biotite schist possibly derived from quartz-feldspar-porphyritic acid volcanic, with accessory zircon and apatite.

HAND SPECIMEN Grey fine-grained rock possibly schistose

Field Note: *Typical grey foliated psammitic microgneiss: what is the protolith?*

Petrography

A visual estimate of the modal mineral abundances:

Mineral	Abundance	Origin/location
Quartz	Dominant	Metamorphic ± phenocrysts
Sericite	Codominant	Ex-feldspar?
Chlorite-sericite-leucoxene	Minor	Ex-biotite
Zircon, apatite	Trace	Accessories

Scattered larger quartz grains in this sample may represent residual phenocrysts to 1.5mm long and larger patches of dense sericite may also represent feldspar phenocrysts, but most of the rock is composed of fine-grained quartz and sericite possibly replacing a quartzofeldspathic micromosaic. Minor schistose biotite has been altered to chlorite, sericite and leucoxene, with pale Mg-Al chlorite. Minor zircon occurs, to 0.15mm in diameter, which would be too large for a sediment with quartz grains as small as those in this thin section, but may be consistent with a former acid volcanic. Minor apatite is fine-grained as also seen in acid volcanics.

SAMPLE AAD001-2485

ROCK NAME (from TS) Laminated quartz-sericite-K-spar-chlorite schist derived from quartz-plagioclase-K-spar-biotite schist with zircon and apatite: possibly metamorphosed acid volcanic with veins containing sericite, chlorite, quartz and unidentified grains.

HAND SPECIMEN Grey fine-grained foliated rock (schist)

Field Note: *Typical grey foliated psammitic microgneiss*

Petrography:

A visual estimate of the modal mineral abundances:

Mineral	**Abundance**	**Origin/location**
[Host Rock]		
Quartz	Abundant	Metamorphic
Sericite	Abundant	Ex-plagioclase?
K-spar	Common	Metamorphic/secondary
Chlorite-leucoxene	Minor	Ex-biotite
Zircon, apatite	Trace	Accessory
[Veins]		
Sericite	Minor	In veins
Clay	Minor	
Chlorite	Very minor	
Alunite-group mineral?	Rare	On a vein margin

The host rock is finely laminated and has a layer-parallel schistosity defined by chloritised biotite. Sparse larger quartz grains, about 1mm long, could have been quartz phenocrysts, but most of the rock is composed of fine-grained quartz, sericite possibly ex-plagioclase and less abundant fine-grained K-spar, some of which may be secondary. There may be early layer-parallel quartz veins that have been metamorphosed. Accessory apatite (to 0.25mm) and zircon (0.05 to 0.15mm) may suggest former acid volcanic rather than metasediment as the protolith.

Crosscutting veins with chlorite-rich segments and sericite or clay-rich segments, to 2mm wide, seem to terminate against slightly oblique veins to 0.4mm wide filled with sericite and

quartz and rimmed by chlorite. A lens in one of the crosscutting veins has rare rhombs of possible alunite-group mineral.

SAMPLE AAD001-0571

ROCK NAME (from TS) Extremely altered foliated rock with lamellae and separate patches of altered pyroxene or scapolite (?), rare altered biotite and lenses of leucoxene in a sericite-clouded matrix. Parallel veins with quartz, chlorite and reddish adularia are present. This may represent severely altered metadolerite.

HAND SPECIMEN Grey-green schist with cream lamellae and a vein with minor earthy hematite or limonite.

Field Note: *Pale green-pink altered semipelitic microgneiss with quartz-hematite vein*

Petrography:

A visual estimate of the modal mineral abundances:

Mineral	**Abundance**	**Origin**
Sericite ± chlorite with possible albite and/or quartz	Dominant	Main hydrothermal minerals
Probable tremolite-chlorite patches	Abundant	Ex-pyroxene/scapolite?
Clay-chlorite-leucoxene	Very minor	Ex-biotite
Leucoxene	Very minor	Ex-ilmenite
Quartz	Minor	Vein minerals`
Chlorite	minor	
Adularia (hematite-stained)	minor	

The bulk of the host rock in this sample is heavily clouded with decussate sericite with microcrystalline aggregates that may contain or consist of albite and/or quartz as well as possible fine-grained chlorite. Lenses, lamellae and blocky patches seem to be composed of fibrous tremolite-actinolite or smectite and minor to abundant chlorite, partly aligned in parallel arrays, defining a foliation, but in other areas as unoriented blocks as much as 3-4mm long. The present mineralogy of these lenses is uncertain and it seems possible that the original material was either clinopyroxene or scapolite. Very minor altered biotite is present

and is both fine-grained and unoriented. However there are disseminated lenses of leucoxene derived from ilmenite lenses as seen in metamorphosed dolerites, suggesting that this sample represents former dolerite.
There is a set of subparallel veins 3-4mm wide with zones of quartz and chlorite in the main vein, although the proportions of quartz and chlorite vary along the length of the vein and one quartz vein passes from one side of the vein to the other in a particularly chlorite-rich segment. Two narrow adularia veins occur largely within the main vein, but one vein passes out of the main vein into a position adjacent to and largely parallel to the main vein.

The mineralogy of this vein may need X-ray diffraction analysis but the original lithology seems to be mafic (e.g. metadolerite).

SAMPLE	AAD001-0203
ROCK NAME (from TS)	Chloritised mafic dyke rock (texturally basalt) with diffuse leucoxene and irregularly disseminated hematite, partly related to chlorite-filled fractures.
HAND SPECIMEN	Dark greenish grey rock with irregularly distributed hematite partly in and adjacent to fractures

Field Note: *Grey-brown ferruginised fine dolerite dyke or chloritised sandstone*

Petrography:

A visual estimate of the modal mineral abundances:

Mineral	**Abundance**	**Origin/location**
Chlorite	Dominant	Pervasive flooding
Hematite	Common	Irregularly disseminated
Leucoxene	Very minor	Diffuse, interstitial

This sample seems to represent former basalt, possibly chilled material in a narrow dyke or on the margin of a larger dyke. The whole rock is largely chlorite with excellent textural preservation as leucoxene and hematite-free areas clearly represent plagioclase laths of different sizes with diffuse leucoxene and irregularly disseminated hematite in interstitial areas. Loose aggregates of larger plagioclase crystals, rarely more than 1mm long, are abundant and are common in quenched mafic dykes, with abundant altered former plagioclase microlites. Intersecting veins are filled with chlorite with no textural preservation and have areas rich in hematite as lamellae within veins and in areas parallel to the vein margins or spreading into irregular masses away from the veins.

SAMPLE AAD001-2573

ROCK NAME (from TS) Altered quartz-bearing amphibolite with albite-sericite ex-plagioclase, disseminated and in quartzofeldspathic veins. Minor microplaty hematite is disseminated.

HAND SPECIMEN Greenish grey fine-grained rock with a possibly hematite-stained granular lens and pale veins

Field Note: *Pale brown semipelitic microgneiss or schist with minor pink quartz vein*

Petrography:

A visual estimate of the modal mineral abundances:

Mineral	**Abundance**	**Origin/location**
Hornblende	Abundant	Metamorphic, foliated
Albite-sericite (hematite-stained)	Abundant	Ex-plagioclase
Quartz	Common	Metamorphic
Microplaty hematite	Very minor	Secondary
Quartz	Minor	Vein minerals
Albite-sericite ± hematite	Minor	
Hornblende	Very minor	
Microplaty hematite	Very minor	In small patches

This sample is finely laminated and foliated but the foliation is defined by lamellae of schistose green hornblende to 0.5mm in grainsize, partly in a layer-parallel foliation but with some hornblende at 30-40° to the layering. Lenses and lamellae with albite-sericite ± hematite-altered fine-grained plagioclase and minor to common fine-grained quartz are also abundant, with sparsely disseminated patches of microplaty hematite. The granular lenses seen in hand specimen seem to represent metamorphosed quartzofeldspathic veins, roughly parallel to the foliation, with quartz to 0.8mm in grainsize disseminated and in lenses parallel to the vein as well as lenses of altered plagioclase. These veins also carry minor largely unoriented hornblende grains within plagioclase-rich areas and larger patches of microplaty hematite occur in and adjacent to these veins. This sample was quartz-bearing amphibolite.

SAMPLE AAD001-2333

ROCK NAME (from TS) Sericite-chlorite-clay-altered interbedded metasandstone and metasiltstone with quartz-chlorite-biotite veins ± pyrite and chlorite veins with epidote and pyrite. Biotite shows clay-chlorite and chlorite-prehnite alteration.

HAND SPECIMEN Banded rock with greenish or grey and pinkish bands, partly slumped or deformed, with a boudin of vein-quartz

Field Note: *Partly pink-altered brown-green hard siliceous banded schist or m icrogneiss with folding and relict bedding*

Petrography:

A visual estimate of the modal mineral abundances:

Mineral	**Abundance**	**Origin/location**
Quartz	Rare to dominant	Recrystallised/detrital
Sericite	Common/dominant	Ex-feldspar?
Chlorite	Common in some areas	Ex-sericite?
Clay-chlorite-leucoxene	Very minor	Ex-biotite
Quartz	Common	
Chlorite ± smectite	Common	In irregular veins that are
Chlorite ± prehnite, biotite	Very minor	mostly layer-parallel
Pyrite	Very minor	
Chlorite > epidote, pyrite	minor	In crosscutting veins

This sample has possible bedding laminations from 5mm upwards in thickness, largely quartz-rich with maximum grainsizes varying between 0.25mm and 0.5mm between layers, suggesting fine to medium-grained sandstone layers. These layers are internally laminated with quartz-rich and sericite-rich layers and a zone oblique to the layering within which there is relatively abundant chlorite as well as sericite. Some of this fine-scale lamination is oblique to the larger-scale layering and suggests cross bedding. Layers with little or no

quartz are also present and seem to represent shale bands from 1mm to 8mm wide, partly boudinaged. Very minor unoriented biotite in the metasediment seems to have been altered to clays or chlorite.

The apparently folded or slumped layers seen in hand specimen seem to correspond to irregular veins from 1mm to 5mm wide rich in granular quartz and irregular masses of chlorite ± smectite. The chlorite in these veins is almost isotropic and intermediate to Mg-rich with low Al. Flakes of biotite in the veins are partly fresh and partly altered to chlorite and/or prehnite. A slightly oblique vein seems to belong to this group, with minor sericite enclosed in chlorite-rich patches as well as granular quartz, and this vein also contains minor pyrite. There are also crosscutting veins with more highly birefringent, optically positive (Al-rich) chlorite as well as rare possibly REE-bearing epidote and very minor pyrite.

SAMPLE AAD001-0246

ROCK NAME (from TS) Sericitised massive rock, apparently rich in granular feldspar but quartz-free, with minor hematite and very minor leucoxene.

HAND SPECIMEN Contact between cream and pale yellow-green layers

Field Note: *Pale green-yellow chlorite-sericite-altered sandstone or metapelite?*

Petrography:

A visual estimate of the modal mineral abundances:

Mineral	**Abundance**	**Origin/location**
Sericite-1	Major	Ex-feldspar?
Sericite-2	Major	Interstitial
Hematite	Very minor	Disseminated
Leucoxene	accessory	Ex-opaque oxide

This sample is homogeneous in thin section with millimetre-sized blocky areas of microcrystalline sericite separated by decussate coarser sericite to 0.1mm in grainsize. Hematite is disseminated through the coarser sericite with very minor leucoxene. This sample seems to have been rich in granular feldspar but the original interstitial material is unclear. It does not seem to represent metasediment, but seems to have been a felsic but quartz-free igneous lithology. Some geochemistry may be useful in identifying the protolith.

PISOLITE SAMPLES

SAMPLE	AAB0419-0360
ROCK NAME (from TS)	Two fragments of variously chlorite-smectite-sericite-leucoxene/titanite-altered laminated amphibolite derived from quartz dolerite with an adularia vein in one chip and smectite-lined fractures in the other.
HAND SPECIMEN	One laminated core fragment and one cream fragment with dark fractures

Field Note: *Green-brown foliated mafic rock, probably amphibolite; is it para-amphibolite (after calc-silicate?).*

Petrography:

A visual estimate of the modal mineral abundances:

Mineral	**Abundance**	**Origin/location**
Chlorite-smectite/sericite/illite	Major	Ex-hornblende
Sericite; chlorite/sericite	Major/abundant	Ex-plagioclase
Quartz	Common	Metamorphic
Leucoxene	Minor	Ex-ilmenite
Epidote Hornblende	Very minor (pale fragment)	Residual metamorphic grains
Adularia	Very minor	In a layer-parallel vein in
Limonite after pyrite	(dark fragment)	the dark core segment

These two core fragments are very different in hand specimen, but seem to represent similar protoliths. The darker core segment has abundant variously chlorite, smectite and or sericite-altered schistose hornblende in lamellae alternating with lamellae of sericite derived from granular plagioclase and minor to common fine-grained quartz. Very long lenses of leucoxene suggest deformed altered former skeletal opaque oxide as seen in dolerites. Along one margin there is a layer-parallel vein of adularia with a lens of limonite, apparently after

pyrite. The other fragment has paler, more smectite/illite-altered schistose hornblende as well as sericite-chlorite-altered feldspar and disseminated quartz (in quartzofeldspathic lamellae). This chip also has lenses of microcrystalline titanite (sphene), rather than leucoxene, and seems to represent metadolerite. This sample also has sparse disseminated epidote in former feldspar-rich lamellae and rare residual amphibole. The crosscutting fractures visible in hand specimen contain smectite.

SAMPLE AAB0405-0160

ROCK NAME (from TS) Hornblende-quartz schist with lenses of titanite and altered biotite; the hornblende has been partly altered to smectite but this seems to represent metamorphosed altered dolerite.

HAND SPECIMEN Green speckled possible amphibolite or altered amphibolite

Field Note: *Amphibolite, partly weathered; could be metadolerite or mafic leucosome?*

Petrography:

A visual estimate of the modal mineral abundances:

Mineral	**Abundance**	**Origin/location**
Hornblende	Major	Metamorphic
Quartz	Abundant	Metamorphic
Smectite	Common	Ex-hornblende
Titanite	Very minor	Ex-ilmenite
Clay/hematite	Very minor	Ex-biotite

This sample has abundant schistose hornblende to 1.5mm in grainsize fractured, veined and rimmed by smectite and lamellae of granoblastic quartz in a micromosaic, but no obvious feldspar. Lenses of titanite occur parallel to the schistosity and there is minor altered biotite largely composed of clays and hematite. This seems to represent a metamorphosed altered dolerite but the apparent lack of feldspar is difficult to understand.

REDSTAR SAMPLES

SAMPLE	AAB0503-0040
ROCK NAME (from TS)	Altered amphibolite with pale amphibole and albite-sericite-chlorite ± clinozoisite-altered plagioclase as well as titanite and opaque oxide: metamorphosed plagioclase-rich gabbro?
HAND SPECIMEN	Laminated grey/grey-green chips

Field Note: *Amphibolite, partly weathered; could be metadolerite of mafic leucosome?*

Petrography:

A visual estimate of the modal mineral abundances:

Mineral	**Abundance**	**Origin/location**
Actinolite	Major	Metamorphic
Albite-sericite-chlorite ± clinozoisite	Major	Ex-plagioclase
Titanite	Very minor	Ex-ilmenite
Oxide	Very minor	Primary/metamorphic

These chips have irregular lenses that contain or consist of foliated granular to prismatic amphibole, possibly actinolite or Mg-rich hornblende, and areas of albite-rich altered granular plagioclase with various combinations of sericite, chlorite and possible clinozoisite. Lenses of titanite are rare but there are also rare opaque oxide grains. It seems likely that this may represent a cumulus gabbro, but some geochemistry may assist in assessing this sample.

SAMPLE AAB0512-0080

ROCK NAME (from TS) Quartz-sericite phyllite derived from probable siltstone, with sericite also in veins and crosscutting limonite-filled fractures.

HAND SPECIMEN Platy foliated pale-coloured chips

Field Note: *Silvery micaceous phyllitic semipelite*

Petrography:

A visual estimate of the modal mineral abundances:

Mineral	**Abundance**	**Origin/location**
Sericite	Dominant	Metamorphic, foliated
Quartz	Major	Metamorphic
Leucoxene	Very minor	Ex-opaque oxide?

These chips are finely laminated and foliated and have alternately quartz-rich and sericite-rich lamellae, mostly 0.05 to 0.2mm wide but as much as 0.4mm in one chip, with quartz to 0.15mm grainsize. The original lithology may have been siltstone, however. Minor leucoxene and limonite occur parallel to the foliation. One chip has layer-parallel and crosscutting veins of decussate sericite ± smectite and irregular limonite-filled fractures.

SAMPLE AAB0513-0200
ROCK NAME (from TS) Laminated quartz-sericite phyllite: metasiltstone?
HAND SPECIMEN Laminated and slightly kinked phyllite

Field Note: *Silvery micaceous phyllitic semipelite*

Petrography:

A visual estimate of the modal mineral abundances:

Mineral	Abundance	Origin/location
Sericite	Major	Metamorphic, foliated
Quartz	Major	Metamorphic
Leucoxene	Very minor	Ex-opaque oxide?

The quartz-rich and sericite-rich lamellae in this thin section range from 0.05mm to 2mm in thickness and are similar to those in the previous sample but have quartz to 0.2mm and rare possibly detrital muscovite to 0.3mm long. Some of the leucoxene is equant rather than elongate. There are narrow clay-filled fractures parallel to the foliation and some quartz-rich layers seem to have interstitial kaolinite. This seems to represent metasiltstone.

SAMPLE AAB0522-0220

ROCK NAME (from TS) Actinolite-rich schistose amphibolite, probably derived from dolerite, and albite-epidote chip derived from a plagioclase-rich layer or vein: not particularly weathered.

HAND SPECIMEN Three foliated actinolite-rich chips and an epidote-rich chip

Field Note: *Brown ferruginous fine-grained amphibolite (weathered or altered?)*

Petrography:

A visual estimate of the modal mineral abundances:

Mineral	**Abundance**	**Origin/location**
[Three chips]		
Amphibole	Dominant	Metamorphic, foliated
Plagioclase	Common	Metamorphic micromosaic
Ilmenite/titanite	Very minor	In lenses ex-opaque oxide
[One chip]		
Epidote	Major	Poikiloblastic
Albite (clouded)	Abundant	Enclosing epidote
Clay-limonite	Very minor	Ex-amphibole and in veins

Three of the chips in this thin section have abundant foliated, sheared and crenulated inequigranular tremolite-actinolite to 2mm in grainsize, commonly with colourless cores and pale green rims. Interstitial lenses of microcrystalline plagioclase are abundant and there are also lenses containing ilmenite and/or titanite. These possibly represent metadolerite. The fourth chip is undeformed and has abundant granular albite enclosing resorbed or skeletal grains of epidote to 6 or 7mm long. The albite is clouded with sericite or clay and also seems to occur in veins, with later clay veins ± limonite. Rare clay-limonite aggregates also seem to have replaced amphibole. This chip seems to represent a rock composed entirely of plagioclase, possibly a feldspar vein or a layer of anorthosite.

CANADIAN SAMPLES

SAMPLE	Canada-1 and Canada-2
ROCK NAME (from TS)	Albite-quartz-biotite gneiss of granitic origin with mylonitic shear zones richer in sericite and biotite, with epidote and possibly transitional epidote-allanite as well as rare carbonate. Do not seem to represent impact melts or pseudotachylite.
HAND SPECIMEN	Foliated granitic gneiss with fine-grained shears

Field Note: *Foliated and perhaps mylonitised granite gneiss; could be pseudotachylite: is this an impact melt rock?*

Petrography:
A visual estimate of the modal mineral abundances:

Mineral	**Abundance**	**Origin/location**
Albite ± K-spar	Dominant	Metamorphic
Quartz	Abundant	
Biotite	Minor	
Muscovite	Trace	
Epidote/allanite	Rare	
Carbonate	Trace	Secondary

This sample is mostly partly recrystallised albitised granitoid with abundant albitised plagioclase to 3mm long (Canada-1) or 4mm (Canada-2) with less abundant fresh or albitised K-spar grains, to 4 or 5mm long, some of which enclose cores of albitised plagioclase. Quartz is also abundant but largely recrystallised with grains about 0.2mm in diameter. Biotite occurs as disseminated aggregates of recrystallised foliated material and in veins with quartz ± feldspar, where it is also recrystallised and foliated. Rare grains of possibly REE-bearing epidote are present. Rare muscovite in this lithology is unoriented and post-tectonic, and there is very minor carbonate.

Parts of each thin section are occupied by shear lamellae to 4mm wide, rich in schistose biotite and/or sericite with fine-grained quartz and microcrystalline recrystallised feldspar in most areas, but some biotite-rich lamellae also contain unoriented sericite or fine-grained muscovite and microcrystalline epidote. Separate small grains of REE-bearing epidote transitional to allanite are also evident. These shears are partly mylonitic but do not represent pseudotachylites or impact melts.

There is no significant difference between these two thin sections which represent granitic gneiss with possibly mylonitic shear zones.