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EL 376

BOOLCOOMATA DAM

FIRST PARTIAL SURRENDER REPORT AT LICENCE EXPIRY/RENEWAL, FOR THE PERIOD 5/12/1977 TO 4/12/1979

Submitted by
Esso Australia Ltd
1980

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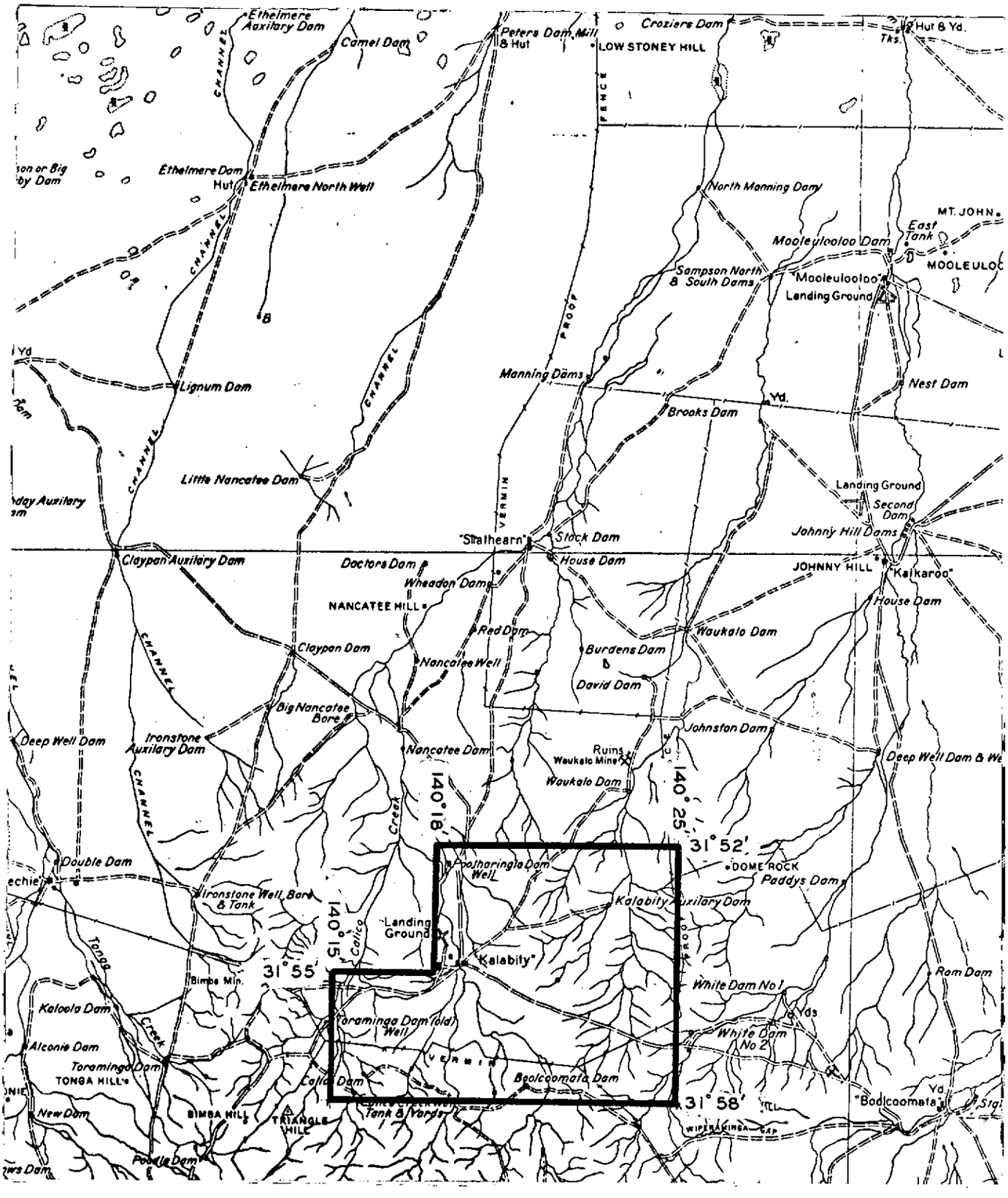
Government of South Australia
Primary Industries and Resources SA

SCHEDULE A



SCALE 1:250 000

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

APPLICANT: ESSO EXPLORATION & PRODUCTION AUSTRALIA INC.

D.M.: 398 / 77

AREA: 149 Square kilometres

1: 250000 PLANS:

CURNAMONA

EXPIRED

LOCALITY: BOOLCOOMATA DAM AREA - APPROX. 40 km N. OF OLARY

EXPIRY DATE: ~~4-12-78~~ 4·6·79 4·12·79

E.L. No.: 376

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CONTENTS ENVELOPE 3623 E.L. No. 376

TENEMENT: Exploration Licence No. 376

TENEMENT HOLDER: Esso Exploration and Production Australia Inc.

REPORT:

PLANS:

ENV.3623

EXPLORATION LICENCE 376, SOUTH AUSTRALIA

FINAL REPORT FOR RELINQUISHED PORTION

0003

to December 4, 1979 (Eighth Quarter)

SUMMARY:

An area of approximately 101 km^2 of the original total of 149 km^2 has been relinquished from E.L. 376. (See Fig. 1). The area comprises poorly outcropping metasediments and granitoids of the Willyama Complex in this area considered to be unprospective for a sizeable base metal deposit.

Work carried out since granting of the licence on December 5, 1977 has included geological mapping of the licence area at 1:25,000 scale and more detailed mapping, petrography and scintillometer traversing on selected areas.

DETAILS OF WORK PERFORMED:

1. Geological mapping at 1:25,000 Scale (See Plan 558-11)

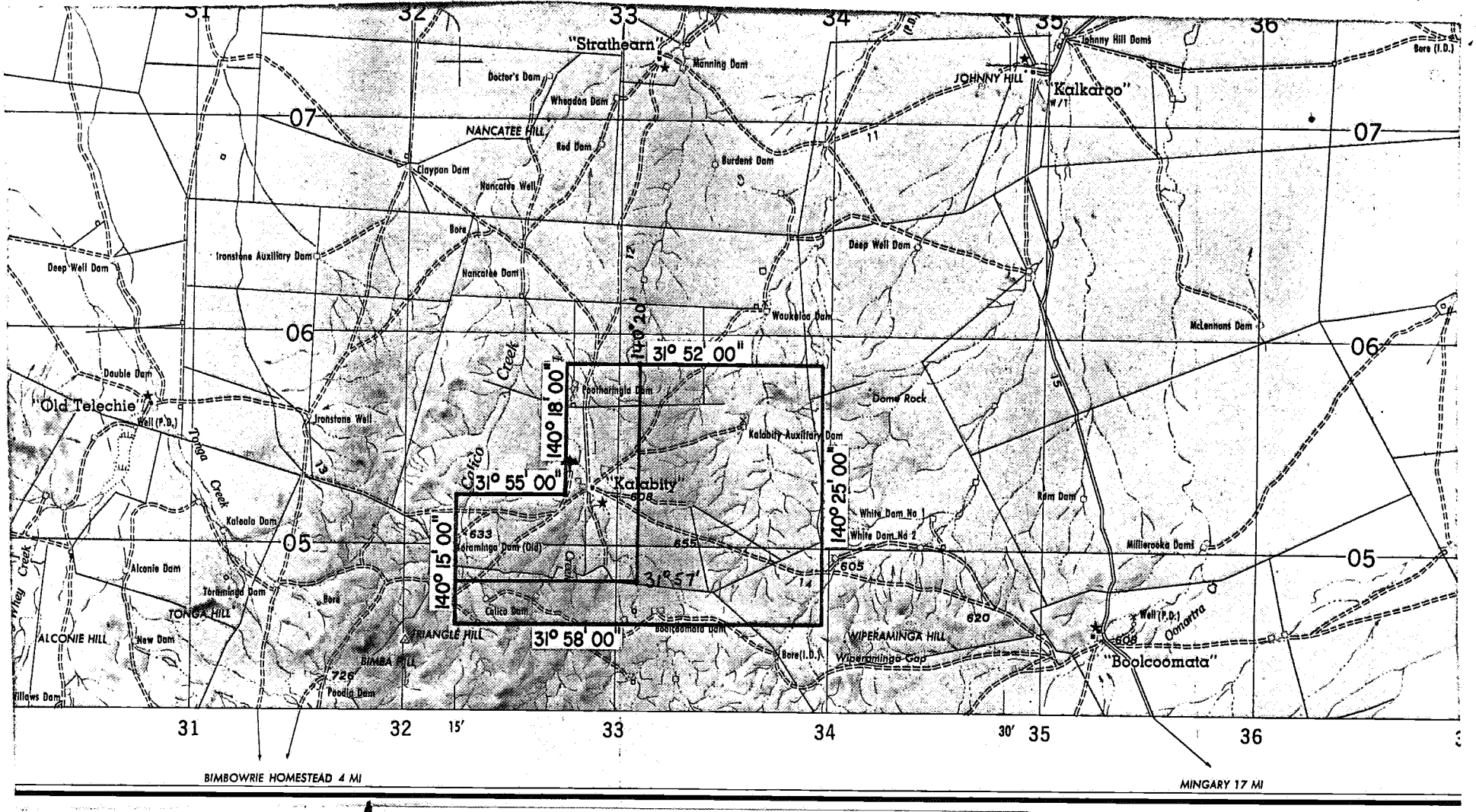
This mapping has been part of an overall study of the Willyama Complex in South Australia, with emphasis placed upon the stratigraphy. The regional geological setting can be summarized as follows:

The major geological elements recognised are a central region of granitoid rocks and migmatites comprising the core of the Kalabity Antiform; and regional metasediments of the Willyama Complex occur along the limbs of the antiform and as remnants within the migmatite complexes.

The granitoid units present in the Exploration Licence include biotite granites, muscovite adamellites and pegmatities. The biotite granites appear to be anatectic melts of the metasedimentary sequence occurring as "stratabound" or partially intrusive bodies. In contrast the muscovite adamellite always has an intrusive character, often cutting the biotite granite. The pegmatoid bodies are the latest intrusive event either crosscutting all other rock types or present as massive sills. Amphibolite stocks and sills (possibly lopolithic) occur in the south west of the region.

Two major metasedimentary units of the Willyama Complex are recognised in the Calico area, the Curnamona Formation and the Upper Schist Group (informal names). A complete stratigraphic sequence includes the following units:

Upper Schist Group	Pelitic Formation Pelitic-Carbonaceous Formation	} Puk
Curnamona Group	Bimba Formation Upper Albite Formation Mixed Albite-Schist Formation Middle Schist Formation Lower Albite Formation.	} Pua



Coal and Minerals Department
ESSO AUSTRALIA LTD.

E.L. 376
Calico Project

AREA RELINQUISHED
(4-12-79)

Scale 1:250,000

Fig. 1

The formations below the Curnamona Group are not exposed within the relinquished area, but elsewhere regionally pass into quartzite, feldspathic quartzite, quartz rich schists, migmatite and gneisses.

Units of the Upper Schist and Curnamona Formations exist within broad folds trending northeast-southwest or north-south.

2. West Wiperaminga Area

The area was checked by geological mapping, traverses with a hand held scintillometer (BGS ISL) and petrological sampling. The petrological descriptions are included in the appendix. A summary of the geology is given in the following section and refers to Plan No. 558-6.

The Lower Albite Unit occupies the core of a broad NE-SW trending antiform and the main rock units include:

a) Quartz-muscovite schists occasionally with remnant andalusite clots. Ewk

b) Well banded (bedded) albite rich feldspathic fine grained metaquartzites or siltstones. Major accessory minerals occurring as disseminations or foliae are biotite, hematite, or pyrite. Minor calc-silicate bearing albite-quartz metasiltstones outcrop in the region (albite-quartz-actinolite/epidote ± diopside rocks). Ewc

c) Quartz-magnetite BIF's are commonly associated with hematite rich units. f1-3

d) At the base of the sequence less feldspathic quartzites become common interbedded with granite gneiss (biotite-quartz felspar rocks) and granitised schists. Ews

The decrease in feldspathic quartzites and a greater proportion of muscovite schist typifies the overlying Middle Schist Unit.

As the title implies the Upper Albite Unit is composed primarily of albite rich metasediments, commonly metasiltstones or albite rich muscovite schists. This is in turn overlain by the Pelitic Carbonaceous Unit, a sequence of quartz-muscovite schists with thin interbedded arenites.

Scintillometer traverse readings and petrology sample locations are plotted on Plan No. 558-7. As previously mentioned the only anomalous readings are from muscovite-biotite-adamellite. Petrographic descriptions of samples 1R and 2R are included in the appendix. In summary these rocks contain quartz 35%, microcline 30%, albite 25%, biotite 3%, muscovite 5%, sericite 1%, hematite 1%, zircon trace, apatite trace. The cause of the radioactivity is unclear but may be due to metamict zircon.

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3. Triangle North Area

This region contains complexly folded metasediments of the Middle Schist (MSU), Upper Albite (UAU) and Pelitic Carbonaceous Units (PCU) intruded by large adamellite bodies and pegmatites. (Refer to Plan 558-9.) Metasediments in the central zone are thought to form the bottom limb of a recumbent fold dipping moderately to the north. This would put the northern schist outcrops below the UAU and in consequence they are placed in the Middle Schist Unit (M.S.U.). The MSU is composed of dark red brown, iron rich quartz-felspar-biotite migmatites and schists with occasional calc-silicate layers. This is overlain by approximately 500 metres of albite metasiltstones, calc-albite rocks and minor calc-silicates of the UAU. The topmost unit (Bimba Horizon) 3-10 m wide contains BIF facies metasediments including a banded Quartz-magnetite/hematite unit that has sporadic copper-oxysalt staining (malachite-chrysocolla).

In the overlying P.C. unit four distinct rock sequences have been mapped:

1) Garnetiferous quartzite interbedded with laminated grey-white to pink muscovite-biotite felspar schists, Pwe?

2) Knotted biotite-muscovite schists, Pws

3) Contorted dark red brown biotite felspar schist, and Pws,

4) Interbedded felspathic siltstone and coarse biotite-muscovite schist. Pws

The metasediments, especially the UAU, are partly granitized as elsewhere in the region to anatectites of a granite-granodiorite composition. A particular feature of the UAU is the intrusion of amphibolite sills and plugs. The sills are rarely wider than 1 metre and pre-date the major deformation events. The amphibolites may have a lopolithic structure with sills wedging out from large stocks, as present in the extreme SW of the mapped area.

Over 70% of the outcropping rocks are adamellites, either a coarse porphyritic type or a more equigranular medium to coarse grained variety. The equigranular types are thought to be related to sheet-like bodies sub-parallel to bedding, and the coarse porphyritic masses are probably major stocks. In the region the last intrusive event was the emplacement of pegmatite bodies as crosscutting and concordant features.

The scintillometer survey results from this area are comparable with the Wiperaminga West survey. Anomalous readings were recorded only over adamellites; values up to 560 c.p.s. in a background of 150-200 c.p.s. were recorded using a BGS-1SL hand held scintillometer. All other rock units give a reading of 150 c.p.s. ($\pm$ 50). Brief petrographic notes are available in the appendix from rock samples collected in the area. (For locations see Plan No. 558-9).

LIST OF PLANS

0007

PLAN NO.	TITLE	SCALE
558-6	Geology Map of West Wiperaminga Area	1:20,100
558-7	Wiperaminga West Area: Scintillometer Traverse Readings and Petrology Sample Locations	1:20,100
558-9	Geology of Triangle North Area	1:5,025 (approx)
558-11	Geological Map - Calico Project	1:25,000

APPENDICES

A. Petrological Descriptions of samples from Wiperaminga West Area.

B. Petrological Notes of samples from Triangle North Area.

APPENDIX A

0008

Petrological Descriptions of samples from
Wiperaminga West Area

(-see Plan No. 558-7 for locations)

A. Muscovite-biotite adamellite

Medium grained, relatively equigranular and massive texture with interlocking anhedra of albite (An_5), microcline and quartz, subordinate medium to coarse grained irregular flakes of muscovite and single grains and aggregates of dark brown to greenish brown, locally oxidised, biotite. Although some quartz is medium grained, most appears strained and shows variable recrystallisation into a mosaic of finer, granular material. Most muscovite texturally appears to be primary, although minor fine grained muscovite along grain boundaries may be secondary. A little fine grained sericite occurs as alteration flecks in albite, rare fine grained magnetite occurs with biotite aggregates and traces of fine grained zircon are sparsely disseminated. Approximate mode is quartz 35%, microcline 26%, albite 30%, muscovite 5%, biotite 3%, sericite 0.5%, magnetite 0.5%, zircon trace.

B. Muscovite-biotite adamellite

Medium grained, relatively equigranular and massive texture with interlocking anhedra of albite (An_5), microcline and quartz, subordinate muscovite and dark brown to greenish-brown biotite. Both micas commonly occur together in medium grained aggregates although muscovite forms a few, coarser irregular flakes. Biotite is locally partly oxidised and stained by limonite. Most muscovite texturally appears primary although some finer grained grains along grain boundaries and as inclusions in albite are probably secondary. A little fine grained sericite occurs as alteration flecking in albite. Sparse anhedra of magnetite are disseminated throughout, commonly occurring with biotite and rare limonite grains appear pseudomorphous after original pyrite. Traces of partly metamict zircon occur rarely. Quartz does not show the extensive recrystallisation evidenced in sample A, but nevertheless is strained and shows local recrystallisation to granulose finer grained aggregates. Approximate mode is quartz 32%, microcline 30%, albite 30%, biotite 3%, muscovite 3%, magnetite 1%, limonite 0.5%, sericite 0.5%, zircon trace.

C. Biotite-muscovite adamellite

Medium grained relatively equigranular massive texture although slightly finer grained than samples A and B. Composed of albite

(An_5), microcline, quartz (grains are strained but show little evidence of recrystallisation) and subordinate dark brown biotite and muscovite. The two micas commonly occur together in aggregates and although some coarser muscovite grains appear texturally primary, some is secondary and occurs as replacements of biotite and albite, and along grain boundaries. A little sericite occurs as alteration flecks in albite. Uncommon narrow veinlike aggregates of muscovite transect the sample. Rare grains of haematite (possibly pseudomorphous after magnetite) are disseminated sparsely and a trace of sphene occurs in biotite. Approximate mode is quartz 37%, microcline 25%, albite 30%, biotite 4%, muscovite 3%, haematite 0.5%, sericite 0.5%, sphene trace.

C" Muscovite-biotite adamellite

Medium to coarse grained interlocking texture; relatively inequigranular with coarser albite and quartz, and finer grained, more interstitial microcline. Composed of albite (An_5), microcline, quartz (grains are strained but only show local recrystallisation) and subordinate dark brown biotite and muscovite. Coarser grained flakes of muscovite may be primary, but finer grained material may be secondary and has possibly replaced biotite and albite. Biotite and muscovite commonly occur together in aggregates. Locally biotite appears to have recrystallised, and in places contains fine grained opaque (? magnetite) inclusions and rare sphene grains. Albite is relatively heavily flecked by fine grained sericite. Approximate mode is quartz 35%, microcline 20%, albite 35%, biotite 4%, muscovite 4%, ?magnetite 0.5%, sericite 1.5%, sphene trace.

G. Muscovite-biotite adamellite

Moderately porphyritic, medium grained, rather inequigranular texture. Composed of ablite (An_5), quartz, microcline and subordinate muscovite and dark brown biotite. Although quartz, feldspars and micas are generally medium grained, quartz and albite commonly form somewhat coarser phenocrysts, whereas microcline is slightly more finer grained and interstitial. Scattered muscovite grains form large porkilitic phenocrysts which are probably primary. Other muscovite grains are finer and may have replaced biotite and albite. A little sericite occurs as flecking in albite. Uncommon disseminated magnetite grains are associated with biotite. Quartz grains are partly strained but show little evidence of recrystallisation. Approximate mode is quartz 35%, albite 30%, microcline 26%, muscovite 6%, biotite 2%, sericite 0.5%, magnetite 0.5%.

H. Quartz-albite-microcline rock

Fine to medium grained granulose interlocking mosaic texture; rock generally massive except for a few fractures. Composed of quartz, albite (An_5), less abundant microcline, subordinate muscovite and haematite (probably pseudomorphous after pyrite) and minor brown biotite. Locally quartz is slightly coarser grained than feldspars.

Haematite is commonly fringed by aggregates of muscovite, and uncommon biotite occurs in association with muscovite (disseminated) and in a narrow veinlike aggregate. Approximate mode is quartz 40%, albite 40%, microcline 14%, haematite 3%, muscovite 2%, biotite 1%.

H" Quartz-albite rock

Fine to medium grained equigranular mosaic texture. Composed of dominant anhedral quartz and albite (with sparsely disseminated coarser quartz grains) and minor disseminated haematite (medium grained pseudomorphs after original pyrite), finer grained magnetite, muscovite and brown biotite. Haematite (ex-pyrite) grains commonly have associated/attached biotite and/or muscovite. Approximate mode is quartz 60%, albite 33%, haematite 2%, magnetite 1.5%, muscovite 2%, biotite 1.5%.

I. Quartz-albite-microcline-magnetite rock

Medium grained, interlocking texture, composed of anhedral quartz, albite (An_5), microcline, subordinate subhedral to ovoid granular magnetite and uncommon muscovite and biotite. Albite tends to be slightly more coarse grained than microcline or quartz, and many grains are poikilitic, enclosing quartz. Magnetite is commonly fringed by narrow muscovite rims. A little muscovite and brown biotite is sparsely disseminated. Approximate mode is quartz 35%, albite 35%, microcline 21%, magnetite 7%, muscovite 1.5%, biotite 0.5%.

I" Quartz-albite (-muscovite-biotite) rock (albite quartzite).

Medium grained, interlocking texture, characterised by strained quartz grains with strongly sutured grain boundaries. Composed of dominant quartz, less abundant albite (An_5) (generally finer grained than quartz), minor disseminated muscovite (intergrown with quartz and albite) and biotite (brown to yellow-brown), and traces of disseminated rutile, pink zircon and magnetite. A weak preferred orientation of biotite grains and albite defines a slight foliation. Narrow veinlike aggregates of coarser muscovite + minor biotite transect the sample. Approximate mode is albite 24%, quartz 70%, muscovite 4%, biotite 2%, rutile trace, zircon trace, magnetite trace.

K. Cordierite-bearing quartz-albite-biotite gneiss

Medium grained, moderately foliated rock with relatively inequigranular texture. Composed of quartz (commonly slightly coarser grained than other minerals, strained and partly recrystallised, with sutured grain boundaries), albite (An_{5-10}), subordinate red-brown biotite flakes, minor interstitial microcline, muscovite, cordierite, haematite (possibly pseudomorphous after original magnetite) and rare zircon (commonly enclosed in biotite). Uncommon cordierite forms medium to coarse grained anhedra, partly replaced by muscovite and fine grained sericite and exhibiting fine lamellar twinning. Fine

grained sericite is relatively abundant and has formed from albite, biotite, muscovite and cordierite; it also forms elongate aggregates transecting the rock, which, in conjunction with a preferred orientation shown by biotite and muscovite flakes, defines the foliation. Biotite and muscovite commonly occur together forming aggregates. Approximate mode is quartz 35%, albite 47%, microcline 3%, biotite 4%, muscovite 3%, sericite 4%, cordierite 2%, haematite 2%, zircon trace.

L. Quartz-microcline-oligoclase rock

Weakly layered rock with medium grained, interlocking, somewhat inequigranular texture. Composed of anhedral strained quartz (showing slight recrystallisation and sutured grain boundaries) and microcline, with subordinate oligoclase (An_{10-15}) and minor haematite (possibly after magnetite), limonite (apparently after pyrite), muscovite, yellow-brown biotite and a trace of zircon. Biotite and muscovite commonly occur together and in places form discontinuous elongate aggregates which partly define the layering. Muscovite also partly fringes haematite grains. Approximate mode is microcline 22%, quartz 60%, oligoclase 10%, haematite 3%, limonite 1%, biotite 2%, muscovite 2%, zircon trace.

M. Muscovite-biotite granodiorite

Medium to coarse grained, relatively massive, inequigranular texture. Composed of quartz (strained grains but little evidence of recrystallisation), albite (An_{5-10}), microcline and subordinate muscovite, brown biotite and minor haematite (possibly after original magnetite), and a trace of zircon (enclosed in biotite and surrounded by pleochroic haloes). Quartz, albite and muscovite commonly form somewhat larger irregular grains, although albite tends to show some subhedral outlines. Coarser grains of muscovite are generally poikilitic, and commonly form aggregates with biotite. Texture of rock is not diagnostic as to whether it represents partly deformed granitic material, or a thoroughly recrystallised metasediment of appropriate composition. Albite grains are flecked by minor sericite, and the local haematite is commonly associated with biotite. Approximate mode is quartz 35%, albite 38%, microcline 15%, muscovite 6%, biotite 4%, haematite 1.5%, sericite 0.5%, zircon trace.

N. Biotite-muscovite adamellite

Weakly foliated, medium to coarse grained allotriomorphic granular texture; rather inequigranular. Composed of quartz (strained, minor recrystallisation and some sutured grain boundaries), albite (An_{5-10}) (grains flecked by minor muscovite and sericite), microcline and subordinate dark brown biotite, ragged ?poikiloblastic muscovite, minor disseminated haematite (possibly after original magnetite) and rare zircon (commonly enclosed in biotite). Foliation is defined by a weak preferred orientation of biotite grains and biotite ± haematite aggregates. Quartz, albite and muscovite are locally coarser grained. Approximate mode is quartz 30%, albite 33%, microcline 25%, biotite 4%, muscovite 6%, haematite 1%, sericite 1%, zircon trace.

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O. Biotite-muscovite granodiorite

Medium to coarse grained, allotriomorphic granular texture; somewhat inequigranular. Sample appears relatively massive with no mineral preferred orientation. Composed of quartz (strained, some sutured boundaries, but little recrystallisation), albite (An_5, slightly flecked by sericite), microcline and subordinate ragged brown to orange-brown biotite and muscovite, minor magnetite (partly altered to haematite and commonly associated with biotite), and traces of rutile, zircon and sphene, the last two occurring as fine grained inclusions in biotite. Quartz, albite and muscovite commonly form coarser grains (i.e. slightly porphyritic) and muscovite commonly forms aggregates with biotite. Fine grained muscovite enclosed by and on grain boundaries of biotite and albite texturally appears secondary. Approximate mode is quartz 35%, albite 42%, microcline 12%, biotite 4%, muscovite 5%, sericite 1%, magnetite-haematite 1%, rutile, sphene and zircon traces.

1st R Muscovite-biotite adamellite

Medium grained, interlocking allotriomorphic granular texture, rather inequigranular. Sample is massive. Composed of quartz (strained grains with recrystallisation in to mosaic aggregates), microcline, albite (An_5, flecked by sericite and secondary muscovite) and subordinate muscovite, dark brown to greenish-brown biotite, minor haematite (probably after original magnetite) and trace zircon (metamict, enclosed in biotite). Quartz and muscovite are locally porphyritic, with the latter forming a few coarse, poikilitic grains. Coarser muscovite appears texturally primary, whereas finer grained muscovite enclosed in albite or associated with biotite is probably secondary. Rare apatite is sparsely disseminated. Cause of radioactivity unclear although it may be due to metamict zircon. Approximate mode is quartz 35%, microcline 30%, albite 25%, biotite 3%, muscovite 5%, sericite 1%, haematite 1%, zircon trace, apatite trace.

2nd R Muscovite-biotite adamellite

Medium grained, allotriomorphic granular texture, rather inequigranular. Sample is massive. Composed of quartz (strained grains and strong recrystallisation into granular mosaic), microcline, albite (An_5, slightly altered to secondary muscovite), subordinate muscovite and dark brown biotite (partly altered to limonite and muscovite) and rare limonite (possibly a replacement of original magnetite) and fine grained metamict zircon. Muscovite in places form coarse porphyritic (and poikilitic) grains, these are texturally primary, other finer grained muscovite enclosed in albite, and at albite and biotite grain boundaries appears largely secondary. In places, biotite and muscovite form aggregates. Approximate mode is quartz 35%, microcline 35%, albite 20%, biotite 3%, muscovite 6%, limonite 1%, zircon trace.

S. Muscovite-biotite adamellite 0013

Medium grained, slightly porphyritic, massive, allotriomorphic granular texture. Composed of quartz (some strained grains, but most recrystallised into mosaics of finer grains occupying former coarser grain sites), microcline, albite (An_5, slightly flecked by sericite and secondary muscovite), subordinate muscovite (including probable primary coarser porphyritic ragged grains and finer, secondary material replacive towards albite and biotite), partly oxidised dark brown to greenish brown biotite (alteration to limonite + muscovite) and traces of limonite (after magnetite with rare relics remaining), zircon and leucoxene (both enclosed in biotite). Approximate mode is quartz 40%, microcline 30%, albite 20%, biotite 2%, muscovite 7%, sericite 0.5%, limonite (-magnetite) 0.5%, zircon trace, leucoxene trace.

U. Quartz-albite (-microcline) rock (Albite quartzite)

Fine to medium grained allotriomorphic granular texture, massive and rather inequigranular. Composed of interlocking quartz, less abundant albite (An_5), minor microcline, sparse ragged muscovite and pale brown biotite, and rare disseminated fine grained rutile and zircon. Quartz and, in places, muscovite, form somewhat coarser grains. Locally biotite and muscovite occur together as aggregates. Approximate mode is quartz 65%, albite 25%, microcline 8%, muscovite 1.5%, biotite 0.5%, rutile trace, zircon trace.

V. Quartz-microcline-albite-cordierite-biotite gneiss

Medium grained, weakly foliated, allotriomorphic granular texture, rather inequigranular. Composed of interlocking quartz, slightly poikilitic albite (An_{10}), microcline and cordierite, ragged flaky yellow-brown to khaki-brown biotite, minor muscovite, disseminated magnetite and a trace of zircon. Foliation is defined by weak preferred orientation of biotite flakes and aggregates. The minor muscovite and magnetite commonly occur in association with biotite aggregates. Cordierite is mostly fresh, although locally flecked by sericite, and although showing fine lamellar twinning similar to plagioclase, it is distinguished by its parallel extinction. Approximate mode is quartz 30%, microcline 22%, albite 25%, cordierite 14%, biotite 6%, muscovite 1%, magnetite 1.5%, sericite 0.5%, zircon trace.

APPENDIX B

Petrological Notes of Samples from

Triangle North Area

(See Plan No. 558-9 for locations)

No. 2 : muscovite adamellite (incipiently pegmatitic)

Fairly coarse, allotriomorphic granular texture; except for coarse muscovite some of which tends to occur in unusual, more or less radiating clusters + quartz; i.e. with incipient pegmatitic mode of occurrence.

Consists of essential quartz, plagioclase, muscovite and potash felspar (the latter in similar abundance as plagioclase which classifies the rock as adamellite rather than granite.) Accessory biotite.

No. 10 : - Two rock types were included in thi sample: a rather massive very fine grained apperent metasediment (a); and a medium grained crystalline igneous rock (b).

10 (a) : metasediment: evenly disseminated fine magnetite

homogeneous fine layered, very fine granuloblastic texture composed of a virtually equal abundance of quartz and plagioclase, subordinate potash felspar. Minor evenly disseminated and roughly layered magnetite (10%), accessory biotite.

No. 10 continued –

10 (b) : weakly porphyritic, medium grained (biotite) muscovite adamellite

An inequigranular, weakly porphyritic texture in which subhedral crystals of plagioclase, similar abundance of perthitic potash felspar, lesser muscovite, and several crystals of quartz measure 2-3 mm in size. These form a loose random aggregate, with intergranular finer crystalline mosaic, apparently more of a primary igneous texture, than the similar, finer recrystallisation mosaics in samples described below.

Quartz is the main component in the finer interstitial mosaic, with lesser felspars of both varieties, minor trains of fine biotite ± accessory magnetite.

No. 12 : leuco potassic granite or grenite aplite

Homogeneous, medium grained leucocratic rock, with irregularly allotriomorphic mosaic texture. Composed predominantly of potash felspar, subordinate quartz and minor plagioclase. Accessory biotite and muscovite. The potash felspar is microperthitic.

No. 6 : stressed and recrystallised, (biotite) muscovite adamellite

Probably an original allotriomorphic granular texture of medium grain size, but confused by irregular patchy domains of much finer mosaic, apparently formed by recrystallisation, possibly + the introduction of some quartz.

Consists essentially (through all grain sizes), of plagioclase, potash felspar and quartz in similar abundance; subordinate quite coarse muscovite; minor clumps of biotite, accessory magnetite and apatite.

Conceivably a modified equivalent of No. 2.

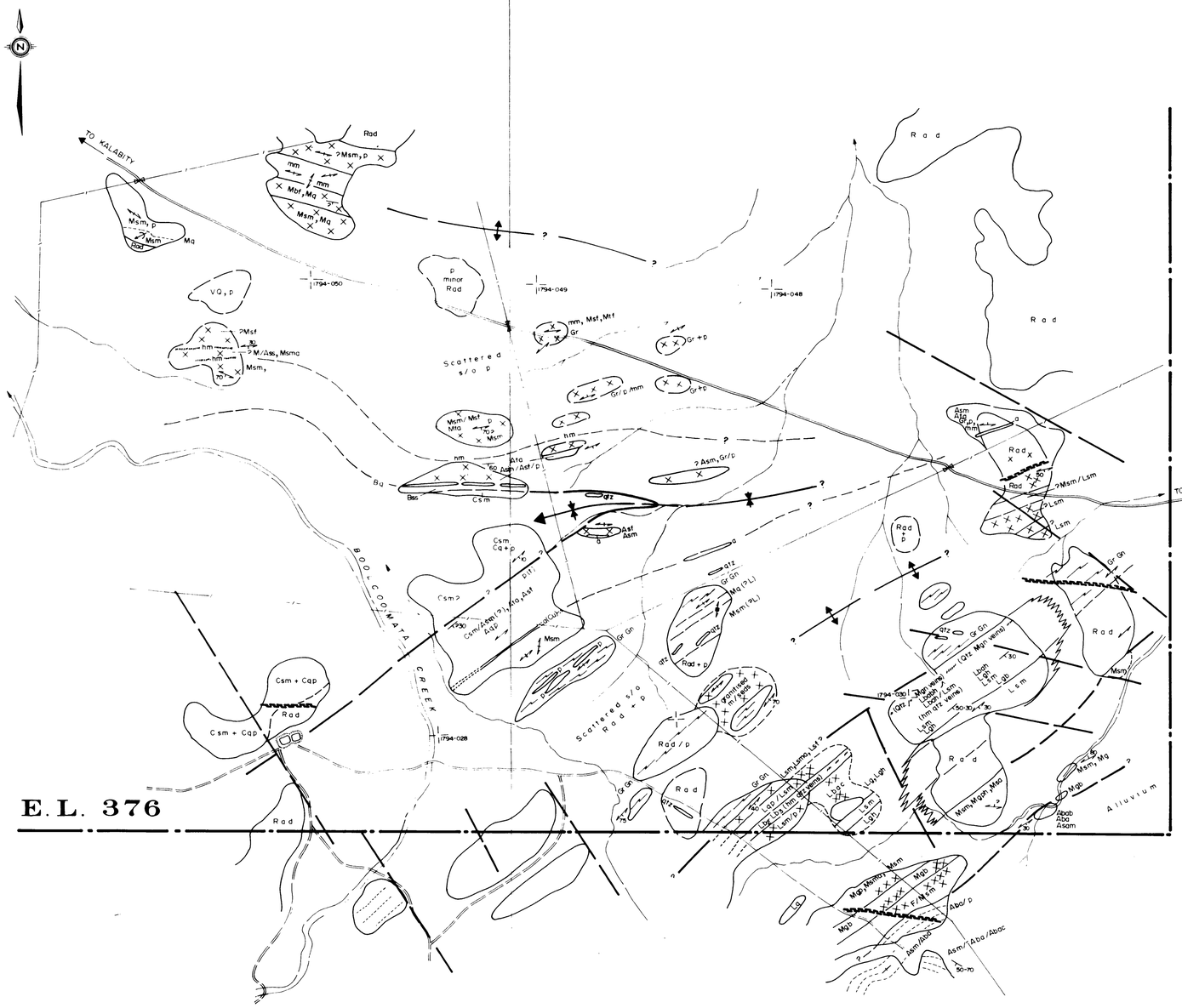
No. 58 : recrystallised microgranite

In thin section this rock also displays a fairly extensively recrystallised mosaic texture, which is probably consistent with muscovite-rich shear planes in hand specimen. Finer recrystallised mosaic + muscovite is intergranular to ?relict, coarser primary crystals, notably of quartz.

The rock consists of essential quartz and potash felspar, with subordinate plagioclase, minor muscovite and minor biotite which has a more restricted abundance than muscovite.

No. 112 : stressed, incipiently recrystallised (muscovite) biotite granite; accessory disseminated magnetite

A medium grained allotriomorphic granular texture, stressed but shows only very minor intergranular recrystallisation (compared with no. 58 and no. 6.) Predominant potash felspar; somewhat subordinate quartz and plagioclase; minor randomly but evenly scattered biotite, lesser muscovite, and magnetite. (The rock is weakly magnetic.)



L E G E N D

UPPER SCHIST FORMATION

PELITIC—CARBONACEOUS UNIT (C)

- Csm — QUARTZ-MUSCOVITE SCHIST (COARSE GRAINED, KNOTTED)
- Cq — METAQUARTZITE (p) PYRITE

BIMBA HORIZON (B)

- Bq — CHERTY FERRUGINOUS METAQUARTZITE
- Bss — SERICITE-CHLORITE SCHIST

CURNAMONA FORMATION

UPPER ALBITE UNIT (A)

- Aba — BANDED ALBITE ROCK (Abab-BIOTITE BEARING, Abac WITH ACTINOLITE/ EPIDOTE AND POSSIBLE DIOPSIDE)
- Ata — ALBITE-METASILTSTONE
- Asm — MICA-SCHIST, Asam ALBITE-MICA SCHIST
- Asf — FELDSPATHIC SCHIST
- Aqp — PYRITIC-? FELDSPATHIC-METAQUARTZITE

MIXED ALBITE-SCHIST UNIT (F)

- NOT SHOWN ON PLAN

MIDDLE SCHIST UNIT (M)

- Msm — QUARTZ-MUSCOVITE SCHIST, Msma/Msa ANDALUSITE SCHIST, Msf FELDSPATHIC MICA SCHIST
- Mg — FELDSPATHIC METAQUARTZITE, Mgp PYRITIC, Mgb BIOTITE BEARING, Mgph HEMATITE-PYRITE BEARING
- Mq — METAQUARTZITE
- Mta — ALBITE METASILTSTONE, Mbf BANDED FELDSPATHIC METASEDIMENT
- Mqg — QUARTZO FELDSPATHIC ARENITE
- Mbf — BANDED FELDSPATHIC ROCK

LOWER ALBITE UNIT (L)

- Lsm — QUARTZ-MUSCOVITE SCHIST (Lsma ANDALUSITE SCHIST)
- Lba — BANDED ALBITE ROCK, Lbab (BIOTITE BEARING), Lbac (ACTINOLITE EPIDOTE BANDED/ DISSEMINATION), Lbah (HEMATITE BANDING/DISSEMINATION)
- Lgh — ALBITE-QUARTZ METASEDIMENT
- Lbz-Lbs — QUARTZ-MAGNETITE, QUARTZ-HEMATITE BIF's
- Lsf — FELDSPATHIC SCHIST
- Lq — METAQUARTZITE (Lqp-PYRITIC)

OTHERS

- Rad — 'REGIONAL' ADAMELLITE, c-m/g WITH MUSCOVITE 'CLOTS'
- × × Gr — GRANITE BODIES, WHITE f-m/g BIOTITE/MUSCOVITE BEARING ROCKS MAYBE STRATABOUND OR IRREGULAR
- p — PEGMATITE BODIES, COMMONLY MASSIVE 'SILLS'
- a — ORTHO-AMPHIBOLITE
- GRANITE-GNEISS, WELL DEVELOPED BIOTITE SCHISTOSITY IN QUARTZ-FELDSPAR-BIOTITE GNEISS
- mm — MIGMATITES
- Gr-Gn — GRANITE GNEISS
- hm — HEMATITE
- VQ, qtz — VEIN QUARTZ

- LIMIT OF OUTCROP
- GEOLOGICAL BOUNDARY
- STRIKE AND DIP OF FOLIATION
- STRIKE AND DIP OF BEDDING
- JOINTS
- SHEARS
- PHOTO-LINEARS (POSSIBLE BLOCK FAULTS)
- FOLDS
- WATER COURSE
- FENCE, GATE
- ROAD
- TRACK
- DAM
- 1794-030 — PHOTO CENTRE
- MINOR SYNCLINE SHOWING PLUNGE

BASE CONSTRUCTED FROM PHOTO MOSAIC

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E.L. 376

CALICO PROJECT

GEOLOGY MAP OF S.E. PORTION OF E.L. 376

SCALE 1:20100 (photoscale)

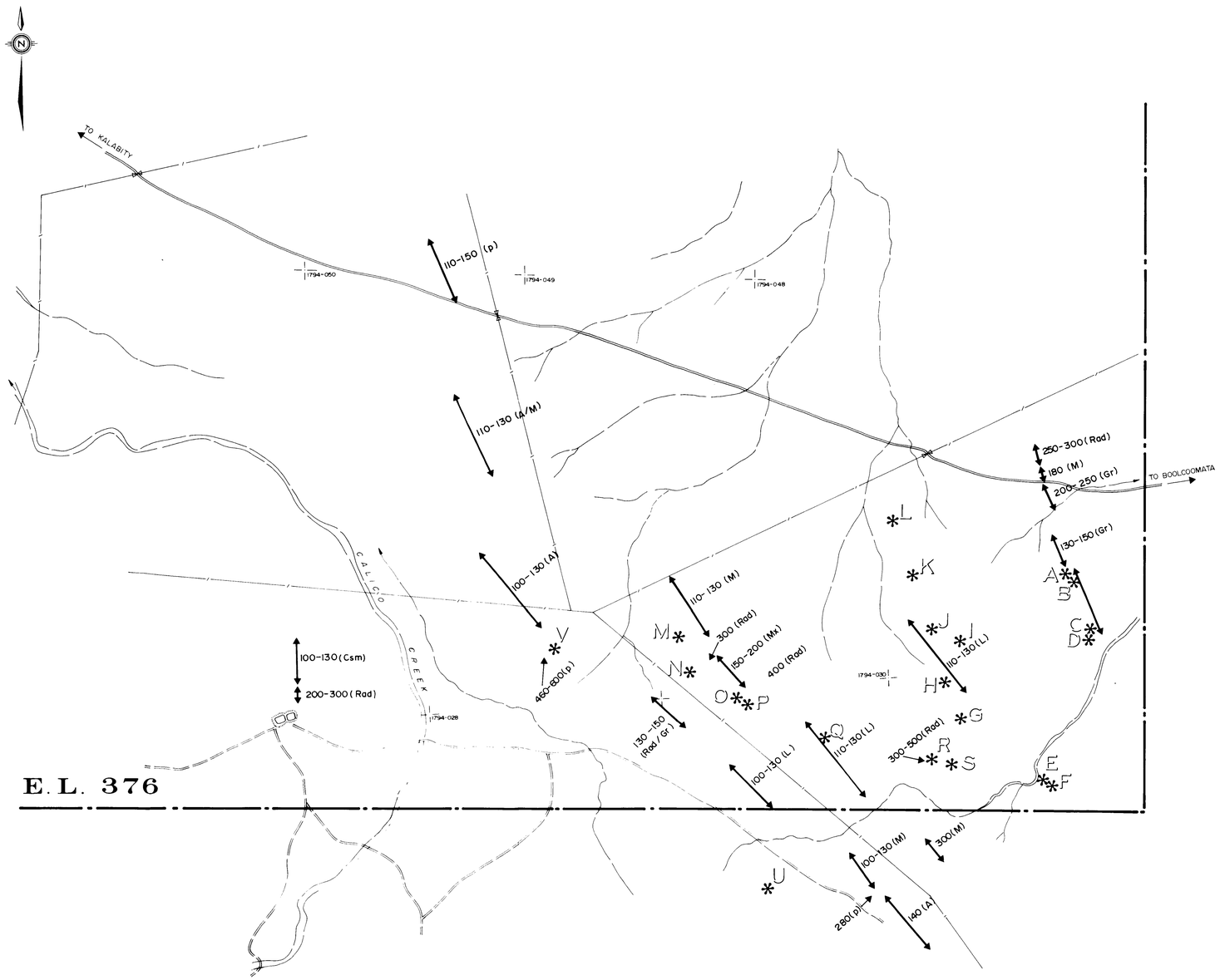
0 200 400 600 800 1000 2000 METRES

AUTHOR P LEWIS — DATE AUG 1978

REVISED — DATE

Dwg No 558-6

3623-1



LEGEND

100-200 (M) — SCINTILLOMETER TRAVERSE, AVERAGE OR RANGE OF READINGS IN COUNTS PER SECOND ON A SCINTREX BGS-1SL (A) PREDOMINANT ROCK TYPE

280 (p) — SPOT LOCATION WITH ANOMALOUS READING

SAMPLE LOCATIONS (A-V EXCLUDING T) PETROLOGICAL STUDY CONDUCTED ON MOST (SEE TEXT)

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CALICO PROJECT

WIPERAMINGA WEST AREA

SCINTILLOMETER TRAVERSE READINGS AND PETROLOGY SAMPLE LOCATIONS

SCALE 1:20100 (photoscale)

0 200 400 600 800 1000 2000 METRES

AUTHOR P LEWIS — DATE AUG 1978

REVISED — DATE

Dwg No 558-7

3623-2

LEGEND

ALLUVIUM

PELITIC CARBONACEOUS UNIT (C)

- C_{4s} GREYISH WHITE FELDSPAR-BIOTITE-MUSCOVITE SCHIST AND GNEISS
- C_{4d} DARK RED-BROWN CONTORTED BIOTITE-FELDSPAR SCHIST
- C_{4g} GREY KNOTTED BIOTITE-MUSCOVITE SCHIST
- C_{4c} GARNETIFEROUS QUARTZITE WITH MUSCOVITE-BIOTITE-FELDSPAR SCHIST

BIMBA HORIZON (B)

- B_{3f} QUARTZ-MAGNETITE BANDED IRON FORMATION

UPPER ALBITE UNIT (A)

- Abb BANDED ALBITE ROCK
- Abm MASSIVE ALBITE ROCK
- Abbi BIOTITE BEARING BANDED ALBITE ROCK
- Abm MUSCOVITE BEARING BANDED ALBITE ROCK
- Abc CALC-ALBITITE

MIDDLE SCHIST UNIT (M)

- Msm QUARTZ-BIOTITE-FELDSPAR MIGMATITES AND SCHIST OCCASSIONAL CALC SILICATE HORIZONS

INTRUSIVES

- Rod COARSE-MEDIUM GRAINED REGIONAL ADAMELLITE
- Rodg COARSE GRAINED REGIONAL ADAMELLITE

OTHER ROCK TYPES

- GRANITE-GRANODIORITE ANATECTITE
- PEGMATITE
- AMPHIBOLITE
- VQ VEIN QUARTZ

- LIMIT OF OUTCROP
- LIMIT OF SUB-OUTCROP
- FAULT
- STRIKE AND DIP OF BEDDING
- OVERTURNED BEDS
- TREND LINES OF BEDDING
- Cu COPPER STAINING
- TRACK
- FENCE
- DAM
- WATER COURSE

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CALICO PROJECT 558

GEOLOGY OF TRIANGLE NORTH AREA

SCALE 1:5000 @ 30"x24"

0 100 200 300 400 500 METRES

AUTHOR L. NIXON DATE NOV. 1979

REVISED DATE

Dwg No. 558-9

PROTEROZOIC

LOWER

CURNAMONA FORMATION

UPPER SCHIST FORMATION

C — PELITIC AND CARBONACEOUS UNIT(C)
Predominatly graphitic(s), meta-pelite(s), siltstone(t) and minor arenite(α)
Narrow calc-silicate, sphalerite horizon at Ironstone Well (Cmcp)

B — BIMBA HORIZON(B)
Highly variable mineralised volcano-sedimentary horizon. Includes gossan [Bg], Calc-silicate [Bc], volcanics [Bv], siltstone ?tuff [Bt], B.I.F. [Bx], schist [Bs] and arenite [Bα]

A — UPPER ALBITE HORIZON(A)
Highly variable volcano-sedimentary horizon generally a banded(Ab) or laminated(Al), Feldspar, calc-silicate rock locally grading to facies described for B
Locally brecciated(a) and local evaporites(Σ)

F — MIXED UNIT (F)
Predominatly meta-pelite(s) and psammo pelite(α), minor calc-silicate

M — MIDDLE SCHIST(M)
Predominatly meta-pelite(Ms) and psammo pelite(Mα)

L — LOWER ALBITE HORIZON(L)
Volcano-sedimentary horizon including albite, quartz, pyrite, hematite tuffite(Ll), Albite schist(Ls), arenite(Lα) and B.I.F [Lx]

LOWER SCHIST FORMATION (D)

D
Predominatly meta-psammite(Dα) and psammo pelite(D) modified by anatexis(Gn)

INTRUSIVE ROCKS

G — Granite and adamellite

a — Amphibolite

p — Pegmatite

GENERAL SYMBOLS

α	Arenite
b	Banded
l	Laminated
s	Schist
v	Volcanic
x	Magnetite (B.I.F)

E.L. 376

KALABITY HOMESTEAD

KALABITY

BOOLCOOMATA

BOOLCOOMATA CREEK

BIMBOWRIE

E.L. Boundary

Boundary Fence

Fence

Track

Creek

AREA GEOLOGY COMPILED FROM ESSO 1:5025 SERIES AND C.E.C. 1:50000 SHEET
BASE COMPILED FROM CARPENTARIA EXPLORATION 1:20000 SERIES

Scale 1:25000

500 0 500 1000 1500 2000

Metres

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E.L. 376

CALICO PROJECT 558

GEOLOGICAL MAP

AUTHOR: G.HEMMING, P.LEWIS

DATE: MARCH 1979

3623-4.

DRAWING Nº 558-11