ANNUAL REPORT

EXPLORATION LICENCE 9345 - TIPPERARY NORTHERN TERRITORY FOR THE PERIOD 11/1/96 TO 12/1/97

1: 250,000 SHEET SD52-8 PINE CREEK
1:100,000 SHEET 5170 TIPPERARY

Distribution:
Principal Registrar, N.T. Dept. Mines & Energy (1)
Homestake Gold of Australia Limited - Perth (2)
Homestake Gold of Australia Limited - Pine Creek (1)

Author:
J.I.STEWART
B.Sc.(Hons.),M.Sc.,Dip.Ed.,
AM.Aust.IMM.
Principal Geologist
Homestake Gold of Australia Ltd.
ACN 008 143 137
February 1997

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

ABSTRACT

Two diamond drillholes located formations equivalent to those on the Pine Creek Geosyncline under deep Cambrian limestone cover. The newly hypothesized Blue Ant Geosuture is a metallogenically active zone requiring further work in pursuit of a Lead-Dakota styled deposit.

KEYWORDS

Koolpin Formation, gold, arsenic, deep drilling, magnetic targets, Blue Ant Geosuture, tourmalinites, F - Na - REE skarns, zinc, blind targets.

SUMMARY

Work on Exploration Licence 9345 comprised the drilling of 862.5 metres of diamond and 186m of RC-percussion in two holes (FEND10, 511.4m and FEND11, 537.1m). The search was for a deposit of the Cosmo-Howley/Lead-Dakota style hosted by 1.85by old silicate-sulphide-carbonate facies Banded Iron Formation.

A combination of macro-regional litho-structural analysis and aeromagnetics was used to target the equivalent of the Koolpin Formation litho facies rocks - best known on the outcropping Pine Creek Geosyncline.

The programme successfully encountered what is believed to be the Middle Koolpin Formation under Gerowie Tuff. Both holes were mineralised with low order gold anomalism, while FEND10 contained extensive "tourmalinites" and unusual skarn-like units (sphalerite-pyrrhotite-scapolite-fluorite-clinopyroxene-sphene-apatite-zircon).

Pending the follow-up helimagnetics surveys, partial leach geochemical orientation and re-interpretation of the drill results along strike, there may be a case in 1997 for further drilling along the strong magnetic anomaly.

1. INTRODUCTION

Tenure: Exploration Licence 9345 was applied for on 28th August, 1995. It was granted to Homestake Gold of Australia Limited on 11th January, 1996 for a period of six years.

This report covers the exploration conducted by Homestake in the period 11th January, 1996 to 12th January, 1997, on four sub-blocks.

Access: Access to the area is via the sealed Stuart Highway to the Mine town at Cosmo-Howley, hence along the Fenton access road and 25km south-west to the tenement area.

2. CONCLUSIONS

It is recommended that detailed magnetics be used to target Middle Koolpin stratigraphy in a structurally complex geometry (eg. refolding, fold nose, and regional mylonite plane). Helimag or ground magnetics will be used to target positions along the 3.5km long anomaly. Targets will be subjected to partial leach geochemistry and, where warranted, diamond drilling.

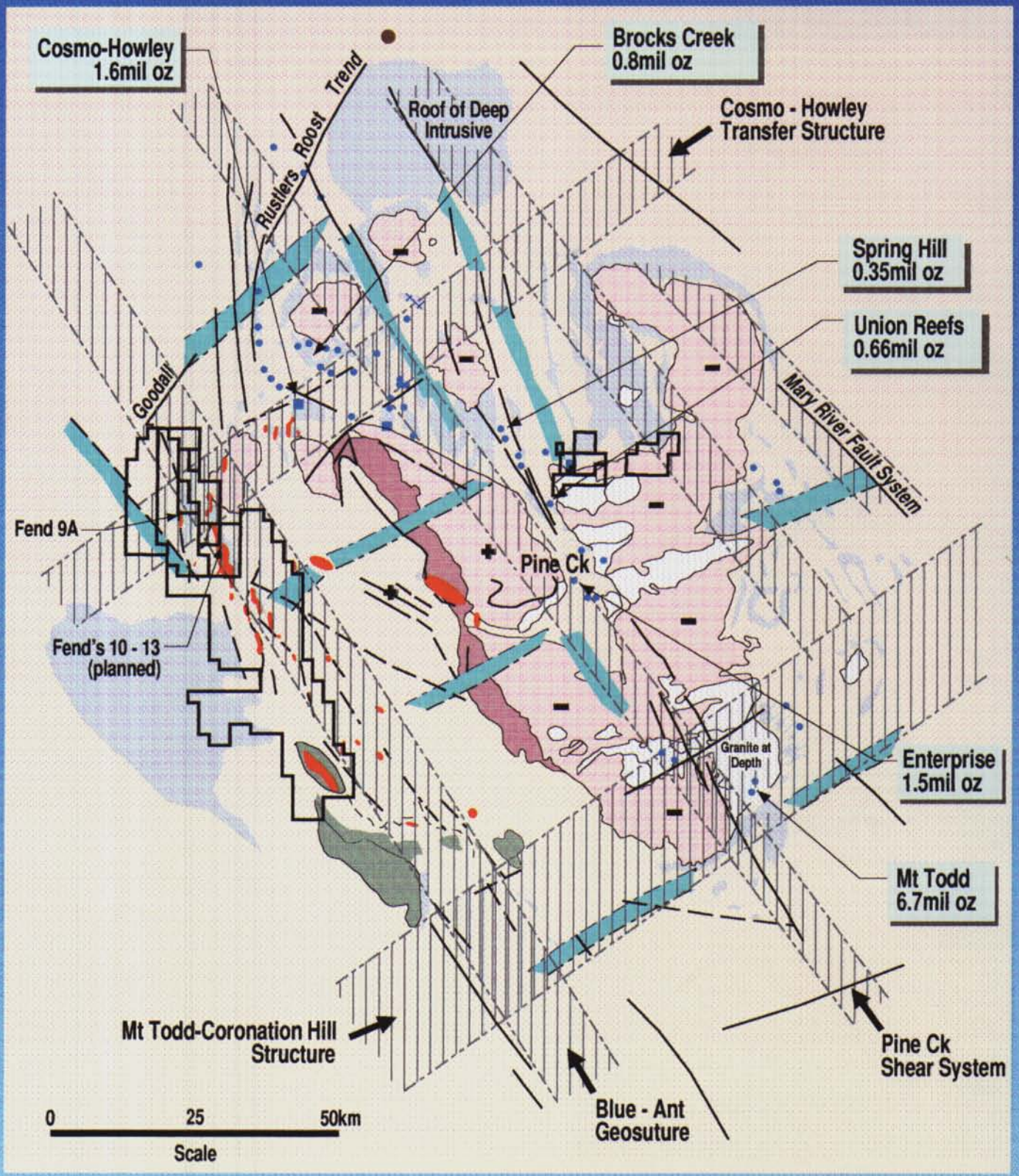
The estimated, proposed expenditure level for 1997 is detailed under Section 7 "Forward Work Programme".

3. HISTORY

The Tipperary prospect was generated as part of the Pine Creek West-Fenton target. After a comprehensive GIS-like compilation of the Pine Creek Geosyncline, it was interpreted that the major basement controls on the Proterozoic, sedimentology, structure, intrusive activity and metallogeny was likely to involve major NNW trending and NE trending geosutures (Figure 1). One of the most important NNW-Geosuture corridors is the Pine Creek Shear System. It is directly and indirectly responsible for over 15 million ounces of gold endowment in the field.

The Homestake study (Stewart, 1993) interpreted another Pine Creek Shear Corridor some 30km to the west-along the western margin of the Cullen Batholith. It has been termed the Blue Ant or Fenton Geosuture, and appears to be of a similar character to its outcropping counterpart.

From detailed comparative analyses (Stewart, 1993, 1994, 1996) it is known that there is a very close similarity between the company's Lead Deposit in South Dakota and the Cosmo-Howley Deposit. It is known that this style of deposit tends toward higher gold grades than the non-BIF hosted deposits.



Major Gravity "Suture"

Major Gravity/Magnetic Lineament

Aeromagnetic Anomaly

Magnetic Halo or "Metasomatic Front" surrounding "Granitoid"

Cullen Batholith

Major Geosuture "Corridor"

Gold Mines

("Dakota" Styled Deposit)

("Callies" Styled Deposit)

Gravity High

Gravity Low

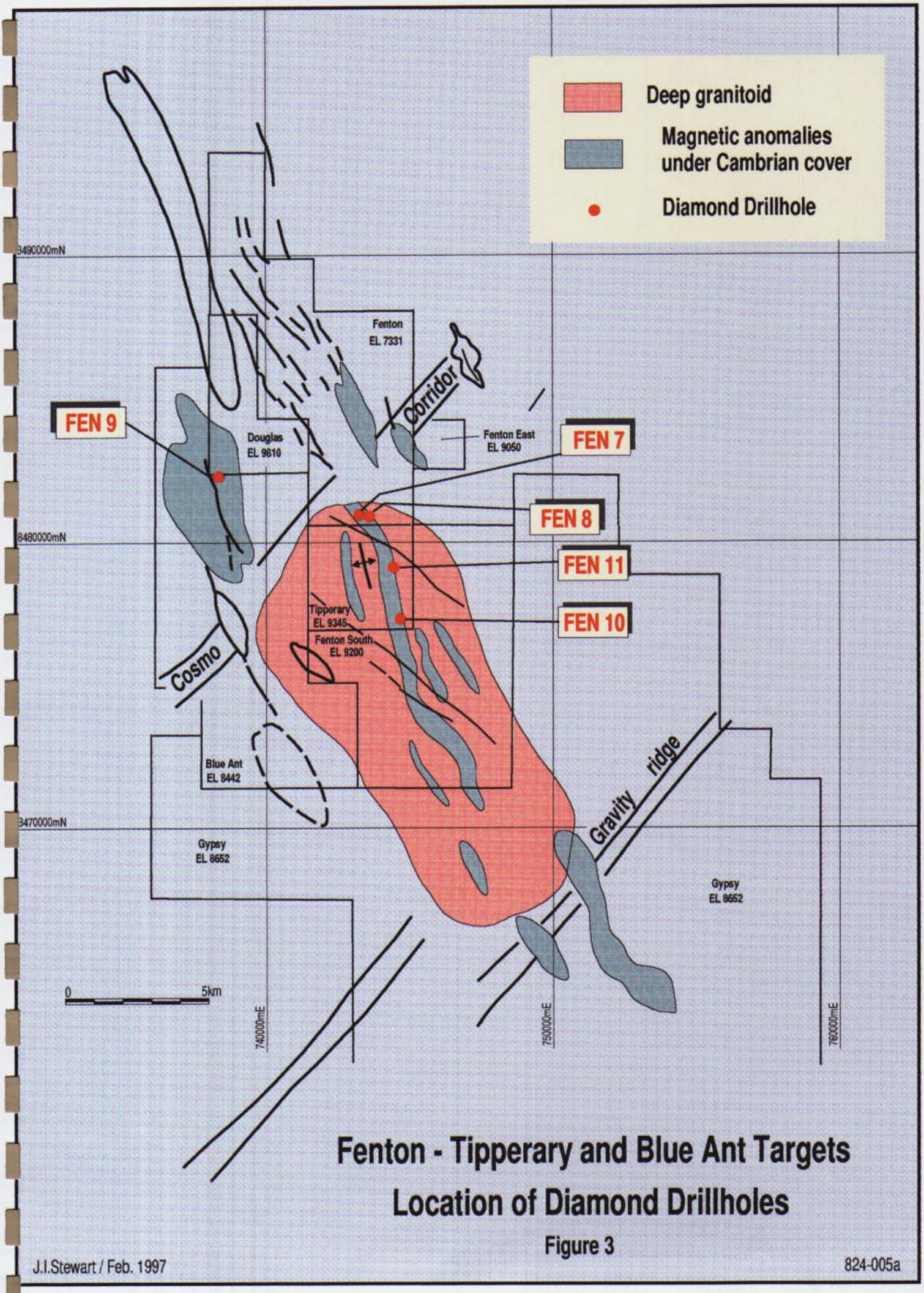
Pine Creek Endowment
15.85 million ounces

Pine Creek West
Igneous and Structural Setting

J.I.Stewart / (1993)

Figure 1

801-16



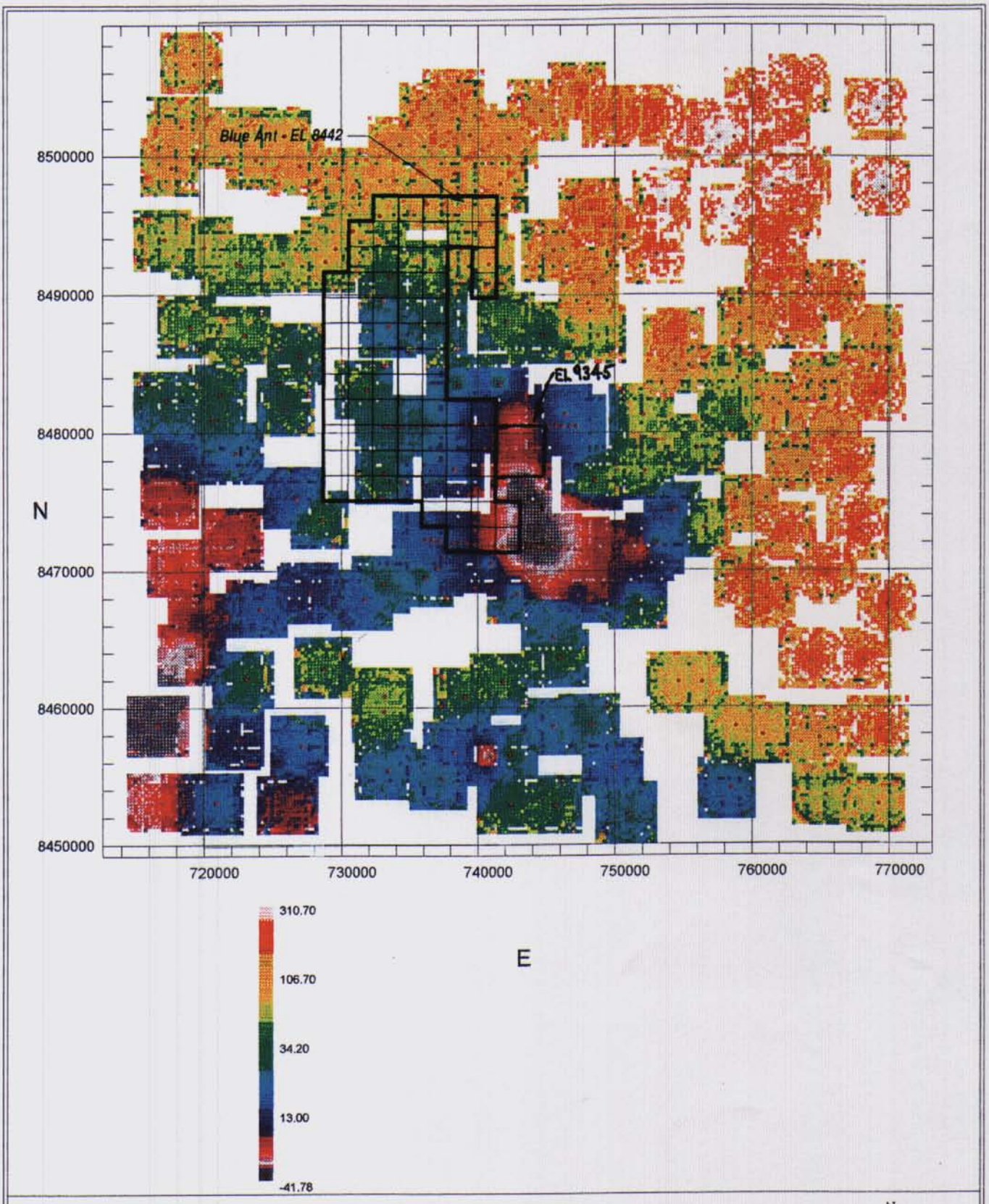
Fenton - Tipperary and Blue Ant Targets

Location of Diamond Drillholes

Figure 3

J.I.Stewart / Feb. 1997

824-005a



EXPLOREMIN PTY LTD

0 8000 16000 24000

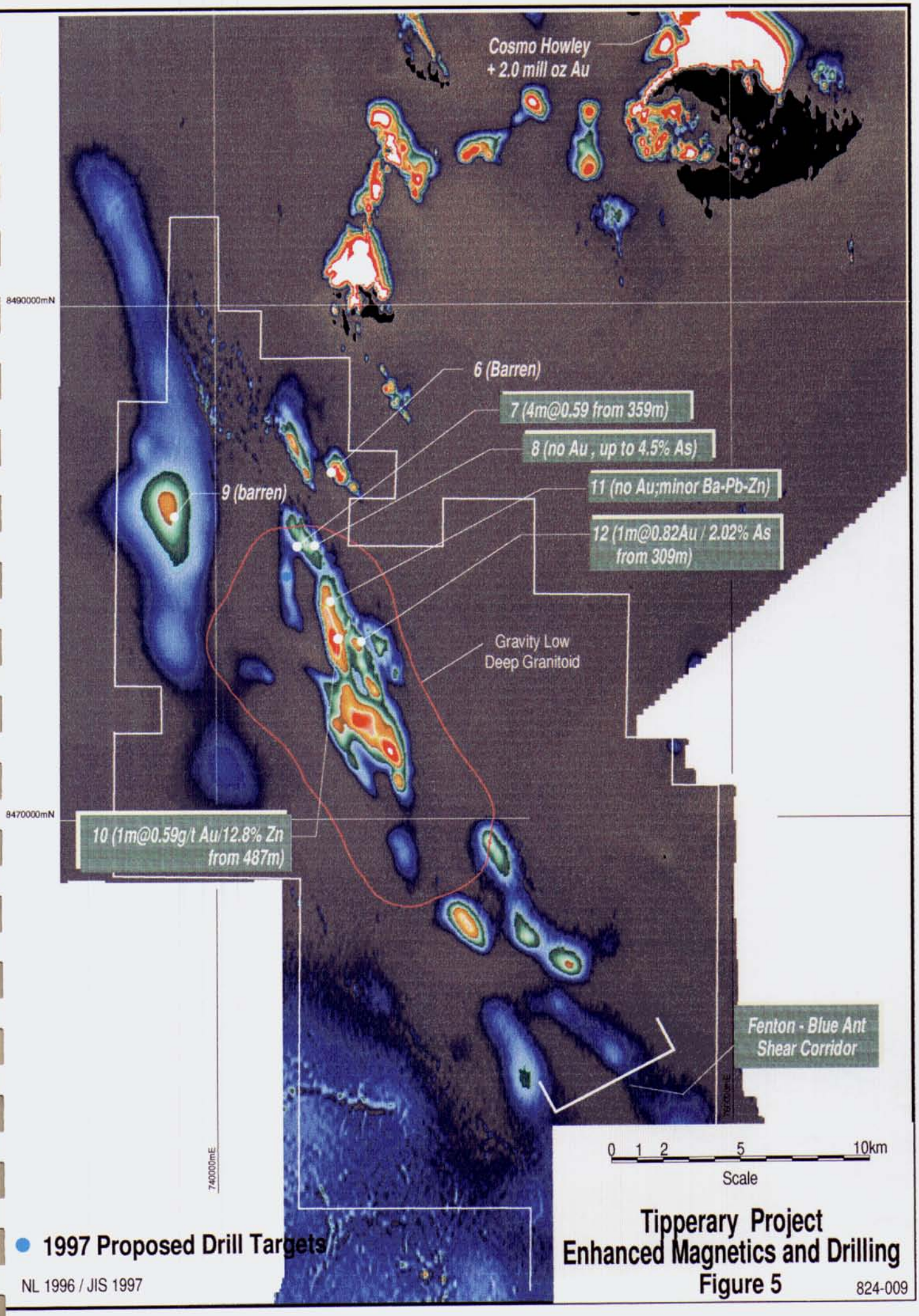
Scale 1: 400000

N

INTERDEX

GEO: JG	HOMESTAKE GOLD OF AUSTRALIA LTD
	TIPPERARY PROJECT
	RESIDUAL BOUGUER GRAVITY MAP
SCALE 1:400000	(AGSO, NTGS & 1995 HGAL SURVEYS)
PLAN: 822-004	DATE:23-01-1996 FIGURE: 4

HGAL data only for stations 500 metre apart


Cosmo Howley
+ 2.0 mill oz Au
8490000mN
6 (Barren)
7 (4m@0.59 from 359m)
8 (no Au , up to 4.5% As)
9 (barren)
11 (no Au;minor Ba-Pb-Zn)
12 (1m@0.82Au / 2.02% As
from 309m)
Gravity Low
Deep Granitoid
8470000mN
10 (1m@0.59g/t Au/12.8% Zn
from 487m)
Fenton - Blue Ant
Shear Corridor
740000mE
0 1 2 5 10km
Scale
1997 Proposed Drill Targets
NL 1996 / JIS 1997
Tipperary Project
Enhanced Magnetics and Drilling
Figure 5
824-009

CAMBRIAN

GEROWIE TUFF?

UPPER KOOLPIN

MIDDLE KOOLPIN

LOWER KOOLPIN

FEND-14

180m

242m

450

T

479

536

T 584 - 589

17m @ 0.74g/t Au
2m @ 2.50g/t Au

T 623 - 627

650

E.O.H.

FEND-15

148m

T 236-238

274

496.40

E.O.H.

FEND-13

41m

130

224 P F fault repeated

Granite stopes out metatuff / siltstone ?

350

370

443.8

E.O.H.

FEND-12

150m

muse-albite tourm.-py. T⊕

250

tourm-chl.-seric.-qtz. T⊕

2m @ 0.25g/t Au

tourm.-chl.-qtz.-sulphide T⊕

305

less metamorphism

1m @ 0.11g/t Au

E.O.H.

FEND-10

146m

granitic rocks stopes metatuff/ siltstone

quartz disrupted

232

278

T⊕

almandine-amphibotite facies

321

T⊕

T⊕

T⊕

371

T⊕

474

4m @ 0.31g/t Au
sphalerite-po-scapolite-fluorite-clinopyroxene skarn ± sphene, apatite, zircon

E.O.H.

plag.-microcline clay-sphalerite-fluorite, baryte ⊕

chl-talc-carb. ⊕

garnet-calcite qtz ⊕

plag.-tourm.-chl.-qtz schist T⊕

albitite ⊕

FEND-11

172m

increased metamorphism

320

1m @ 0.56g/t Au

400

aplite stopes dolerite ?

431

1m @ 0.17g/t Au

1m @ 0.25g/t Au

508

537.1

E.O.H.

FEND-9A

360m

Drilling on margin of granitic body & down dip
Thikness exagerated

443

488

584

725.60

E.O.H.

LEGEND

Lithologies

- Cambrian limestone
- Metasiltstone
- Metatuff & metasiltstone
- Metadolerite
- Pyrrhotitic carbonaceous siltstone
- Chloritic cherty BIF
- Biotite metasiltstone
- Recrystalised limestone & calc-silicate
- Granitic rocks
  - pegmatite
  - granite
  - aplite

Symbols

- Unconformity
- Probable correlation
- Possible correlation
- T 584 - 589 Tourmalinite or tourmalinization
- ⊕ Petrological samples

SCALE

0 25 50 75 100 125 150m

Homestake Gold of Australia

Fenton Project

REGIONAL STRATIGRAPHIC SECTION CORRELATIONS

Survey: S. Ohmotosha December 1996
Addition: J. I. Stewart

Figure 6

Additionally, the host stratigraphy is very amenable to geophysical exploration.

An exploration strategy has been evolved which takes into account the company's extensive knowledge of Proterozoic BIF hosted deposits, the totally unexplored nature of the Blue Ant Geosuture, and the particular amenability of the conceptual ore model to geophysical targeting.

The Tipperary project is part of a large Exploration Licence holding over the Blue Ant Geosuture where the Cambrian Limestone cover is thinnest. This larger project area is shown on Figure 2, and is over 70km in strike coverage.

4. GEOLOGICAL SETTING

The Proterozoic rock sequence at Tipperary is totally covered by extensive Cambrian aged limestone. The basement, however, almost certainly belongs to the South Alligator Group (1.85byr.) - see Figure 1. This is usually subdivided, in ascending order, into the Koolpin Formation, the Gerowie Tuff and the Mount Bonnie Formation. The Koolpin Formation is apparently underlain by the Mount Partridge Group (namely the Wildman Siltstone and Mundorgie Sandstone) and the Namoona Group (Masson Formation, Coomalie Dolomite etc.) which are essentially shale-siltstone, limestone, calcareous shale and sandstone sequences. The Koolpin Formation is broadly characterised by carbonaceous shales, silicate-sulphide - "iron formations" and mafic sills (Zamu Dolerite). There is evidence from current work that the Lower Koolpin Formation is transitional into an older calcilutite-limestone sequence, which opens the possibility that it may be temporally related to the Mount Partridge Group. The Middle Koolpin sequence, both regionally and locally, consists of the maximum concentration of banded iron, nodular chert units below an essentially pyrrhotitic shale sequence (the Upper Koolpin). It is a well recognised time stratigraphic unit comprising chemically distinctive concentrations of silicate and sulphide Fe (cummingtonite-actinolite, grunerite, garnet, pyrrhotite-pyrite), nodular chert, "tourmalinites" and pyrrhotitic shale (Nicholson & Eupene, 1984).

Overlying the Upper Koolpin sequence is the Gerowie Tuff which consists of white-black siliceous welded tuffs, tuffaceous siltstones (Goulevitch, 1980), grey siltstones and laminated chert. The stratigraphically higher Mount Bonnie sequence consists of a hybrid mixture of Koolpin and Gerowie-like lithologies and fly schoidal (greywacke) sediments of the overlying Burrell Creek Formation (Finniss River Group).

At Tipperary the subsurface Proterozoic geology is compatible with that seen on the Pine Creek Geosyncline. The gross geophysical signature consists of a distinctive, 3km long magnetic high (Figure 5) within a 12km x 4km magnetic complex. The Tipperary anomaly itself is part of a 10km long linear feature which has been dissected and rotated along strike by NW trending faults or

shears (Figure 3). At its northern extremity, drilling in FEND's 7 & 8 (EL7331) indicate a Gerowie Tuff-like sequence. Drilling along strike to the south into a stronger magnetic position could conceivably encounter progressively lower stratigraphic units. Interpretations also indicate that the main Tipperary anomaly could be the eastern limb of an anticline.

Gravity surveys also show that the 12 x 4km magnetic complex, of which the Tipperary area is part, lies above the centre of a gravity low (Figure 4). This feature measures 12 x 5km in dimensions (is about 20 milligal in magnitude) and could represent the "roof zone" of a specialised felsic intrusive? This intrusive lies several kilometres west of the main mass of Cullen Batholith, and is bounded on each extremity by 040° trending geosutures or structural corridors (Figure 3).

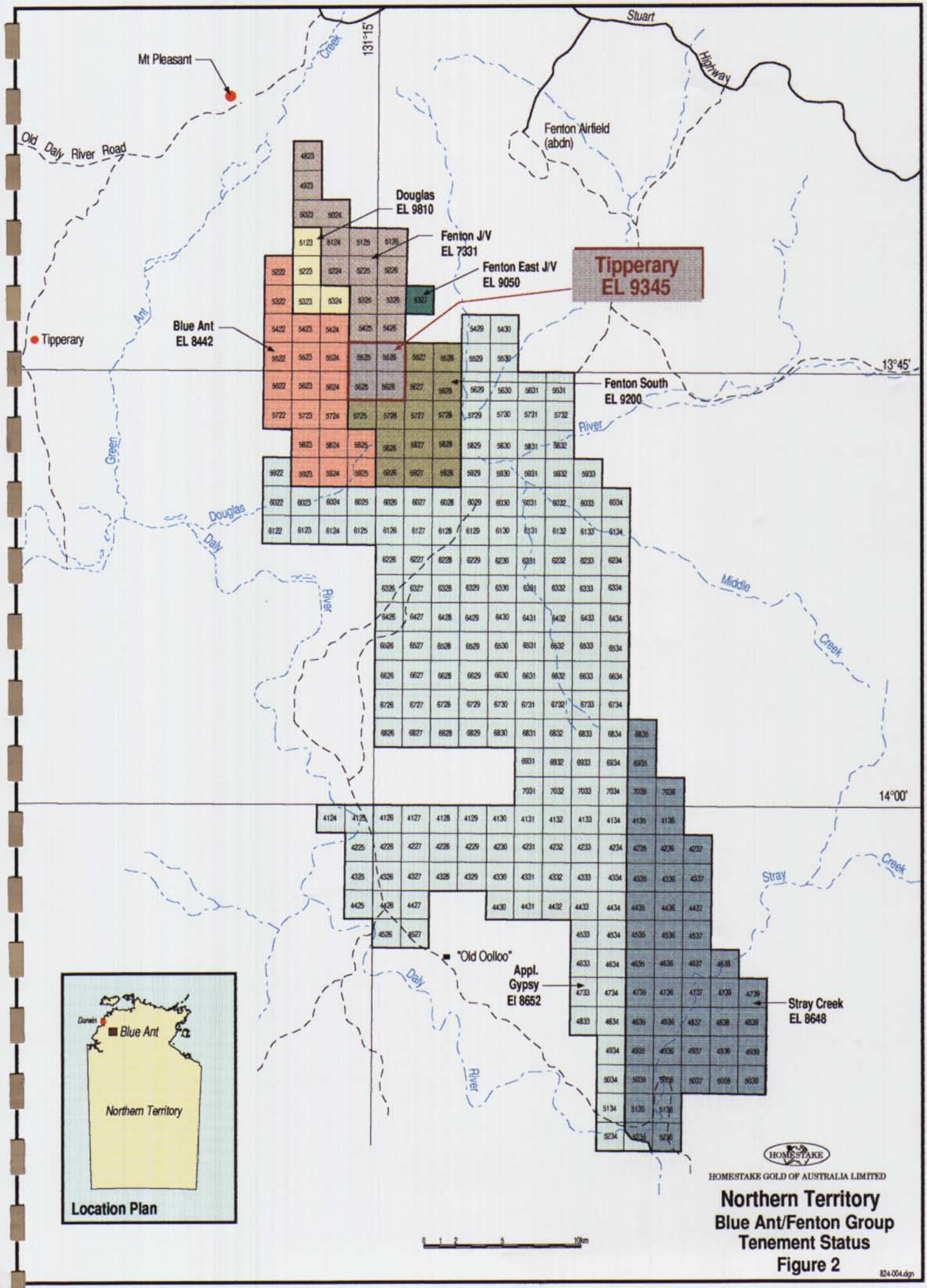
Although lying over 50km west of the Pine Creek area the Tipperary-Fenton anomalies appear to represent South Alligator Group stratigraphy wrapping around the northern contact of the main Cullen Batholith (through the Cosmo-Howley area) and down its western contact for a distance of over 80km in strike. The prospective rocks are folded into at least one NNW trending anticline and faulted-sheared along a 5 to 8km wide corridor known as the Blue Ant or Fenton Shear Zone. Within this structure there are a number of NW trending fault-shear zones spaced 2 to 5km apart. The central area has been intruded by a large granite mass (at perhaps 500m to 1,000m depth?). To the west there is a belt (5km wide) of deep, moderately magnetic, sediments which appear to be also of South Alligator style. The relationship and extent of Early Proterozoic Groups still further west, deep under Cambrian cover, are unknown.

The Tipperary area is covered by over 90 metres of Cambrian aged limestone (90m in FEND10 and 94m in FEND11) and up to 2 metres of brown clay and soil. The Cambrian sequence comprises limestone and calcareous siltstone. The two rock types range from grey to brown in colour, are well bedded to chaotically bedded, ubiquitously karstified and calcite healed, and dominantly dolomitic.

The basal 10 to 12 metres consists of a chocolate brown calcareous siltstone or siltstone breccia. The lower 3m is a "rubble zone" over the Proterozoic unconformity. Work is being undertaken on the trace element characteristics of the unconformity for possible use in the detection of geochemical dispersion haloes from As-Au enriched basement.

5. WORK COMPLETED AND EXPENDITURE

During the reporting period Homestake completed aeromagnetics surveys, recovery of magnetic anomalies, diamond drilling, geophysical interpretations, magnetic susceptibility measurements and assaying for Au and As.


Mt Pleasant
Old Daly River Road
131°15'
Stuart Highway
Fenton Airfield (abdn)
Douglas EL 9810
Fenton J/V EL 7331
Fenton East J/V EL 9050
Tipperary EL 9345
Blue Ant EL 8442
Tipperary
Ant
Green
Douglas
Daly
River
Fenton South EL 9200
13°45'
Middle Creek
14°00'
Stray Creek
"Old Ooiloo"
Appl. Gypsy EL 8652
Stray Creek EL 8648
Darwin
Blue Ant
Northern Territory
Location Plan
0 1 2 5 10km
HOMESTAKE GOLD OF AUSTRALIA LIMITED
Northern Territory
Blue Ant/Fenton Group
Tenement Status
Figure 2
824-004.dgn

Supervision and execution of the drilling programme was undertaken by Exploremin Pty Ltd of Darwin, and geologists Karl Lindsay-Parks of Arnhem Geological Exploration Services (Tennant Creek) and Simon Omotosho of Auserian Exploration (Darwin). Drilling was undertaken by Gaden Drilling of Batchelor; Assaying was completed by AssayCorp. of Pine Creek.

The drilling completed is listed as follows:

HOLE	AMG N	AMG E	RC	DIAMOND (m)	TOTAL (m)
FEND 10	8477000	744700	99.00	412.40	511.40
FEND 11	8478440	744400	87.00	450.1	537.1
			186.00	862.5	1,048.5

Figures 5 & 11 illustrate the location of the drilling.

Appendices I & II contain drill logs and assay certificates. Figures 7, 8, 9 & 10 contain the geological cross sections and assay sections for each drillhole.

Expenditure for the period is detailed as follows:

	$
SALARIES AND WAGES	8,403
CONSULTANTS & TECHNICAL	
Petrological	10,006
Geological	53,275
Field Assistants	3,670
Surveying	1,230
Geophysical	15,697
Other	550
DRILLING	
Core	199,391
Non-Core	7,000
Assaying	29,767
Field, Camp Supplies	12,639
Site Preparation	2,231
Tenement Maintenance	812
Travel, Accommodation, Meals	7,140
Vehicles & Field Equipment	1,679
Support Activities	8,390
Overheads	36,190
TOTAL: ($A)	**398,070**

6. RESULTS AND DISCUSSION

The results of the deep drilling are detailed below:

FEND10: The hole was precollared to 99 metres in Cambrian limestone. It was terminated at 511.4m after penetrating 86 metres of granite (fractured, hematitic, vughy, orange-pink pegmatite, aplite etc) stoped and quartz veined metatuff/siltstone, a BIF-dolerite sequence to 321 metres followed by biotitic metasiltstone and dolerite to 474 metres. The lower 37.4 metres consisted of recrystallised limestone and calc-silicate rocks.

In terms of magnetic susceptibility the BIF - dolerite sequence and the lower 80 metres of the hole are clearly related to the magnetic anomaly. However, it is probable that a further 80 to 100 metres of drilling would have covered the entire modelled magnetic response. The extensive carbonate facies rocks in the lower 38 metres has been interpreted as a classical footwall sequence to the BIF bearing Koolpin sequence.

Figure 6 shows a broad stratigraphic correlation, which indicates that FEND10 has drilled deepest into the FW sequence below the target BIF horizon.

Compared to the other holes, FEND10 illustrates the greatest variety of regional metamorphic facies, a stoping-out of the Gerowie Tuff sequence, an unusually thick (150 metres) sequence of metasiltstones between BIF and carbonate rocks, and abundant coarse tourmaline bearing units.

The target horizon underlies hematitic dolerite (233.1 to 241.4m), fractured - vughy, quartz veined mudstone (241.4 - 243.5m), and carbonaceous - pyritic mudstone (243.5m to 249.2m) below a base of oxidation at 243m? Minor chloritic-cherty siltstone and dolerite between 249.2 and 278m (Hangingwall Dolerite ?) pass downward into chloritic, cherty, garnetiferous variably pyrrhotitic (2 to 20%) siltstone. Rare arsenopyrite to 3mm size occurs at 310.4 and 318.4m, 358.8m, 428.4m, 444m and 458.8m. Between 278 and 321m the Banded Iron Formation nodule-cherty-chloritic siltstone sequence is regionally altered to almandine-amphibolite facies and retrograde altered to biotite - chlorite. Distinctive bands of tourmaline - quartz-garnet-chlorite, sulphide-amphibole-feldspar and clinopyroxene-sericite-pyrrhotite occur within the BIF. The gold grades in this target BIF horizon are distinctly anomalous only. Three intervals range from 2 to 6 metres in width with 0.03 to 0.09 g/t Au.

Visible tourmaline occurs at 344, 335.5 - 358.9, 351, 411, 446.9m, 469 - 469.3m, 476.8 - 490.4, 507 etc. metres and appears to predominate in and below the target horizon. It is mostly in the form of distinctive sedimentary bands and strata controlled coarse disseminations. From current observations in FEND10 and other studies (Nicholson, 1980; Stewart, 1996 etc., Herbert, 1996 - Appendix IV), it is fairly certain that this tourmaline is both related to

syn-sedimentary processes and subsequent diagenetic-metasomatic events. It supports our interpretation that the stratigraphic position is Middle to Lower Koolpin.

If this is correct, then there is clearly a thickening in the Lower Koolpin position at FEND10, and that the sequence is lacking in the graphite component compared to Cosmo-Howley and Mt Porter.

A biotite-chlorite-schist zone occurs at 451 to 457.4m.

Between 476.8 and 490.4m a chloritic, fluorite (>5%) rich, pyrrhotitic (10%), sphalerite (25%), calcite, calc-silicate unit is located within the Footwall Calcareous sequence.

Appendix IV deals thoroughly with this unusual unit. In summary, it ranges from a coarse grained pale brown sphalerite-scapolite (25%) -fluorite-clinopyroxene (± chalcopyrite, pyrrhotite) rock to a finer grained green (to pink) fluorite (40%) - plagioclase-clinopyroxene (40%) - sphene (35) - apatite(1%) - zircon (5%) - sericite-quartz assemblage. Analytical work returned an interval of 4.0 metres at 0.31g/t Au (484-488m). Within this interval the best Au (0.62g/t) correlated with 14ppm As, 460ppm Cu, **12.8% Zn**, 3.0ppm Ag.

This Zn, P, Na, Cl, F, REE enriched unit is believed to represent a hydrothermal "skarn" derived from the deep underlying granite or a recrystallised syn-sedimentary volcanogenic hydrothermal metasomatite. (Goulevitch pers. comm. & Herbert, Appendix IV).

FEND11: FEND11 is located 1.5km north of FEND10 along the magnetic basement strike trend. It was drilled to 537.1 metres after exiting the Cambrian unconformity at 172 metres.

The lower 140 metres of the hole exhibited lithological and magnetic susceptibility features suggestive of an inconclusive test of the magnetic anomaly and the Koolpin target. The Middle Koolpin BIF target may occur deeper in the section, may be faulted off section, or is manifest by this hole in a structurally/metasomatically reworked position??

The entire hole contained quartz veining occupying from 1 to 13% of the rock.

From 172 to 320 metres a metasiltstone contained minor plagioclase-microcline-sphalerite-fluorite-baryte veins and garnet-calcite-quartz veins. Tuffaceous metasiltstones occupied the interval between 320 and 400 metres. Various, (minor but ubiquitous) pegmatitic and K-feldspar veins, fluorite and arsenopyrite bearing patches indicate a strong contact hydrothermal overprint. At 400 to 431 metres an aplitic unit partly stopes out the Hangingwall Dolerite. This is a structurally complex zone including quartz-chlorite-plagioclase-tourmaline schist, albitite and quartz-po-aspy veins.

From 431 to 508 metres the target horizon may be represented by quartz veined chloritic metasiltstone and dolerite.

FEND11 is distinctive in its degree of gross quartz veining, increased metamorphic grade and ubiquitous fluorite (eg. 218.8, 239, 228, 253, 284, 342, 391, 397 & 453 metres), K-feldspar veining/alteration, and (to a lesser extent) baryte (439.5 & 235m), tourmaline (235, 374, 390.5, 399 & 427m), and arsenopyrite (250, 333, 396.2, 398, 404, 427m).

Mineralisation occurs in the following positions:

235m - brecciated, albitized plagioclase-microcline, sphalerite, clay, fluorite, baryte (Appendix III);

285m - garnet-calcite-quartz-zoisite-chlorite-spidote calc-silicate skarn;

398 - 400m - 0.56g/t Au over 1m, 9060 to 1.58% As over 2m - top of faulted off target?

BIF - From (m)	To (m)	Width (m)	Au (g/t)	As (ppm)
449	451	1.0		700
454	455	1.0	0.13	
461	462	1.0		930
478	479	1.0	0.34	
502	504	2.0	0.05	

DISCUSSION

The results of drilling at Tipperary confirm that the aeromagnetic anomalies are indeed the prospective Middle Koolpin Formation equivalent.

Mineralisation obtained is mostly related to overprinting by basinal metasomatic events and hydrothermal activity circulating above the roof zone of a buried granitic batholith. Examples of this include extensive and ubiquitous quartz veining, K-feldspar-quartz, hematite dusting, arsenopyrite-pyrite, fluorite ± baryte veins and replacements and reconstitution of tourmaline and scapolitic rocks.

Including FEND's 7 & 8 near the northern boundary of EL9345, every hole drilled on the tenement (a strike coverage of nearly 4km) has indicated that the aeromagnetic anomaly is on or near a zone of major regional thermal and/or hydrothermal overprinting.

Whilst the preferred target for Homestake is a BIF hosted Cosmo-Howley/Lead-Dakota look-a-like, there is every possibility that other ore deposit styles could be found in the region.

Gold and arsenic values in the BIF units of FEND's 10 & 11 are anomalous only. Whilst this may be indicative of a protore Au-As source we are yet to encounter a BIF position where metal grades are upgraded to an economically significant level.

The zinc bearing skarn-like bodies found in this drilling are not considered to be a Homestake target at this stage.

7. FORWARD WORK PROGRAMME

During the 1997 field season, it is intended to re-interpret all of the drilling results from the Fenton project. A detailed helimag or ground magnetics survey will be considered for use in targeting suitable lithostructural positions of enhanced Au-As fluid flow. With the current knowledge of stratigraphy and structure in the Pine Creek West area, we are now confident that the original exploration strategy is sound.

Pending the results of target analysis further diamond drilling may be warranted to the south of FEND10 or adjacent to FEND11. The budget detailed below is based upon the above work.

	$
SALARIES AND WAGES	4,000
CONSULTANTS & TECHNICAL	
Geophysics	20,000
Other	32,000
Drilling	*100,000
Assaying	*12,000
Field, Camp Supplies	6,000
Site Preparation	2,000
Travel, Accommodation, Meals	5,000
Vehicles & Field Equipment	2,000
Support Activities	6,000
Overheads	18,900
TOTAL:	**207,900**
Approximate Budget ***without drilling***	**80,000**

* Costs pending review of new geophysical programme.

8. REFERENCES

EUPENE, G.S.: 1994. Review Report on Exploration at Mount Porter. Internal Report for Pine Creek Goldfields Limited.

GOULEVITCH, J.: 1980. Stratigraphy of the Kapalga Formation North of Pine Creek and its Relationship to Base Metal Mineralisation. Proc. of International Symposium on Pine Creek Geosyncline, 1980.

NICHOLSON, P.M. and EUPENE, G.S.: 1984. Controls on Gold Mineralisation in the Pine Creek Geosyncline. Aust.IMM Conference, Darwin N.T., 1984.

STEWART, J.I.: 1993. Summary Review of the Potential of the Pine Creek Geosyncline - Northern Territory. Unpublished Internal Report to Homestake Gold; Report Number 1993-34.

STEWART, J.I.: 1994. Comparative Analysis of the Cosmo-Howley and Homestake Lead-Dakota Deposits. Unpublished Internal Report to Homestake Gold; Aug. 1994.

STEWART, J.I.: 1996. Paragenetic Evolution of the Cosmo-Howley and Mount Porter Deposits from Petrographic studies of Drill Core. Unpublished Internal Report to Homestake Gold; Sept. 1996.

744500

744600

744700

FEND10

0

-100

-200

-300

-400

RL

DRILL HOLE LEGEND

LHS Posting : AU PPM

RHS Posting : AS PPM

FEND10 (EOH 511.4)

744500

744600

744700

EXPLOREMIN PTY LTD

INTERDEX

Scale 1:500

E

CR 97 / 171

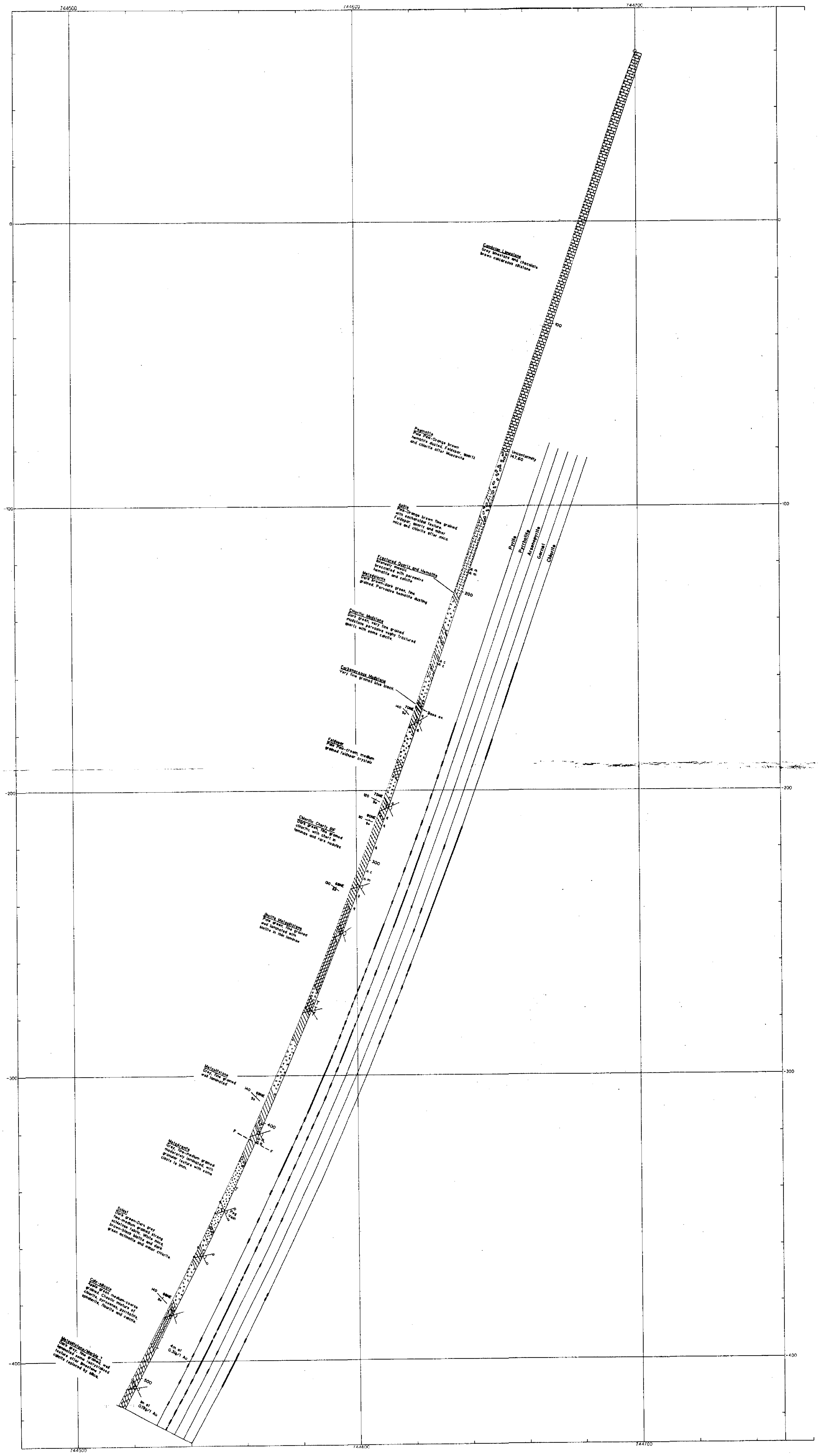
CLIENT: HOMESTAKE GOLD AUSTRALIA

EL9345 TIPPERARY CENTRAL

FEND10 ASSAY PROFILE

LHS Au ppm RHS As ppm

GEOL JG	SCALE 1:500	REPORT:
DRAWN:	DATE : 01-10-1996	PLAN: FIGURE 7



744500
744600
744700
0
-100
-200
-300
-400
RL
Cambrian Limestone
Grey limestone and chocolate brown calcareous siltstone
100
Pegmatite
Pale Pink-Orange brown hematite dusted, Feldspar, quartz and chlorite after Muscovite
Unconformity 147.60
Aplite
Pink-Orange brown fine grained with sacharoidal texture. Feldspar, quartz and minor mica and chlorite after mica.
Pyrite
Pyrrhotite
Arsenopyrite
Garnet
Chlorite
Fractured Quartz and Hematite
Intensely mosaic brecciated with pervasive hematite and calcite
Metadolerite
Dark brown-dark green, fine grained. Pervasive hematite dusting
200
Chloritic Mudstone
Dark green, very fine grained mudstone pervasive vughy fractured quartz with some calcite.
Carbonaceous Mudstone
Very fine grained blue black.
Base ox.
Feldspar
Pale Pink-cream medium grained feldspar crystals
Chloritic Cherty BIF
Dark green, fine grained chloritic with chert in laminae and rare nodules.
300
Biotite Metasiltstone
Pale green, fine grained well laminated with biotite in thin laminae
Metasiltstone
Grey, fine grained well laminated
400
MetaArenite
Grey, fine-medium grained moderately laminated, with granular texture with some clasts le 1mm.
Peg Vein
Schist
Dark green-Dark grey fine-medium grained strong schistose fabric. White mica, brown-black biotite and dark green actinolite and minor chlorite.
Calc-silicate
Apple green medium-coarse grained. Chaotic mixture of chlorite, pyroxenes, pyrrhotite, sphalerite, flourite and calcite.
4m at 0.3g/t Au
Metasiltstone/Marble ?
Dark grey, fine grained, well laminated some recrystalised texture after limestone ? calcite replaced by silica.
500
1m at 0.19g/t Au
E

LEGEND

- Cambrian Limestone
- Mudstone
- Carbonaceous Mudstone
- Chlorite Cherty BIF
- Metadolerite
- Biotite Metasiltstone
- Metasiltstone
- MetaArenite
- Schist
- Metasiltstone/Marble?
- Calc-silicate
- Pegmatite
- Aplite
- Pervasive
- Intermittent
- ΔR Rubble Breccia and Crumbled Core
- Δc Crackle Breccia
- Δm Mosaic Breccia
- Unconformity
- q Quartz/chert in veins and laminae
- Core-bedding angle
- Core-vein angle (Quartz unless otherwise stated)
- Fractured Quartz
- F – – – F Fault attitude unknown
- In space orientation bedding strike and dip
- T Tourmaline

CR97/171

EXPLOREMIN PTY LTD

INTERDEX

Scale 1:500

CLIENT: HOMESTAKE GOLD AUSTRALIA

EL9345 TIPPERARY CENTRAL

FEND10 PROFILE

GEOLOGY

GEO: S O	SCALE 1:500	REPORT:
DRAWN:	DATE: 18-09-1996	PLAN: FIGURE 8

744200

744300

744400

FEND11

DRILL HOLE LEGEND
LHS Posting : AU PPM
RHS Posting : AS PPM

0

-100

-200

-300

-400

RL

100

200

300

400

FEND11 (EOH 537.1)

744200

744300

744400

E

EXPLOREMIN PTY LTD

INTERDEX

Scale 1:500

CR97/171

CLIENT: HOMESTAKE GOLD AUSTRALIA

EL9345 TIPPERARY CENTRAL

FEND11 ASSAY PROFILE

LHS - Au ppm RHS - As ppm

GEO: JG	SCALE 1:500	REPORT:
DRAWN:	DATE : 07-10-1996	PLAN: FIGURE 9

744200 744300 744400

-100 -200 -300 -400

RL

Cambrian Limestone
Pale grey limestone and chocolate brown calcareous siltstone

Metagreywacke and Metasiltstone
Pale grey fine-grained metasediment with some clasts to 2mm with uniformly fine-grained metasiltstone

Pegmatite
Pink coarse-grained, some minor chloritic alteration

Metagreywacke
Pale brown, fine-grained, facies, massive with scattered clastic grains to 1mm

Mudstone
Dark green-black, very fine grained and massive

Meta-Arenite
Grey, fine grained, massive slightly coarser clasts

Metadolerite
Grey, fine grained, moderately laminated

Calc-Silicate
Chloritic mix of chlorite, tourmaline and calcite
Pale olive green

Metatuff and Metasiltstone
Interbedded pale grey fine grained siliceous metatuff grey and darker grey, fine grained metasiltstone

Apatite
Pale red-brown-orange fine grained quartz-feldspar. Shear weak lamination defined by chloritic streaks

Metadolerite
Dark green fine grained and massive

Chloritic Cherty BIF
Dark green fine grained with chert in laminae and rare nodules.

Biotite Metasiltstone
Dark grey, fine grained with chert in laminae. Rare pyrite in numerous laminae.

Unconformity 171/85

Pyrite
Pyrrhotite
Arsenopyrite
Chlorite
Garnet

Fe Vein

LEGEND

- Cambrian Limestone
- Metagreywacke and Metasiltstone
- Metagreywacke
- Metasiltstone
- Mudstone
- Meta-Arenite
- Calc-Silicate
- Metadolerite
- Metatuff and Metasiltstone
- Chloritic Cherty BIF
- Biotite Metasiltstone
- Pegmatite
- Apatite
- Pervasive
- Intermittent
- c Crackle breccia
- m Mosaic breccia
- R Rubble breccia and crumbled core
- Unconformity
- Quartz/chert in laminae and veins
- T Tourmaline
- Core-bedding angle
- Core-vein angle (quartz unless otherwise stated)
- In space oriented bedding strike and dip
- F Fault, Attitude unknown

CR97/171

EXPLOREMIN PTY LTD

INTERDEX

Scale 1:500

E

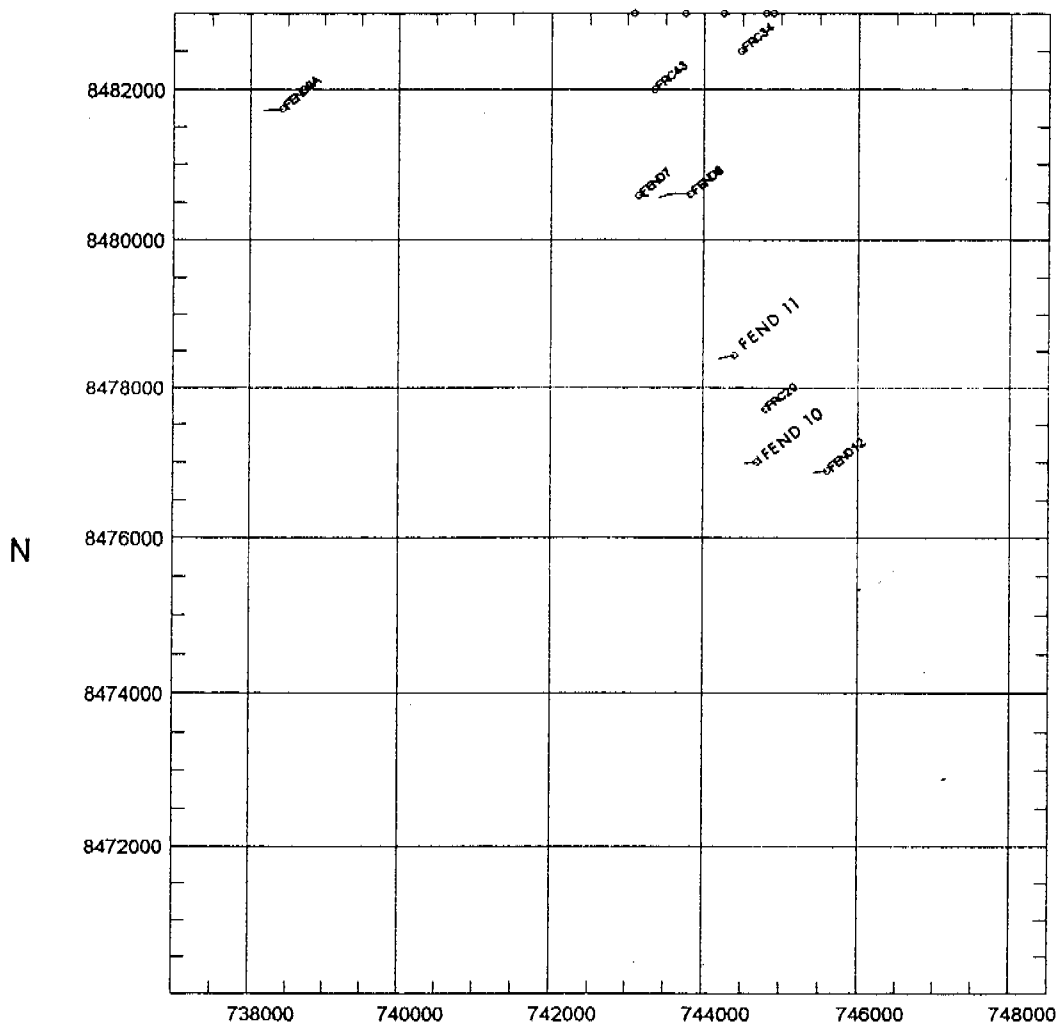
CLIENT: HOMESTAKE GOLD AUSTRALIA

EL9345 TIPPERARY CENTRAL

FEND11 PROFILE

GEOLOGY

GEO: S C
DRAWN:
SCALE 1:500
DATE : 18-09-1996
REPORT:
PLAN: FIGURE 10



EXPLOREMIN PTY LTD

INTERDEX

0 2000 4000 6000

Scale 1: 100000

CLIENT: HOMESTAKE GOLD AUSTRALIA

TIPPERARY PROJECT

DRILL HOLE LOCATIONS

GEO:	SCALE 1:100000	REPORT:
DRAWN:	DATE : 22-10-1996	FIGURE 11

APPENDIX I

FEND10 DRILL LOG AND ASSAYS

EXPLOREMIN PTY LTD - DRILL HOLE LOG

drilog01.dot

Drill Hole: FEND 70
Tenement: EL 9345
Prospect: TIPPERARY CENTRAL
Map Ref: TIPPERARY 1:100,000

AMG/~~Grid~~ E: 744700
AMG/~~Grid~~ N: 8477000
RL Collar: 60
Client: HOMESTAKE

Azimuth: 260° T/MAG
Inclination: -68.5°
Total Depth:
Casing:

Commenced: 1/8/96
Completed: RC completed 2/8
Hole Size: 4½"
Sample Type: RC 2m composite

Sheet: 1 of 5
Logged by: S.O.
Drillers: G A DEN.
Drill Type: WARMAN UNIVERSAL 1000

From	To	SampNo	Lithology	Colour	Texture	Major Minerals	Minor Minerals	Trace Minerals	Comments
0	1		Brown soil & clay	Brown	fine grained	clay			
1	2	F10/0-2	laterite & clay & limestone	yellow brown	"	clay & calcite	Iron oxides		fizz with HCl.
2	3		Limestone	yellow-grey	"	Calcite	Iron oxides.		
3	4	F10/2-4	"	"	"	"	"		
4	5		"	"	"	"	"		
5	6	F10/4-6	"	Grey.	"	Calcite			Some calcite veining
6	7		"	"	"	"			
7	8	F10/6-8	"	Yellow.	"	"	Iron oxides.		
8	9		"	Dark grey	fine grained.	Calcite.			strong fizz with HCl
9	10	F10/8-10	"	"	"	"			
10	11		"	"	"	"			
11	12	F10/10-12	"	"	"	"			
12	13		"	"	"	"			
13	14	F10/12-14	"	"	"	"			
14	15		"	"	"	"			
15	16	F10/14-16	"	"	"	"			
16	17		"	"	"	"			
17	18	F10/16-18	"	"	"	"			
18	19		"	"	"	"			
19	20	F10/18-20	"	"	"	"			
20	21		"	"	"	"			
21	22	F10/20-22	"	"	"	"			
22	23		"	"	"	"			
23	24	F10/22-24	"	"	"	"			

EXPLOREMIN PTY LTD - DRILL HOLE LOG

drilog01.dot

Drill Hole: FEND -10
Tenement: EL 9345
Prospect: TIPPERARY CENTRAL
Map Ref: TIPPERARY 1:100,000

AMG/~~Grid~~ E: 744700
AMG/~~Grid~~ N: 8477000
RL Collar: 60m
Client: HOMESTAKE

Azimuth: 260° AIMIB
Inclination: -68.5°
Total Depth:
Casing:

Commenced: 1/8/96
Completed: RC completed 2/8
Hole Size: 4½"
Sample Type: RC 2m Composite

Sheet: 2 of 5
Logged by: S.O.
Drillers: GADEN
Drill Type: WARMAN UNIVERSAL 1000

From	To	SampNo	Lithology	Colour	Texture	Major Minerals	Minor Minerals	Trace Minerals	Comments
24	25		Limestone	Dark grey	fine grained	Calcite			
25	26	F10/24-26	"	"	"	"			
26	27		"	"	"	"			
27	28	F10/26-28	"	"	"	"			
28	29		"	"	"	"			
29	30	F10/28-30	"	"	"	"			
30	31		"	"	"	"			
31	32	F10/30-32	"	Red brown	"	Iron oxides + calcite			
32	33		"	Grey-Red brn	"	Calcite.	Iron oxides		
33	34	F10/32-34	"	Pale red brown	"	Calcite + Iron oxides			
34	35		"	"	"	"			
35	36	F10/34-36	"	"	"	"			
36	37		"	"	"	"			
37	38	F10/36-38	"	Pale grey	"	Calcite.	Iron oxides		
38	39		"	Tan	"	Calcite.	Iron oxides		
39	40	F10/38-40	"	White-Dark grey	"	Calcite	Iron oxides.		
40	41		"	Grey	"	"			
41	42	F10/40-42	"	Pale grey	"	"			
42	43		"	"	"	"			
43	44	F10/42-44	"	"	"	"			
44	45		"	Chocolate Brown	"	Iron oxides	Calcite		Strongly Iron oxide stained > calcite
45	46	F10/44-46	"	"	"	"	"		less vigorous fizz with HCl
46	47		"	"	"	"	"		" "
47	48	F10/46-48	"	"	"	"	"		" "

EXPLOREMIN PTY LTD - DRILL HOLE LOG

drilog01.dot

Drill Hole: FEND 10
Tenement: EL 9345
Prospect: TIPPERARY CENTRAL
Map Ref: TIPPERARY 1:100,000

AMG/~~Grid~~ E: 744700
AMG/~~Grid~~ N: 8477000
RL Collar: 60 m
Client: HOMESTAKE

Azimuth: 260° MAG
Inclination: -68.5°
Total Depth:
Casing:

Commenced: 1/8/96
Completed: RC completed 2/8
Hole Size: 4½"
Sample Type: RC 2m composite

Sheet: 3 of 5
Logged by: S-O
Drillers: CADEN
Drill Type: HANNAN UNIVERSAL 1000

From	To	SampNo	Lithology	Colour	Texture	Major Minerals	Minor Minerals	Trace Minerals	Comments
48	49		Limestone	Grey-Dark grey	fine grained	Calcite			
49	50	F10/48-50	"	"	"	"			
50	51		"	"	"	"			
51	52	F10/50-52	"	"	"	"			
52	53		"	"	"	"			
53	54	F10/52-54	"	Tan-grey	"	Calcite	Iron oxides		
54	55		"	"	"	"	"		
55	56	F10/54-56	Limestone + calcite.	White-Tan	"	Calcite.			80% massive calcite veining
56	57		Limestone	Pale brown	"	Iron oxides + calcite			
57	58	F10/56-58	"	"	"	"			
58	59		"	"	"	"			
59	60	F10/58-60	"	"	"	"			
60	61		"	"	"	"			
61	62	F10/60-62	"	"	"	"			
62	63		"	"	"	"			
63	64	F10/62-64	"	"	"	"			
64	65		"	"	"	"			
65	66	F10/64-66	"	"	"	"			
66	67		"	"	"	"			
67	68	F10/66-68	"	"	"	"			
68	69		"	"	"	"			
69	70	F10/68-70	"	"	"	"			
70	71		"	"	"	"			
71	72	F10/70-72 WET SAMPLE	"	"	"	"			

EXPLOREMIN PTY LTD - DRILL HOLE LOG

drilog01.dot

Drill Hole: FEND-10 | AMG/~~Grid~~ E: 744700 | Azimuth: 260° TIMIS | Commenced: 1/8/96 | Sheet: 4 of 5
Tenement: EL 9345 | AMG/Grid N: 8477000 | Inclination: -68.5° | Completed: RC completed 2/8 | Logged by: S.O
Prospect: TIPPERARY CENTRAL | RL Collar: 60m | Total Depth: | Hole Size: 4½" | Drillers: GARDEN
Map Ref: TIPPERARY 1:100,000 | Client: HOMESTAKE | Casing: | Sample Type: RC 2m Composite | Drill Type: WARMAN UNIVERSAL 1000

From	To	SampNo	Lithology	Colour	Texture	Major Minerals	Minor Minerals	Trace Minerals	Comments
72	73	wet sample	Limestone	Pink-brown	fine grained	Calcite + Iron oxide			
73	74	F10/72-74	"	"	"	"			
74	75	wet sample	"	"	"	"			
75	76	F10/74-76	"	"	"	"			
76	77	wet sample	Limestone	Pale Tan	"	"			
77	78	F10/76-78	"	"	"	"			
78	79	wet sample	"	"	"	"			
79	80	F10/78-80	"	"	"	"			
80	81	wet sample	"	Pale Grey	"	Calcite			
81	82	F10/80-82	"	"	"	"			
82	83	wet sample	"	"	"	"			
83	84	F10/82-84	"	Red brown	"	Calcite + Iron oxide			minor calcite veining
84	85	wet sample	"	"	"	" "			" "
85	86	F10/84-86	"	Grey	"	Calcite			
86	87	wet sample	"	"	"	"			
87	88	F10/86-88	"	"	"	"			
88	89	wet sample	"	"	"	"			
89	90	F10/88-90	"	"	"	"			
90	91	wet sample	"	"	"	"			
91	92	F10/90-92	"	Grey-brown	"	"			
92	93	wet sample	"	"	"	"			
93	94	F10/92-94	"	"	"	"			
94	95	wet sample	"	"	"	"			
95	96	F10/94-96	"	"	"	"			

EXPLOREMIN PTY LTD - DRILL HOLE LOG

drilog01.dot

Drill Hole: FEND-10
Tenement: EL9345
Prospect: TIPPERARY CENTRAL
Map Ref: TIPPERARY 1:100,000

AMG/~~Grid~~ E: 744700
AMG/~~Grid~~ N: 8477000
RL Collar: 60m
Client: HOMESTAKE

Azimuth: 260° TIMIB
Inclination: -68.5°
Total Depth:
Casing:

Commenced: 1/8/96
Completed: Recompleted 2/8
Hole Size: 4½"
Sample Type: RC 2m composite

Sheet: 5 of 5
Logged by: S.O.
Drillers: CADEN
Drill Type: WARMAN UNIVERSAL 1000

From	To	SampNo	Lithology	Colour	Texture	Major Minerals	Minor Minerals	Trace Minerals	Comments
96	97		Limestone	Grey-brown	fine grained	Calcite			
97	98	wet sample	"	"	"	"			
98	99	F10/96-99	"	"	"	"			
			END RC	GOTO	NQ CORE.				

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND -10	AMG/~~Grid~~ E: 744700	Azimuth: 260° TMG	Commenced: 1/8/96	Sheet: 1 of 7
Tenement: EL 9345	AMG/~~Grid~~ N: 8477000	Inclination: -65.5°	Completed:	Logged by: S.O.
Prospect: TIPPERARY CENTRAL	RL Collar: 60 m	Total Depth:	Hole Size: NQ	Drillers: GADEN
Map Ref: TIPPERARY 1:100000	Client: HOMESTAKE	Casing: 9m	Sample Type: ½ CORE (1m)	Drill Type: WARMAN UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	30m / -72° / 259°m	60m / -73.5° / 254°m	-90m / -73° / 254.5°m	130m / -73° / 251°m

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	sllic	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
99.00	114.15	Limestone Grey, fine grained limestone characterised by intense solution collapse breccia, and Vughs some calcite lined. Calcite also fills some spaces between breccia.																							
114.15	117.00	Limestone/calcareous siltstone 50% of interval made up of limestone as above remaining of brown fine grained more massive calcareous siltstone. Both lithologies, chaotically intermixed																							
117.00	128.00	Limestone: Grey fine grained, solution collapse breciated with resultant calcite dissolution Vughs - as above.																							
128.00	134.00	Limestone. Grey, fine grained tightly packed solution collapse breccia also been recealed in places by white calcite. - Hence this interval does not show any Vughs as above																							
134.00	147.00	Calcareous siltstone: chocolate brown, fine grained massive calcareous rock. shows minor (irregular) breccia bleached to a tan colour & also some recessive loose breccia clasts of the same rock. This unit is representative in the area as existing just above the unconformity.																							
147.60	175.00	Granite Pegmatite Pale Pink - Orange brown																							

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-10	AMG/~~Grid~~ E: 744700	Azimuth: 265° T/M/B	Commenced: 1/8/96	Sheet: 2 of 7
Tenement: EL 9345	AMG/~~Grid~~ N: 8477000	Inclination: -68·5°	Completed:	Logged by: S.O.
Prospect: TIPPERARY CENTRAL	RL Collar: 60m	Total Depth:	Hole Size: NQ	Drillers: CADEN
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing: 99m	Sample Type: ½ CORE (1m)	Drill Type: WARMAN UNIVERSAL 120
Hole Survs - Depth/Incln/Azim	160m / -73° / 252°m	190m / -73° / 255°	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss'mn	patc hes	Alteration/Metamorphism (est %) cbt	sillic	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
147.00	175.00	(CONT) coarse grained - Major mineralogy hematite dusted feldspar, pale grey feldspar, quartz, Dark green chlorite after Muscovite mica, minor flesh muscovite mica - feldspar. capillaries to core width in places show schistic effect - From 164.70 - 167.85 see a fine grained rock with weak sugary texture, red brown in colour major mineralogy pinkish feldspar & Quartz. This is an Aplite dyke within the pegmatite - May represent late volatile pulse. - upper contact ~ 45° TCA. Bottom 2.5m of interval shows increasing hem dusted feldspar - Around 171m see ½cm. brecciated (milled with rounded clasts & some open cracks & vugs to pink with calcite. whole interval appears somewhat cracked & strained - 170.80 - 173.30 - Aplite interval with clots of hematite to 1cm max.			hem	5%		✓	✓																			
175.00	203.20	Aplite Pink - Orange brown, fine grained rock with weak sugary (saccharoidal) texture. mineralogy is feldspar, quartz, mini mica and clots of chlorite after mica to 5mm in places - Some (rare) small (1cm) pockets show grain size up to pegmatite. Also some zones appear to comprise mostly of feldspar.			hem	2%		✓	✓															164.70	Aplite contact	45	

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-10	AMG/~~Grid~~ E: 744700	Azimuth: 260° TMG	Commenced: 1/8/96	Sheet: 3 of 7
Tenement: EL 9345	AMG/~~Grid~~ N: 8477000	Inclination: -65.5°	Completed:	Logged by: SO.
Prospect: TIPPERARY CENTRAL	RL Collar: 600m	Total Depth:	Hole Size: NQ	Drillers: GADEN
Map Ref: TIPPERARY 1:10,000	Client: HOMESTAKE	Casing: 59m	Sample Type: ½ CORE (1m)	Drill Type: WIRTHMAN UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	/ /	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	sillic	tour	chl	bt	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
188.0	203.80	(cont) Some rare chloritic veins from 190-90 TCA. From 188.0 - 191.0 rock is Pale pink and composes mostly of feldspar. Some rare pegmatite size quartz. From 191.10 - 193 rock is massive brecciated with chloritic and red brown clay gouge zone (10cm thick) at 191.70 may point to faulting Some calcite fracture filling. 195.50 see 10cm green chloritic zone. 196 - 199.4 Zone of pale pink pegmatite 199.4 - end interval Aplite.																				188.0	Chloritic vein	10	
203.80	204.70	Fractured Quartz + Hematite. Top 5cm of interval. Dark green chloritic zone, minor quartz. Remainder interval white quartz. Intensely massive brecciated. with red brown hematite filling cracks. Interval has been pervasively shattered. Calcite also present with hematite filling cracks Interval. 70% Qtz, 30% Hem + Calcite.		Qtz Hem																					
204.70	205.50	Quartz. massive white Quartz, minor thin hematite cracks + calcite in veins to 5mm.																							
205.50	216.25	Altered Hematised Dolerite Dark brown - dark green, fine grained rock. Some v. weak fabric in places. Pervasively shattered in patches																							

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND - 10	AMG/~~Grid~~ E: 744700	Azimuth: 260° AIM/B	Commenced: 1/8/96	Sheet: 4 of 17
Tenement: EL 9345	AMG/~~Grid~~ N: 8477000	Inclination: -68.5°	Completed:	Logged by: S.O
Prospect: TIPPERARY CENTRAL	RL Collar: 60.4	Total Depth:	Hole Size: NB	Drillers: GADEN
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing: 99m	Sample Type: ½ core (1m)	Drill Type: WARMAN UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	220m / -72.75° / 254.5°m.	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	silic	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
205.50	216.25	(CONT) with hematitic - Major mineralogy, chlorite mica some weak calcite veining ~ 5mm Top 1.5m of is bright green, fine grained with hematitic streaking & Wispy fractured quartz ion veins at ~30°TCA & // TCA. Top interval may represent ultra altered zone. Wispy fractured hematitic quartz also form. 209.20 – 210.00 Bottom 40cm of interval show texture. // To contact. 2cm		Qtz	Hem	20%		✓	✓	1%												216.25	DSJ contact	40	
216.25	233.10	Wispy & fractured quartz & Chloritic Mudstone Zone. A chaotically intermixed zone of white fractured and wispy quartz with hematite in cracks with Dark green mudstone. Mudstone filling cracks in quartz in top 4m of interval from 225.4 – 227.0 mudstone is intensely crackle brecciated by calcite veining. Sections ~ 1cm in mudstone appear Carbonaceous Overall mudstone is chloritic & wispy. All wispy in Qtz & Mudstone are calcite Fine. At 223. apple green serpentine infirm. 225.4 – 227 powdery green. alteration mineral. Interval ~ 60% mudstone 40% Quartz.			Hem	2%		✓	✓	5%															

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-10	AMG/Grid E: 744700	Azimuth: 260° T/M/G	Commenced: 1/8/96	Sheet: 5 of 17	
Tenement: EL 9345	AMG/Grid N: 7477000	Inclination: -65.5°	Completed:	Logged by: S.D.	
Prospect: TIPPERARY CENTRAL	RL Collar: 600m	Total Depth:	Hole Size: NQ	Drillers: GADEN	
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing: 9.4m	Sample Type: 1/2 CORE (1m)	Drill Type: WALLMAN LONGYEAR LT/1000	
Hole Survs - Depth/Incln/Azim	/ /	/ /	/ /	/ /	

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	sillic	tour	cht	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
216.25	233.10	(cont) At ~230.50 possible very fine grained disseminated graphitic also graphitic on slick surfaces around 235m. This zone may represent a slightly more reactive mudstone (carbonaceous &/or calcareous?) layer that has facilitated intense alteration																							
233.10	241.40	Altered Hematitic clustal/ferruginous Dolerite																							
		Dark green fine-medium grained by virtue of numerous mica flakes. Rock is cut by fragmentary and hematitic clustal quartz veins in top 3m. Non Pervasive patchy olive green brown hematite. Minor calcite veins to 1mm from 237-238.5 rock is red brown & strongly ferruginous. Dolerite has been altered strongly resulting in slight increase in grain size as seen by mica flakes, but retains massive slightly crystalline appearance of unaltered dolerite. From 239.5 -241.40 Dolerite is dark green, massive & appears fresher & less altered. with minor calcite + Qtz veins to 1cm			hem	10%		✓	✓	1/2%			7%		5%							241	calcite vein	24	
241.40	243.50	Fractured, highly Quartz + included Mudstone.																							
		Zone of white-red brown highly & fractured quartz with slivers & intervals to 20cm of Dark grey green chloritic mudstone.			hem	1%		✓		1%															

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-10	AMG/~~Grid~~ E: 744700	Azimuth: 260° T/M/B	Commenced: 1/8/96	Sheet: 6 of 17	
Tenement: EL 9345	AMG/~~Grid~~ N: 8477000	Inclination: -68.5°	Completed:	Logged by: S.O.	
Prospect: TIPPERARY CENTRAL	RL Collar: 60m	Total Depth:	Hole Size: NQ	Drillers: CADEN	
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing: 99m	Sample Type: ½ CORE (1m)	Drill Type: LONGYEAR UNIVERSAL 1000	
Hole Survs - Depth/Incln/Azim	250m / -72.25° / 254.5°m	/ /	/ /	/ /	

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/ngt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	sllic	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
241.40	243.50	(CONT). It appears that these veiny, quartz rich zones may form preferentially between different lithologies - fluid conduit?																							
243.50	244.80	Carbonaceous Mudstone v.fine grained blue black rock with 10cm pug clay zone at 244.4. At 244.4 sec. chaotic quartz feldspar veining with clots of pyrite to 5mm. Inkwell is also more chloritic towards base		1%	Py				✓				2%												
244.80	249.20	Pyritic Siltstone. Dark grey-dark green siltstone characterised by bedded to disseminated pyrite to ~40% of core volume. Pyrite occurs as concentrations along a preferred direction or laminations to ~1cm thick also as v. fine disseminations throughout interval and more rarely as clots in small veins. chloritic and darker bands also impart "bedded" character to interval. some partly developed, white, veiny quartz layers to 4cm. * CORE ORIENTATED FROM 249.30 - 253.7 *		40%	Py		✓	✓	✓				5%									247.80	Lower int con.	40	
249.20	253.03	Chloritic cherty siltstone. Dark olive green fine grained laminated rock. Characterised by laminae, lenses & nodules of sugary textured chert. 2 chert laminae are up to 4cm thick. Pyrite occurs parallel		15	Py		✓		✓	<1%			10%												

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-10	AMG/Grid E: 744700	Azimuth: 260° T/MIG	Commenced: 1/3/96	Sheet: 7 of 17
Tenement: EL 9345	AMG/Grid N: 8477000	Inclination: -68·5	Completed:	Logged by: S.A
Prospect: TIPPERARY CENTRAL	RL Collar: 600m	Total Depth:	Hole Size: NQ	Drillers: GADEN
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing: 99m	Sample Type: ½ CORE (1m)	Drill Type: WARMAN UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	/ /	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	sillc	tour	chl	bl	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
244·20	253·00	(cont) to laminations and also in clots around the perimeter of some clast nodules. also some fine grained calcite in rock groundmass & plans. In space orientation reveals that at 250·8 laminations or bedding is 140/70NE.																				250·8	So.	37	320
253·00	265·00	Variably altered hematite dusted Dolerite							✓													252·0	So.	40	
		Diffuse contact zone above variable zones of red brown hematite dusted and dark grey green, fresher medium grained dolerite. Hematite lined micro fracturing throughout interval. clots of pyrite to 3cm at 256·60. Calcite veinlets to 3mm throughout zone. also some patchy pink at 264.		<1%	Py			✓																	
					hem	5%																			
265·00	270·50	Massive Feldspar Flooded Zone. Pale pink – cream medium grained rock comprises almost entirely of tightly packed crystals of orthoclase feldspar. Some rare inclusions to 3cms of micaceous metasediment. Bottom 3cm of zone shows pyrite in cracks. Top & bottom 30-50cm of zone pink plagioclase feldspar.																							
270·50	278·00	Dolerite Dark green fine to medium grained massive, feldspar, pyroxene & minor mica.		1%	Py																				

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-10	AMG/~~Grid~~ E: 744700	Azimuth: 260° T/M/G	Commenced: 1/8/94	Sheet: 8 of 17
Tenement: EL 9345	AMG/~~Grid~~ N: 8477000	Inclination: -68.5	Completed:	Logged by: S.O
Prospect: TIPPERARY CENTRAL	RL Collar: 60m	Total Depth:	Hole Size: NQ	Drillers: GADEN
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing: 9m	Sample Type: ½ CORE (1m)	Drill Type: LONGYEAR UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	280m 1-72° 1250.5m	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	silic	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
275.50	278.00	(cont) Bottom 1.5m of interval slightly coarser grained and pyritic to 15%.																							
		*CORE ORIENTATED FROM 275.5 -																							
278.00	284.10	Chloritic cherty siltstone. Dark green-grey fine grained aphanitic recrystallised and baked. some chert in laminae. Pyrite in lamina. 20cm pegmatite interval at 279m, 5cm Pegmatite @ 280.5. Mineralogy plagioclase, biotite, chlorite, pyrite. First Pyrrhotite comes in suddenly at 282.20 in discrete bed/lamination. In space orientation shows bedding @ 280.4 to be 120/75 NE. At 283.40 see 30cm zone with Garnets to 1mm that comprise ~20% core.		2%	Py		✓																			
				5%	2:3		✓	✓														278.30	laminations	55	315
																						280.4	laminations	45	305
284.10	285.60	Dolerite. Dark olive green fine grained massive. Pyrrhotite absent - minor pyrite in clots. Contact indistinct		<1%	Py				✓																
285.60	287.30	Garnet-pervus cherty siltstone. Dark grey fine grained recrystallised siltstone, minor chert bands // to lamination with garnets to 1mm in distinct beds. In space orientation at 286m bedding is 110/80 NE. Minor Pyrite in clots to 3mm.		1%	Py				✓													286	laminations	35	300
287.30		Pyrrhotitic cherty siltstone. Green fine grained well laminated rock with numerous		20%	2:18		✓																		

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-10	AMG/~~Grid~~ E: 744700	Azimuth: 260° TMI/B	Commenced: 1/8/96	Sheet: 9 of 17
Tenement: EL 9345	AMG/~~Grid~~ N: 8477000	Inclination: -68.5	Completed:	Logged by: S.O
Prospect: TIPPERARY CENTRAL	RL Collar:	Total Depth:	Hole Size: NQ	Drillers: GIDEN
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing: 99m	Sample Type: ½ CORE (1m)	Drill Type: WARMAN UNIVERSAL NQ
Hole Survs - Depth/Incln/Azim	310m -71° 259°M	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	sillic	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
288.30	303.00	(CONT) chert bands & lenses to 4cm Mnrl. abundant pyrrhotite in laminae to 18% of core. 2% pyrite. 15cm Pegmatite @ 288.30 In space orientation @ 290 laminations/bedding 110/72NE. 5cm massive pyrite vein @ 302.8 showing Euhedral cubes of pyrite to 5mm in width. 30cm pyrite veins as above @ 303.00																				290	laminations S0.	40	300
																						296	laminations S0	48	300
																						298	laminations S0.	40	300
																						302.80	Pyrite vein	48	315
																						305.80	Pyrite vein	36	
303.00	305.20	Contorted pyritic cherty Siltstone. Dark green fine grained, chloritic rock. Pyrite only in chaotic contorted patches around contorted cherty lenses. Some white massive non cherty quartz lenses. Bottom 1m of interval is crackle brecciated. Some coarser patches - metamorphic effect.		10	Py				✓				11.												
305.20	319.40	Pyrrhotitic cherty Siltstone Pale green, fine grained. well laminated with chert bands to 3cm. Pyrrhotite in laminae with minor pyrite. From 306.70 - 307.0 see a massive brecciated zone with large clasts of pyrite, pyrrhotite and flourite filling cracks. 308.30 - 308.45 strongly chloritic, dark green zone with minor crackle brecciation - NO pyrrhotite only pyrite. Appears disturbed/disrupted zone. Loss Pyrrhotite. From 309.30 - 311.10 laminated pyrrhotitic siltstone with euhedral garnets to 1mm disseminated		20%	4:16		✓		✓				5%.				<1%	✓					310.50	laminations S0.	52	340
																						316.20	laminations S0	45	330

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-10	AMG/~~Grid~~ E: 744700	Azimuth: 260° TIMB	Commenced: 1/8/96	Sheet: 10 of 17	
Tenement: EL9345	AMG/~~Grid~~ N: 8477000	Inclination: -65.5°	Completed:	Logged by: SD	
Prospect: TIPPERARY CENTRAL	RL Collar:	Total Depth:	Hole Size: NQ	Drillers: CADEW	
Map Ref: TIPPERARY 1:100,000	Client: NORTHSTAR	Casing: 9m	Sample Type: 1/2 CORE (1m)	Drill Type: LONGYEAR UNIVERSAL 100	
Hole Survs - Depth/Incln/Azim	/ /	/ /	/ /	/ /	

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	silic	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
305.20	319.40	(CONT) to 10% of introd. At 310.4 within slightly darker green chloritic band to 3cm. minor clots of Arsenopyrite to 5mm. Also see. speckl of Apy at. 318.40. Also garnets from. 317.40 – 318.40. Dark green strongly chloritic zone from. 317.70 – 318.10. At 318.60 within. Pyritic patchy zone to 5cm see. 2 clots of red brown hematite to 5mm. In space orientation of core. bedding is at. 316.20 is 130/68 NE. *CORE ORIENTATED FROM 310.20 – 324.20 *																		Trace.		319.0	laminated So	50	320
319.40	329.20	Pyritic Siltstone. Pale green, fine grained laminated with pyrt in laminae to 3mm. 2cm pegmatite vein @ 319.70. 3cm pegmatite vein at. 319.90. No pyrrhotite in this interval. From 324.20 – 324.60 chloritic mudstone zone. Some laminae to 3cm are replaced by fine grained feldspar. Some grain size increase due to metamorphism. In Space. orientation of core at. 323.30 bedding at. 150/70 NE. slightly micaceous + increased chlorit from. 324.80 – 325.50.		5%	Py		✓						1%								319.90	Peg vein. contact	45	250
																						323.3	laminated So	42	350
																						327.80	laminated So	38	
329.20	331.45	chloritic Mudstone. Dark green, very fine grained + massive, with possible serpentine minerals.																							

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-10	AMG/~~Grid~~ E: 744700	Azimuth: 260° T/M/~~B~~	Commenced: 1/8/96	Sheet: 11 of 17
Tenement: EL9345	AMG/~~Grid~~ N: 8477000	Inclination: -68·5°	Completed:	Logged by: S.O.
Prospect: TIPPERARY CENTRAL	RL Collar:	Total Depth:	Hole Size: NQ	Drillers: GADEN
Map Ref: TIPPERARY ~~GRID~~ 1:100,000	Client: HOMESTAKE	Casing: 99m	Sample Type: ½ CORE (1m)	Drill Type: WARMAN UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	340m / -70 / 253°	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	silic	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
331·45	334·00	Pyritic siltstone. Pale green, fine grained laminated with Pyrite in laminae. Pegmatite vein from 333·60 22cm thick shows clot of Arsenopyrite to 1cm.		5%	Py		✓						11%							Trace		333·4	Lamination 50	55	
																						335·60	Peg contact. Top	28	
																						335·90	Bottom	36	
334·00	350·30	Metasiltstone. Grey-pale olive green, fine grained very well laminated calc. bands from 1mm – 2cm. Dark bands mm are. brown mica/Biotite rich, greener fine grained bands more chloritic. Pyrite occurs in clots and aggregates to 1cm. adjacent & within darker green chloritic bands. 30cm Pegmatite veins at 335·60 and 336·10. Some minor red brown feldspar replaced laminae to 2cm. At 345·50 get 50cm thick zone of black acicular crystals of Actinolite with brown mica/Biotite rich laminae. From 347·80 some. minor pyrrhotite is dispersed bands. to 5cm.		3%	2½:½		✓		✓				3%									336·10	Peg Contact. TOP	55	
																						336·40	Bottom	55	
350·30	354·40	Dolerite. Dark green, fine grained massive characterised by some chaotic pink feldspar stranding due to alteration. Contact zone somewhat gradational. Minor disseminated pyrite throughout intrusive. Disseminated pyrrhotite from 351 – 351·40 · Possible sphalerite clots in top ·5m of intrusive.		4%	2:2			✓																		

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-10	AMG/~~Grid~~ E: 744700	Azimuth: 260° T/M/G	Commenced: 1/8/96	Sheet: 12 of 17
Tenement: EL 9345	AMG/~~Grid~~ N: 8477000	Inclination: -68.5°	Completed:	Logged by: S.O.
Prospect: TIPPERARY CENTRAL	RL Collar:	Total Depth:	Hole Size: NQ	Drillers: CADEN
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing: 99m	Sample Type: ½ CORE (1m)	Drill Type: WARMAN UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	378m / -68.5° / 256°	400m / -67.75° / 254.5°	/	/

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	silic	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
354.40	359.0	Metasiltstone Grey-Pale olive green, fine grained well laminated. Pyrk in laminae. Pyrhotite starts again a ragged ilets and laminae 358.5. From 335.50 — 358.90 see brown angular aggregates to 1cm - possible sphalerite. No possible sphalerite in laminae to 1cm. at 358.80. Clot of Arsenopyrite to 2mm at 358.80 - 20cm pegmatite vein @ 358.80		3	2½:½		✓														Trace		358.80	Reg fracture	45	
																						359.00	Top bottom	45	
																						359.80	Reg cafe	49	
																						361.10	Top bottom	43	
																						357.0	lamination So	55	
							minor															368.0	PCO cafe top	38	
359.0	370.5	Massive Metasiltstone. Grey, fine grained with very rare lamination. Sum weak metamorphic cleavage of green minerals. Pyrhotite is finely disseminated throughout intrusive with some po occurring as fracture filling. Pyrk occurs mostly filling fractures to 1mm. 35cm pegmatite @ 360.80, 25cm pegmatite @ 364.80, 1.10 pegmatite from 368. Pegmatite show myrmekitic graphic texture. Bottom 0.5m of intrusive paler grey with fine grained feldspar. + Possible sphalerite in lamination @ 050 TCA.		5%	1:4		✓	✓															369.10	Reg contact bottom	50	
																						370.40	lamination So?	50	
370.50	391.80	Dolerite Dark green-green, fine grained massive. Some fractures lined with chlorite and some pink feldspar. Some weak metamorphic segregation of chloritic minerals. Pyrhotite is variably finely disseminated. Pyrk more common. as dissemination veins and in patches and structures		8%	7:1			✓	✓																

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND -10	AMG/~~Grid~~ E: 744700	Azimuth: 260° TIMIB	Commenced: 1/8/96	Sheet: 13 of 17
Tenement: EL 9345	AMG/~~Grid~~ N: 8477000	Inclination: -68·5°	Completed:	Logged by: S.O.
Prospect: TIPPERARY CENTRAL	RL Collar:	Total Depth:	Hole Size: NQ	Drillers: GADEN
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing: 99m	Sample Type: ½ CORE (1m)	Drill Type: WARMAN UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	/ /	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	sillic	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
391·80	401·00	Metasiltstone Grey, fine grained laminated with pyrite defining most laminae to 5mm. Some minor pyrrhotite in laminae to 5cm as at 397. Some Graphite on some slick surfaces in areas of crumbled core. In space orientation @ 400m So = 140/68NE. 80cm pegmatite vein from 397·10. Pegvein // to So		5%	4:1		✓															400	laminated So	40	320
																						401	Peg contact	48	300
																						404	So	50	300
																						403·90	Peg contact	50	300
401·00	403·45	Pegmatite Pale Pink coarse grained appears over printed by later feldspar. Some myrmekitic texture. Some chlorite altered muscovite Trace of pyrite in bottom of interval. * CORE ORIENTATED FROM 398·80 - 405·20 *			Trace																				
403·45	415·35	Metasiltstone. Grey - Dark grey fine grained well laminated. Pyrite on laminae. 405·20 - 405·70 core reduced to shattered fragments and pug clay - carbonaceous. 408·40 - 408·90 crumbled + pug clay - carbonaceous. Three zones very fractured/fracture zone. 407·70 - 407·50 White pegmatite interval - non homolitic dusting. Milky orthoclase feldspar. 40cm pegmatite interval at 412·80. Some minor pyrrhotite as laminae to 1mm. From 409m irregular shaped white patches of fine grained mineral - Mica? to 1cm max. White interval appears slightly darker + probably weakly carbonaceous		8%	7:1		✓																				

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-10	AMG/~~Grid~~ E: 744700	Azimuth: 260° TM/B	Commenced: 1/8/96	Sheet: 14 of 17
Tenement: EL 9345	AMG/~~Grid~~ N: 8477000	Inclination: -68.5°	Completed:	Logged by: S.D.
Prospect: TIPPERARY CENTRAL	RL Collar:	Total Depth:	Hole Size: NQ	Drillers: CAIDEN
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing: 99m	Sample Type: ½ CORE (1m)	Drill Type: LONGYEAR UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	/ /	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	silic	lour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
415.35	417.50	Pegmatite - Orange brown pegmatite. Appears fractured & resealed by later feldspar-minor mica						minor																	
417.50	441.90	Metasandstone Grey fine-medium grained well-moderately laminated. Rock appears granular as compared to uphole rocks can make out some individual rounded clasts to 1mm. Rock is well sorted. Laminae are variably pyrrhotitic & pyritic. Some scattered particles of v. pale fine grained mineral - Mica to 1cm. Pegmatite intervals 50cm Pegmatite parallel to bedding. Minor crystalline Arsenopyrite on fracture surface at 428.4. Minor Pyrrhotite & Chalcopyrite on fracture surface at 423.3. Also possible Hornblende at 425.10 m fracture surface. In space Orientation @ 438.20 220/68SE		4	1:3		✓	✓														Trace		426.10	laminations	58	350
																						433.5	Vein?	47	010
441.90	443.15	Pegmatite. Pink - pale grey. Feldspar crystals to cm width. Appears fractured & resealed. with quartz #CORE ORIENTATED FROM 423.3 - 440.2 #		Py	Trace.				✓																
443.15	446.90	Metasandstone · Grey fine grained well laminated minor clastic component - recrystallised - Pyrrhotite disseminated throughout to ~3%. Pyrite on fracture surfaces that cut lamination. Some lamination defined by brown laminae to 5mm thick		3%	Fine Py			✓	✓												Trace					

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-10	AMG/~~Grid~~ E: 744700	Azimuth: 260° T/M/G	Commenced: 1/8/96	Sheet: 15 of 17	
Tenement: EL9345	AMG/~~Grid~~ N: 8477000	Inclination: -68.5°	Completed: 27/8/96	Logged by: S.O.	
Prospect: ZIPPERARY CENTRAL	RL Collar: 60m	Total Depth: 511.40	Hole Size: NQ	Drillers: GADEN	
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing: 99m	Sample Type: ½ CORE (1m)	Drill Type: WARMAN UNIVERSAL 1000	
Hole Surys - Depth/Incln/Azim	430m 1-66.25° 1258°m	460m 1-65 1257.5°m	/ /	/ /	

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	silic	lour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
443.15	446.90	(CONT) layers composed of brown - yellow brown rectangular mineral probable amphibole - suspect metamorphic effect. Bottom 1m of interval shows some fine grained whispy feldspar veining, ± replacement. Minor Apy within one brown band. * CORE ORIENTATED FROM 442.60 – 482.00 *																				443.15	Ag contact	35	048
																						444.40	laminated So?	40	060
446.90	451.00	Metadolerite. Dark green, fine grained massive. Veh. some minor quartz veining - diffuse to 1cm thick. Pyrrhotite is disseminated on some laminae & in rugged patches to 5mm. Top 1m of interval show brown clumps of mineral - sphalerite? to 5mm. Possibly same mineral as seen in brown laminae in Metasediite above		10%	1%			✓	✓													448.30	Po vein	56	110
																						449.20	Qtz vein.	51	060
																						450.20	Po lam	35	250
																						451.90	Qtz vein.	40	050
																						452.10	Qtz vein.	50	120
																						453.10	Qtz vein	30	075
																						454.10	Qtz vein.	30	070
451.00	457.40	Schist Dark green - Dark grey, medium grained. Strong schistose fabric major mineralogy of white mica, brown-black biotite & dark green acicular actinolite & chlorite. and disseminated pyrrhotite. 70% of interval composed white zones of quartz, feldspar with some pale purple fluorite. Minor green chlorite zone. 4cm thick at 454.0 shows euhedral, rectangular pale green crystals to 2cm with gut schistose effect. Possible massive actinolite crystals (2cm) On margin of quartz layer at 458.80 see cbt of Arsenopyrite to 1cm.		5%	Po Trace Py			✓	✓				1%	25%		1%				Trace	Patch					

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-10	AMG/~~Grid~~ E: 744700	Azimuth: 260°	TIMIB	Commenced: 1/8/96	Sheet: 16 of 17
Tenement: EL 9345	AMG/~~Grid~~ N: 8477000	Inclination: -68.5°		Completed: 27/8/96	Logged by: S.O
Prospect: TIPPERARY CENTRAL	RL Collar: 10m	Total Depth: 511.40		Hole Size: NQ	Drillers: GADEN
Map Ref: TIPPERARY 1:100000	Client: HOMESTAKE	Casing: 9m		Sample Type: ½ CORE (1m)	Drill Type: LONGYEAR UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	490m -64° 1255m	/ /		/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %)						Alteration/Metamorphism (est %)										Apy	Vns	Depth	Struc	α	β
				ES/O	py/po	hem/mgt	bdd	diss' mn	palc has	cbt	sillic	tour	chl	bt	ser/mus	actin	gnt	cord	andl		qtz/cbt/S				
451.00	457.40	(CONT) with clst of pyrite & pyrrhotite. This schistose interval may represent a more highly metamorphosed zone of the underlying metadolerite.																							
457.40	473.40	Metadolerite - Dark olive green, fine grained & massive fine grained pyrrhotite disseminated throughout & minor pyrite. Minor quartz veining to 1cm & minor pale felsic alteration to 5mm either side of fractures. Bottom & top contacts gradational. Some clumping of pale green mineral - chlorite? in bottom 1m of interval. Possible sphalerite to 3mm from 469 - 469.30.		8%	Po			✓															459.50	ab vein	48	330
473.40	476.80	Metasiltstone/arenite - Dark grey - grey, fine grained well laminated. Pyrrhotite disseminated throughout & on some laminae. Some minor pink feldspar replacement along laminae. Minor relict clastic component. Rock appears largely recrystallised with pale green growth of chlorite disrupting some laminae		2%	Po		✓	✓															475.50	laminath S0	45	010
476.80	490.40	Chlorite, flourite, sulphide rock/calc-silicate - Apple green, medium - coarse grained rock. Chaotic mixture of chlorite - apple green with sulphides, flourite and some massive (to 2cm) rectangular pale green actinolite? crystals & crystals show good schistose effect on cleavage surfaces. Sulphides - mainly pyrrhotite are unevenly distributed		10%	Po	Zns~1%		✓	✓	2%			10%			10%							480.30	relict laminath S0	50	030

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND -10	AMG/~~Grid~~ E: 744700	Azimuth: 260° TIMIS	Commenced: 1/8/96	Sheet: 17 of 17
Tenement: EL 9345	AMG/~~Grid~~ N: 8477000	Inclination: -68·5°	Completed: 27/8/96	Logged by: S·O·
Prospect: TIPPERARY CENTRAL	RL Collar: 600m	Total Depth: 511·40	Hole Size: NQ	Drillers: GADEN.
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing: 99m	Sample Type: ½ CORE (1m)	Drill Type: NARMAN UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	/ /	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	palc hos	Alteration/Metamorphism (est %) cbt	sillic	tour	chl	bl	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
476·80	490·40	(cont) and varies from small 5mm pebbles to 3cm pebbles in concentrations to width of core. 487-488 core is 60% pyrrhotite, 25% sphalerite, 10% chlorite & 5% fluorite. See some relict actinolite? laths to 1cm in sulphide pebbles. The rock has a weak relict lamination as feldspar rich zones. Calcite in varying concentrations makes up groundmass & has weak fizz with HCl bottom 20cm of interval as pale pink pegmatite. Feldspars appear superficially saussuritised. - Hydrothermal milling of alteration fluids? No obvious Apy.																Trace					
490·40	511·40 E·O·H·	Metasiltstone. Dark grey, fine grained, well laminated. Biotite rich. Some mins slightly schistose zones (upper metabasic?) as from: 493·40-495·20. Minor pegmatite veins to 10cm. 40cm pink pegmatite from: 497·60-498·00 Possible sphalerite in laminae from 495-496, adjacent to pegmatite at 497·6 & from: 507-508. Pyrrhotite disseminated throughout & pyrite is rare. veins flat cut lamination. Some minor chlorite & fluorite zones with chl+fl 11 to laminae c.g. from: 503·70-504·70. Whole rock is moderately recrystallised. In space orientation at 493m So = 160/78E. E·O·H·		8%	Po	Rare	Py	✓					17.	10%													
																						492·80	laminated So	47	355
																						493·50	laminated So	47	
																						496·50	Peg vein	43	
																						504·80	laminated So	54	
																						511·00	laminated So	55	

[redacted] EXPLOREMIN PTY LTD [redacted]

CORE RECOVERY, RQD, FRACTURE COUNT

Drill Hole: FEND-10	AMG/~~Grid~~ E: 744700	Azimuth: 240° AMG	Commenced: 1/8/96	Sheet: 1 of 5
Tenement: EL9345	AMG/~~Grid~~ N: 8477000	Inclination: -68.5°	Completed:	Logged by: S. MATOSIN
Prospect: TIPPERARY CENTRAL	RL Collar: 600m	Total Depth:	Hole Size: NQ	Drillers: GARDEN

From	To	Interval	Recov'd	Length in Sticks >10 cm	No of Open Fractures	No of Strongly Healed Fractures	No of Weakly Healed Fractures	No of open Fractures with slick coat	Comments
89.0	102.00	3.00	2.55	1.70					
102.00	104.55	2.55	2.55	1.55					
104.55	107.65	3.10	3.10	2.60					
107.65	110.75	3.10	3.10	2.47					
110.75	111.95	1.20	0.53	0.40					Highly limestone
111.95	114.00	2.05	2.05	1.23					
114.00	116.70	2.70	2.70	1.17					
116.70	119.80	3.10	3.10	1.83					
119.80	122.90	3.10	2.72	2.42					Highly limestone
122.90	125.90	3.00	3.00	2.63					
125.90	125.90	3.00	3.00	2.42					
128.90	131.90	3.00	3.10	3.00					
131.90	134.90	3.00	3.00	2.80					
134.90	137.90	3.00	3.00	2.78					
137.90	140.90	3.00	3.00	1.80					
140.90	143.70	2.80	2.80	2.80					
143.70	146.80	3.10	3.10	2.80					
146.80	149.90	3.10	3.10	3.10					
149.90	152.90	3.00	3.00	2.50					Pegmatite
152.90	155.90	3.00	3.00	2.50					
155.90	158.90	3.00	3.00	2.85					
158.90	161.90	3.00	3.00	1.01					
161.90	164.90	3.00	3.00	2.60					
164.90	166.65	1.75	1.70	0.30					
166.65	167.90	1.25	1.10	0.26					
167.90	170.90	3.00	3.00	1.67					
170.90	173.60	2.70	2.70	1.12					
173.60	176.55	2.95	2.95	1.20					
176.55	178.90	2.35	3.25	0.63					
178.90	181.50	2.60	2.30	0.90					

[redacted] EXPLOREMIN PTY LTD

CORE RECOVERY, RQD, FRACTURE COUNT

Drill Hole: FEND-10	AMG/~~Grid~~ E: 744700	Azimuth: 260° T/M/G	Commenced: 1/9/96	Sheet: 2 of 5
Tenement: EL 9345	AMG/~~Grid~~ N: 8477000	Inclination: -68.5°	Completed:	Logged by: S.O.
Prospect: TIPPERARY CONTACT	RL Collar: 60.00	Total Depth:	Hole Size: NQ	Drillers: GADEN

From	To	Interval	Recov'd	Length in Sticks >10 cm	No of Open Fractures	No of Strongly Healed Fractures	No of Weakly Healed Fractures	No of open Fractures with slick coat	Comments
181.50	184.00	2.50	2.38	1.60					
184.00	185.90	1.90	2.00	1.24					
185.90	188.90	3.00	3.00	2.12					
188.90	190.70	2.80	2.80	0.54					
190.70	191.90	1.20	1.20	0.47					
191.90	194.90	3.00	3.00	1.87					
194.90	197.90	3.00	3.00	2.10					
197.90	200.90	3.00	3.00	1.90					
200.90	203.90	3.00	3.00	1.70					
203.90	206.90	3.00	3.00	1.68					
206.90	209.90	3.00	3.00	2.17					
209.90	213.00	3.10	3.10	2.84					
213.00	216.00	3.00	3.00	2.90					
216.00	218.90	2.90	2.90	1.34					
218.90	222.00	3.10	3.10	2.62					
222.00	224.90	2.90	2.90	1.76					
224.90	227.90	3.00	3.00	1.35					
227.90	230.90	3.00	3.00	1.91					
230.90	233.50	2.60	2.60	1.23					
233.50	236.60	3.10	3.10	2.85					
233.60	239.70	3.10	3.10	2.00					
239.70	242.80	3.10	3.10	2.26					
242.80	245.90	3.10	3.10	1.77					
245.90	249.00	3.10	3.10	2.12					
249.00	252.00	3.00	3.00	1.51					
252.00	255.00	3.00	3.00	2.47					
255.00	258.00	3.00	3.00	2.20					
258.00	261.00	3.00	3.00	2.75					
261.00	264.00	3.00	3.00	2.50					
264.00	267.00	3.00	3.00	1.93					

EXPLOREMIN PTY LTD
CORE RECOVERY, RQD, FRACTURE COUNT

Drill Hole: FCND-10	AMG/~~Grid~~ E: 744700	Azimuth: 260° TIMIG	Commenced: 1/8/16	Sheet: 3 of 5
Tenement: EL 9345	AMG/~~Grid~~ N: 8477000	Inclination: -68.5°	Completed:	Logged by: S.O
Prospect: TIMPERLEY CENTRAL	RL Collar:	Total Depth:	Hole Size: NQ	Drillers: CADEN.

From	To	Interval	Recov'd	Length in Sticks >10 cm	No of Open Fractures	No of Strongly Healed Fractures	No of Weakly Healed Fractures	No of open Fractures with slick coat	Comments
267.00	270.00	3.00	3.00	2.95					
270.00	273.00	3.00	3.00	2.80					
273.00	275.80	2.80	2.80	2.80					
275.80	278.90	3.10	3.10	3.10					
278.90	282.00	3.10	3.10	2.13					
282.00	284.90	2.90	2.90	2.90					
284.90	287.90	3.00	3.00	2.61					
287.90	290.90	3.00	3.00	3.00					
290.90	292.25	1.35	1.35	1.26					
292.25	293.90	1.65	1.65	1.15					
293.90	296.90	3.00	3.00	2.90					
296.90	299.30	2.40	2.40	2.25					
299.30	301.90	2.60	2.60	2.45					
301.90	305.00	3.10	2.90	2.40					
			Loss of 20cm from		304-305				
305.00	308.00	3.00	3.00						
308.00	311.10	3.10	3.10	2.73					
311.10	314.20	3.10	3.10	2.75					
314.20	317.30	3.10	3.10	3.10					
317.30	320.40	3.10	3.10	3.05					
320.40	323.50	3.10	3.10	2.02					
323.50	326.15	2.65	2.55	1.45					
			loss of	10cm from	324-325				
326.15	328.75	2.60	2.60	1.95					
328.75	331.85	3.10	3.10	2.80					
331.85	334.90	3.05	3.05	2.78					
334.90	338.00	3.10	3.10	2.80					
338.00	341.10	3.10	3.10	2.85					
341.10	344.20	3.10	3.10	3.00					
344.20	347.20	3.00	3.00	3.00					

EXPLOREMIN PTY LTD
CORE RECOVERY, RQD, FRACTURE COUNT

Drill Hole: FEND-10	AMG/Grid E: 744700	Azimuth: 260° TMG	Commenced: 1/8/96	Sheet: 4 of 5
Tenement: EL 9345	AMG/Grid N: 8477000	Inclination: -65.5°	Completed:	Logged by: S.O.
Prospect: TIMBERMILL CENTRAL	RL Collar:	Total Depth:	Hole Size: NQ	Drillers: GARDEN

From	To	Interval	Recov'd	Length in Sticks >10 cm	No of Open Fractures	No of Strongly Healed Fractures	No of Weakly Healed Fractures	No of open Fractures with slick coat	Comments
347.20	350.20	3.00	3.00	2.55					
350.20	353.30	3.10	3.10	3.03					
353.30	356.40	3.10	3.10	3.85					
356.40	359.50	3.10	3.10	3.10					
359.50	362.50	3.00	3.00	2.73					
362.50	365.60	3.10	3.10	2.88					
365.00	368.70	3.10	3.10	3.05					
368.70	371.80	3.10	3.00	2.80 loss	0.10 from	369-370			
371.80	374.90	3.10	3.10	3.01					
374.90	378.00	3.10	3.10	3.05					
378.00	381.00	3.00	3.00	3.00					
381.00	384.00	3.00	3.00	2.95					
384.00	387.00	3.00	3.00	2.70					
387.00	390.00	3.00	3.00	2.95					
390.00	392.75	2.75	2.75	2.40					
392.75	395.60	2.85	2.85	2.00					
395.60	395.80	0.20	0.30	0.30					
395.80	398.90	3.10	2.90	2.80					
			loss	0.20 from 395-396					
398.90	401.55	2.65	2.65	2.40					
401.55	403.25	1.70	1.70	1.70					
403.25	405.00	1.75	1.75	1.40					
405.00	406.30	1.30	1.20	0.45					
			loss 0.10	from 405-406					
406.30	408.00	1.70	1.70	0.38					
408.00	408.90	0.90	0.90	0.00					
408.90	411.00	2.10	2.10	1.30					
411.00	414.00	3.00	3.00	2.95					
414.00	417.00	3.00	3.00	2.50					
417.00	420.00	3.00	3.00	2.80					

EXPLOREMIN PTY LTD
CORE RECOVERY, RQD, FRACTURE COUNT

Drill Hole: FEND-10	AMG/~~Grid~~ E: 744700	Azimuth: 260° TIM/B	Commenced: 1/8/96	Sheet: 5 of 5
Tenement: EL9345	AMG/~~Grid~~ N: 8477000	Inclination: -68·5°	Completed: 27/8/96	Logged by: S·O.
Prospect: TIPPERARY CENTRAL	RL Collar:	Total Depth: 511·40m	Hole Size: NQ	Drillers: CAIDEN

From	To	Interval	Recov'd	Length in Sticks >10 cm	No of Open Fractures	No of Strongly Healed Fractures	No of Weakly Healed Fractures	No of open Fractures with slick coat	Comments
420·00	423·00	3·00	3·00	2·92					
423·00	426·00	3·00	3·00	2·80					
426·00	429·00	3·00	3·00	3·00					
429·00	432·00	3·00	3·00	2·30					
432·00	435·00	3·00	3·00	2·45					
435·00	437·30	2·30	2·30	1·90					
437·30	440·40	3·10	3·10	2·90					
440·40	442·60	2·20	2·20	1·28					
442·60	445·70	3·10	3·10	2·80					
445·70	448·80	3·10	3·10	2·95					
448·80	451·90	3·10	3·10	3·00					
451·90	455·00	3·10	3·10	3·05					
455·00	458·10	3·10	3·10	3·05					
458·10	461·20	3·10	3·10	3·10					
461·20	464·30	3·10	3·10	3·10					
464·30	467·40	3·10	3·10	3·10					
467·40	470·50	3·10	3·10	3·10					
470·50	473·60	3·10	3·10	3·10					
473·60	476·70	3·10	3·10	3·01					
476·70	479·80	3·10	3·10	3·10					
479·80	482·90	3·10	3·10	3·10					
482·90	486·00	3·10	3·10	2·95					
486·00	489·00	3·00	3·00	3·00					
489·00	492·00	3·00	2·73	2·63					
		490-491	only 0·77	long.					
492·00	495·00	3·00	3·00	2·50					
495·00	498·00	3·00	3·00	2·91					
498·00	501·00	3·00	3·00	2·90					
501·00	503·05	2·05	2·05	1·55					
503·05	503·90	0·85	0·85	0·85					
503·90	507·00	3·10	3·08	3·08					
507·00	510·00	3·00	3·00	2·75					
510·00	511·40	1·40	1·40	1·31					
		E·O·H.							

EXPLOREMIN PTY LTD
CORE RECOVERY, RQD, FRACTURE COUNT

Drill Hole: FEND-10	AMG/~~Grid~~ E: 744700	Azimuth: 240° TIM/G	Commenced: 1/8/96	Sheet: 5 of 5
Tenement: EL9345	AMG/~~Grid~~ N: 8477600	Inclination: -68° 5°	Completed: 21/8/96	Logged by: S.O.
Prospect: TIPPERARY CENTRAL	RL Collar:	Total Depth: 511.40m	Hole Size: NQ	Drillers: CAIDEN

From	To	Interval	Recov'd	Length in Sticks >10 cm	No of Open Fractures	No of Strongly Healed Fractures	No of Weakly Healed Fractures	No of open Fractures with slick coat	Comments
420.00	423.00	3.00	3.00	2.92					
423.00	426.00	3.00	3.00	2.80					
426.00	429.00	3.00	3.00	3.00					
429.00	432.00	3.00	3.00	2.30					
432.00	435.00	3.00	3.00	2.45					
435.00	437.30	2.30	2.30	1.90					
437.30	440.40	3.10	3.10	2.90					
440.40	442.60	2.20	2.20	1.28					
442.60	445.70	3.10	3.10	2.80					
445.70	448.80	3.10	3.10	2.95					
448.80	451.90	3.10	3.10	3.00					
451.90	455.00	3.10	3.10	3.05					
455.00	458.10	3.10	3.10	3.05					
458.10	461.20	3.10	3.10	3.10					
461.20	464.30	3.10	3.10	3.10					
464.30	467.40	3.10	3.10	3.10					
467.40	470.50	3.10	3.10	3.10					
470.50	473.60	3.10	3.10	3.10					
473.60	476.70	3.10	3.10	3.01					
476.70	479.80	3.10	3.10	3.10					
479.80	482.90	3.10	3.10	3.10					
482.90	486.00	3.10	3.10	2.95					
486.00	489.00	3.00	3.00	3.00					
489.00	492.00	3.00	2.73	2.63					
		490-491	only 0.77	long.					
492.00	495.00	3.00	3.00	2.52					
495.00	498.00	3.00	3.00	2.91					
498.00	501.00	3.00	3.00	2.90					
501.00	503.05	2.05	2.05	1.55					
503.05	503.90	0.85	0.85	0.85					
503.90	507.00	3.10	3.08	3.08					
507.00	510.00	3.00	3.00	2.75					
510.00	511.40	1.40	1.40	1.31					
		E.O.H.							

ASSAYCORP

Report Code: ..... AC 31039
Samples Received: 02/08/96
Number of Samples: 90

Homestake Gold of Australia Ltd.
9th Floor 2 Mill Street
Perth WA 6000

Reference: 10063
Project: .....
Cost Code: .....

Assaycorp Pty Ltd
A.C.N. 052 982 911
174 Ward St
Pine Creek NT 0847
Ph (08) 8976 1262
Fax (08) 8976 1310

Report Distribution
J.Stewart
J.Goulevitch

Sample Preparation:

Assay Data:

Analysis	Analytical Technique	Precision & Accuracy	Detection Limit	Data Units
Au	FA50	Acc. ± 15%	0.01	ppm
Au(R)	FA50	Acc. ± 15%	0.01	ppm
As	AAS/MA-3	Prec. ± 10%	1	ppm

FEND10 Reading
FEND11 Reading

Report Comment:

Authorisation: Ray Wooldridge
Report Dated: 10/08/96

ASSAYCORP

ASSAY CODE: AC 31039

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)
F10 0-2	<0.01		8
F10 2-4	<0.01		7
F10 4-6	<0.01		9
F10 6-8	<0.01		8
F10 8-10	<0.01	<0.01	7
F10 10-12	<0.01		7
F10 12-14	<0.01		6
F10 14-16	0.02		5
F10 16-18	0.02		5
F10 18-20	<0.01		7
F10 20-22	<0.01		4
F10 22-24	<0.01		5
F10 24-26	<0.01		8
F10 26-28	<0.01		8
F10 28-30	<0.01		5
F10 30-32	<0.01		4
F10 32-34	0.01		3
F10 34-36	<0.01		1
F10 36-38	<0.01		1
F10 38-40	<0.01		2
F10 40-42	<0.01	<0.01	7
F10 42-44	<0.01		2
F10 44-46	<0.01		2
F10 46-48	<0.01		2
F10 48-50	<0.01		3

ASSAYCORP

ASSAY CODE: AC 31039

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)
F10 50-52	<0.01		6
F10 52-54	<0.01		4
F10 54-56	<0.01	<0.01	5
F10 56-58	<0.01		4
F10 58-60	0.02		2
F10 60-62	0.02		3
F10 62-64	0.02		3
F10 64-66	<0.01		2
F10 66-68	<0.01		3
F10 68-70	<0.01		3
F10 70-72	0.02		3
F10 72-74	<0.01		2
F10 74-76	<0.01	<0.01	1
F10 76-78	0.02		2
F10 78-80	<0.01		3
F10 80-82	<0.01		4
F10 82-84	<0.01		5
F10 84-86	<0.01		13
F10 86-88	<0.01		8
F10 88-90	<0.01		5
F10 90-92	<0.01		15
F10 92-94	<0.01		15
F10 94-96	<0.01		18
F10 96-99	<0.01		12
F11 0-2	<0.01	<0.01	14

ASSAYCORP

Report Code: ..... AC 31424
Samples Received: 19/08/96
Number of Samples: 73

Homestake Gold of Australia Ltd.
P.O.Box 7189 Cloisters Sq.
Perth WA 6850

Reference: 10065
Project: .....
Cost Code: .....

Assaycorp Pty Ltd
A.C.N. 052 982 911
174 Ward St
Pine Creek NT 0847
Ph (08) 8976 1262
Fax (08) 8976 1310

Report Distribution
J.Stewart
J.Goulevitch

Sample Preparation:

Assay Data:

Analysis	Analytical Technique	Precision & Accuracy	Detection Limit	Data Units
Au	FA50	Acc. ± 15%	0.01	ppm
Au(R)	FA50	Acc. ± 15%	0.01	ppm
As	AAS/MA-3	Prec. ± 10%	1	ppm

F10 140-296.m

Report Comment:

Authorisation: Ray Wooldridge
Report Dated: 26/08/96

ASSAYCORP

ASSAY CODE: AC 31424

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)
F10 140-141	<0.01		13
F10 141-142	<0.01	<0.01	10
F10 142-143	<0.01		7
F10 143-144	<0.01		7
F10 144-145	<0.01		6
F10 145-146	<0.01		10
F10 146-147	<0.01		9
F10 147-148	<0.01		15
F10 148-149	<0.01	<0.01	20
F10 149-150	<0.01		9
F10 150-151	<0.01		16
F10 151-152	<0.01		7
F10 152-153	<0.01		11
F10 153-154	<0.01		7
F10 154-155	<0.01	<0.01	10
F10 200-01	<0.01		25
F10 202-3	<0.01		20
F10 204-5	<0.01		10
F10 206-7	<0.01		20
F10 208-9	<0.01		45
F10 210-11	<0.01		81
F10 212-13	<0.01		55
F10 214-15	<0.01		33
F10 216-17	<0.01	<0.01	40
F10 218-19	0.01		6

ASSAYCORP

ASSAY CODE: AC 31424

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)
F10 220-21	<0.01		60
F10 222-23	<0.01		28
F10 224-25	<0.01		19
F10 226-27	0.03		51
F10 228-29	<0.01		50
F10 230-31	<0.01	<0.01	67
F10 232-33	<0.01		43
F10 234-35	<0.01		22
F10 236-37	<0.01		42
F10 238-39	<0.01		74
F10 240-41	<0.01		44
F10 242-43	<0.01		30
F10 244-245	0.01	0.01	160
F10 245-246	<0.01		94
F10 246-247	<0.01		140
F10 247-248	0.01	0.01	320
F10 248-249	<0.01	<0.01	84
F10 249-250	<0.01		45
F10 250-251	0.01		320
F10 251-252	0.01	0.01	110
F10 252-253	<0.01		160
F10 253-254	<0.01		91
F10 256-57	<0.01		72
F10 259-60	<0.01		33
F10 262-63	<0.01		24

ASSAYCORP

ASSAY CODE: AC 31424

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)
F10 265-66	<0.01		24
F10 268-69	0.03		21
F10 271-72	<0.01		66
F10 274-75	<0.01		23
F10 277-278	<0.01		28
F10 278-279	0.02		17
F10 279-280	0.03		37
F10 280-281	0.06		140
F10 281-282	0.01		9
F10 282-283	0.03		18
F10 283-284	<0.01	<0.01	100
F10 284-285	<0.01		18
F10 285-286	<0.01		83
F10 286-287	<0.01		21
F10 287-288	0.03		18
F10 288-289	0.03		10
F10 289-290	0.05		14
F10 290-291	0.08	0.06	20
F10 291-292	0.05		20
F10 292-293	0.09	0.06	47
F10 293-294	<0.01		4
F10 294-295	0.01	<0.01	11
F10 295-296	0.02		5

ASSAYCORP

Report Code: ..... AC 31628
Samples Received: 26/08/98
Number of Samples: 74

Homestake Gold of Australia Ltd.
P.O.Box 7189 Cloisters Sq.
Perth WA 6850

Reference: 10069
Project: .....
Cost Code: .....

Assaycorp Pty Ltd
A.C.N. 052 982 911
174 Ward St
Pine Creek NT 0847
Ph (08) 8976 1262
Fax (08) 8976 1310

Report Distribution
J.Stewart
J.Goulevitch

Sample Preparation:

Assay Data:

Analysis	Analytical Technique	Precision & Accuracy	Detection Limit	Data Units
Au	FA50	Acc. ± 15%	0.01	ppm
Au(R)	FA50	Acc. ± 15%	0.01	ppm
As	AAS/MA-3	Prec. ± 10%	1	ppm
Cu	AAS/MA-3	Prec. ± 10%	1	ppm
Pb	AAS/MA-3	Prec. ± 10%	2	ppm
Zn	AAS/MA-3	Prec. ± 10%	1	ppm

F10 296-370m

Report Comment:

Authorisation: Ray Wooldridge
Report Dated: 31/08/98

ASSAYCORP

ASSAY CODE: AC 31628

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)
F10 296-297	0.03		11	183	<2	58
F10 297-298	0.05		13	200	<2	41
F10 298-299	0.07	0.07	34	108	<2	116
F10 299-300	<0.01		48	110	<2	51
F10 300-301	<0.01		13	90	35	134
F10 301-302	<0.01	<0.01	11	161	36	77
F10 302-303	<0.01		21	309	69	34
F10 303-304	<0.01		85	127	70	35
F10 304-305	<0.01		550	32	21	44
F10 305-306	0.01		43	207	14	75
F10 306-307	0.03		29	302	7	99
F10 307-308	<0.01		56	156	4	70
F10 308-309	0.02		140	93	<2	118
F10 309-310	<0.01		90	99	25	134
F10 310-311	0.05	0.05	180	105	13	94
F10 311-312	<0.01	<0.01	35	103	6	85
F10 312-313	<0.01		18	106	18	92
F10 313-314	<0.01		26	173	23	227
F10 314-315	<0.01		16	266	<2	28
F10 315-316	0.01		59	145	<2	68
F10 316-317	0.02		19	274	<2	27
F10 317-318	<0.01		50	142	2	211
F10 318-319	0.06	0.12	115	148	11	241
F10 319-320	<0.01		25	80	33	170
F10 320-321	<0.01		49	98	17	60

ASSAYCORP

ASSAY CODE: AC 31628

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)
F10 321-322	<0.01		33	26	<2	26
F10 322-323	<0.01		35	61	<2	26
F10 323-324	<0.01	<0.01	51	24	3	26
F10 324-325	<0.01		2	6	<2	34
F10 325-326	<0.01	<0.01	14	<1	<2	34
F10 326-327	<0.01		30	16	<2	35
F10 327-328	<0.01	<0.01	96	93	<2	39
F10 328-329	<0.01	<0.01	22	39	<2	49
F10 329-330	<0.01		3	<1	<2	27
F10 330-331	<0.01		1	<1	<2	18
F10 331-332	<0.01		29	39	<2	26
F10 332-333	<0.01		39	60	<2	26
F10 333-334	<0.01		1140	69	<2	34
F10 334-335	<0.01		52	39	2	86
F10 335-336	<0.01		140	47	7	102
F10 336-337	<0.01	<0.01	65	77	4	83
F10 337-338	<0.01		55	52	<2	92
F10 338-339	0.02	<0.01	54	92	<2	74
F10 339-340	<0.01		25	195	<2	80
F10 340-341	<0.01	<0.01	20	58	<2	94
F10 341-342	<0.01		32	88	<2	124
F10 342-343	<0.01		21	85	<2	84
F10 343-344	<0.01		9	71	<2	80
F10 344-345	<0.01		7	92	<2	221
F10 345-346	0.03		84	82	<2	128

ASSAYCORP

ASSAY CODE: AC 31628

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)
F10 346-347	<0.01		31	185	<2	113
F10 347-348	<0.01		14	211	<2	59
F10 348-349	<0.01		35	207	17	53
F10 349-350	<0.01		12	113	<2	117
F10 350-351	<0.01		103	141	<2	61
F10 351-352	<0.01		16	75	<2	44
F10 352-353	<0.01	<0.01	18	49	<2	27
F10 353-354	<0.01		29	16	<2	97
F10 354-355	<0.01		13	109	<2	51
F10 355-356	<0.01		19	130	<2	70
F10 356-357	<0.01		14	131	<2	37
F10 357-358	<0.01		11	137	6	54
F10 358-359	0.02		330	118	11	58
F10 359-360	<0.01		46	72	<2	56
F10 360-361	0.02	0.02	230	67	<2	48
F10 361-362	<0.01	<0.01	300	42	<2	46
F10 362-363	<0.01		16	47	<2	38
F10 363-364	0.02		30	37	3	61
F10 364-365	<0.01		19	43	2	61
F10 365-366	<0.01		50	57	<2	42
F10 366-367	<0.01		20	57	2	50
F10 367-368	<0.01		39	55	20	37
F10 368-369	<0.01	<0.01	29	20	17	5
F10 369-370	<0.01		72	54	7	29

ASSAYCORP

Report Code: ..... AC 31717
Samples Received: 30/08/96
Number of Samples: 91

Homestake Gold of Australia Ltd.
P.O.Box 7189 Cloisters Sq.
Perth WA 6850

Reference: 10071
Project: .....
Cost Code: .....

Assaycorp Pty Ltd
A.C.N. 052 982 911
174 Ward St
Pine Creek NT 0847
Ph (08) 8976 1252
Fax (08) 8976 1310

Report Distribution
J.Stewart
J.Goulevitch

Sample Preparation:

Assay Data:

Analysis	Analytical Technique	Precision & Accuracy	Detection Limit	Data Units
Au	FA50	Acc. ± 15%	0.01	ppm
Au(R)	FA50	Acc. ± 15%	0.01	ppm
As	AAS/MA-3	Prec. ± 10%	1	ppm
Cu	AAS/MA-3	Prec. ± 10%	1	ppm
Pb	AAS/MA-3	Prec. ± 10%	2	ppm
Zn	AAS/MA-3	Prec. ± 10%	1	ppm
Ag	AAS/MA-3	Prec. ± 10%	0.5	ppm

Report Comment:

Authorisation: Ray Wooldridge
Report Dated: 12/09/96

ASSAYCORP

ASSAY CODE: AC 31717

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)
F10 370-71	<0.01		29	126	26	39	--
F10 372-73	<0.01		8	150	19	50	--
F10 374-75	0.02		6	125	17	113	--
F10 376-77	0.01		8	103	18	34	--
F10 378-79	<0.01		7	144	20	92	--
F10 380-81	<0.01		7	140	15	35	--
F10 382-83	<0.01		8	168	13	36	--
F10 384-85	0.02		24	142	18	35	--
F10 386-87	0.01		23	85	12	25	--
F10 388-89	0.01	<0.01	24	63	13	25	--
F10 390-91	<0.01		19	42	7	34	--
F10 392-93	<0.01		43	83	8	13	--
F10 394-95	<0.01	<0.01	13	126	7	13	--
F10 396-97	<0.01		68	99	49	35	--
F10 398-99	<0.01		37	50	26	23	--
F10 400-1	<0.01		56	116	12	39	--
F10 402-3	<0.01		22	15	14	5	--
F10 404-5	<0.01		60	17	21	10	--
F10 406-7	<0.01		160	8	12	42	--
F10 408-9	<0.01		5	4	4	14	--
F10 410-11	<0.01		23	201	10	12	--
F10 412-13	<0.01		24	173	24	37	--
F10 414-15	<0.01		1090	100	26	59	--
F10 416-17	<0.01		220	16	19	13	--
F10 418-19	<0.01		100	113	79	55	--

ASSAYCORP

ASSAY CODE: AC 31717

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)
F10 420-21	<0.01		85	70	6	69	--
F10 422-23	<0.01		41	18	7	77	--
F10 424-25	0.01		40	22	<2	86	--
F10 426-27	<0.01		42	81	13	84	--
F10 428-429	<0.01		630	185	13	151	--
F10 429-430	<0.01		15	156	22	121	--
F10 430-431	0.01	<0.01	14	131	28	106	--
F10 431-432	<0.01	0.01	16	100	62	84	--
F10 432-433	<0.01		5	59	8	64	--
F10 433-434	0.02		6	53	12	59	--
F10 434-435	0.01		19	40	24	43	--
F10 435-436	<0.01		14	38	24	47	--
F10 436-437	0.01		5	55	11	44	--
F10 437-438	<0.01		7	76	7	50	--
F10 438-439	<0.01		5	65	12	85	--
F10 439-440	<0.01		3	73	8	59	--
F10 440-441	<0.01		38	68	14	59	--
F10 441-442	<0.01		9	90	22	58	--
F10 442-443	<0.01		7	6	31	14	--
F10 443-444	<0.01		11	64	16	25	0.9
F10 444-445	<0.01		16	115	9	34	1.0
F10 445-446	<0.01		95	130	8	35	1.0
F10 446-447	<0.01		32	93	11	57	1.0
F10 447-448	<0.01		7	154	<2	26	1.1
F10 448-449	<0.01		670	94	<2	65	--

ASSAYCORP

ASSAY CODE: AC 31717

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)
F10 449-450	<0.01		8	116	6	90	--
F10 450-451	0.03		12	110	7	71	--
F10 451-452	<0.01		3	83	<2	100	--
F 452-453	<0.01		4	17	12	45	--
F10 453-454	<0.01	<0.01	80	49	2	147	--
F10 454-455	<0.01		13	14	4	86	--
F10 455-456	0.02		400	25	3	114	--
F10 456-457	0.03		25	53	3	113	--
F10 457-458	0.02		96	64	<2	60	--
F10 458-459	<0.01		17	31	<2	17	--
F10 459-460	<0.01		57	49	3	22	--
F10 460-461	<0.01		16	50	<2	20	--
F10 461-462	<0.01		10	105	<2	20	--
F10 462-463	<0.01		8	92	4	15	--
F10 463-464	<0.01		8	45	4	15	--
F10 464-465	<0.01	<0.01	3	30	4	16	--
F10 465-466	<0.01	<0.01	<1	61	<2	27	--
F10 466-467	<0.01		<1	82	3	13	--
F10 467-468	<0.01		<1	41	4	14	--
F10 468-469	<0.01		3	176	<2	12	--
F10 469-470	<0.01		5	179	<2	13	--
F10 470-471	<0.01		5	43	<2	22	--
F10 471-472	<0.01		12	49	<2	11	--
F10 472-473	<0.01		25	33	<2	24	--
F10 473-474	0.01		4	80	2	70	--

ASSAYCORP

ASSAY CODE: AC 31717

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)
F10 474-475	0.02		7	103	12	93	--
F10 475-476	<0.01		3	84	27	99	--
F10 476-477	0.05		3	56	25	182	--
F10 477-478	0.07	0.07	30	50	33	174	--
F10 478-479	0.01		25	29	21	66	--
F10 479-480	0.04		100	85	30	200	--
F10 480-481	0.02		35	39	12	110	--
F10 481-482	0.01		69	31	168	117	--
F10 482-483	0.05		140	96	12	255	--
F10 483-484	0.09	0.09	31	31	21	342	--
F10 484-485	0.47	0.41	170	280	27	600	--
F10 485-486	0.10	0.11	24	67	<2	4530	--
F10 486-487	0.03	0.03	150	50	21	3270	--
F10 487-488	0.54	0.62	14	460	<2	12.80%	3.0
F10 488-489	<0.01		23	68	89	4660	2.6
F10 489-490	0.02		15	147	37	740	--

ASSAYCORP

Report Code: ..... AC 31899
Samples Received: 06/09/96
Number of Samples: 55

Homestake Gold of Australia Ltd.
P.O.Box 7189 Cloisters Sq.
Perth WA 6850

Reference: 10076
Project: .....
Cost Code: .....

Assaycorp Pty Ltd
A.C.N. 052 982 911
174 Ward St
Pine Creek NT 0847
Ph (08) 8976 1262
Fax (08) 8976 1310

Report Distribution
J.Stewart
J.Goulevitch

Sample Preparation:

Assay Data:

Analysis	Analytical Technique	Precision & Accuracy	Detection Limit	Data Units
Au	FA50	Acc. ± 15%	0.01	ppm
Au(R)	FA50	Acc. ± 15%	0.01	ppm
As	AAS/MA-3	Prec. ± 10%	1	ppm
Cu	AAS/MA-3	Prec. ± 10%	1	ppm
Pb	AAS/MA-3	Prec. ± 10%	2	ppm
Zn	AAS/MA-3	Prec. ± 10%	1	ppm
Ag	AAS/MA-3	Prec. ± 10%	0.5	ppm

FEM010 496-511.4
FEM011 165-199.

Report Comment:

Authorisation: Ray Wooldridge
Report Dated: 19/09/96

ASSAYCORP

ASSAY CODE: AC 31899

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)
F10 490-491	<0.01		6	69	46	109	0.8
F10 491-492	<0.01		12	74	41	125	0.6
F10 492-493	<0.01		5	62	26	121	0.6
F10 493-494	<0.01		2	89	21	189	0.7
F10 494-495	0.02		3	76	18	140	1.2
F10 495-496	<0.01		10	82	96	51	0.6
F10 496-497	<0.01		4	63	10	45	0.5
F10 497-498	<0.01		4	64	267	28	<0.5
F10 498-499	<0.01		14	60	22	42	0.5
F10 499-500	<0.01	<0.01	8	112	<2	20	<0.5
F10 500-501	<0.01	<0.01	8	75	9	30	<0.5
F10 501-502	<0.01		14	103	2	22	<0.5
F10 502-503	<0.01		5	89	13	95	0.6
F10 503-504	0.09		5	110	18	129	1.2
F10 504-505	0.18	0.19	2	127	26	138	1.3
F10 505-506	<0.01		4	102	24	153	1.1
F10 506-507	<0.01		15	150	11	57	0.8
F10 507-508	<0.01		25	143	15	41	0.5
F10 508-509	0.03		11	141	8	81	0.8
F10 509-510	<0.01		9	183	4	74	1.0
F10 510-511.4	<0.01		6	193	14	71	1.0
F11 165-166	<0.01		40	--	--	--	--
F11 166-167	<0.01		50	--	--	--	--
F11 167-168	<0.01	<0.01	29	--	--	--	--
F11 168-169	<0.01		37	--	--	--	--

FEND-10

Meter	min	max
147.	2	3
148	0	0
149	0	2
150	0	0
151	0	0
152	0	0
153	0	0
154	0	0
155	0	0
156	0	0
157	0	0
158	0	0
159	0	0
160	0	0
161	0	0
162	0	0
163	0	0
164	0	0
165	0	0
166	0	0
167	0	0
168	0	0
169	0	0
170	0	0
171	0	0
172	0	0
173	0	0
174	0	0
175	0	0
176	0	0
177	0	0
178	0	0
179	0	0
180	0	0
181	0	0
182	0	0
183	0	0
184	0	0
185	0	0
186	0	0
187	0	0
188	0	0

FEND-10

Meter	min	max
189.	0	0
190	0	0
191	0	0
192	0	0
193	0	0
194	0	0
195	2	0
196	0	0
197	0	0
198	0	0
199	0	0
200.	0	0
201	0	0
202	0	0
203	0	0
204	0	0
205	0	0
206	0	0
207	7	13
208	15	23
209	40	43
210	6	10
211	34	35
212	37	52
213	23	25
214	25	45
215	75	90
216	50	57
217	10	15
218	3	3
219	34	40
220	0	0
221	3	5
222	0	0
223	16	24
224	3	9
225	0	0
226	0	0
227	24	27
228	35	41
229	0	0
230	0	0
231	0	0
232	3	6

FEND-10

Meter	min	max
233	59	65
234	27	39
235	50	54
236	40	44.
237	20	24
238	60	63
239	24	31
240	46	57.
241	19	27.
242.	30	35
243	20	25
244	17	24
245	57	62.
246	0	0
247	0	3
248	0	0
249	0	0
250	8	12
251	24	26
252	8	13.
253	0	0
254	31	35
255	8	11
256	0	3
257	0	0
258	7	11
259	19	23
260	0	0
261	0	0
262	0	0
263	13	15
264	11	36
265	2	6
266	0	0
267	0	0
268	0	0
269	0	0
270	0	0
271	19	20
272	12	15
273	26	35
274	15	27
275	13	21
276	12	13

FEND-10

Meter	min	max
277	6	17.
278	36	78
279	0	0
280.	15	21
281	16	17.
282.	32	42.
282.3	1141	2173
282.6	4000	4100
283.	11	12.
283.3	26	491
283.6	77	112.
284	87	158
284.3	18	23
284.6	15	50
285	24	131
285.3	22	36
285.6	0	0
286	13	25
286.3	15	48
286.6	17	36
287.	56	170
287.3	864	24
287.6	439	1100
288	303	647
288.3	11	12.
288.6	321	988
289	3101	5027
289.3	3848	5109
289.6	2080	3700
290.0	2969	4534
291.3	1937	2813
291.6	3400	5800
292	1946	4822
292.3	5000	6700
292.6	3701	4907
293	288	818
293.3	1998	3003
293.6	2923	5611
294.	4900	7318
294.3	832	2345
294.6	120	130
295	4907	5305
295.3	888	1109

metre	min	max
295.6	513	2213
296	3127	4687
296.3	234	1481
296.6	3910	5301
297	2308	5463
297.3	1657	3300
297.6	2052	7371
298	3361	8704
298.3	679	1507
298.6	328	329
299	131	1777
299.3	30	6
299.6	4190	6916
300	15	3221
300.3	718	3895
300.6	931	2906
301	650	1589
301.3	172	884
301.6	2867	8323
302	1806	2836
302.3	317	1406
302.6	3595	5564

Metre	min	max
303	0	0
303.3	0	0
303.6	0	0
304	3	19
304.3	0	0
304.6	0	0
305	30	369
305.3	1944	3719
305.6	1160	3381
306	3683	5576
306.3	2459	5850
306.6	3036	9823
307	187	558
307.3	4508	5558
307.6	2877	4540
308	278	1320
308.3	43	70
308.6	196	404
309	1972	3595
309.3	1270	2422
309.6	510	1288
310	70	124

metre	min	max
310.3	787	1874
310.6	645	2376
311	326	1017
311.3	3360	5570
311.6	2896	3893
312	790	1692
312.3	272	1165
312.6	2089	3780
313	2267	5031
313.3	3047	6685
313.6	4412	6960
314	4640	7243
314.3	5805	7801
314.6	4120	6776
315	4674	8798
315.3	2708	4641
315.6	1611	3490
316	4293	6470
316.3	4732	7496
316.6	3512	5739
317	2843	4759
317.3	1512	2690

Metre	min	max
317.6	608	1145
318	332	610
318.3	571	1869
318.6	294	504
319	611	1049
319.3	1162	2501
319.6	94	142
320	5	6
320.3	73	443
320.6	37	57
321	84	90
321.3	65	16
321.6	11	12
322	7	7
322.3	18	20
322.6	17	19
323	49	136
323.3	3	7
323.6	—	—
324	25	34
324.3	27	36
324.6	45	68

metre	min	max
325	19	23
325.3	0	0
325.6	0	0
326	0	0
326.3	0	0
326.6	0	3
327	0	0
327.3	0	0
327.6	0	0
328	0	0
328.3	0	0
328.6	0	0
329	0	0
329.3	0	0
329.6	0	0
330	0	0
330.3	0	3
330.6	0	0
331	0	0
331.3	0	2
331.6	0	0
332	0	0

metre	min	max
332.30	0	0
332.60	0	0
333	0	0
333.30	0	0
333.60	0	0
334	0	0
334.30	0	0
334.6	0	0
335	0	0
335.3	0	15
335.6	0	0
336	0	0
336.3	0	0
336.6	19	131
337	7	37
337.3	0	0
337.6	0	5
338	0	0
338.3	0	0
338.6	0	0
339	7	46
339.3	0	0

metre	min	max
339.6	39	157
340	0	0
340.3	0	7
340.6	3	109
341	0	0
341.3	0	0
341.6	0	1
342	0	0
342.3	0	0
342.6	0	0
343	0	0
343.3	0	0
343.6	0	0
344	0	0
344.3	0	0
344.6	0	0
345	0	0
345.3	2	7
345.6	0	0
346	0	0
346.3	0	0
346.6	0	0

metre	min	max
347	0	0
347.3	122	402
347.6	12	32
348	0	0
348.3	10	90
348.6	0	0
349	0	0
349.3	0	0
349.6	23	167
350	0	0
350.3	107	261
350.6	88	1238
351	16	60
351.3	896	2015
351.6	134	229
352	206	311
352.3	0	0
352.6	0	0
353	3	22
353.3	0	0
353.6	0	0
354	49	183

FEND-10

354	23	194	361.3	799	3073
354.3	342	1041	361.6	351	950
354.6	0	0	362	355	976
355	0	0	362.3	695	844
355.3	0	0	362.6	640	1232
355.6	294	954	363	499	1092
356	7	27	363.3	637	1032
356.3	3	26	363.6	443	1214
356.6	0	0	364	205	341
357	14	16	364.3	554	990
357.3	884	4092	364.6	800	1665
357.6	77	361	365.	0	0
358	74	296	365.3	78	177
358.3	60	74	365.6	70	151
358.6	84	236	366.	648	802
359.	0	0	366.3	644	822
359.3	854	1258	366.6	178	282
359.6	1455	3677	367.	190	488
360	1072	2478	367.3	346	628
360.3	805	2078	367.6	658	916
360.6	278	505	368.	263	50
361.	59	0	368.3	13	47.

FEND-10

metre	min	max	metre	min	max
368.6	0	2	376	0	0
369	21	48	376.3	0	8
369.3	243	276	376.6	7	45
369.6	569	674	377	214	1121
370.0	30	128	377.3	264	445
370.3	253	410	377.6	128	468
370.6	2102	2903	378	13	45
371	37	183	378.3	0	0
371.3	152	457	378.6	88	210
371.6	283	642	379	207	668
372	810	1453	379.3	97	188
372.3	1000	1686	379.6	11	376
372.6	34	77	380.0	649	1184
373	11	21	380.3	572	1400
373.3	105	11	380.6	107	158
373.6	66	139	381	0	0
374	27	49	381.3	0	0
374.3	378	417	381.6	0	0
374.6	2	11	382	42	85
375	2805	3113	382.3	155	161
375.3	1203	2446	382.6	1280	2109
375.6	631	728	383	18	132

FEND-10

metre	min	max	metre	min	max
383.3	12	15	390.6	0	0
383.6	15	20	391.0	0	0
384	0	0	391.3	0	0
384.3	10	15	391.6	272	368
384.6	0	0	392	385	479
385	0	0	392.3	0	0
385.3	0	0	392.6	0	0
385.6	1	2.	393	0	0
386	7	45	393.3	241	566
386.3	0	0	393.6	401	679.
386.6	203	250	394	775	1106
387	0	0	394.3	510	732
387.3	48	114	394.6	93	195
387.6	150	332	395	1065	1831
388	70	140	395.3	20	224
388.3	0	0	395.6	5	7
388.6	0	0	396	148	654
389	0	0	396.3	27	266
389.3	150	223	396.6	624	811
389.6	0	0	397	1946	4997
390	0	0	397.3	0	0
390.3	0	0	397.6	0	0

FEND-10

398.00	137	166	405.3		
398.30	12	26	405.6		
398.60	0	0	406		
399	0	0			
399.3	15	34			
399.6	0	0			
400	0	0			
400.3	0	0			
400.6	0	0			
401	0	0			
401.3	0	0			
401.6	0	0			
402	0	0			
402.3	0	0			
402.6	0	0			
403	0	0			
403.3	0	0			
403.6	0	0			
404	0	0			
404.3	0	0			
404.6	0	0			
405	0	0			

FOLD-10

metre	Min	Max
383·3	12	15
383·6	15	20
384	0	0
384·3	10	15
384·6	0	0
385	0	0
385·3	0	0
385·6	1	2
386	7	45
386·3	0	0
386·6	203	250
387	0	0
387·3	48	114
387·6	156	332
388	70	140
388·3	0	0
388·6	0	0
389	0	0
389·3	150	223
389·6	0	0
390	0	0
390·3	0	0
390·6	0	0
391·0	0	0
391·3	0	0
391·6	272	368
392	385	479
392·3	0	0
392·6	0	0
393	0	0
393·3	241	566
393·6	401	679
394	775	1106
394·3	510	732
394·6	93	195
395	1065	1831
395·3	20	224
395·6	5	7
396	148	654
396·3	27	266
396·6	624	811
397	1946	4997
397·3	0	0
397·6	0	0

FOLD-10

398·00	132	166
398·30	12	26
398·60	0	0
399	0	0
399·3	15	34
399·6	0	0
400	0	0
400·3	0	0
400·6	0	0
~~401~~ 400	0	0
401·3	0	0
401·6	0	0
402	0	0
402·3	0	0
402·6	0	0
403	0	0
403·3	0	0
403·6	0	0
~~404~~ 403·9	0	0
404·3	0	0
404·6	0	0
405	0	0
405·3	0	0
405·6	10	63
406	2	5
407	0	2
408	0	0
409	0	0
410	108	1668
411	268	398
412	260	810
413	16	21
414	315	409
415	245	376
416	5	?
417	13	41
418	529	1609
419	354	413
420	332	1133
421	320	949
422	350	438
423	27	48
424	0	0
425	208	293

HEND-10

metre	min	max
426	13	67
427	17	50
428	203	288
429	949	2008
430	752	834
431	537	650
432	89	201
433	346	368
434	22	35
435	180	285
436	96	136
437	280	315
438	273	384
439	1081	1534
440	413	806
441	203	1320
442	0	0
443	0 kg	0
444	2156	2613
445	2048	2750
446	519	850
447	2591	4750
448	458	702
449	1218	1776
450	911	1610
451	1681	3083
452	1067	2576
453	0	0
454	207	545
455	0	0
456	8	49
457	229	542
458	145	218
459	~~138~~ 38	124
460	258	368
461	8	63
462	1064	2159
463	81	167
464	109	393
465	82	163
466	471	2295
467	76	240
468	179	552
469	784	2070
470	1283	2240
471	303	420
472	95	112
473	241	443
474	1732	2218
475	1039	1486
476	41	65
477	27	56
478	34	140
479	164	1484
480	459	8850
481	26	50
482	21	27
483	124	793
484	577	2677
485	322	4326
486	39	1159
487	341	1186
488	417	5911
489	5	11
490	272	1354
491	280	942
492	381	1406
493	178	262
494	2056	3015
495	2201	2762
496	632	899
497	1143	1928
498	573	12131
499	757	~~1179~~ 1359
500	1244	1767
501	1768	2095
502	991	1341
503	734	1590
504	1704	11146
505	1222	2205
506	213	354
507	253	397
508	465	1183
509	760	1520
510	910	1184
511	3947	2424
512		
513		
514		
515		

APPENDIX II

FEND11 DRILL LOG AND ASSAYS

EXPLOREMIN PTY LTD - DRILL HOLE LOG

drilog01.dot

Drill Hole: FEND 11
Tenement: EL 9345
Prospect: TIPPERARY CENTRAL
Map Ref: TIPPERARY 1:100,000

AMG/~~Grid~~ E: 744400
AMG/~~Grid~~ N: 8478440
RL Collar:
Client: HOMESTAKE

Azimuth: 260° TIMIS
Inclination: -68.5°
Total Depth:
Casing: 87m

Commenced: 25/7/96
Completed: RC on 27/7/96
Hole Size: 4½"
Sample Type: RC 2m composite

Sheet: 1 of 4
Logged by: S.O
Drillers: GADEN
Drill Type: WARMAN UNIVERSAL 1000

From	To	SampNo	Lithology	Colour	Texture	Major Minerals	Minor Minerals	Trace Minerals	Comments
0	1		laterite	Red brown	Pisolitic	Iron oxides	clay.		
1	2	F11/ 0-2	Limestone.	Pale Tan	Fine grained	Calcite.	Iron oxides	Manganese	Some minor dendritic manganese + stringers thro'
2	3		"	"	"	"	"		
3	4	F11/ 2-4	"	"	"	"	"		Calcite as part of groundmass of rock.
4	5		"	"	"	"	"		
5	6	F11/4-6	"	"	"	"	"		
6	7		Limestone.	Pale Mauve.	"	"	"	Clay	
7	8	F11/6-8	"	"	"	"	"	"	
8	9		"	Pale Mauve - Tan	Fine grained	Calcite.	Iron oxides.		
9	10	F11/8-10	"	Dark grey	"	"			Fresher limestone. Calcite as
10	11		"	"	"	"			part of groundmass. No Iron
11	12	F11/10-12	"	"	"	"			oxides.
12	13		"	"	"	"			
13	14	F11/12-14	"	"	"	"			
14	15		"	"	"	"			
15	16	F11/14-16	"	"	"	"			
16	17		"	"	"	"			
17	18	F11/16-18	"	"	"	"			
18	19		"	"	"	"			
19	20	F11/18-20	"	"	"	"			
20	21		"	"	"	"			
21	22	F11/20-22	"	"	"	"			
22	23		"	"	"	"			Some calcite veining
23	24	F11/22-24	"	"	"	"			

EXPLOREMIN PTY LTD - DRILL HOLE LOG

drilog01.dot

Drill Hole: FEND 11 | AMG/~~Grid~~ E: 744400 | Azimuth: 260° TIM/Ø | Commenced: 25/7/96 | Sheet: 2 of 4
Tenement: EL 9345 | AMG/~~Grid~~ N: 8478440 | Inclination: -68·5° | Completed: RL on 27/7/96 | Logged by: S.O.
Prospect: TIPPERARY CENTRAL | RL Collar: | Total Depth: | Hole Size: 4½" | Drillers: GADEN
Map Ref: TIPPERARY 1:100,000 | Client: HOMESTAKE | Casing: 8m | Sample Type: RC 2m composite | Drill Type: WARMAN UNIVERSAL 1000

From	To	SampNo	Lithology	Colour	Texture	Major Minerals	Minor Minerals	Trace Minerals	Comments
24	25		Limestone	Dark grey	fine grained	Calcite			Calcite as part of groundmass
25	26	F11/24-26	"	"	"	"			
26	27		"	"	"	"			
27	28	F11/26-28	"	"	"	"			
28	29		"	"	"	"			
29	30	F11/28-30	"	"	"	"			
30	31		"	"	"	"			
31	32	F11/30-32	"	"	"	"			
32	33		"	"	"	"			
33	34	F11/32-34	"	"	"	"			
34	35		"	"	"	"			
35	36	F11/34-36	"	"	"	"			
36	37		Limestone.	Grey	"	"			Some minr calcite veining
37	38	F11/36-38	"	"	"	"			
38	39		"	"	"	"			
39	40	F11/38-40	"	Grey & red brown	"	Calcite	1mm oxide		Some Fe ox stained chips.
40	41		"	"	"	"	"		" "
41	42	F11/40-42	"	Pale red brown	"	Calcite & 1mm oxides			
42	43		"	brown	"	"			
43	44	F11/42-44	"	white	"	Carbonate-Dolomite?	1mm oxides		NO - very weak fizz with HCl
44	45		"	Yellow Tan	"	Carbonate.		1mm oxide.	" "
45	46	F11/44-46	"	Pale grey	"	"		"	As above.
46	47		"	Grey-white	"	"			
47	48	F11/46-48	"	Dark grey	"	"			

EXPLOREMIN PTY LTD - DRILL HOLE LOG

drilog01.dot

Drill Hole: FEND 11
Tenement: EL 9345
Prospect: TIPPERARY CENTRAL
Map Ref: TIPPERARY 1:100,000

AMG/~~Grid~~ E: 744400
AMG/~~Grid~~ N: 8478440
RL Collar:
Client: HOMESTAKE

Azimuth: 268° TIMIB
Inclination: -68.5°
Total Depth:
Casing: 8m

Commenced: 25/7/96
Completed: RC on 27/7/96
Hole Size: 4½"
Sample Type: RC 2m composite

Sheet: 3 of 4
Logged by: S-A
Drillers: GADEN
Drill Type: WARMAN UNIVERSAL 1000

From	To	SampNo	Lithology	Colour	Texture	Major Minerals	Minor Minerals	Trace Minerals	Comments
48	49		Limestone.	Grey	fine grained	Calcite.			
49	50	F11/48-50	"	Pale orang.	"	calcite + Iron oxide			
50	51		"	Pale grey	"	calcite			
51	52	F11/50-52	"	"	"	"			
52	53		"	Red brown	"	Iron oxides	Carbonate		strong Iron staining
53	54	F11/52-54	"	"	"	"	"		"
54	55		"	"	"	"	"		"
55	56	F11/54-56	"	"	"	"	"		"
56	57		"	Grey.	"	Calcite.			
57	58	F11/56-58	"	"	"	"			
58	59		"	Pale orang.	"	Calcite + Iron oxides			
59	60	F11/58-60	"	Grey	"	calcite			
60	61		"	"	"	"			
61	62	F11/60-62	"	"	"	calcite + Qtz			Quartz in veins
62	63		"	Tan	"	carbonate & calcite		Iron oxides	No py - very minor py with Mal.
63	64	F11/62-64	"	"	"	"		"	
64	65		"	"	"	"		"	
65	66	F11/64-66	"	"	"	"		"	
66	67		"	"	"	"		"	
67	68	F11/66-68	"	"	"	"		"	
68	69		"	"	"	"		"	
69	70	F11/68-70	"	"	"	"		"	
70	71		"	"	"	"		"	
71	72.	F11/70-72.	"	"	"	"		"	

EXPLOREMIN PTY LTD - DRILL HOLE LOG

drilog01.dot

Drill Hole: FEND 11
Tenement: EL 9345
Prospect: TIPPERARY CENTRAL
Map Ref: TIPPERARY 1:100000

AMG/~~Grid~~ E: 744400
AMG/~~Grid~~ N: 8478440
RL Collar:
Client: HOMESTAKE

Azimuth: 260° TMIB
Inclination: -68.5°
Total Depth:
Casing: 87m

Commenced: 25/7/96
Completed: RC on 27/7/96
Hole Size: 4 1/2"
Sample Type: RC 2m Composite

Sheet: 4 of 4
Logged by: S.O
Drillers: GARDEN
Drill Type: WARMAN UNIVERSAL 1000

From	To	SampNo	Lithology	Colour	Texture	Major Minerals	Minor Minerals	Trace Minerals	Comments
72	73		NO SAMPLE						
73	74	72-74 NO SAMPLE	"						
74	75		"						
75	76	74-76 NO SAMPLE	"						
76	77		Limestone.	Red brown	fine grained.	Calcite	2m oxides		Increased Fe oxide content at brown colour.
77	78	F11/76-78.	"	"	"	"	"		
78	79		"	"	"	"	"		
79	80	F11/78-80 wet	"	"	"	"	"		
80	81		"	"	"	"	"		
81	82	F11/80-82 wet	"	"	"	"	"		
82	83		"	"	"	"	"		
83	84	F11/82-84 wet	"	"	"	"	"		
84	85		"	"	"	"	"		
85	86		"	"	"	"	"		
86	87	F11/84-87 wet	"						
			END RC GOTO NQ CORE.						

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260° A/M/G	Commenced: 15/9/96	Sheet: 1 of 21
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -68.5	Completed: 11/9/96	Logged by: S.OMOTOSHO
Prospect: TIPPERARY CENTRAL	RL Collar: 72m	Total Depth: 537.1	Hole Size: NQ	Drillers: GADEN
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE.	Casing:	Sample Type: 1/2 CORE (1m)	Drill Type: WARMAN UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	6m / -67.50 / —	30m / -69.5 / 260°	60m / -69.75 / 258°	101m / -70 / 255°

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	sillic	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
87.00	95.00	Limestone: Pale red brown - pale grey fine grained calcareous - minor stylolites & tightly packed breccia. Bottom 4m of interval vuggy & crackle brecciated. Possible Siderite as well formed, Iron stained crystals in some vuggs. Calcite in fracture fillings																							
95.00	106.00	Chloritic Calcareous Siltstone Pale - Dark green fine grained, moderately laminated. Strongly Chloritic. Variably sized & shaped calcareous nodules to 3cm. Bottom 5m of interval massive brecciated.																							
106.00	113.50	Calcareous Siltstone Pale tan, fine grained Calcareous with variable intervals of tightly packed rubble brecciation - solution collapse breccia.																							
113.50	128.60	Vuggy limestone. Grey, fine grained. vuggy & rubble brecciated with calcite fracture filling.																							
128.60	168.40	Calcareous Siltstone: Brown - fine grained minor Pale grey intervals. Whole interval loosely packed rubble breccia																							
168.40	171.65	Calci-Rudite. Pale pink fine - coarse grained Sand size particles with clasts - sub angular to 3cm diameter. Clasts of quartz, lithic fragments of metasediment calcite in matrix. Represents the																							

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260° T/M/B	Commenced: 15/8/96	Sheet: 2 of 21
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -68.5	Completed: 11/9	Logged by: S.O.
Prospect: TIPPERARY CENTRAL	RL Collar: 72	Total Depth: 537.1	Hole Size: NQ	Drillers: GADEN
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing:	Sample Type: ½ CORE (1m)	Drill Type: WARMAN UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	255m / -67.5 / 255.25	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	sllic	tour	chl	bl	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
168.40	171.65	(cont) rubble zone directly above the fossil proterozoic landscape/unconformity.																							
171.65	196.70	Metagreywacke/meta siltstone pale red brown-pale grey, fine to medium grained. Oxidised with red brown intervals with strong hematite dusting. Interval comprised fine grained sediment with dispersed & unsorted clastic grains to 2mm (greywacke) interbedded with fine grained (siltstone intervals) Interval shows weak to moderate crackle brecciation by calcite & quartz veining to 1cm. 186.10 - 189.20 strong crackle brecciation. 176.80 - 180.00 mosaic brecciation with calcite infilling with dot of pyrite to 5mm. Start of interval - 171.65 - 172.00 Pale/v. pale green, with fragmental quartz veins. Some (non dusted) quartz veining to 3cm. Bottom 1m of interval: clay altered & chloritic - pale green with hematitic patches. CORE ORIENTATED FROM 189.40 - 195.50 ft - Multiple brecciation events. evident in strong crackle brecciated zone - calcite veins cut quartz veining. Qtz veins also variable shattered with calcite & hematite infilling. 20cm pegmatite vein at 195		Trace	Py				✓	27.									cbt	172.20	Qtz vein.	26	
																						178.0	Qtz vein.	48	
																						181.20	Qtz vein	40	
																						185.40	Qtz vein.	62	
																						191.00	Qtz vein.	75	340
																						192.50	Qtz vein.	45	310
																						194.40	Qtz vein.	33.	310
																						180.20	Calcite vein	15	120
196.70	205.50	Pegmatite Pale orange - pale grey coarse grained pegmatite. Quartz, feldspar & mica.																							

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260° TIMIS	Commenced: 15/8/96	Sheet: 3 of 21
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -68·5	Completed: 11/9	Logged by: S·O.
Prospect: TIPPERARY CENTRAL	RL Collar: 72	Total Depth: 537.1	Hole Size: NQ	Drillers: GADEN
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing:	Sample Type: ½ CORE (1m)	Drill Type: WARMAN UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	131m 1-70 1255·5	162m 1-70 1255·5	192m 1-68° 1255°	225 1-68 1253°

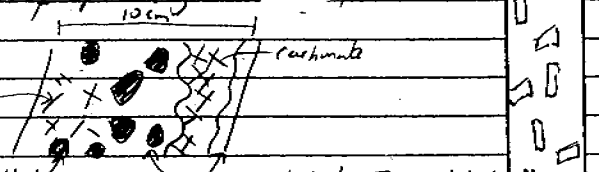
From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	silic	tour	chl	bt	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
196·70	205·50	(CONT) feldspar to core width, white quartz appear to fill interstitial crystals spaces. Mica crystals to 5mm.		-																		196·70	FEND contact	65	
																						206·20	QTZ vein	25	
205·50	207·50	Metagreywacke. Pale brown, fine grained, fairly massive. Some relict clastic grains to 1mm. Two pegmatite veins to 10cm. Intervals is weakly fractured white quartz vein to 15mm.		-																					
207·50	214·00	Pegmatite. Pink coarse grained. 207·50 - 209·00. Pegmatite is chloritically altered. Mica - dark green soft chlorite - crowds on cracks // TCA + purple fluorite veins from 209·35 to end of interval. Pegmatite is massive & unaltered. Some minor alteration of mica → chlorite. Some fine grained - recrystallised interval.		-									3%			fluorite veins ≤ 1mm								
214·00	221·6	Metagreywacke. Pale brown, fine grained massive. Relict quartz clasts to 2mm. 20% of core comprises orange brown, fine grained feldspar - aplitic zones. Aplitic zones are rugged & patchy. At 218·80 calcite vein to 5mm with dark purple fluorite selvages. Some minor white quartz. net veining from 220·30 - 221·00. 219·20 - 219·30 dark green chloritic zone with white fragmented quartz. V. minor calcite veining to 1mm in interval.		-																		218·80	Calcite Fluorite vein.	50	

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-1	AMG/~~Grid~~ E: 744400	Azimuth: 260° TIMIB	Commenced: 15/3/96	Sheet: 4 of 21
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -65°	Completed: 11/4	Logged by: S.O.
Prospect: TIPPERARY CENTRAL	RL Collar: 72	Total Depth: 537.1	Hole Size: NJ.	Drillers: GADEN
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing:	Sample Type: ½ CORE (1m)	Drill Type: WHITMAN UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	/ /	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	sillc	tour	chl	bl	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
221.6	240.70	Pegmatite Orange brown-pink coarse grained. plagioclase, quartz, minor + partially altered micas. Two calcite ± Hematite veins to 3mm. Trace of pyrite at 233m - 235.0 & 235.30 rubble breccia/gouge, loosely packed sub-angular clasts of Massive sphalerite? infills voids with white acicular crystals to 1cm long - carbonates growing within sphalerite & on edges of sphalerite growth. Minor Hematite with sphalerite.		Trace	Py				✓							Trace?						228.15	Hematite Calcite vein.	25	
																						239.10	Hematite vein	15	
																						240.70	Fault contact	65	
240.70	241.80	Metasiltstone Pale grey, fine grained; moderately laminated, with moderate quartz. chlorite quartz veins to 15mm.																							
241.80	243.70	Chloritic Mudstone. Dark green-black, fine grained, massive - mainly chlorite with fine grained white mica, gypsum, slight sheen to rock. At 243 clots of pyrite to ½ width rare ± 6cm long, cut by dendritic quartz? veinlets to 1mm. Mica to 5mm in isolated patch at bottom of interval with blood red hematite spotting.		<1%	Py				✓				80%									P				



EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260° TIMIS	Commenced: 15/8/96	Sheet: 5 of 21
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -65°	Completed: 4/9	Logged by: S.O.
Prospect: TIPPERARY CENTRAL	RL Collar: 72 m	Total Depth: 337.1	Hole Size: NQ	Drillers: CAIDEN
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing:	Sample Type: Y/core (cm)	Drill Type: MARIMAN UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	255 / -68 / 253	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss'mn	patc hes	Alteration/Metamorphism (est %) cbt	sillic	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
243.70	245.35	Pegmatite - Pale pink, coarse grained, K-feldspar, Quartz + mica.		-																					
245.35	249.40	Metamorphic - Grey, fine grained, massive minor K-spar, about veining minor chlor clasts.		-																		244.40	Veg contact	65	
																						251.50	foliation	55	
																						251.80	Veg contact	15	
249.40	250.60	Pegmatite Pale grey-pink - K+Na spar, increased mica; some minor pale green serpentine mineral, pegmatite cut by fine chlorite veins to base + bottom 50cm of interval.																				253.70	Veg contact	68	
									vein													262.0	foliation	57	
250.60	251.80	Metasiltstone - Pale grey-green, fine grained weakly laminated. laminations cut by thin <1mm pyrite veins // TCA with possible trace of Arsenopyrite. Minor chlorite in cracks.		<1%	Py				✓													263.20	Calcite vein.	45	
																						273.70	foliation	55	
251.80	253.70	Pegmatite - Pale grey, coarse grained, Na-spar rich, + Quartz, K-spar + Mica.		-																					
253.70	284.20	Metasiltstone - Grey, fine grained, moderately laminated. Pyrite occurs in rare veins on fracture surfaces. Some creamy K-spar veining cuts laminations, also diffuse zones of creamy K-spar - 3-4cm. Pyrite veins appear to be offset by laminations in sing. cases. Feldspar veins mostly offset by quartz + pyrite veins. 262.7 - 263.8 rock is dark green, chloritic with increased calcite veining. Pegmatite mostly to fabric - could be.		<1%	Py	Trace	Po		✓				<1%													

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260° TM/B	Commenced: 15/8/96	Sheet: 6 of 21	
Tenement: EL 9345	AMG/~~Grid~~ N: 6478440	Inclination: -68.5	Completed: 11/9	Logged by: S.O	
Prospect: TINKERBELL CENTRAL	RL Collar: 72m	Total Depth: 537.1m	Hole Size: NQ	Drillers: CHDEN	
Map Ref: TINKERBELL 1:100,000	Client: HOMESTAKE	Casing:	Sample Type: ½ CORE (1m)	Drill Type: WARMAN UNIVERSAL NQ	
Hole Survs - Depth/Incln/Azim	255 -65 / 255	/ /	/ /	/ /	

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	palc hes	Alteration/Metamorphism (est %) cbt	silic	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
253.70	284.20	(cont) strongly silicified basic lyte with developed regional fabric. Whole interval is weak-moderately crackle brecciated with quartz veins to 5mm. Some slightly coarser grained individual beds to 10cm, possibly fining/grading upwards - 270.70-271.15 pale green calc-silicate zone - chlorite, calcite, K-spar, minor fluorite & pyrite + trace of pyrrhotite.																							
284.20	285.10	Calc silicate chaotic mix of chlorite, calcite, fluorite - pale olive green, fine grained. 10cm K-spar zone & 2cm calcite vein, pink adjacent to dark green chlorite vein. Dark purple fluorite ~3%.		<1%	Py			1	✓	40%			10%												
285.10	289.50	Metasilt/fine Pale grey, fine grained moderately laminated. Minor calcite veining & 1mm + minor K-spar veining. Minor pyrite. *CORE ORIENTATED FROM 285.1 - 287.8 * In space orientation at 285.4 so = 160/65E		<1%	Py		✓															285.40	so	65	330
																						287.10	so	60	315
289.50	290.15	Metadolerite Dark green, fine grained cryptoline, disperse calcite veining 0.1m. granoblastic, Mineralogy - actinolite, feldspar Minor fabric developed. Patchy pyrite & pyrrhotite. Some pyrite along fractures		<1%	1:1				✓													290.15	DD/contact	75	

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260° TIMIS	Commenced: 15/8/16	Sheet: 7 of 21
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -68°	Completed: 4/9	Logged by: SD
Prospect: TIPPERARY CENTRAL	RL Collar: 72m	Total Depth: 537.1	Hole Size: NQ	Drillers: GADEN
Map Ref: TIPPERARY 1:100,000	Client: ~~NOMESTAKE~~	Casing:	Sample Type: ½ CORE (1m)	Drill Type: ~~VERTICAL~~ ANGLED 1000
Hole Survs - Depth/Incln/Azim	315 -64 1254	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	pauc hes	Alteration/Metamorphism (est %) cbt	sllic	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
270.15	333.00	Meta siltstone Grey - dark grey, fine grained, moderately laminated. Pyrite only in fractures to 2cm also weakly concentrated in some laminae and in later cross cutting fractures to ~1mm thick. No pyrrhotite - Intrusive is pervasively veined - 4 types of veining. a, diffuse, whispy quartz veins to ~3mm impacts moderate crackle brecciation texture in rock. b, Thicker white quartz veins to 3cm are generally parallel to lamination/bedding. Sympathetically have minor flecks of pyrrhotite within them also arranged parallel to S0 + minor pyrite. Po also in vein selvage c, Calcite veins & veinlets to 5mm, brecciated attitudes, but mainly appear to be open space filling & small breccia zone filling at 302.0 see collapsed texture calcite vein with clots of pyrite, Hematite & minor galena. Rafts of vein also moderately hematite altered. d, Pegmatite veins to 15cm - rare. only seen one at 301.50.		1%	Py	Py>Po	✓		✓		<1%												274.20	QB vein	80	
																						294.50	QB vein	70	
																						301.80	Intrusive contact	70	
																						333.80	QB vein	62	
																						334.60	QB vein	48	
QB veining 0.8% of intrusive thickness		order of veining abundance by core volume. b > c > a > d. Significant zones of veining are as follows. - Type b - white QB veins+sulphides. 2cm @ 291, 1cm @ 292.3, 1cm @ 294.2 2cm @ 294.5, 1cm @ 296, 3cm @ 301.		← clot of sphalerite + Pyrite in Pegmatite selvage.																					

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-11	AMG/~~Grid~~ E: 7444 00	Azimuth: 360° TIMIB	Commenced: 15/8/96	Sheet: 8 of 21
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -65°	Completed: 11/9	Logged by: S.O.
Prospect: TIPPERARY CENTRAL	RL Collar: 72 m	Total Depth: 537.1	Hole Size: NQ	Drillers: GAIDEN
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing:	Sample Type: ½ core (cm)	Drill Type: conventional universal rig
Hole Survs - Depth/Incln/Azim	/ /	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	silic	tour	cht	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
310.15	333.00	(cont) 1cm @ 301.40, 3cm @ 302.80																				321.9	qtz vein	58	
		5cm @ 303.50, 4cm @ 304.60, 2cm @																							
		307.50, 5mm @ 310.10, 1cm @ 311.6. 1cm		~0.5% vein																					
		@ 323.10 2cm @ 325.50 + 1 Healed Apy, 3cm																							
		@ 330, 3cm @ 331.40, 2cm @ 332.2.																							
		Type C calcite veins significant areas		calcite veins																					
		2cm @ 312 20cm zone @ 310.7, 40cm zone																							
		@ 313 Type a-chlorite cbt veins most		crumbled core																					
		prevalent between 295 - 324m. 305.8 -																							
		306.6 intense, crackle quartz veining resulting in strong																							
		Silicification. Core is variably fractured from ~ 306.8																							
		- 312m. It appears that calcite veining																							
		increases in this area (fracture filling) & all																							
		quartz type veining is nearly absent in this																							
		probable crush/fault zone. See distinctive																							
		pale red brown zones of alteration probable																							
		K-spar +/or hematite staining from 304 - 305.8																							
		319.7 - 325.30. These pegmatitic zones																							
		moderately fractured. Fractures post date cbt veining																							
		white sulphidic veining sometimes folded as at																							
		325.50 x 293.50 with cm thick. Type of veining - oldest first.																							
		b-d-a-C. or b-a-d-c.																							
333.00	340.90	Pegmatite. Pale orange, coarse grained, crackled		—									<1%									340.90	Peg contact	38	
		K-spar, Na-spar, quartz & some white mica. Crystals																							
		appear mostly broken & not as massive as previous																							

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744405	Azimuth: 260° TIMIS	Commenced: 15/8/96	Sheet: 9 of 21
Tenement: EL 9345	AMG/~~Grid~~ N: 6478940	Inclination: -65	Completed: 11/9	Logged by: SO
Prospect: TIPPERARY CENTRAL	RL Collar: 72 m	Total Depth: 537.1	Hole Size: NQ	Drillers: GADEN
Map Ref: TIPPERARY 1:100,000	Client: ASMESTAKE	Casing:	Sample Type: ½ CORE (1m)	Drill Type: MACHINAN UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	351 / -62 / 254	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	sillc	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
339.10	340.90	(CONT) pegmatite. Top 1.5m of interval is almost pervasively mussivic - rubble brecciated with dark green chlorite matrix. possible fault margin.																							
340.90	366.10	Metasiltstone. Grey - dark grey, fine grained, well laminated with Top 2m of interval dark green, fine grained & massive. maybe due to contact metamorphic effect of above pegmatite. or compositional differences ie. more mafic. Laminated metasiltstone interval differs from previous interval in that pale red brown alteration zones are pervasive on a laminae scale & not in distinct massive zones as previously. K-spar ± Hematite alteration zones from 1mm - 5cm parallel to So. Pegmatite veins absent. Only v. minor whispy quartz veins but increased white sulphidic quartz veining. Major Quartz veins are as follows.		2%	3:1		✓	✓	✓				chl													
Qtz veining 2.44% of interval thickness		5cm @ 341.80 2cm @ 342.70 5mm @ 343 2cm @ 343.50 4cm @ 343.20 1cm @ 344.60 2cm @ 345.30, 5mm @ 347, 2cm @ 347.7 & 347.8, 2cm @ 349, 2cm @ 350.8, 2cm @ 351 10cm @ 353, 5mm @ 356.30, 2cm @ 356.40 1cm @ 357.4, 5cm @ 358, 5mm @ 358.6 & 2cm @ 360.3, 2cm @ 360.8, 1cm @ 362,																							
																						342.3	Calcite Hematite ven.	23	
																						343.0	QTZ Ven.	65	
																						346	So	65	
																						348.2	So	65	
																						349	QTZ Veining	35	
																						350.8	QTZ Ven.	58	
																						353.0	QTZ Ven.	63	
																						358.0	QTZ Ven.	63	
																						359.0	So	67	

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

dnlog05.dot

Drill Hole: FDH3-71	AMG/~~Grid~~ E: 744400	Azimuth: 260° (MAG)	Commenced: 15/8/96	Sheet: 10 of 21	
Tenement: EL 7345	AMG/~~Grid~~ N: 8478440	Inclination: -63 S	Completed: 11/9	Logged by: S.O.	
Prospect: TIPPERARY CENTRAL	RL Collar: 72m	Total Depth: 537.1	Hole Size: NQ	Drillers: CADEN	
Map Ref: TIPPERARY 1:100 000	Client: HOMESTAKE	Casing:	Sample Type: ½ CORE (1m)	Drill Type: LONGYEAR UNIVERSAL 1000	
Hole Survs - Depth/Incln/Azim	/ /	/ /	/ /	/ /	

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	silic	tour	cht	bl	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
340.40	366.20	(cont) 2 x 1cm @ 363 1cm @ 363.50 2cm @ 363.50 3cm @ 364.3 1cm @ 364.35 2cm @ 366.2 : Calcite veins are as follows 2cm calcite with internal fluorite vein @ 364.3 1cm calcite vein // TCA chlorite cuts & displaces calcite vein @ 342.7 1cm calcite vein orig @ 351.3°. Sulphides increased in this interval also pyrrhotite is larger clots to 2cm in quartz veins Pyrite is coarsely disseminated in patches & clots roughly parallel to So. Rare zones of increased concentrations/veins 2cm thick at 353.6. Zone from 345.5 – 347.20 Coarser grained dark green locally schistose with patchy K-spar alteration & with disseminated pyrite & pyrrhotite - may be metabasic dyke?!! Quartz veining absent in this interval. At 366.2 fluorite after calcite. At 354.6 laminations are folded parallel to core axis - reverts back to 55° TCA after 22cm. Appears Pegmatite below intruded parallel to So.																									
366.20	370.25	Pegmatite: Pale orange – pink, coarse grained appears overprinted by later quartz veins. Cracks brecciated by chlorite veinlets 1mm. & minor fluorite veinlets 0.5–1mm		–									<1%										370.25	Pegmatite	42	

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	silic	tour	cht	bl	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
																						354.8	55	55	
																						363.7	85 vein	60	
																						344.0	55	62	
																						366.20	Pegmatite contact	63	

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260 M/M/B	Commenced: 15/3/96	Sheet: 1 of 2	
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -68 S	Completed: 11/9	Logged by: S.O	
Prospect: TIPPERARY CENTRAL	RL Collar: 72m	Total Depth: 537.1m	Hole Size: NQ	Drillers: CADEN	
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing:	Sample Type: ½ core (cm)	Drill Type: WARMINGTON UNIVERSAL 10.5	
Hole Survs - Depth/Incln/Azim	375 / -61 / 1254.5	/ /	/ /	/ /	

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/~~mgt~~	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	sillc	tour	chl	bt	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
370.65	374.3	Metasiltstone. Pale grey-green-grey fine grained well laminated. Minor pale red brown K-spar alteration, minor Qtz veining, no visible veining. 25cm pegmatite vein at 372.70. Thin dark purple thanite veining @ 370.35. 1cm Qtz + sulphide vein @ 377m. Pyrite in laminae. Qtz veins have possible sphalerite in selvage @ 371		<1%	Py	Fe ox	BV		✓													371	Qtz vein	58	
374.3	375.20	Pegmatite. Pale creamy-pale pink coarse grained pegmatite. ~ 11 to 50		—																		374.3	Peg/Qtz/Bd.	55	
																						375.2	Peg contact	40	
375.20	377.20	Metasiltstone. Grey-pale grey fine grained well laminated. Pervasive pale red brown K-spar alteration on laminae scale. Pegmatite & quartz-sulphide veining; minor thanite veining. Pegmatite veining occurs as follows 5cm @ 377.20, 1cm @ 378.1, 70cm @ 380.6, 10cm @ 382.10, 2cm @ 381.80, 2cm @ 384.4, 10cm @ 385.20. Qtz sulphide veining. (Qtz veins mostly have internal streaky Po, minor Py + cpy in selvage) occurs as follows 2cm @ 375.35, 3 x 1cm @ 376.4, 1cm @ 377, 5cm @ 377, 5cm @ 378.3, 3 x 2cm @ 378.50, 4cm @ 379.1, 1cm @ 379.2, 2cm @ 379.5, 1cm @ 379.65, 1cm @ 379.85, 2 x 5cm @ 380, 2cm @ 380.4, 1cm @ 380.6, 3cm @ 381.6		3/.	2:1		✓		✓												Apy from 376.20		377.0	Qtz vein.	52	
																						378.0		50	60.
																						379.50	Qtz vein.	50	
																						380.7	Peg/Qtz/Bd.	55	
																						381.4	Peg/Qtz/Bd.	40	
																						381.6	Qtz vein.	45	
																						384	Qtz Vein.	55	
																						384.60	Qtz Vein	65	

EXPLOREMiN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260° TIMG	Commenced: 15/3/96	Sheet: 12 of 21
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -63.5	Completed: 11/9	Logged by: S.D.
Prospect: TIPPERARY CENTRAL	RL Collar: 72m	Total Depth: 537.1	Hole Size: NQ	Drillers: GADEN
Map Ref: TIPPERARY 1:100...	Client: HOMESTAKE	Casing:	Sample Type: 1/2 CORE (1m)	Drill Type: NAUMAN ANIVERSAL 1000
Hole Survs - Depth/Incln/Azim	/ /	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc has	Alteration/Metamorphism (est %) cbt	silic	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
375.20	377.20	(cont) 1cm@ 383.10, 1cm@ 383.40, 2cm @ 383.90, 1cm@ 385.10 3x1cm@ 384.50 2cm@ 385.40, 2cm@ 1cm@ 386.10, 5cm@ 386.9 2cm@ 387.2, 2x 2cm@ 387.5, 2cm@ 387.90 2cm @ 388, 1cm@ 388.10, 3x 2cm@ 388.8, 2cm@ 388.9 3cm@ 389 3cm@ 389.3 2cm@ 389.5 2x1cm@ 389.6, 2cm@ 390.8 4cm@ 391, 1cm@ 391.70, 2cm@ 391.80, 1cm@ 392, 1cm@ 392.4, 1cm@ 393.6 1cm@ 395 1cm@ 394.7 1cm@ 394.8 1cm@ 395, 2cm@ 395.4, 3x1cm@ 395.5, 2cm @ 396.5. Some minor zones of massive pyrite to 2cm, pyrite mostly roughly parallel to laminations & finely disseminated finely. Pyrite is brecciated with quartz veining mostly. All 395.5 see black euhedral crystals of Pyrite to 8mm along with some minor Hematite veins. This marks end part of more massive chloritic Hematite zone from 388.20 - 391.70. Increase massive Sulphide in this zone & actinolite crystals at 391.3. Massive clots of Apy to 3cm@ 391.20' and then in clots to 5mm disseminated to end of interval.																								
																						355.50	Qb vein	55	
																						385.50	So	55	
																						386.50	So	60	
																						388.0	Qb vein	75	
																						391.4	Qb vein	80	
																						393.60	Qb vein	65	
																						394.80	Qb vein	65	
																						395.40	Qb vein	65	
																						397.60	Qb vein	60	

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260° T/M/B	Commenced: 15/8/96	Sheet: 13 of 21
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -68.5	Completed: 11/9	Logged by: SD
Prospect: TIPPERARY CENTRAL	RL Collar: 372 m	Total Depth: 537.1	Hole Size: NQ	Drillers: GADEN
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing:	Sample Type: 1/2 CORE (1m)	Drill Type: WARMAN UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	/ /	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	sillc	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
397.20	405.0	Chloritic metasiltstone/Biotite schist.		10%	1:4			✓	✓				5%	10%						<1%	Qtz/Sulph	348.0	Qtz vein	55	
		Zone of mixed green chloritic - pale grained metasediment, with dark grey - black, medium grained schistose rock with mica & biotite defining schistosity. Schist : siltstone ~ 1:1																				349.10	Qtz vein	46	
		Some minor pale red-brown K-spar alteration in top 1m of interval + minor pale green alteration associated with some red alteration		-Qtz																		349.50	Qtz vein	38	
Qtz veining 12-3% of interval thickness		around 402. Qtz sulphide vein ext/ext after 400.5: 398 - 399 comprises white quartz vein with 15% Pyrrhotite ≯5% Py & ~ < 1% Apy disseminated in ragged clots that appear to fill micro fractures in the quartz. Arsenopyrite seems preferentially concentrated in dark green chloritic slivers within the quartz. Other Qtz/sulphide veins are 2cm @ 399. 2cm @ 399.10, 2cm @ 399.15. clots of Apy seem to form occur within chlorite, released at 399.2. Minor rare clots of chalcopyrite to 2mm occasionally visible. Minor fluorite veining associated with red & green alteration. Zone Po & Apy occurs from ~ strongly developed biotite schist at 404 Po also disseminated in schist & siltstone																							

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260° T/M/B	Commenced: 15/8/96	Sheet: 14 of 21
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -68·5	Completed: 11/9	Logged by: S.O.
Prospect: TIPPERARY CENTRAL	RL Collar: 72m	Total Depth: 537.1	Hole Size: NQ	Drillers: ONDEN
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing:	Sample Type: ½ CORE (1m)	Drill Type: WAGMAN UNIVERSAL 100
Hole Survs - Depth/Incln/Azim	408 1-59 1254	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	sllic	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
405·00	411·00	Chloritic metasiltstone: Dark green fine grained moderately laminated. Pyrite increased in abundance over pyrrhotite & occurs in ragged clots to 2cm and in streaks roughly parallel to lamination. Pyrrhotite occurs as fine dissemination, patchily dispersed. From 407·90 - 411·00 rock is pervasively quartz veined - differs from Qtz/sulphide veining above as here chlorite attitude shows some control on fracture & veining open spaces - appears to be fracture filling & planar. Main sulphide is fine grained Pyrite with minor Sphalerite & chalcopyrite & pyrrhotite. Possible warped chert nodules at ~ 410·40. This is a disturbed zone & typically pyrrhotite reverts back to pyrite in centre of strain *CORE ORIENTATED 406.1 → 410·5 *		15%	20:1			✓	✓					3%													
				(contorted within qtz)																					
411·00	427·20	Aplite Pale red-brown - orange, fine grained Qtz, ~~fs~~ spar, shows weak lamination defined by dark green-black chloritic streaks. Top 2m of interval shows some minor pegmatite intrusive to 2cm also shows pale grey Quartz veins to 3mm being cut by white quartz veins to 2cm with open space texture with some pyrite in core. Qtz veins		1%	Pyrite			✓					1%			<1%									

From	To	Depth	Struc	α	β
		406·0	qtz vein	60	
		406·8	qtz vein	27	330
		407·2	chlorite vein	30	330
		407·8	Sc	38	330
		407·82	qtz vein	42	330
		408·7	qtz vein ruptured	27	050
		410·20	chert/Sc	50	
		410·40	chert/Sc	35	
		417·00	laminated	40	
		427·20	Aplite contact	48	
		423·00	qtz vein	25	

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260° TIMIB	Commenced: 15/8/96	Sheet: 15 of 21
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -68.5	Completed: 11/9	Logged by: S.S.
Prospect: TIPPERARY CENTRAL	RL Collar: 72m	Total Depth: 537.1m	Hole Size: NQ	Drillers: GAIDEN
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing:	Sample Type: ½ CORE (1m)	Drill Type: WIREMAN UNIVERSAL 1200
Hole Survs - Depth/Incln/Azim	/ /	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	sillic	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
411.00	427.20	(cont) 413-413.30 ragged qtz-carb vein with disseminated pyrrhotite & pyrite. Wall rock altered shows patchy clots of pyrite to 2mm & dark grey-brown rounded patches to 1cm. 424.20 patches of dark green actinolite?																							
427.20	427.60	Chlorite Sulphidic Metasiltstone: Dark green fine grained with weak lamination, some dark green seams of acicular actinolite. To 1cm. Interval 20% pyrite, 5% pyrrhotite & <1% Arsenopyrite disseminated as clots to 5mm.		25%	2:1				✓				30%			5%				<1%					
427.60	430.50	Aplite-Pegmatite Top 0.70m of interval fine grained aplite with felsic changes abruptly into coarse grained pegmatite minor chlorite on fractures. 10cm chloritic siltstone zone at 430m with pyrite in mangies. Meta		<1%	Py				✓													430.	Peg contact	58	
430.50	433.50	Pyrrhotitic/siltstone. Dark grey fine grained, well laminated with bronze stain caused by fine grained disseminated pyrrhotite on laminae. Pyrite occurs in veins to 5mm that cross cut lamination. 432.300 20cm quartz vein with 30% pyrite clots to 2cm. Minor galena in thin veins & isolated cbt to 1mm.		30%	1:4			✓	✓				10%									432.0	Pyrrh.	42.	
																						432.5	50	34	

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FCNO -11	AMG/~~Grid~~ E: 744400	Azimuth: 260° TIMG	Commenced: 15/8/96	Sheet: 16 of 21
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -68.5	Completed: 11/9	Logged by: S.O.
Prospect: TIPPERARY CENTRAL	RL Collar: 72 m	Total Depth: 537.1 m	Hole Size: NQ	Drillers: GAD EW
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing:	Sample Type: ½ CORE (1m)	Drill Type: WARMAN UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	445 / -58 / 253	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	sillc	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
433.50	444.0	Chloritic Metasiltstone Dark green, fine-grained, moderately laminated, minor quartz veining & concentrations of euhedral pyrite in patches to ¼ core width. From 437.50 - 439.40 pale grey-white pegmatite vein x 2 m either side of this pegmatite increased white chaotic quartz veining with patchy pyrite in selvedges, also white crystalline crystals, soft - Baryte. Unit in this Qtz, carbonate zone is fractured with some chloritic grey clay. From 439.50 - 439.90 is a grey grey clay bounded zone of brecciated chloritic metasediment with infilling white fibrous Baryte with clot of galena to 1cm, sphalerite on fractures & euhedral disseminated pyrite. Slickensided surfaces on top of interval - definite fault zone. Below. 439.90 rock is more massive but still laminated with patchy pyrite. Qtz sulphide veins as follows 10cm @ 434 3x2 cm @ 434.7 1cm @ 441.8 2x1cm @ 441.9 8cm @ 442.30, 2cm @ 442.6		5%	Py		✓		✓				20%													
Qtz Veining 2-7% of interval thickness							mtx																		
																						441.80	Qtz vein	65	
																						442.0	SO	68	
				Pug clay																					
				Baryte																					
				sphalerite																					
				pyrite veining																					
444.0	453.0	Metabasite. Dark green, fine grained. Carbonate, some baryte rich patches - massive. Some metamorphic laminae towards bottom metre		3%	Py			✓								5%						451.5	Laminated	45	

[redacted] EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG [redacted]

drilog05.dot

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260° T/M/G	Commenced: 15/5/96	Sheet: 17 of 21	
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -68·5	Completed: 11/9/96	Logged by: S·O·	
Prospect: TIPPERARY CENTRAL	RL Collar: 72m	Total Depth: 537·1m	Hole Size: NQ	Drillers: GADEN	
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing: 87m	Sample Type: ½ CORE (1m)	Drill Type: WARMAN/UNIVERSAL NQ	
Hole Survs - Depth/Incln/Azim	475 1-57 1250·5	/ /	/ /	/ /	

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	palc hes	Alteration/Metamorphism (est %) cbt	sllic	tour	chl	bl	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
444·00	453·00	(cont) of interval · rare clot of pyrk to 3cm · ↑ in rare · thin pyrk on fractures · Dolerite mineralogy shows weak penvasive pervasive grained dark green actinolite · feldspar + biotite · Patchily hematite dusted quartz vein fm. 447·80 — 448 · also 3cm K-spar altered zone at 450m · Pyrrhotite absent fm interval ·																							
453·00	462·50	Chloritic Metasiltstone Dark green fine grained well laminated with · disseminated pyrrhotite · ± minor pyrk · Po ± Pyrite in laminae ± in Qtz veining quartz veining that is parallel to laminations Type b' veins · Massive clot of Po to 1cm @ 459·50 · Flowrik vein with pyrk at 453 · Qtz, sulphide veins are as follows 1cm @ 453·5 5cm @ 454·85 3cm @ 455, 1cm @ 455·5, 1cm @ 456' 2cm @ 456·60 8cm @ 456·80 5cm @ 457 2×1cm ± 457·5, 4×2cm around 458 2 ± 1cm @ 459 1cm @ 458·8, 3×1cm @ 459·80, 5cm @ 460 11×1cm fm. 460·10, 2cm @ 460·60, 5×1cm @ 462		4/.	1:4		✓	✓														458	QTZ Ven	65	
Qtz Veining 6·8% of interval thickness.																						458·40	Sh	55	
																						462·00	QTZ Ven	51	
462·50	478·00	Metadolerite · Dark olive green fine grained massive with capitaline texture · Mineralogy of feldspar, minor actinolite ·		5/.	4:1			✓		2/	·		</1			1/.									

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260 TIMIS	Commenced: 15/8/96	Sheet: 18 of 21
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -68.5	Completed: 11/9/96	Logged by: S.D.
Prospect: TIPPERARY CENTRAL	RL Collar: 72m	Total Depth: 537.1	Hole Size: NQ	Drillers: GADEN.
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing: 8.7m.	Sample Type: ½ CORE (Lim.)	Drill Type: WAMAN UNIVERSAL 120
Hole Survs - Depth/Incln/Azim	524 / -56 / 257	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	sillic	tour	chl	bt	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
471.50	478.00	(CONT) speckled chlorite; some v. minor foliation development in places depicted by feldspar. In bottom 1m of interval see brown, lath like clumps of mineral to 4mm - probable hornblende. Throughout interval white - strongly mineral to 1mm - leucoxene?! Pyrite and/or disseminated throughout. Pyrrhotite present only from ~476m occurring in ragged clots with pyrite to 5mm. Py:Po upper to correspond with zone of brown mineral (hornblende?) There is a 30cm included, metasediment interval with quartz veining from 475.35. The dolerite shows moderate calcite veining to 5mm from 466 - 472.																				471.90	Calcite vein	45	
																						479.30	Calcite vein	58	
																						471.9	Calcite vein	32	
																						475.6	QTZ vein	55	
478.00	523.50	Chloritic pyrrhotitic Metasiltstone. Dark green, fine grained well laminated. Pyrrhotite occurs in fine scattered massive concentrations to 5cm ragged patchy concentrations in quartz veins & most commonly finely disseminated colony laminae re bated. Pyrite occurs as pyrrhotite but in lesser concentrations. Garnet occurs as euhedral porphyroblasts to 5mm from 480.2 - 480.5. Interval is sporadically but		10%	1:5		✓	✓	✓	<1%			5%			<1%	<1%						482.30	QTZ vein	55	360
																						484	QTZ vein	60	015
																						484.50	QTZ vein	60	030
																						484.80	QTZ vein	60	015

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260° T/M/G	Commenced: 15/8/96	Sheet: 19 of 21
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -68.5	Completed: 11/9/96	Logged by: S.O.
Prospect: TIPPERARY CENTRAL	RL Collar: 72m	Total Depth: 537.1m	Hole Size: NQ	Drillers: GADEN
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing: 87m	Sample Type: 1/2 CORE (1m)	Drill Type: WARMAN UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	/ /	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %): ΣS/O, py/po, hem/mgt, bdd, diss' mn, patc hes	Alteration/Metamorphism (est %): cbt, silic, tour, chl, bi, ser/mus, actin, gnt, cord, andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
478.00	523.30	(CONT) pervasively quartz veins. Appear to be pale grey-white quartz veins ± pyrrhotite with max thickness of 3cm and parallel to S0 as seen uphole & more massive chaotically orientated white, massive Qtz with large sulphide Po = Py (bb to 3cm & minor calcite vein to 1.5cm & pegmatite/aplite veins to 15cm. Bedding parallel at Qtz veins are as follows 3x.5mm @ 488.7 3cm @ 482 2cm @ 482.10 5cm @ 482.5 3cm @ 482.70 1cm at 482.4 1cm @ 484 2cm @ 484.2, 3cm @ 484.3, 2cm @ 484.35 1cm @ 484.80 1cm @ 485.7 3cm @ 486.1 6cm @ 487 1cm @ 487.5 2cm @ 488.3, 2cm @ 488.6, 1cm @ 493.0, 1cm @ 493.8, 3x1cm @ 494, 3cm @ 494.4, 2cm @ 494.5, 10cm between 494.4 ~~&~~ 497.70, 4cm @ 498.2, 15cm from 498.2 – 500. 3cm @ 500.30, 2cm @ 501.3 2cm @ 501.4 3cm @ 501.70 3cm @ 503.70 4cm @ 507.90, 2cm @ 509.20 1cm @ 502.70 504.30, 2cm @ 510.3 ~~513~~ 2cm @ 518.40 ~~520~~ 2cm @ 520.70. Massive white quartz + sulphide are as follows 25cm @ 475.5 25cm @ 479.50 Quartz, chlorite, pyrite, pyrrhotite		massive Qtz + Py, Po + cpy				495.5	S0	45	
								499	Qtz vein	45	
								499.10	S0	45	
								506.6	S0.	50	
								507.80	Aplite contact	48	
								509.2	S0	48	
								520.4	Qtz vein.	60	
								521	S0.	65	

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260° TIM/B	Commenced: 15/8/96	Sheet: 20 of 21
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -68·5	Completed: 11/9/96	Logged by: SO
Prospect: TIPPERARY CENTRAL	RL Collar: 72m	Total Depth: 537.1	Hole Size: NQ	Drillers: GADEN
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing: 5.7m	Sample Type: ½ CORE (1m)	Drill Type: WARMAN UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	534 1-55 1253	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	sillic	tour	chl	bi	ser/mus	actin	grt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
474·0	523·30	(CONT) with mini chalcopyrite zone from 490 – 493·5 This zone has since included chlorite metasediment. Solid Quartz + Sulphides from 491·40 - 493·5. Top of Quartz interval can see quartz pseudomorphs after Augite? with ⬡ & ⬭ shapes. This zone could be after a basic dyke?// Granitic veins are as follows. Aplite 32cm @ 480, & 483·5 10cm aplite @ 498 20cm Aplite @ 507·3, 2cm pegmatite @ 511·5, 10cm pegmatite @ 512·8 10cm pegmatite. 515 40cm aplite pegmatite & flourite @ 515·62. 40cm aplite @ 517·0. From 515m interval becoming more schistose with metamorphic increase in grain size - higher grade metamorphism * CORE ORIENTATED FROM 474·1 - 486·1 * In space orientation at 482·30, δ_0 = 170/62E																								
Qtz veining 1·3% of interval thickness																									
523·30	531·5	Pegmatite. Red brown coarse grained K-Na-spar, Qtz only v. minor Mica, some chlorite after Mica. NO sulphides																							
531·5	537·1	Metasiltstone pale grey, fine grained moderate luminosity, some brown luminosity.		<1%	1:1		/		✓																
Qtz veining 1·25% of interval thickness.		Qtz sulphide veins as follows 1cm @ 532·40. 2cm @ 533, 4cm @ 533·5, .15cm peg																							

EXPLOREMIN PTY LTD - DIAMOND DRILL HOLE LOG

drilog05.dot

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260° (T/M/G	Commenced: 15/8/96	Sheet: 21 of 21
Tenement: EL9345	AMG/~~Grid~~ N: 8478440	Inclination: -68.5	Completed: 11/9/96	Logged by: S.O.
Prospect: TIPPERARY CENTRAL	RL Collar:	Total Depth: 537.1	Hole Size:	Drillers: GADON
Map Ref: TIPPERARY 1:100,000	Client: HOMESTAKE	Casing: 37m	Sample Type: HQ CORE (Im)	Drill Type: LONGYEAR UNIVERSAL 1000
Hole Survs - Depth/Incln/Azim	/ /	/ /	/ /	/ /

From	To	Geological Description	Graph Log	Mineralisation Fe-S-O (est %) ΣS/O	py/po	hem/mgt	bdd	diss' mn	patc hes	Alteration/Metamorphism (est %) cbt	silic	tour	chl	bi	ser/mus	actin	gnt	cord	andl	Apy	Vns qtz/cbt/S	Depth	Struc	α	β
534.5	537.1	(CONT) vein at 534.4, 70cm pegvein at 535.9																				532.9	qtz vein	65	
		Country rock much less sulphidic & 'dry' looking. Some minor red brown alteration.																				533.5	SO	55	
		Sparse rare galena & more massive pyrite associated with pegmatite vein.																				534.6	Peg contact	48	
		E.O.H.																							

EXPLOREMIN PTY LTD

CORE RECOVERY, RQD, FRACTURE COUNT

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260° TIMIB	Commenced: 15/8/96	Sheet: 1 of 6
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -68.5	Completed: 11/9	Logged by: S.O.
Prospect: TIPPERARY CENTRAL	RL Collar: 72m	Total Depth: 537.1	Hole Size: NQ	Drillers: GADEN.

From	To	Interval	Recov'd	Length in Sticks >10 cm	No of Open Fractures	No of Strongly Healed Fractures	No of Weakly Healed Fractures	No of open Fractures with slick coat	Comments
87.00	90.00	3.00	3.00	2.80					
90.00	93.00	3.00	3.00	2.00					
93.00	96.80	3.80	2.80	2.00					
96.80	99.10	3.00	3.00	2.90					
99.10	102.10	3.00	3.00	2.70					
102.10	105.10	3.00	3.00	2.00					
105.10	108.10	3.00	3.00	1.50					
108.10	111.10	3.00	3.00	2.70					
111.10	114.10	3.00	3.00	2.65					
114.10	117.10	3.00	3.00	1.35					
117.10	119.00	1.90	1.90	0.52					Highly limestone
119.00	122.10	3.10	3.00	2.00					" "
122.10	123.10	1.00	1.00	0.10					" "
123.10	126.10	3.00	3.00	2.75					
126.10	129.10	3.00	3.00	2.90					
129.10	132.10	3.00	3.00	2.90					
132.10	135.10	3.00	3.00	2.78					
135.10	138.10	3.00	3.00	3.00					
138.10	139.10	1.00	1.00	0.95					
139.10	141.10	2.00	2.00	1.90					
141.10	144.10	3.00	3.00	2.75					
144.10	147.10	3.00	3.00	2.55					
147.10	150.10	3.00	3.00	2.85					
150.10	153.10	3.00	3.00	2.70					
153.10	156.10	3.00	3.00	2.85					
156.10	159.10	3.00	3.00	2.90					
159.90	162.10	3.00	3.00	2.85					
162.10	164.80	2.70	2.70	2.70					
164.80	167.80	3.00	3.00	3.00					
167.80	170.80	3.00	3.00	3.00					

[redacted] EXPLOREMIN PTY LTD [redacted]

CORE RECOVERY, RQD, FRACTURE COUNT

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260° T/M/B	Commenced: 15/8/96	Sheet: 2 of 6
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -68.5	Completed: 16/8	Logged by: S.O
Prospect: TIPPERARY CENTRAL	RL Collar: 72 ~	Total Depth: 553.1	Hole Size: NQ	Drillers: GADEN.

From	To	Interval	Recov'd	Length in Sticks >10 cm	No of Open Fractures	No of Strongly Healed Fractures	No of Weakly Healed Fractures	No of open Fractures with slick coat	Comments
170.80	173.80	3.00	3.00.	2.80.					
173.80.	176.80.	3.00	3.00	3.00.					
176.80.	179.80	3.00.	3.00	2.97					
179.80.	182.80	3.00	3.00	1.90					
182.80	183.90	1.10	1.10	0.47					
183.90	186.10	2.20	2.20.	2.00.					
186.10	189.10	3.00	3.00	2.75					
189.10	192.10	3.00	3.00	2.65					
192.10	195.10	3.00	3.00.	3.00.					
195.10	198.10	3.00	3.00	2.75					
198.10	201.10	3.00.	3.00	2.85					
201.10	204.10	3.00	3.00	3.00					
204.10.	207.10	3.00	3.00	1.45					
207.10	209.70	2.60	2.60.	1.30					
209.70	212.70	3.00	3.00	2.90					
212.70	213.20	0.50	0.50	0.50.					
213.20	216.10	2.90	2.90.	1.06					
216.10	219.10	3.00	3.00	2.06					
219.10	221.60	2.50.	2.50	1.36					
221.60	224.70	3.10	3.10	2.85					
224.70	227.70	3.00	3.00	2.85					
227.70	230.80	3.10	3.10	3.00					
230.80.	233.80	3.10	3.10	2.90					
253.80.	236.90	3.10	3.10	3.00					
236.90	239.90	3.00	3.00	2.80.					
239.90	243.00	3.10	3.10	1.88					
243.00	245.20	2.20	2.20	1.23					
245.20	248.40	3.20	3.20	1.74					
248.40	251.50	3.10	3.10	1.98					
251.50.	254.60	3.10	3.10	2.35					

EXPLOREMIN PTY LTD
CORE RECOVERY, RQD, FRACTURE COUNT

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260° TIM/B	Commenced: 15/8/96	Sheet: 3 of 6
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -68.5	Completed: 11/9	Logged by: S.O.
Prospect: TIPPERARY CENTRAL	RL Collar: 72m	Total Depth: 537.1m	Hole Size: NQ	Drillers: CADEN

From	To	Interval	Recov'd	Length in Sticks >10 cm	No of Open Fractures	No of Strongly Healed Fractures	No of Weakly Healed Fractures	No of open Fractures with slick coat	Comments
254.60	257.60	3.00	3.00	1.85					
257.60	260.60	3.00	3.00	2.65					
260.60	263.70	3.10	3.10	1.50					
263.70	266.70	3.00	3.00	2.82					
266.70	269.80	3.10	3.10	2.80					
269.80	272.80	3.00	3.00	2.35					
272.80	275.90	3.10	3.10	2.83					
275.90	278.90	3.00	3.00	2.10					
278.90	282.00	3.10	3.10	1.97					
282.00	285.10	3.10	3.10	2.34					
285.10	288.10	3.00	3.00	1.66					
288.10	291.10	3.00	3.00	2.09					
291.10	294.10	3.00	3.00	2.50					
294.10	297.10	3.00	3.00	1.90					
297.10	300.10	3.00	3.00	1.45					
300.10	303.10	3.00	3.00	2.50					
303.10	306.10	3.00	3.00	2.62					
306.10	308.40	2.30	2.30	0.30					
308.40	311.30	2.90	2.90	0.75					
311.30	314.20	2.90	2.90	1.10					
314.20	316.90	2.70	2.70	0.30					
316.90	318.10	1.20	1.20	0.00					
318.10	321.00	2.90	2.90	0.56					
321.00	321.60	0.60	0.20	0.00	321-322 0.60m recovered.				
321.60	324.20	2.60	2.60	0.96					
324.20	326.20	2.00	2.00	0.11					
326.20	326.70	0.50	0.50	0.00					
326.70	329.10	2.40	2.40	0.30					
329.10	332.10	3.00	3.00	1.87					
332.10									

EXPLOREMIN PTY LTD

CORE RECOVERY, RQD, FRACTURE COUNT

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260° TM/B	Commenced: 15/8/96	Sheet: 4 of 6
Tenement: EL 9345	AMG/~~Grid~~ N: 8478440	Inclination: -65.5	Completed: 11/9	Logged by: S.O
Prospect: TIPPERARY CENTRAL	RL Collar: 72m	Total Depth: 537.1	Hole Size: NW	Drillers: GARDEN

From	To	Interval	Recov'd	Length in Sticks >10 cm	No of Open Fractures	No of Strongly Healed Fractures	No of Weakly Healed Fractures	No of open Fractures with slick coat	Comments
333.80	335.10	1.30	1.30	0.38					
335.10	335.40	0.30	0.40 +10cm	0.00					
335.40	336.00	0.60	0.42 ↓	0.32 Tube	loss ~ 8cm.				
336.00	336.50	0.50	0.30 ↑	0.30					
336.50	339.10	2.60	2.80 +20	2.40					
339.10	342.10	3.00	3.00	1.53					
342.10	345.10	3.00	3.00	1.15					
345.10	348.10	3.00	3.00	1.66					
348.10	351.10	3.00	3.20?	1.95					
351.10	354.10	3.00	3.00	1.15					
354.10	357.10	3.00	3.00	1.80					
357.10	359.50	2.40	2.40	0.30					
359.50	362.50	3.00	3.00	1.37					
362.50	365.50	3.00	3.00	1.64					
365.50	368.50	3.00	3.00	1.42					
368.50	369.50	1.00	1.00	0.00					
369.50	372.10	2.60	2.60	0.97					
372.10	375.10	3.00	3.00	1.20					
375.10	378.10	3.00	3.00	2.30					
378.10	381.10	3.00	3.00	1.73					
381.10	384.10	3.00	3.00	1.20					
384.10	386.50	2.40	2.40	0.61					
386.50	389.60	3.10	3.10	1.92					
389.60	392.70	3.10	3.10	1.80					
392.70	395.80	3.10	3.10	1.82					
395.80	398.90	3.10	3.10	2.37					
398.90	402.00	3.10	3.10	2.23					
402.00	405.10	3.10	3.10	2.36					
405.10	408.00	2.90	2.90	1.20					
408.00	409.50	1.50	1.50	0.45					

EXPLOREMIN PTY LTD
CORE RECOVERY, RQD, FRACTURE COUNT

Drill Hole: FEND 11	AMG/~~Grid~~ E: 744400	Azimuth: 260° T/M/G	Commenced: 15/3/96	Sheet: 5 of 6
Tenement: EL 9345	AMG/~~Grid~~ N: 8477 8440	Inclination: -68.5°	Completed: 11/4/96	Logged by: SO
Prospect: TIMEBAILEY CENTRAL	RL Collar: 72 ~	Total Depth: 537.1	Hole Size: NQ	Drillers: CADEN

From	To	Interval	Recov'd	Length in Sticks >10 cm	No of Open Fractures	No of Strongly Healed Fractures	No of Weakly Healed Fractures	No of open Fractures with slick coat	Comments
409.50	411.10	1.60	1.60	0.76					
411.10	414.00	2.90	2.72	2.40					
414.00	417.10	3.10	3.10	0.36					
417.10	420.00	1.90	1.90	1.65					
420.00	420.50	0.50	0.67 ↓	0.67					
420.50	423.10	2.60	2.40	0.55					
423.10	426.10	3.00	3.00	2.40					
426.10	427.6	1.50	1.50	1.35					
427.6	429.1	1.50	1.50	0.85					
429.1	432.1	3.00	3.00	2.66					
432.1	434.8	2.70	2.70	2.55					
434.8	437.8	3.00	3.00	1.00					
437.80	440.90	3.10	3.10	1.03					
440.90	444.00	3.10	3.10	1.21					
444.00	447.10	3.10	3.10	2.30					
447.10	449.80	2.70	2.70	2.61					
449.80	452.80	3.00	3.00	2.85					
452.80	455.80	3.00	3.00	3.00					
455.80	458.80	3.00	3.00	2.80					
458.80	461.90	3.10	3.10	3.07					
461.90	465.00	3.10	3.10	3.05					
465.00	468.00	3.00	3.00	2.88					
468.00	471.1	3.10	3.10	3.08					
471.1	474.1	3.00	3.00	3.00					
474.1	477.1	3.00	3.00	2.90					
477.1	480.1	3.00	3.00	2.85					
480.1	483.1	3.00	3.00	2.24					
483.1	486.1	3.00	3.00	2.40					
486.1	489.1	3.00	3.00	2.70					
489.1	491.8	2.70	2.70	2.33					

EXPLOREMIN PTY LTD
CORE RECOVERY, RQD, FRACTURE COUNT

Drill Hole: FEND-11	AMG/~~Grid~~ E: 744400	Azimuth: 260° TIM/B	Commenced: 15/8/96	Sheet: 6 of 6
Tenement: EL9345	AMG/~~Grid~~ N: 8478440	Inclination: -68.5	Completed: 11/9/96	Logged by: S.O.
Prospect: TIPPERARY CENTRAL	RL Collar: 72m	Total Depth: 537.1m	Hole Size: NQ	Drillers: GADEN

From	To	Interval	Recov'd	Length in Sticks >10 cm	No of Open Fractures	No of Strongly Healed Fractures	No of Weakly Healed Fractures	No of open Fractures with slick coat	Comments
491.8	493.5	1.70	1.55	1.55	loss of 0.15	from 493-494.			
493.5	495.1	1.60.	1.60.	1.50.					
495.1	498.2	3.10	3.10	2.95					
498.2	501.1	2.90	2.90	2.55					
501.1	504.1	3.00	3.00	2.33					
504.1	507.1	3.00	3.00	1.52					
507.1	510.1	3.00	3.00	2.26					
510.1	513.1	3.00	3.00	2.68					
513.1	516.1	3.00	2.90.	1.65	loss 0.1 from 513-514				
516.1	519.1	3.00.	3.00	2.16.					
519.1	522.1	3.00	3.00	2.27.					
522.1	525.1	3.00	3.00	0.96.					
525.1	528.1	3.00.	3.00.	1.78.					
528.1	531.1	3.00	3.00.	1.80					
531.1	531.5	0.40	0.37	0.20.					
531.5	534.1	2.60	2.60.	1.62.					
534.1	537.1	3.00	3.00	2.60.					
		E.O.H							

ASSAYCORP

Report Code: ..... AC 31039
Samples Received: 02/08/96
Number of Samples: 90

Homestake Gold of Australia Ltd.
9th Floor 2 Mill Street
Perth WA 6000

Reference: 10063
Project: .....
Cost Code: .....

Assaycorp Pty Ltd
A.C.N. 052 982 911
174 Ward St
Pine Creek NT 0847
Ph (08) 8976 1262
Fax (08) 8976 1310

Report Distribution
J.Stewart
J.Goulevitch

Sample Preparation:

Assay Data:

Analysis	Analytical Technique	Precision & Accuracy	Detection Limit	Data Units
Au	FA50	Acc. ± 15%	0.01	ppm
Au(R)	FA50	Acc. ± 15%	0.01	ppm
As	AAS/MA-3	Prec. ± 10%	1	ppm

FEND10 Assays
FEND11 Assays

Report Comment:

Authorisation: Ray Wooldridge
Report Dated: 10/08/96

ASSAYCORP

ASSAY CODE: AC 31039 Page 3 of 4

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)
F11 2-4	<0.01		7
F11 4-6	<0.01		5
F11 6-8	<0.01		2
F11 8-10	<0.01		4
F11 10-12	<0.01		7
F11 12-14	<0.01		8
F11 14-16	<0.01		9
F11 16-18	<0.01		8
F11 18-20	<0.01	<0.01	8
F11 20-22	<0.01		9
F11 22-24	<0.01		8
F11 24-26	<0.01		10
F11 26-28	<0.01		8
F11 28-30	<0.01		9
F11 30-32	<0.01		10
F11 32-34	<0.01		10
F11 34-36	<0.01		8
F11 36-38	<0.01		6
F11 38-40	<0.01		5
F11 40-42	<0.01		<1
F11 42-44	<0.01		1
F11 44-46	<0.01	<0.01	5
F11 46-48	<0.01		12
F11 48-50	<0.01		6
F11 50-52	<0.01		2

ASSAYCORP

ASSAY CODE: AC 31039 Page 4 of 4

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)
F11 52-54	<0.01		2
F11 54-56	<0.01		2
F11 56-58	<0.01		4
F11 58-60	<0.01		7
F11 60-62	<0.01		11
F11 62-64	<0.01		3
F11 64-66	<0.01		4
F11 66-68	<0.01		4
F11 68-70	<0.01		4
F11 70-72	<0.01		2
F11 76-78	<0.01		1
F11 78-80	<0.01	<0.01	1
F11 80-82	<0.01		1
F11 82-84	0.02	0.02	1
F11 84-87	<0.01	<0.01	<1

ASSAYCORP

Report Code: ..... AC 31899
Samples Received: 06/09/96
Number of Samples: 55

Homestake Gold of Australia Ltd.
P.O.Box 7189 Cloisters Sq.
Perth WA 6850

Reference: 10075
Project: .....
Cost Code: .....

Assaycorp Pty Ltd
A.C.N. 052 982 911
174 Ward St
Pine Creek NT 0847
Ph (08) 8976 1262
Fax (08) 8976 1310

Report Distribution
J.Stewart
J.Goulevitch

Sample Preparation:

Assay Data:

Analysis	Analytical Technique	Precision & Accuracy	Detection Limit	Data Units
Au	FA50	Acc. ± 15%	0.01	ppm
Au(R)	FA50	Acc. ± 15%	0.01	ppm
As	AAS/MA-3	Prec. ± 10%	1	ppm
Cu	AAS/MA-3	Prec. ± 10%	1	ppm
Pb	AAS/MA-3	Prec. ± 10%	2	ppm
Zn	AAS/MA-3	Prec. ± 10%	1	ppm
Ag	AAS/MA-3	Prec. ± 10%	0.5	ppm

FEM10 490-511.4
FEM11 165-199.

Report Comment:

Authorisation: Ray Wooldridge
Report Dated: 19/09/96

ASSAYCORP

ASSAY CODE: AC 31899

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)
F10 490-491	<0.01		6	69	46	109	0.8
F10 491-492	<0.01		12	74	41	125	0.6
F10 492-493	<0.01		5	62	26	121	0.6
F10 493-494	<0.01		2	89	21	189	0.7
F10 494-495	0.02		3	76	18	140	1.2
F10 495-496	<0.01		10	82	96	51	0.6
F10 496-497	<0.01		4	63	10	45	0.5
F10 497-498	<0.01		4	64	267	28	<0.5
F10 498-499	<0.01		14	60	22	42	0.5
F10 499-500	<0.01	<0.01	8	112	<2	20	<0.5
F10 500-501	<0.01	<0.01	8	75	9	30	<0.5
F10 501-502	<0.01		14	103	2	22	<0.5
F10 502-503	<0.01		5	89	13	95	0.6
F10 503-504	0.09		5	110	18	129	1.2
F10 504-505	0.18	0.19	2	127	26	138	1.3
F10 505-506	<0.01		4	102	24	153	1.1
F10 506-507	<0.01		15	150	11	57	0.8
F10 507-508	<0.01		25	143	15	41	0.5
F10 508-509	0.03		11	141	8	81	0.8
F10 509-510	<0.01		9	183	4	74	1.0
F10 510-511.4	<0.01		6	193	14	71	1.0
F11 165-166	<0.01		40	--	--	--	--
F11 166-167	<0.01		50	--	--	--	--
F11 167-168	<0.01	<0.01	29	--	--	--	--
F11 168-169	<0.01		37	--	--	--	--

ASSAYCORP

ASSAY CODE: AC 31899

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)
F11 169-170	0.05		62	--	--	--	--
F11 170-171	0.05	0.03	51	--	--	--	--
F11 171-172	<0.01		62	--	--	--	--
F11 172-173	<0.01		24	--	--	--	--
F11 173-174	<0.01		14	--	--	--	--
F11 174-175	<0.01		12	--	--	--	--
F11 175-176	<0.01		19	--	--	--	--
F11 176-177	<0.01		48	--	--	--	--
F11 177-178	0.02		19	--	--	--	--
F11 178-179	<0.01		15	--	--	--	--
F11 179-180	<0.01		13	--	--	--	--
F11 180-181	<0.01		54	--	--	--	--
F11 181-182	<0.01		51	--	--	--	--
F11 182-183	<0.01		38	--	--	--	--
F11 183-184	<0.01		43	--	--	--	--
F11 184-185	<0.01	<0.01	17	--	--	--	--
F11 185-186	<0.01		47	--	--	--	--
F11 186-187	<0.01		88	--	--	--	--
F11 187-188	<0.01		31	--	--	--	--
F11 188-189	<0.01	<0.01	65	--	--	--	--
F11 189-190	<0.01		18	--	--	--	--
F11 190-191	<0.01		80	--	--	--	--
F11 191-192	<0.01		22	--	--	--	--
F11 192-193	<0.01		103	--	--	--	--
F11 193-194	<0.01		93	--	--	--	--

ASSAYCORP

ASSAY CODE: AC 31899

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)
F11 194-195	<0.01		51	--	--	--	--
F11 195-196	<0.01		20	--	--	--	--
F11 196-197	<0.01		28	--	--	--	--
F11 197-198	<0.01		82	--	--	--	--
F11 198-199	<0.01		93	--	--	--	--

ASSAYCORP

Report Code: ..... AC 31946
Samples Received: 07/09/96
Number of Samples: 32

Homestake Gold of Australia Ltd.
P.O.Box 7189 Cloisters Sq.
Perth WA 6850

Reference: 5756
Project: .....
Cost Code: .....

ASSAYCORP PTY LTD
A.C.N. 052 982 911
174 Ward St
Pine Creek NT 0847
Ph (08) 8976 1262
Fax (08) 8976 1310

Report Distribution
J.Stewart
J.Goulevitch

Sample Preparation:

Assay Data:

Analysis	Analytical Technique	Precision & Accuracy	Detection Limit	Data Units
Au	FA50	Acc. ± 15%	0.01	ppm
Au(R)	FA50	Acc. ± 15%	0.01	ppm
As	AAS/MA-3	Prec. ± 10%	1	ppm

F11
383-413m

Report Comment:

Authorisation: Ray Wooldridge
Report Dated: 10/09/96

ASSAYCORP

ASSAY CODE: AC 31946

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)
F11 382-383	<< Sample not received >>		
F11 383-384	0.02	0.02	170
F11 384-385	<0.01		78
F11 385-386	<0.01		83
F11 386-387	<0.01		27
F11 387-388	<0.01		250
F11 388-389	0.02		410
F11 389-390	0.02		2040
F11 390-391	<0.01		180
F11 391-392	<0.01		94
F11 392-393	<0.01		130
F11 393-394	0.09	0.11	82
F11 394-395	<0.01		55
F11 395-396	<0.01		160
F11 396-397	0.26	0.27	21
F11 397-398	0.01		36
F11 398-399	0.54	0.56	9060
F11 399-400	0.15		1.58%
F11 400-401	<0.01		370
F11 401-402	<0.01		140
F11 402-403	<0.01		440
F11 403-404	0.04	0.02	490
F11 404-405	<0.01		88
F11 405-406	<0.01		130
F11 406-407	<0.01		150

ASSAYCORP

ASSAY CODE: AC 31946

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)
F11 407-408	0.02		450
F11 408-409	0.03		430
F11 409-410	0.03		400
F11 410-411	0.08	0.10	730
F11 411-412	<0.01		150
F11 412-413	<0.01	<0.01	140
F11 413-414	<< Sample not received >>		

ASSAYCORP

Report Code: ..... AC 32160
Samples Received: 17/09/96
Number of Samples: 148

Homestake Gold of Australia Ltd.
P.O.Box 7189 Cloisters Sq.
Perth WA 6850

Reference: 10082
Project: .....
Cost Code: .....

Assaycorp Pty Ltd
A.C.N. 052 982 911
174 Ward St
Pine Creek NT 0847
Ph (08) 8976 1262
Fax (08) 8976 1310

Report Distribution
J.Stewart
J.Goulevitch

Sample Preparation:

Assay Data:

Analysis	Analytical Technique	Precision & Accuracy	Detection Limit	Data Units
Au	FA50	Acc. ± 15%	0.01	ppm
Au(R)	FA50	Acc. ± 15%	0.01	ppm
As	AAS/MA-3	Prec. ± 10%	1	ppm

FEND!!
233-437

Report Comment:

Authorisation: Ray Wooldridge
Report Dated: 22/09/96

ASSAYCORP

ASSAY CODE: AC 32160

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)
FII 233-234	<0.01		41
FII 234-235	<0.01		16
FII 235-235.2	<0.01		460
FII 235.2-236	<0.01		30
FII 236-237	<0.01		25
FII 243-244	<0.01		59
FII 246-247	<0.01	<0.01	100
FII 249-250	<0.01		48
FII 252-253	<0.01		60
FII 255-256	<0.01		98
FII 258-259	<0.01		36
FII 261-262	<0.01		64
FII 264-265	<0.01		520
FII 267-268	<0.01		30
FII 270-270.80	<0.01		26
FII 270.8-271.15	<0.01		47
FII 237-274	<0.01		39
FII 276-277	<0.01		32
FII 279-280	<0.01	<0.01	21
FII 282-283	<0.01		49
FII 284-285	<0.01		59
FII 288-289	<0.01		32
FII 289.45-290.15	<0.01		670
FII 291-292	<0.01		34
FII 294-295	<0.01		85

ASSAYCORP

ASSAY CODE: AC 32160

Sample	Au (ppm)	Au(R) (ppm)	As (ppm)
FII 297-298	<0.01		21
FII 300-301	<0.01		60
FII 303-304	<0.01		94
FII 306-307	<0.01		170
FII 309-310	<0.01		140
FII 312-313	<0.01		2
FII 315-316	<0.01		39
FII 318-319	<0.01	<0.01	180
FII 321-322	<0.01		260
FII 324-325	<0.01		7
FII 327-328	<0.01		220
FII 330-331	<0.01		7
FII 337-338	<0.01	<0.01	55
FII 342-343	<0.01		210
FII 345-346	<0.01		130
FII 348-349	<0.01		23
FII 351-352	<0.01		62
FII 354-355	<0.01		10
FII 356-357	<0.01		140
FII 360-361	<0.01		47
FII 363-364	<0.01		190
FII 366-367	<0.01		80
FII 370-371	<0.01		51
FII 373-374	<0.01		68
FII 376-377	<0.01		23

ASSAYCORP

ASSAY CODE: AC 32160 Page 3 of 6

Sample		Au (ppm)	Au(R) (ppm)	As (ppm)
FII	379-380	<0.01		1480
FII	382-383	<0.01		64
FII	413-414	<0.01		73
FII	424-425	<0.01	<0.01	66
FII	425-426	<0.01		700
FII	426-427	<0.01		14
FII	437-438	<0.01		74
FII	438-439	<0.01		48
FII	439-440	<0.01		41
FII	440-441	<0.01		110
FII	441-442	<0.01		98
FII	442-443	<0.01		95
FII	443-444	<0.01	<0.01	50
FII	444-445	<0.01		100
FII	445-446	<0.01		31
FII	446-447	<0.01		41
FII	447-448	<0.01	<0.01	79
FII	448-449	<0.01		120
FII	449-450	<0.01		700
FII	450-451	0.03	0.06	700
FII	451-452	<0.01		69
FII	452-453	<0.01		89
FII	453-454	<0.01		40
FII	454-455	0.17	0.13	130
FII	455-456	<0.01		36

ASSAYCORP

ASSAY CODE: AC 32160 Page 4 of 6

Sample		Au (ppm)	Au(R) (ppm)	As (ppm)
FII	456-457	0.02		50
FII	457-458	<0.01		86
FII	458-459	<0.01		64
FII	459-460	0.02	0.01	97
FII	460-461	<0.01	<0.01	160
FII	461-462	<0.01		930
FII	462-463	<0.01		50
FII	463-464	<0.01		39
FII	466-467	<0.01		48
FII	469-470	<0.01		63
FII	472-473	<0.01		30
FII	475-476	<0.01		18
FII	478-479	0.17	0.34	38
FII	479-480	<0.01		41
FII	480-481	<0.01		51
FII	481-482	<0.01		26
FII	482-483	0.02		26
FII	483-484	<0.01		39
FII	484-485	<0.01		24
FII	485-486	<0.01		27
FII	486-487	<0.01		41
FII	487-488	<0.01	<0.01	32
FII	488-489	<0.01		25
FII	489-490	<0.01		40
FII	490-491	<0.01		27

ASSAYCORP

ASSAY CODE: AC 32160

Sample		Au (ppm)	Au(R) (ppm)	As (ppm)
FII	491-492	<0.01		42
FII	492-493	<0.01		48
FII	493-494	<0.01		24
FII	494-495	0.02		11
FII	495-496	<0.01		14
FII	496-497	<0.01		12
FII	497-498	<0.01		9
FII	498-499	<0.01		17
FII	499-500	<0.01	<0.01	13
FII	500-501	0.02		14
FII	501-502	<0.01		130
FII	502-503	0.04	0.05	27
FII	503-504	0.03	0.05	26
FII	504-505	<0.01	<0.01	26
FII	505-506	<0.01		38
FII	506-507	<0.01		20
FII	507-508	<0.01		21
FII	508-509	<0.01		19
FII	509-510	<0.01		13
FII	510-511	<0.01		23
FII	511-512	<0.01		25
FII	512-513	<0.01		33
FII	513-514	<0.01		47
FII	514-515	<0.01		24
FII	515-516	<0.01		33

ASSAYCORP

ASSAY CODE: AC 32160

Sample		Au (ppm)	Au(R) (ppm)	As (ppm)
FII	516-517	<0.01		30
FII	517-518	<0.01		8
FII	518-519	<0.01		11
FII	519-520	0.05	0.04	7
FII	520-521	0.03	0.02	7
FII	521-522	<0.01	<0.01	9
FII	522-523	<0.01		18
FII	531-532	0.03	<0.01	28
FII	532-533	0.02		30
FII	533-534	0.03		11
FII	534-535	0.02		28
FII	535-536	0.04		42
FII	536-537	<0.01		18
FII	427-428	<0.01		1160
FII	428-429	<0.01		14
FII	429-430	<0.01		150
FII	430-431	<0.01	<0.01	75
FII	431-432	0.03		32
FII	432-433	0.03		120
FII	433-434	0.02		1080
FII	434-435	0.03		34
FII	435-436	<0.01		120
FII	436-437	0.02		200

22-09-1996 08:31

START FEND - 11

Meter	Min	Max
165	7	31
166	15	36
167	19	27
168	3	21
169	0	6
170	0	0
171	0	0
173	0	0
173	0	0
174	0	0
175	0	0
176	0	0
177	0	0
178	0	17
179	0	3
180	0	0
181	0	0
182	0	0
183	0	0
184	0	0
185	0	0

Mag. Susc.

Meter	Min	Max
186	0	0
188	11	22
190	10	17
192	13	23
194	7	15
196	0	0
198	0	0
200	0	0
202	0	0
204	0	0
206	0	2
208	2	1
210	0	0
212	0	0
214	0	3
216	0	0
218	0	0
220	0	6
222	0	0
224	0	0
226	0	0

228	0	0
230	0	0
232	0	0
234	0	0
236	0	0
238	0	0
240	0	0
242	0	3
244	0	0
246	0	0
248	0	0
250	0	0
252	0	0
254	0	0
256	0	0
258	0	0
260	94	670
262	30	42
264	3	6
266	3	56
268	0	0
270	15	19
272	5	7

274	10	39
276	7	54
278	1	3
280	15	22
282	5	12
284	11	60
286	15	20
288	26	36
290	19	40
292	8	11
294	18	20
296	0	0
298	0	0
300	7	13
302	0	11
304	0	29
306	0	0
308	18	29
310	8	18
312	0	0
314	0	0
316	0	0
318	0	3

22-09-1996 08:32

FEND

Meter	Low	High
320	0	0
322	0	6
324	0	0
326	0	5
328	10	86
330	0	0
332	8	59
334	0	0
336	0	0
338	0	0
340	0	0
342	0	0
344	121	695
346	319	2292
348	55	83
350	42	589
352	41	105
354	0	0
356	1039	6217
358	8	192
360	0	27
362	0	0

Meter	Low	High
364	90	1929
366	6	16
368	0	0
370	0	0
372	0	0
374	8	70
376	0	0
378	0	0
380	0	0
382	11	92
384	13	18
386	15	26
~~387~~	~~11~~	~~31~~
~~388~~	~~145~~	~~607~~
389		
390		
391		
392		
393		
394		
395		
396		

386.3	13	50
386.6	3	7
387	11	31
387.3	0	181
387.6	0	6
388	12	373
388.3	94	552
388.6	234	847
389	530	1422
389.3	350	810
389.6	99	136
390	134	327
390.3	59	984
390.6	176	1201
391	99	177
391.3	27	93
391.6	32	95
392	107	465
392.3	16	25
392.6	8	15
393	36	92
393.3	30	177
393.6	9	17

394	234	384
394.3	23	126
394.6	7	22
395	16	45
395.3	201	368
395.6	51	185
396	13	22
396.3	88	305
396.6	12	26
397	7	10
397.3	21	31
397.6	921	3367
398	516	2493
398.3	429	1440
398.6	166	576
399	137	199
399.3	233	3010
399.6	56	970
400	38	70
400.3	21	39
400.6	669	1001
401	91	239
401.3	253	2224

FEND -1/

401.6	115	3351
402	291	11214
402.3	113	707
402.6	0	0
403	51	343
403.3	31	202
403.6	0	0
404	139	419
404.3	54	1029
404.6	1810	3260
405	269	4756
405.3	62	1119
405.6	6	512
406	17	26
406.3	8	27
406.6	37	69
407	45	56
407.3	90	50
407.6	65	99
408	27	55
408.3	20	39
408.6		
409	29	99

409.3	39	56
409.6	32	59
410	29	75
410.3	0	704
410.6	112	1143
411	0	173
412	21	69
413	53	155
414	107	172
415		
416		
417		
418		
423	0	0
424	0	0
425	19	258
426	27	172
427	50	122
428	0	156
429	0	0
430	8	31
430.5	596	5225

FEND -1/

431	5043	5123
431.5	871	3794
432	530	2311
432.5	322	1432
433	843	3557
433.5	257	1362
434	2000	21000
434.5	27	446
435	1	25
435.5	21	169
436	0	0
436.5	0	0
437	0	0
437.5	0	20
438	0	0
438.5	0	0
439	0	0
439.5	0	0
440	0	0
440.5	0	0
441	0	0
441.5	0	0
442	0	0

442.5	0	0
443	0	0
443.5	0	0
444	0	0
444.5	0	187
445	0	26
445.5	0	16
446	0	23
446.5	3	93
447	0	15
447.5		0
448		0
448.5	0	36
449	12	31
449.5	0	20
450	0	0
450.5	0	0
451	0	0
451.5	0	0
452	0	1
452.5	0	0
453	0	6
453.5	286	1492

22-09-1996 08:33

FEND-11

454	259	7500
454.5	69	222
455	743	4991
455.5	156	460
456	0	94
456.5	16	56
457	1203	2727
457.5	2100	5430
458	1590	3963
458.5	1491	9519
459	1760	9375
459.5	2700	13700
460	1200	4591
461.5	221	569
461	153	891
461.5	0	0
462	881	3210
462.5	0	10
463	0	0
463.5	0	0
464	0	0
464.5	0	0
465	0	0

465.5	0	37
466	0	0
466.5	0	2
467	0	31
467.5	0	30
468	0	11
468.5	1	10
469	57	63
469.5	53	65
470	34	50
470.5	31	41
471	43	55
471.5	82	105
472	31	58
472.5	50	68
473	34	41
473.5	31	42
474	31	36
474.5	34	74
475	326	2437
475.5	176	739
475.6	49	102

FEND 11 continues on the following page.

22-09-1996 08:34

263 1710 FEND 11

	4354	8371
499	2201	4529
	3514	5505
	1570	5899
500	4440	7458
	1954	4220
	4445	5317
501	1433	4152
	2143	4122
	3128	5333
502	16	4582
	1299	6429
	1441	3120
503	2863	9359
	1112	1721
	237	10300
504	765	3956
	37	228
	452	2127
505	0	22
	0	108
	0	221
506	0	0
	0	15
	326	692
507	190	457
	162	966
	0	1660
508	602	1428
	0	105
	208	759
509	596	991
	1397	3221
	150	229
	765	1022
510	307	979
	902	1847
	650	1775
511	2077	3370
	791	3384
	900	1479
512	961	1966
	950	1675
	154	557
513	29	93
	23	74
	138	562
514	588	965
	95	1651
	157	298
515	7	41
	26	35
	74	146
516	101	745
	137	223
	65	2080
519	178	286
	25	95
	16	503
518	0	0
	27	66
	11	507
519	136	954
	373	892
	103	933
520	854	954
	321	651
	850	1223
521	161	478
522	66	295
	337	751
	272	950
523	58	89
	0	0
	0	6
524	0	0
525	0	2
526	0	2
527	0	8
528	0	11
529	0	0
530	0	0
531	0	0
	11	254
532	0	0
532.6	12	106
533	151	389
533.3	8	247
533.6	87	720
534	42	743
534.3	57	965
534.6	0	1780
535	496	1122
535.3	1360	2378
535.6	350	840
526	211	2441
536.3	571	1008
536.6	830	1609
537	214	571

END - FEND-11

476	53	83

FEND 11

476.5	170	259
477	774	2718
477.3	2163	3952
477.6 ch	728	3742
478	615	2674
	246	678
	23	248
479	31	60
	218	5631
	16	758
481	0	170
	220	3258
	623	1960
481	53	515
	76	155
	5700	3956
482	4860	8315
	3491	875
	3772	6002
483	1542	2695
	1498	5290
	22	52
484	322	1356
	855	1932
	350	1298
485	175	692
	845	5440
	627	4830
486	29	441
	39	191
	291	2341
487	178	3450

489	569	5180
	3095	5910
489	1612	11280
	317	1070
	853	4553
489	1122	3550
	2300	5527
	99	112
490	11	218
	46	171
	362	7420
491	1756	11191
	1112	11200
	100	926
492	45	2184
	51	128
	174	6358
493	252	6250
	50	544
	993	4586
494	1948	11782
	1760	9276
	3390	10084
495	5750	7907
	2635	9602
	2511	5159
496	3200	10206
	2211	7901
	2735	4750
497	2837	5151
	3089	4524
	2185	4600
498	185	10380

APPENDIX III

PETROLOGICAL REPORT
A. PURVIS - PONTIFEX AND ASSOCIATED

Pontifex & Associates Pty. Ltd.

TELEPHONE (08) 332 6744
FAX (08) 332 5062

26 KENSINGTON ROAD, ROSE PARK
SOUTH AUSTRALIA 5067
A.C.N. 007 521 084

P.O. BOX 91, KENT TOWN
SOUTH AUSTRALIA 5071

MINERALOGICAL REPORT NO. 7230

by A.C. Purvis, PhD

October 30th, 1996

TO : Homestake Gold of Australia Ltd
9th Floor, 2 Mill St
PERTH WA 6000

Attention : Jim Stewart

YOUR REFERENCE : Order No. 5759

MATERIAL : 10 Samples, Fenton Prospect

IDENTIFICATION : FEND 9A, 11 and 12

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

SAMPLES & SECTIONS : Returned to you with this report.

PONTIFEX & ASSOCIATES PTY. LTD.

SUMMARY COMMENTS

Ten samples from the Fenton Prospect are described in this report, using polished thin sections. The suite as a whole, is discussed below, including a tabulation of the individual lithologies. Your field notes supplied are given in the descriptions, wth comments as seemed appropriate. Selected photomicrographs of sulphides accompany some descriptions.

The rocks are quite complex, with some apparently altered metabasic igneous rocks, as in FEND-11, 263 m, and a variety of quartz-chlorite schists ± sericite after plagioclase (or fresh plagioclase), ± minor to abundant tourmaline, in FEND-11, 399 m, FEND-12, 289. 287 and 302 m. These are the main arsenopyrite-bearing samples in this suite, those is FEND-12 at 287 and 302 m having possible loellingite as inclusions in the arsenopyrite, as well as pyrrhotite or pyrite after pyrrhotite, and possible Bi minerals in FEND-12, 287 m. Early sulphides seem to reflect relatively low sulphur fugacities, with higher values in later sulphides.

Tourmaline also occurs in a quartzofelspathic schist with minor muscovite (FEND-12, 249 m), passing into a more muscovite-rich zone and a tourmaline-zone adjacent to an apparent quartz vein with minor albite and sulphides (pyrite > chalcopyrite). This sample, with those above, indicates tourmalinisation as a significant event in this area.

One sample (FEND-9A, 470 m) shows a transition from quartz-biotite schist (with sericite after plagioclase), into quartz-biotite-garnet schist, and thence into hornblende-garnet-quartz schist with pyrite after pyrrhotite and rare chalcopyrite. This is a common style of metasomatic transition, indicating Ca addition, and in some areas indicates proximity to gold-bearing veins.

The sample from FEND-11 at 285 m is a garnet-calcite calc silicate with early zoisite and later chlorite + epidote. This also has lenses of pyrite and rare pyrrhotite. The only abundant base-metal sulphides are in the shallower sample (FEND-11, 235 m) which has a breccia of albitised plagioclase > microcline in a sphalerite-rich matrix with clays and fluorite, passing into a fluorite-barite zone with fragments of breccia and small fluorite-quartz-sphalerite lenses. This seems to be a hydrothermal breccia with a complex fluid.

The only other felspathic rock is FEND-11, 413 m with layers passing from a plagioclase micromosaic into a quartz-plagioclase micromosaic and it is cut by chlorite-rich stylolite veinlets. It also has wide quartz veins. Minor pyrite is disseminated and occurs in both the quartz veins and the chloritic stylolites.

SAMPLES DESCRIBED IN REPORT NO 7230

Hole and depth	Lithology
FEND-11, 235 m	Contact between breccia of plagioclase and microcline grains, with minor muscovite and a clay-sphalerite-fluorite matrix, and a vein also with some felspar breccia fragments, as well as quartz, in a matrix with fluorite, barite and minor sphalerite.
FEND-11, 263 m	Chlorite-?talc-carbonate-leucoxene schist of basic igneous origin with layer-parallel quartz veins, a folded quartz-carbonate vein and late cross cutting carbonate veins, also minor pyrite.
FEND-11, 285 m	Garnet-calcite-quartz rock with early ?zoisite, later chlorite and epidote, also lenses of pyrite and rare pyrrhotite. Calc silicate.
FEND-11, 399 m	Plagioclase-tourmaline-chlorite-quartz schist with leucoxene and sulphides (arsenopyrite, pyrite, pyrrhotite, rare chalcopyrite), cut by a quartz vein with chlorite, sulphides and rare apatite.
FEND-11, 413 m	Albite rock passing into albite-quartz rock (?aplite), with chlorite-rich stylolite-like veins, also some quartz veins ± checkerboard albite ± felted-prismatic quartz ± chlorite, with minor sulphide disseminated and in the veins.
FEND-9A, 470 m	Transition from quartz-biotite schist with sericite after plagioclase into quartz-biotite-garnet schist, and thence into hornblende-garnet-quartz schist with layer-parallel quartz veins and disseminated sulphides (pyrite after pyrrhotite and rare chalcopyrite).
FEND-12, 249 m	Quartz-rich vein with minor clouded albite, tourmaline and sulphide, in contact with a quartzofelspathic metasediment containing schistose muscovite and tourmaline, passing into muscovite and then tourmaline-rich zones towards the vein.
FEND-12, 280 m	Tourmaline-chlorite-sericite-sulphide-quartz-(leucoxene)-rock
FEND-12, 287 m	Quartz-chlorite-rich schist with abundant sericite apparently after felspar, also sulphides (arsenopyrite, pyrite and rare chalcopyrite ,+ ?loellingite and possible Bi minerals), sphene and epidote-allanite.
FEND-12, 302 m	Tourmaline-chlorite-quartz-sulphide rock with arsenopyrite (enclosing pyrrhotite and ?loellingite), pyrite (largely low-temperature pyrite?), pyrrhotite and rare chalcopyrite.

INDIVIDUAL DESCRIPTIONS

FEND-11, 235 m **Contact between breccia of plagioclase and microcline grains, with minor muscovite and a clay-sphalerite-fluorite matrix, and a vein also with some felspar breccia fragments, as well as quartz, in a matrix with fluorite, barite and minor sphalerite.**

Field Note: Sphalerite, baryte?, fluorite breccia zone in pegmatite.

The wafer of core material from which this polished thin section was made has a band or vein of purple fluorite and a more granular felspathic area. In thin section the apparently felspathic area has fragments from 0.05 mm to 5mm in size, with various combinations of microcline and pale brownish clouded plagioclase. Some of the fragments are internally brecciated, but these are not common. Fine flakes and shreds of muscovite are also present.

Much of the matrix seems to be either very finely comminuted felspar(s) or clays, but there are also large areas within which the matrix or cement is essentially all sphalerite. The sphalerite occurs as lenses to 2 mm wide and varies from quite dark red in some masses, though dark orange-brown in the cores of others, to quite pale in the rims and also as anastomosing aggregate enclosing very small felspar fragments. The more granular sphalerite aggregates also contain minor to abundant fluorite, partly as euhedral crystals to 1 mm in size. There is possibly 10% sphalerite in the breccia, as well as rare small cubes of pyrite to 0.1 mm and also rare probable marcasite.

This breccia passes into a vein with an irregular but sharp contact. The vein also has areas of felspathic breccia to 3 mm in diameter, commonly mantled by fine 'dog-tooth' quartz (passing into areas of very fine grained granular to prismatic quartz). However, much of the vein is composed of fluorite with sparse unoriented bladed crystals of barite to 6 x 1 mm. Fine granular fluorite-sphalerite aggregates are also present in the vein.

FEND-11, 263 m **Chlorite-?talc-carbonate-leucoxene schist of basic igneous origin with layer-parallel quartz veins, a folded quartz-carbonate vein and late cross cutting carbonate veins, also minor pyrite.**

Field Note: Sheared carbonate-altered basic dyke?

There is a strong schistosity in this sample, which is laminated on a scale of 0.2 to 2 mm. The laminations are variously rich in schistose chlorite, possible talc (less probably sericite), granular quartz and generally clouded fine grained carbonate. There are also probable chlorite-quartz intergrowths which seem to have replaced former amphibole. Fine leucoxene is disseminated but there is no evidence of former coarse skeletal opaque oxides (as in a dolerite, for example). There are some layer-parallel quartz veins with talc and rare chlorite, and accessory disseminated sulphides.

The sulphides are mostly pyrite, locally as lenses to 2 mm long parallel to the schistosity, with disseminated finer-grained pyrite from 0.2 to 0.4 mm in grainsize. At one end to the thin section there is a layered folded quartz-carbonate vein which seems to have been folded about the schistosity in the host rock. Late-stage cross cutting carbonate veins also occur.

The original lithology would seem to have been of mafic igneous character, but may have been fine grained. A narrow dyke would possibly contain such a lithology, however.

FEND-11, 285 m **Garnet-calcite-quartz rock with early ?zoisite, later chlorite and epidote, also lenses of pyrite and rare pyrrhotite. Calc silicate.**

Field Note: Calc-silicate zone

Large areas of coarse garnet occur in this sample, rarely with anisotropic zones. The matrix is largely very coarse calcite with some small areas of granular quartz. There are also some weakly pleochroic prisms which are colourless to very pale green in colour and seem to be zoisite, and are partly altered to a pale brownish possible clay mineral. The garnet has been cut by carbonate veins and also contains abundant flecks and veins of chlorite. Ragged lenses of chlorite also occur in the carbonate to quartz-rich areas. An apparently later, more highly birefringent epidote mineral (apparently more iron-rich than the zoisite) occurs as anhedral grains and small prisms, locally cutting across the probable zoisite.

Pyrite occurs as vein-like lenses composed of aggregates of small cubes to 0.5 mm in grainsize, largely in quartz. Rare pyrrhotite occurs as recrystallised aggregates from 0.1 to 0.5 mm in diameter.

FEND-11, 399 m **Plagioclase-tourmaline-chlorite-quartz schist with leucoxene and sulphides (arsenopyrite, pyrite, pyrrhotite, rare chalcopyrite), cut by a quartz vein with chlorite, sulphides and rare apatite.**

Field Note: Arsenopyrite in metasiltstone + quartz vein.

The host rock in this sample is dominated by partly sericitised plagioclase as grains to 0.8 mm in size with lamellae of schistose chlorite and of fine grained granular quartz. Poikilitic to prismatic orange-brown tourmaline crystals to 1.5 mm long are relatively minor (20-25%) on one side of the quartz vein, but is abundant (~40%) on the other side. In the less tourmaline-rich rock there are pale brown grains to 0.5 mm grainsize which may be allanite. Ragged patches of leucoxene occur in the chlorite and suggest that it may have replaced biotite. There are also apatite grains to 0.1 mm long, but only very small radioactive grains.

Large grains of arsenopyrite to 2 mm long are common in zones in the host rock, as well as cubic to more ragged crystals of pyrite to 1 mm in size. In areas adjacent to the pyrite and arsenopyrite, there is abundant pyrrhotite as interstitial anhedral recrystallised aggregates. Rare chalcopyrite occurs with the pyrrhotite and also with pyrite.

The main vein is about 8 mm wide and composed of ragged deformed quartz grains, some of which show deformation lamellae. Minor chlorite occurs with lenses of sulphides and accessory fine grained granular apatite. In the vein, pyrite is more abundant, partly as apparently primary cubic crystals, also as aggregates of apparently hopper-shaped crystals with granular to prismatic marcasite, and some porous pyrite after pyrrhotite. Both of the latter sulphide habits suggest low-temperature pyrite. Arsenopyrite is less abundant in the vein than in the host rock, as crystals to 1.5 mm long. There is also some pyrrhotite, passing into pyrite by way of 'graphic' intergrowths.

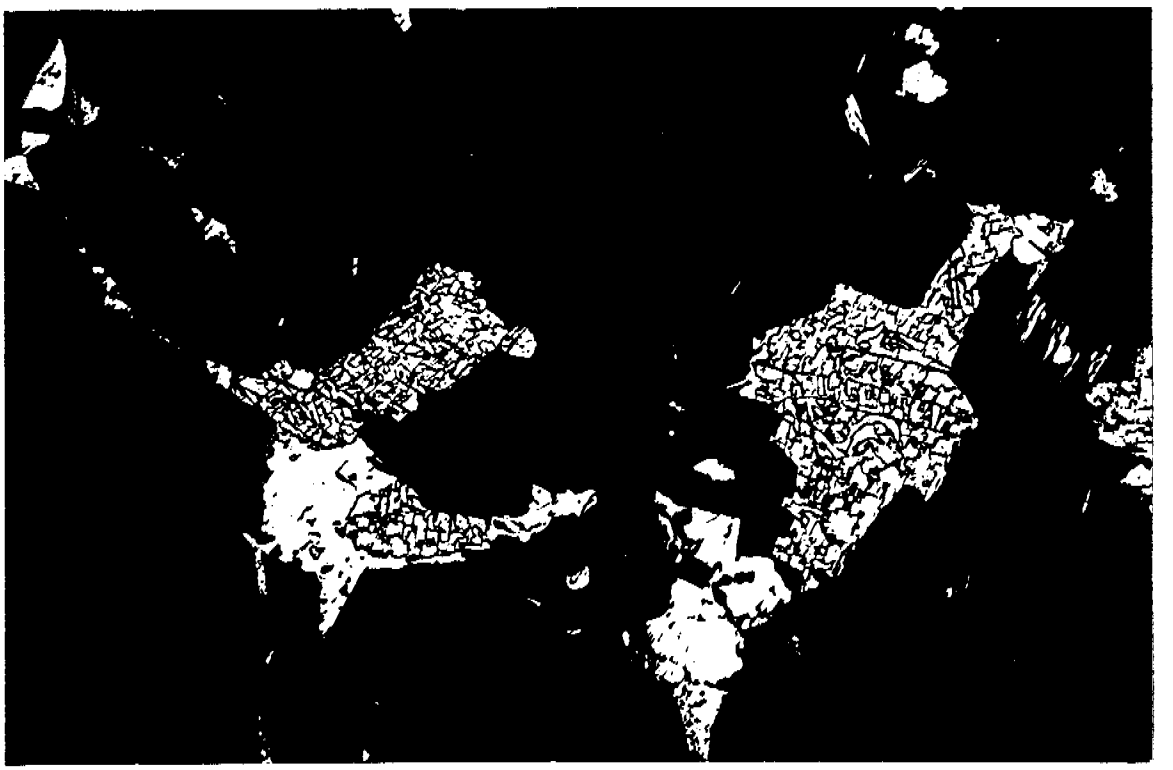


Fig 1 **FEND-11, 399 m** 0.11 mm

PTS. Reflected plane light. Irregular grains of pyrrhotite ('smooth' very pale brownish), passing into almost 'graphic' intergrowths of secondary pyrite, almost certainly after pyrrhotite. [More commonly, pyrite after pyrrhotite has a lamellar to colloform texture.]

Fig 2 **FEND-11, 399 m** 0.11 mm

PTS Reflected plane light. The bulk of the sulphide in this photomicrograph is low-temperature pyrite (corroded-looking) with some granular to prismatic marcasite (prismatic crystal close to the centre and whiter grains below this).

FEND-11, 413 m — **Albite rock passing into albite-quartz rock (?aplite), with chlorite-rich stylolite-like veins, also some quartz veins ± checkerboard albite ± felted-prismatic quartz ± chlorite, with minor sulphide disseminated and in the veins.**

Field Note: Sheared aplite with arsenopyrite in ?chloritic wisps.

The host rock in this sample is largely granular plagioclase (?albite) with a grainsize of less than 1 mm. In some zones there is minor chlorite, partly after biotite, and patches of microcrystalline chlorite which may be filling cavities. Minor checkerboard albite, apparently after alkali felspar, occurs in some zones and some contain minor to common (up to 35%) quartz. This may be an aplite but has some quartz-free zones.)

Chlorite-rich stylolite-like veins occur and carry some of the sulphide in the rock (referred to in your notes as chloritic wisps). There are early veins of coarse granular quartz (to 5 mm grainsize) passing into lenses largely composed of checkerboard albite, and some sulphide occurs in the quartz in these veins. There is also a cross cutting vein with areas of granular to cherty to felted-prismatic quartz passing into areas with quartz prisms and interstitial chlorite. There are fragments of quartzofelspathic rock from the host rock in this vein. Smaller similar veins occur nearby, and these veins are partly bordered by stylolite-like veins. Some of the stylolite-like vein also cut across the apparently earlier quartz veins referred to above.

The disseminated sulphide is essentially all pyrite, largely as small cubes ~0.05 mm in size, with some larger fractured grains in the stylolite-like veins, and rare pyrite to 1 mm grainsize in the quartz veins, with rare chalcopyrite (rarely rimming sphalerite).

FEND-9A, 470 m

Transition from quartz-biotite schist with sericite after plagioclase into quartz-biotite-garnet schist, and thence into hornblende-garnet-quartz schist with layer-parallel quartz veins and disseminated sulphides (pyrite after pyrrhotite and rare chalcopyrite).

Field Note: Sheared cherty schist.

Part of this sample is a biotite-rich quartz-biotite schist with minor (~15%) sericite after plagioclase as well as 35% biotite and 50% quartz. The quartz occurs as grains to 0.4 mm in size, but this may simply reflect the metamorphism as only very small radioactive grains and apatite, suggesting possibly a metasiltstone. It passes into a schist in which the schistosity flows around abundant large poikiloblastic garnet grains to 4 mm long, with abundant quartz as small inclusions, and with some clay-chlorite alteration of the biotite. Very minor sulphides occur in this lithology. Beyond a layer-parallel quartz vein there is a hornblende-rich schist with the hornblende partly altered to chlorite, with minor garnet as essentially compact, non-poikilitic grains and minor quartz. There are quite common layer-parallel quartz veins in this lithology and also disseminated sulphides.

The sulphides include lensoidal aggregate of pyrite-marcasite, apparently after pyrrhotite, and some porous pyrite after pyrrhotite. There is rare fine grained chalcopyrite. The hornblende in this lithology is pale green and up to 1.5 mm grainsize, with rare grains apparently having thin lamellae of cummingtonite parallel to (101).

The quartz vein on the boundary between quartz-biotite-garnet schist and hornblende-garnet-quartz schist has clay margins fine cherty quartz ± limonite-clouded carbonate and inclusions of partly limonitised carbonate and clays. The quartz veins within the hornblende-rich schist seem to be earlier and are mostly granular quartz with rare sulphides.

Lithological transitions of this type are commonly associated with metasomatic zoning about veins or vein-sets, or about shear zones, and in some areas indicate proximity to gold-bearing veins.

FEND-12, 249 m — **Quartz-rich vein with minor clouded albite, tourmaline and pyrite > chalcopyrite, in contact with a quartzofelspathic metasediment containing schistose muscovite and tourmaline, passing into muscovite and then tourmaline-rich zones towards the vein.**

Field Note: Pegmatite vein and metasediment contact with bands of brown mineral frequently seen on intrusive contacts.

Part of this sample is apparently the pegmatite referred to in your notes, but seem to be dominated by quartz. There are zones containing clear quartz, separated from zones containing clouded quartz by stylolite-like veins containing pale magnesian chlorite ± muscovite. The clear quartz zones carry minor clouded albite (including some checkerboard albite as well as normal albite) and skeletal, possibly leached prisms of orange-brown tourmaline to 3 mm long. The stylolite-like veins have rare sulphide grains.

The host rock is a quartzofelspathic schist with plagioclase > quartz as grains to 0.25 mm in size, also fine grained granular to prismatic tourmaline, commonly schistose, and minor disseminated muscovite. This passes into a zone some 10 mm wide, rich in schistose muscovite, with the amount of schistose orange-brown tourmaline increasing across the zone to about 15%. The adjacent zone, some 5 mm thick, is dominated by schistose brown tourmaline to 2.5 mm in grainsize with minor (~25-30%) quartz, and with some fibrous overgrowths of brown to blue tourmaline on the coarser orange-brown tourmaline.

The main sulphide is fine to coarse pyrite, commonly amoeboid to poikilitic in habit, with rare chalcopyrite in the vein.

FEND-12, 280 m **Tourmaline-chlorite-sericite-sulphide-quartz-(leucoxene)-rock**

Field Note: Metadolerite with smaller brown mineral after tourmaline.

There is a partial fan of zoned fresh tourmaline prisms some 25 mm long in this sample, as well as disseminated smaller prisms to 5 mm long. Again some of the tourmaline has grey-blue cores and orange-brown rims and some is orange-brown throughout. The tourmaline in the fan is predominantly grey-blue, however. The matrix is commonly dominated by schistose chlorite with some disseminated sulphides and leucoxene, but there are disseminated patches of fine decussate sericite and in some areas decussate fine sericite is the dominant component. Lenses of quartz are also disseminated, quite irregularly, but with the larger quartz-rich areas adjacent to sericite-rich zones.

FEND-12, 287 m **Quartz-chlorite-rich schist with abundant sericite apparently after felspar, also sulphides (arsenopyrite, pyrite and rare chalcopyrite ,+ ?loellingite and possible Bi minerals), sphene and epidote-allanite.**

Field Note: Metadolerite with patchy arsenopyrite from 0.37 g/t Au intercept.

There is possibly 35-40% fine granular quartz in this sample, as well as abundant schistose chlorite disseminated and in lenses parallel to the schistosity and abundant fine decussate sericite. The sericite seems to be after felspar, but this is not certain. There are also quartz veins parallel to the schistosity with sulphides. The sulphides include common but irregularly disseminated arsenopyrite to 3 mm grainsize, partly in quartz veins. One of the arsenopyrite grains has inclusions of possible bismuth and bismuthinite or a similar bismuth mineral. Other grains have inclusions of possible loellingite to 0.6 mm in size. Amoeboid pyrite grains are also abundant to 2 mm in size, rarely enclosing chalcopyrite. There is disseminated sphene and an epidote-like mineral which may have zones of allanite as well as more normal epidote.

It is possible that the original lithology was a dolerite as suggested in your notes, but the rock has been highly altered and there is little textural evidence as to its original nature.

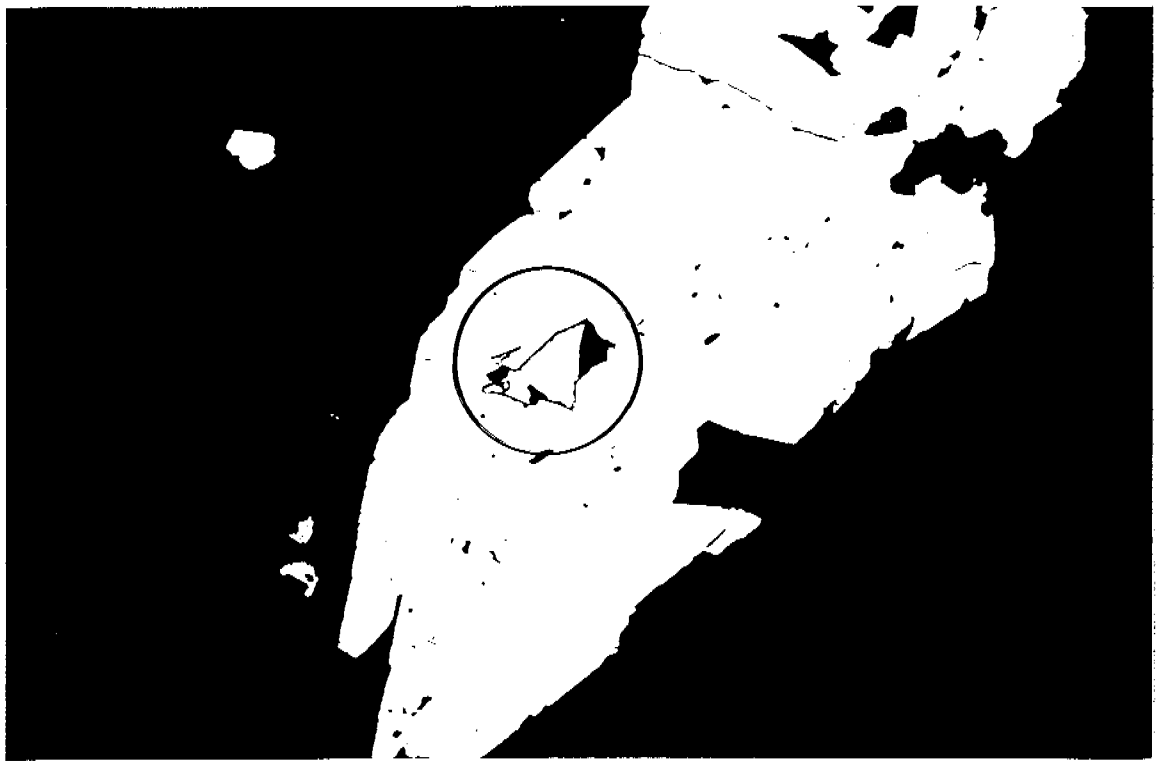


Fig 3 **FEND-12, 287 m** 0.11 mm

PTS Reflected plane light. A large crystal of arsenopyrite is shown in this photomicrograph with a two-phase inclusion of possible bismuth minerals (circled), also minor very small separate grains of chalcopyrite (yellow) and arsenopyrite (white) in the host rock (quartz-chlorite schist).

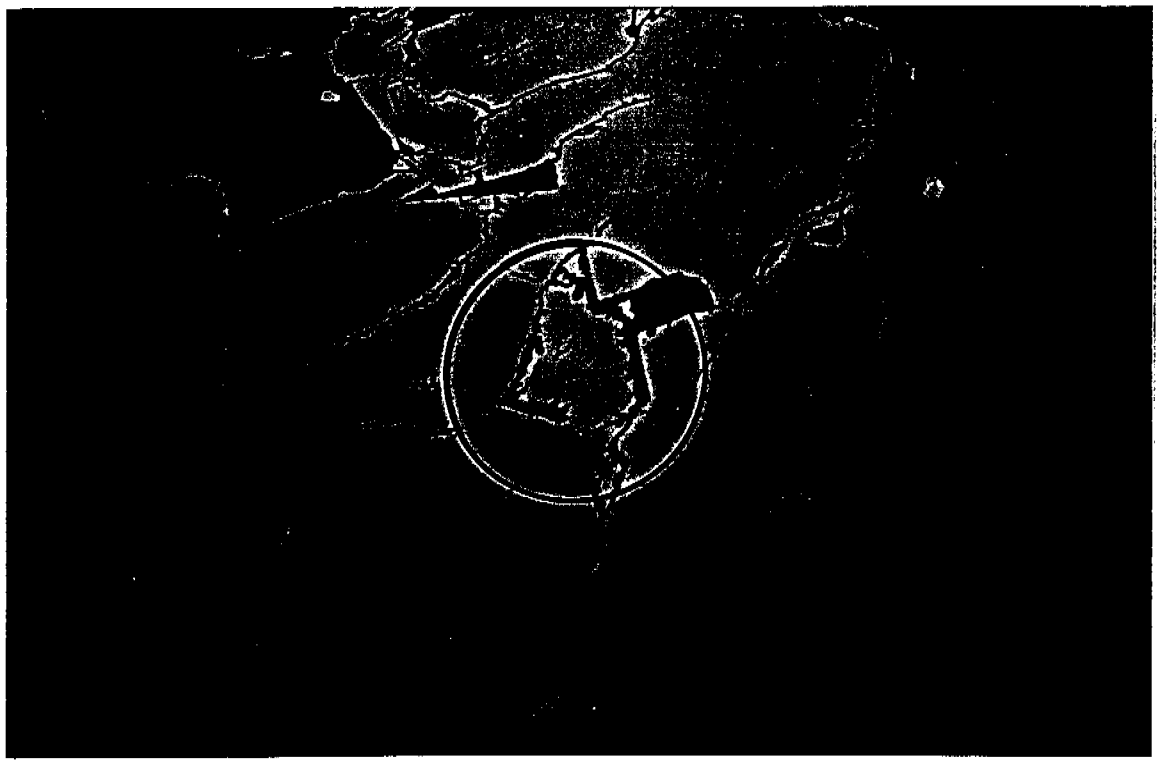


Fig 4 **FEND-12, 287 m** 0.11 mm

PTS Reflected plane light. The inclusion in this large arsenopyrite crystal is apparently loellingite, with some marginal alteration and resorption.

Fig 4 **FEND-12, 287 m** 0.11 mm

PTS Reflected plane light. The inclusion in this large arsenopyrite crystal is apparently loellingite, with some marginal alteration and resorption.

FEND-12, 302 m **Tourmaline-chlorite-quartz-sulphide rock with arsenopyrite (enclosing pyrrhotite and ?loellingite), pyrite (largely low-temperature pyrite?), pyrrhotite and rare chalcopyrite.**

Field Note: Metadolerite with major sulphides including arsenopyrite with large crystals of brown minerals after tourmaline.

Coarse tourmaline occurs in this sample as fresh prisms to 5 x 3 mm. The tourmaline locally has grey-blue cores and orange-brown rims but is partly orange-brown throughout. It has not been replaced by brown minerals as suggested in your notes, however. In addition to tourmaline there is abundant irregularly disseminated sulphide. The matrix has abundant pale magnesian tourmaline as well as granular quartz. Rare apparently residual biotite occurs in the chlorite, which also has abundant leucoxene, possibly after fine grained sphene. There are broad similarities between this vein and pyritic veins seen by the writer close to the Arnhem-land escarpment in the Northern Territory. There is no clear evidence that this was a metadolerite, but the original lithology is uncertain.

Common to abundant sulphides in this sample include large grains of arsenopyrite to 2 mm long, locally enclosing pyrrhotite and possible loellingite. There are also abundant coarse complex aggregates of apparently low-temperature pyrite, as well as some pyrrhotite passing into lamellar secondary pyrite, also some skeletal pyrite with hopper-like internal textures.

Fig 5 **FEND-12, 302 m** 0.11 mm

PTS Reflected plane light. Coarse arsenopyrite dominates this photomicrograph, with low-temperature pyrite probably after pyrrhotite (top left-hand side, brownish cream) enclosing a smaller arsenopyrite crystal and a patch of chalcopyrite. The large arsenopyrite grain encloses pyrrhotite (brownish) and probable loellingite (whiter, slightly bluish compared to the arsenopyrite, (circled).

APPENDIX IV

PETROLOGICAL REPORT

H.K. HERBERT AND ASSOCIATES PTY LTD

PETROGRAPHIC AND MINERAGRAPHIC REPORT ON 26 DRILL CORE SAMPLES, "FEN 10" SERIES

By

Dr Hugh K. Herbert

H.K. Herbert & Associates Pty Ltd
PO Box 318
Como WA 6152

30 October 1996

PETROGRAPHIC AND MINERAGRAPHIC REPORT ON 26 DRILL CORE SAMPLES, "FEN 10" SERIES

OBJECTIVES OF INVESTIGATION

Stated objectives of the petrographic and mineragraphic analysis of samples examined and reported here include:-

1. An evaluation of inferred higher metamorphic grade relative to alleged equivalent rocks at the Cosmo Howley deposit;
2. A comparison of downhole mineralogical, and hence, lithological variations;
3. Evaluation of paragenetic, deformational, metamorphic and hydrothermal relations specifically with respect to inferred ductile deformation and precursor lithologies; and
4. An assessment of possible petrogenesis of contained sulphide mineralisation.

MATERIALS

Twenty six (26) core samples were submitted for polished thin section preparation and petrographic and mineragraphic analysis. The samples were designated as follows:

FW 229 54.9
MP 228 195.5
MP 230 131
MP 231 315
MP 231 321.7
FEN11 266m
FD10 266
FEN10 300.5
FEND10 310.3
10 312.2
FEN10 339
F10 344
FEN10 357
FEND10 358.8
10 374.5
10 411
FEN10 448.5
10 477
FEN10 484.5
10 486.2
10 487.8
10 488
10 493
10 500.5
10 503.8
10 507.2

RESULTS

Sample FW229 54.9 - Scapolitised skarn

In the polished thin section, this sample displays coarse compositional banding. One band comprises massive, coarse-grained carbonate with an average grainsize of about 1mm. The carbonate is dusted by dispersed sparse globules (<0.02mm) of pyrrhotite and chalcopyrite-bearing sphalerite. These sulphide blebs are of intragranular distribution, unrelated to twin and/or grain boundaries. Sphalerite is honey-brown in colour and contains a very fine-grained emulsion of chalcopyrite.

The massive carbonate band borders a band comprising residual clinopyroxene ovoids in a turbid carbonate matrix and marked by strongly zoned, idiomorphic crystals of pale brown to green isotropic to low first order grey birefringent "mineraloid". The phase represents about 15% of the band and appears to be an indefinite alteration product after scapolite. This band passes through a massive band of carbonate and epidotised garnet and then to a zone of recrystallised fine-grained granular, equant polygonised clinopyroxene in a matrix of coarse scapolite plates (Plate 1a). The whole is veined by clean carbonate veins and stringers. Dispersed sphene granules, often strongly coloured in shades of pink and red, are not uncommon.

Sparse granules of honey-brown sphalerite together with pyrite/marcasite grains are present as the sulphide phase. These sphalerite grains are characterised by a dense, fine-grained emulsion of chalcopyrite globules. A lone small prism of arsenopyrite is present.

Sample MP228 195.5 - Recrystallised, impure sulphidic "chert"

The polished thin section is of a very well banded matrix with banding being emphasised by variations in the proportions of very fine-grained sulphide and biotite. Within the sulphide- and biotite-rich bands, both phases occur as discontinuous clots and patches, generally elongated parallel to banding (Plate 1b). The matrix consists of an exceedingly fine-grained, polygonised felsic mosaic, dominated by quartz, with average grain size <0.01mm. Parallel bands of biotite/sulphide traverse the felsic matrix. The matrix has characteristics of a recrystallised chert or other chemical siliceous sediment. The sulphide if pyrite with trace chalcopyrite. Minor hematite/ilmenite granules are present randomly dispersed throughout.

Sulphide comprises about 15% by volume with a similar amount of biotite. Minor chlorite occurs associated with coarser sulphide clots.

Sample MP230 131 - Garnet "amphibolite"

This sample is a well-banded amphibole rock with banding defined mainly by variations in their relative abundance of pyrrhotite blebs and grains with associated minor chalcopyrite. The whole is traversed by a 1mm wide vein of semi-massive

cellular pyrite as well as very narrow, sparse veinlets of quartz sub-parallel to the pyrite vein. The pyrite vein is marked by a 1-2mm wide zone, either side, of complete sulphide depletion. Sulphide comprises about 15% of the matrix while amphibole is about 80%. The remainder is largely of dispersed altered garnet and trace quartz granules. Garnets are sub-idioblastic and appear to be zonally altered, suggesting primary compositional zoning. Garnets are typically dispersed individuals about 0.2mm in size. Amphibole is pleochroic from grass green to emerald green and exhibits a decussate fabric of interfelted rosettes and sheaves of amphibole prisms (Plate 2a).

Sulphide granules are generally <0.2mm in size and have a sub-parallel orientation at an angle to apparent compositional banding. The sulphide is more of less evenly dispersed with granules locally aggregating into coarser individual clots.

Part of the opacity of the section is likely due to an exceptionally fine-grained dusting by graphite.

Sample MP231 315 - Laminated graphite-biotite-quartz rock

This polished thin section is of a compositionally very well-banded rock. It is free of sulphide but does contain sparse iron oxide granules, possibly hematite.

The rock consists of alternating graphite-rich and graphite-poor laminae (Plate 2b). Constituent phases are biotite plates and flakes (~30%) set in a felsic matrix dominated by quartz. Biotite plates are <0.05mm in size, while the felsic matrix is very uniform-grained at <0.02mm. Overall fabric within the matrix is decussate equant, and granoblastic. This rock could be interpreted to represent a biotite-grade metamorphosed equivalent of MP231 321.7m described below. However, it is stratigraphically higher, and is separated by only 6.7 meters from the latter which is entirely chlorite-bearing. Furthermore, graphitic layers in this section are entirely free of tourmaline in contrast to MP231 321.7m. In this case, mineralogical variation between the spatially closely associated samples probably has very little to do with P-T effects.

Sample MP231 321.7 - Pyrrhotite-graphite-tourmaline-feldspar-carbonate-chlorite-quartz laminate.

In the examined polished thin section, the rock matrix is strongly compositionally banded from sub-millimeter to centimeter scale. Dark bands are highly graphitic and rich in tourmaline (Plate 3a); light coloured bands are relatively free of graphite and carry no tourmaline. Hence, in this rock, there is a very specific association of relatively coarse tourmaline prism with graphite-rich bands.

Sulphides are pyrrhotite and chalcopyrite. Pyrrhotite occurs as lozenge-shaped grains and granular aggregates, grains and ribbons parallel to compositional banding. Chalcopyrite tends to be rather coarse-grained and to occur as composites with

pyrrhotite. Matrix graphite in the graphite-rich bands is so fine-grained as to be barely perceptible at 400 magnification. However, semi-massive rims of graphite <0.03mm wide, and consisting of a very fine-grained interfelted mosaic of graphite flecks, occur about tourmaline prisms in the tourmaline-graphite bands. Graphite is also locally concentrated within the tourmaline prisms as core concentrations and radial septa (Plates 3a and b). Tourmaline prisms are radially and sector colour, and hence presumably compositionally, zoned. It appears clear that the tourmaline has grown within the graphite-rich band and has incorporated graphite within it during growth. It would also appear that the included graphite septa have influenced zoning characteristics. As with Cosmo Howley tourmaline-bearing rocks, there appears to be an interesting association of coarse graphite encapsulating the tourmaline prisms. Here, however, the graphite is a massive fine-grained interfelted mass whereas, at Cosmo Howley, encapsulating graphite occurs as "coarse" flakes. Graphite occurring within the tourmaline prisms is again exceptionally fine-grained and is barely perceptible at 400X.

Tourmaline growth within the graphite-rich layers has not perturbed the delicate laminar structure of the graphitic host bands (Plate 3b). There is no evidence to suggest that the rock evolved in a ductile deformation zone. Tourmaline growth appears to have been a static event. Random cracks within the tourmaline prisms have been healed by pyrrhotite stringers. Many tourmaline prisms are partially fringed by "chalcedonic" silica or quartz (Plates 3a and b) with a fine filamentous structure. Most filament bundles are normally disposed to the tourmaline prism face with which they are in contact. Every single graphite-rich band in the section, irrespective of width, is tourmaline-bearing. If the tourmaline is argued to reflect boron metasomatism, then such metasomatism has been very specific and does not appear to have impacted upon presumed primary carbonate clots in "non-graphitic" laminae. The overall characteristics tend to favour primary boron enrichment of carbon-rich laminae.

While the graphite-rich bands appear particularly opaque, the dominant constituents, ignoring tourmaline, are micro-crystalline quartz and pale green chlorite in the ratio ~1:1. Micro-crystalline quartz and chlorite are also the main components of the light coloured, weakly graphitic, bands and have a somewhat coarser grainsize at <0.02mm. Lenticular carbonate clots are dispersed uniformly within these graphite-poor laminae and have the long dimension of the lenticles aligned parallel to compositional banding. Carbonate comprises about 15% of these bands but is totally absent from graphite-rich, tourmaline-bearing bands. Given the nature of the matrix, and the uniform but random, distribution of the clots, the carbonate is viewed as being a primary constituent of the rock matrix in which it occurs.

Other thin laminae within the rock are composed almost entirely of chlorite while still others are a quartz-chlorite mixture possessing a coarser grainsize at <0.05mm. Further laminae are composed of poikiloblastic feldspar plates (<0.01mm) containing an abundance of fine pyrrhotite globules and blebs. In the feldspar-rich laminae, carbonate is locally more abundant at ~40%, again as banding-parallel lenticles.

The respective components all appear to represent primary compositional features. Sparse thin quartz veinlets traverse the section at a shallow angle to compositional banding. Apart from the sparse quartz veinlets, infilling brittle fracture zones, the matrix appears little deformed.

Sample FEN11 266 - Quartz veined, quartz-tourmaline-plagioclase rock

The examined polished thin section consists of contrasting interdigitating areas, with about 40% of the section being coarse-grained, strained vein quartz possessing strongly sutured grain boundaries, abundant evidence of high stored strain in the form of strain domains and undulose extinction, and an abundance of intersecting fluid inclusion trains which impart an overall turbidity to the quartz. The fluid inclusions are a two phase liquid-gas mixture, with about 50% of individual inclusions being occupied by a gas bubble. The average grainsize of component quartz grains is about 1mm.

The rock matrix is extensively veined by fine quartz stringers and stringer arrays having a crude sub-parallel arrangement (Plate 4a). The rock consists of abundant olive-brown tourmaline in a turbid clay-altered and sericitised feldspar matrix. Tourmaline grades through the section from about 80% (Plate 4a) of the rock matrix to about 5% (Plate 4b) dispersed equant granules. Altered feldspar exhibits complementary concentration behaviour. About 3 to 5% clean interstitial quartz is locally present. The examined area of the sample is impoverished in sulphide.

Whereas tourmaline has a very strong association with graphitic laminates (pelites) at Cosmo Howley, and a very specific association has been demonstrated for sample MP231 231.7m (above) in this study, tourmaline in the present matrix is not associated with graphite. Hence, the graphite-tourmaline association is not ubiquitous. Despite the strong clay alteration and/or sericitisation of matrix feldspar, possibly a response to a superimposed fluid flux, the nature and gradational distribution of the tourmaline appear to support primary boron enrichment in the sediment. The gradational character of the tourmaline distribution has parallels with graded bedding, but, in this case, abundance rather than grainsize. It is possible that the tourmaline may be of clastic origin and that the compositional gradation may reflect settling characteristics from a suspended sediment load dominated by feldspar. It is further possible that the alteration exhibited by the feldspar may represent an inherited, and preserved, weathering feature imposed during exhumation and erosion of the source of clastic detritus. If this is so, then departure from association with graphite may be postulated to represent clastic introduction versus primary chemical boron enrichment in the precursors to graphite-rich assemblages. Notwithstanding, such an interpretation demands minimal post depositional metamorphic recrystallisation of the matrix, a thesis difficult to sustain given the suggested upper greenschist-amphibolite facies conditions believed to have prevailed in the region.

There does not appear to be any obvious connection between tourmaline and the gross quartz veining episode, nor is there any connection with late-stage superimposed quartz stringer arrays that simply traverse the matrix as well as coarse vein quartz.

The stringer arrays are evidence of late-stage brittle rupture and apparently localised fluid invasion of the matrix. Rock characteristics are incompatible with ductile deformation.

Sample FD 10 266 - Altered, chlorite-carbonate-plagioclase rock

The examined polished thin section comprises a very coarse-grained (<8.0mm), strongly sericitised and clay-altered, turbid plagioclase aggregate with dispersed composite clots of chlorite and carbonate. The plagioclase matrix is traversed by a sub-parallel anastomosing array of thin albite-epidote-chlorite-carbonate veinlets and irregular clots (Plate 5a). The degree of clay-alteration/sericitisation of plagioclase is similar to that exhibited by FEN11 266. The secondary veinlet and clot assemblage is consistent with low-greenschist mineral assemblages of the quartz-albite-muscovite-chlorite sub-facies and is clearly superimposed upon the turbid plagioclase matrix. However, while sericitisation of plagioclase is strong, the plagioclase matrix does not appear to display general alteration and recrystallisation characteristics consistent with superimposed low-greenschist facies conditions.

Sample FEND10 300.5 - Contorted, sulphidic biotite-tourmaline-garnet-amphibole-quartz-feldspar rock

In polished thin section, the rock matrix is compositionally coarsely banded and contorted. The matrix contains a 2 x 1cm ellipse of relatively coarse-grained quartz throughout which is dispersed minor pyrrhotite granules unrelated to any grain boundary, that is, the pyrrhotite is intragranular. Coarse pyrite, chalcopyrite and pyrrhotite splashes occur marginally disposed within the quartz. Elsewhere, a 2mm wide band consists of ~50% cellular lace-work pyrite associated with tourmaline, quartz, garnet and chlorite pseudomorphs after amphibole.

Banding is defined by variations in the relative proportions of partially chloritised foxy orange biotite, zoned olive-green tourmaline, abundant dispersed garnet idioblasts, sulphide, ragged pale green amphibole, quartz, sericitised and epidotised feldspar along with trains of exolved turbid rutile granules resulting from chloritisation of biotite (Plate 5b). The biotite-chlorite relations could be interpreted in one of two ways. First, the chlorite is a retrograde alteration product after biotite, implying that the rock matrix was recrystallised above the biotite isograd in the upper greenschist or almandine amphibolite facies, and subsequently partially retrogressed. Secondly, the chlorite-biotite relations reflect prograde transition of chlorite to biotite at the biotite isograd. Textural relations, together with the presence of chlorite pseudomorphs after amphibole, relict radiogenic damage haloes in chlorite patches and the trains of very fine rutile granules restricted to chlorite within chlorite-biotite composites all favour retrogression of titaniferous biotite. Hence, the rock matrix, assuming almandine rather than spessartine and hornblende rather than actinolite, comprises an almandine amphibolite facies product and so represents a higher grade rock than those hosting the Cosmo Howley deposit.

A narrow band traversing the matrix, is dominated by elliptical clots (2-3mm) of an intimate intergrowth of garnet, sulphide and quartz encased in chlorite pseudomorphs after amphibole. The band also contains poikiloblastic tourmaline-quartz-sulphide clots of generally similar habit to the garnet-bearing clots. Pyrrhotite is the sulphide involved.

This matrix represents another sample in which moderately abundant tourmaline is not associated with graphite. Tourmaline within the sample generally occurs as relatively uniform, equant dispersed prisms. Typically, it is olive-green in colour, often exhibiting a brownish core region indicating some degree of compositional zoning.

Amphibole occurs as ragged plates and prisms, is pale green in colour and is often selectively pseudomorphed by chlorite in selected laminae. Felsic components are composed of clean sub-granoblastic, equant polygonal quartz grains and partially sericitised and epidotised feldspar.

Sample FEND10 310.3 - Sulphide-garnet amphibolite

In polished thin section the matrix is predominantly of coarse, clean amphibole plates (~50%) in the general size range 0.3 to 0.5mm. The amphibole is strongly pleochroic from pale olive brown to washed out emerald green. Grains are sub-polygonised consistent with amphibolite facies recrystallisation (Plate 6a).

Garnet is the next most abundant phase (~30%) occurring as coarse anhedral grains to 4mm poikiloblastically enclosing quartz prisms, sulphide granules and meshwork, and amphibole plates. Elsewhere, garnet forms a coarse-grained granular, amoeboid meshwork with amphibole.

Fine dispersed quartz granules (~4%) <0.1mm occur within, and at the grain boundaries of, amphibole plates. Garnet is concentrated in distinct parallel bands throughout the amphibole matrix suggestive of primary compositional banding consistent with fine matrix sulphide which is also concentrated into parallel bands.

Several fractures up to 1.5mm wide traverse the garnet-amphibole matrix normal to compositional banding. These fractures are infilled with coarse epidote and pyrrhotite together with minor pyrite, chalcopyrite and occasional grains of ragged, corroded anhedral arsenopyrite. Sulphide in compositional bands is pyrrhotite with trace chalcopyrite. Total sulphide is about 15%.

Sphene granules <0.1mm, comprising <1% by volume, are scattered throughout specific amphibole bands within the amphibolite. Other amphibole bands are free of sphene. In one band through the section, amphibole forms coarse prisms, parallel to compositional banding, intergrown with coarse pale biotite/phlogopite laths up to 1mm long by 0.3mm wide. Fine-grained biotite flecks <0.05mm are poikiloblastically enclosed within associated garnet.

While the matrix illustrates post-metamorphic brittle rupture and healing by epidote sulphide veinlets, there are no obvious features to suggest syn- or post-metamorphic ductile deformation.

Sample 10 312.2 - Pyrrhotite-feldspar-clinopyroxene rock

In polished thin section this rock is composed of coarse-grained clinopyroxene prisms (Plate 6b) up to 10mm long but, more normally 1 to 3mm, set in a turbid interstitial matrix of strongly sericitised feldspar. Clinopyroxene comprises about 70%, and feldspar, 20% by volume. The remaining 10% of the matrix is sulphide, comprising coarse splashes of pyrrhotite. These pyrrhotite splashes are made up of single or relatively few unstrained and untwinned grains. Pyrrhotite also occurs as wispy cleavage stringers within silicates and as bleb clusters. In the coarser pyrrhotite, occasional blocky laths of marcasite occur.

Clinopyroxene illustrates minor very pale green to colourless amphibole alteration. Pyrrhotite stringers and bleb clusters are commonly associated with areas of amphibole alteration within the clinopyroxene. Dispersed, palest pink, sub-idioblastic sphene grains, ranging from 0.05 t0 0.2mm are scattered throughout the matrix.

Sample FEN10 339 - Amphibole-biotite-feldspar-quartz rock

In polished thin section the rock illustrates three coarse compositional bands about 1.5cm wide. In the first of these, very coarse-grained (~4mm) quartz poikiloblastic amphibole plates and prisms occur dispersed throughout the band. Together with amphibole, the band comprises lepidoblastic laths of olive-brown biotite in a granoblastic matrix of quartz and feldspar with associated sulphide granules (Plate 7). Biotite comprises about 25%, amphibole ~15% with the remainder being quartz and feldspar. The biotite in this band appears quite fresh with no evidence of alteration to chlorite. As well, feldspar is fresh and does not exhibit the turbid clay and sericitic alteration observed in earlier described samples.

The second, and medial band, is mineralogically and texturally similar to the first band except that the medial band is impoverished in amphibole and is marked by transition of biotite through to pale green chlorite. Biotite vestiges up to 10% of their original volume remain. Passage to the third band is marked by a sharp increase in coarse poikiloblastic amphibole plates and clots and about 50% chloritisation of biotite. The contrasting behaviour of biotite to chloritisation across three centimeter-wide bands in a single thin section may suggest compositionally controlled selectivity. If so, contrasting biotite composition would appear to be a reflection of inherited precursor mineral domain chemistry and implies minimal short-range diffusional equilibration within the matrix, even under the suggested almandine amphibolite facies regime of recrystallisation. While biotite illustrates a variable response to alteration between compositional bands, feldspar and amphibole have been unaffected by the alteration process.

Sulphide, where present, is concentrated in the amphibole plates and clots. The sulphide is cellular and lacy pyrite with associated minor chalcopyrite.

Sample F10 344 - Tourmaline-biotite (chlorite)-feldspar-quartz rock

The polished thin section comprises three broad bands. The medial band is of poorly lepidoblastic, partially chloritised foxy brown biotite laths, of uniform grainsize (~0.1-0.15mm), set in a granoblastic felsic matrix of quartz and sericitised feldspar with scattered granules and prisms of green-brown tourmaline and slender apatite rods (Plate 8a). Granules of sulphide are sparsely dispersed throughout. Grainsize of all constituents is similar, with quartz comprising about 50%, sericitised feldspar 25%, biotite 20%, tourmaline 3%, sulphide 1% and apatite < 1%.

The bordering bands are of massive chloritised foxy brown biotite with abundant exolved rutile granules (Plate 8b). The interfaces between the bands are marked by coarse granular clots of pyrite up to 1.5mm with associated granules of very pale to colourless sphalerite. Elsewhere, sulphide consists of cellular and lacy pyrite clots with some associated chalcopyrite. Chalcopyrite occurs as discrete bleb and grain clusters and as a composite component with sphalerite. Sphalerite grains occur in clusters as irregular cuspate patches.

While evidence of minor post-metamorphic brittle rupture is present in the form of moderately abundant, sub-parallel transgressive quartz veinlets, essentially normal to compositional layering, no evidence of syn- or post-metamorphic ductile deformation is evident.

Sample FEN10 357 - Quartz-biotite (chlorite)-tourmaline-amphibole rock

In polished thin section the matrix is composed mainly of a decussate aggregate of colourless amphibole and zoned pale orange to orange tourmaline prisms (Plate 9a). The tourmaline prisms are uniformly dispersed throughout the matrix, are generally equant in habit and are of uniform size in the range 0.5 to 1.0mm. Tourmaline comprises ~40% by volume of the matrix.

Amphibole is colourless and coarse-grained in the size range 0.5 to 1.0mm and forms decussate stumpy prismatic meshworks to the dispersed tourmaline. Amphibole comprises about 50% of the section.

Localised patches of foxy biotite have been 80 to 100% chloritised. Optical characteristics suggest that the chlorite may be quite magnesian in character. Biotite/chlorite grainsize is coarse and the texture decussate. Phyllosilicate comprises ~5% by volume.

Minor interstitial quartz is present and also occurs as a ubiquitous fringe to sulphide granules. Quartz comprises about 3 modal per cent and sulphide <2% by volume.

Some tourmaline prisms are poikiloblastic in sulphide with accompanying quartz fringe. Sulphide is pyrrhotite with trace pyrite.

The essential bi-modality of the rock, being composed of sub-equal amounts of tourmaline and amphibole is interesting as is the uniform equant decussate texture. Ubiquitous quartz fringes to pyrrhotite granules is unique, thus far, in all materials petrographically examined from the region. The rock is completely free of graphite. Hence, once again, a tourmaline-rich sample is showing departure from the graphite-tourmaline association established in graphitic laminates at Cosmo Howley.

Sample FEND10 358.8 - Quartz veined, sphene-quartz-tourmaline-biotite rock

The rock matrix is composed of coarse prisms of partially zoned, orange-brown tourmaline up to 1mm long (30%), coarse biotite laths with about 10% cleavage-controlled chlorite replacement (55%), irregular sphene grains and granules (3%), together with ~7% interstitial quartz. Biotite is foxy orange in colour and strongly pleochroic from foxy orange to almost colourless.

The rock matrix is invaded by very coarse-grained quartz with sub-parallel hair-like trains of fluid inclusions and exhibiting evidence of strong strain as indicated by the presence of strain domains and undulose extinction. Quartz grainsize is up to 4mm.

The interface between the quartz vein material and rock matrix is marked by pyrite concentration forming a penetrating lacework along cleavage within biotite thereby developing a feathery, wispy intergrowth. Here, chloritisation of the biotite is more intense up to 50%. Sulphide within the general rock matrix is sparse and is dominated by pyrrhotite and chalcopyrite with lesser pyrite.

Sample 10 374.5 - Sulphidic, sphene-tourmaline-quartz-amphibole-plagioclase rock

In polished thin section, this rock is crudely compositionally banded with one half being coarser grained and composed of dispersed pale orange-brown clots and ragged prisms of tourmaline up to 4mm in size, granular sphene clots, abundant opaques, quartz, turbid clay-altered and sericitised plagioclase, apatite, and slender amphibole prisms and sheaves.

Tourmaline comprises about 15% of the matrix within the band and is clearly not associated with graphite. In this sample, tourmaline appears to be poorly crystalline and to consist of ragged granular clots (Plate 10a) and to occur randomly dispersed throughout the band. Tourmaline in the clots is commonly associated with granular sphene.

The overall grainsize for other components of the band is relatively finer grained than the tourmaline clots and is moderately uniform. Quartz, comprising about 15% of the band matrix occurs as interstitial sub-granoblastic grains and granular patches to other

mineral components. About 30% turbid, clay-altered and sericitised plagioclase has a similar form and distribution to quartz with which it is associated. Pale green to colourless amphibole prisms (~15%) are dispersed throughout the band matrix and also occur in some concentration as a component of the tourmaline-rich clots. Sphene occurs as granules and granular aggregates dispersed throughout, and as a component of tourmaline-bearing clots. Sphene comprises about 5% of the band matrix.

Opaques are principally pyrrhotite granules and aggregates, comprising about 15%, dispersed fairly uniformly throughout the matrix together with minor chalcopyrite.

The second band is free of tourmaline and is composed of finer-grained clay-altered and sericitised plagioclase and colourless amphibole prisms, sphene granules and clots, epidote and quartz (Plate 10b); sulphide is markedly impoverished in this band relative to the former and comprises about 3 to 5% of the band matrix.

Turbid clay-altered and sericitised plagioclase comprises about 50% of the band and forms a matrix to other mineral constituents of the band. Amphibole, about 30%, occurs as dispersed prisms and prism aggregates forming a poorly defined nematoblastic alignment parallel to gross compositional banding. Sphene granules and granular aggregates have an amoeboid distribution in dispersed clots throughout the band matrix. Quartz is interstitial to other mineral components while sulphide aggregates have amoeboid form. Sulphide in the band matrix is predominately pyrrhotite with trace chalcopyrite.

Sample 10 411 - Polymictic breccia

In polished thin section, the rock is strongly deformed and contorted and comprises a range of compositionally distinctive blocks. These include graphite-muscovite schist, containing dispersed prisms, granular ribbons and augen rich in stumpy pale orange-brown tourmaline, muscovite-chlorite-quartz, wispy interfelted muscovite, feldspar-quartz-muscovite, and tourmaline schist blocks.

Wispy interfelted muscovite blocks are essentially free of graphite and tourmaline. Feldspar-rich areas are flecked with replacive decussate sericite. Tourmaline prisms are up to 1mm long but normally are of equant stumpy habit. Muscovite laths are bent and deformed. Chlorite illustrates anomalous green-brown birefringence.

Moderately sparse pyrite and pyrrhotite, with lesser chalcopyrite, comprise dispersed grains (0.02-0.1mm) while dispersed titan-magnetite/ilmenite is locally concentrated to ~l-2%. Wispy lacy veins of pyrite occur parallel and transgressive to foliation. Pyrite grains dispersed throughout the rock matrix appear to be of primary origin. Abundant wispy convoluted graphite flakes and clots, with individual flakes being <0.1mm long and <0.01mm wide (Plate 11a), occur in some blocks. The graphite is relatively uniform in size, is concentrated in individual bands and defines a well-developed foliation.

In this matrix, tourmaline is closely associated with graphite-rich areas. The tourmaline occurs as discrete prisms, granular trains and as clots and augen.

The component blocks of the rock matrix are compositionally sharply contrasted and illustrate a chaotic structure consistent with a breccia. However, the relationship of the blocks strongly suggests that the breccia has sustained a recrystallisation overprint; the blocks appear to be welded together.

Sample FEN10 448.5 - Quartz-sulphide-veined, sulphidic sphene-quartz-amphibole-feldspar-biotite rock

The polished thin section is divided into two, one half being massive sulphide-quartz vein material. The main sulphide is coarse pyrrhotite. The pyrrhotite contains some coarse splashes of chalcopyrite and irregular patches and wisps of marcasite with associated secondary pyrite. Elsewhere, uncommon patches of cellular secondary pyrite borders the pyrrhotite. Ragged arsenopyrite grains, up to 1mm in size, are fairly common. The arsenopyrite is commonly fractured and healed by chalcopyrite. Pyrrhotite forms a continuous jagged band across the section up to 10mm wide. Other coarse splashes of pyrrhotite occur within quartz. Quartz vein material is very coarse grained (up to 6mm) and contains irregular intersecting fluid inclusion trains. The quartz is in a state of stored strain as indicated by undulose extinction and development of strain domains. The vein quartz contains minor, partially sericitised plagioclase grains and has entrained irregular wedges and clots composed of fine-grained sericitised plagioclase, quartz, chlorite, trace biotite and sphene. These are most likely rock fragments.

The second half of the section is composed of decussate biotite/phlogopite, quartz, sericitised feldspar, sphene granules and ragged colourless amphibole granules and plates together with dispersed granules and granular aggregates of pyrrhotite with trace chalcopyrite (Plate 11b). Biotite/phlogopite comprises about 40% of the half, colourless amphibole granules ~20% , sericitised plagioclase ~30%, quartz 5% with about 5% combined sphene and sulphide in the approximate ratio of 1:1. Sulphide in the rock matrix is dominantly pyrrhotite with trace chalcopyrite and rare pyrite.

Sample 10 477 - Sphene-fluorite-plagioclase-clinopyroxene rock

In polished thin section, the rock matrix consists of coarse plates of clinopyroxene, up to 8.0mm in size, containing irregular patches of fluorite, coarse granoblastic polygonal fluorite areas up to 5.0mm long, partially sericitised plagioclase aggregates, with a grainsize of about 1.0mm, intergrown with granular clinopyroxene of similar grainsize (Plate 12a). Scattered sphene prisms and aggregates to 1.0mm size are present.

The sole sulphide is pyrite occurring as cellular granules, cellular clusters and stringers. Pyrite stringers have been introduced, in stepped fashion, into fractured fluorite and so post-dates fluorite.

For the examined polished thin section, clinopyroxene comprises about 40% by volume, sericitised plagioclase ~40%, fluorite ~15%, Sphene ~3% and pyrite ~2%.

The undeformed, granoblastic polygonal nature of the matrix, including, in particular, the fluorite, does not favour recrystallisation in a zone undergoing ductile deformation. Rather, the fabric is compatible with growth in a low directed stress environment leading to substantial equilibration of grain boundary relations (Plate 12b). Naturally, rock matrices may undergo multiple episodes of deformation and recrystallisation during their evolutionary history and usually only provide clear evidence of the last recrystallisation event affecting them. However, the well developed foam aggregate structure, together with late superimposition of pyrite upon the fluorite matrix suggests that the fluorite, and associated phases, was an integral component of the rock matrix prior to the last recrystallisation episode affecting it. Such a conclusion would appear to preclude metasomatic introduction by fluids emanating from young granitoid intrusions and clearly has important implications for petrogenetic modeling, and hence, ore search strategy.

Sample FEN10 484 5 - Sulphidic sphene-carbonate-apatite-scapolite-fluorite-clinopyroxene-plagioclase rock

The polished thin section may be divided into sulphide-rich and sulphide-poor halves. The sulphide-rich half consists of coarse pyrrhotite splashes, finer granules and wisps with associated minor chalcopyrite, usually in composite relations with the pyrrhotite. Localised marcasite after pyrrhotite is present and minor pyrite occupies structural discontinuities in the matrix. Clusters of deep red-brown sphalerite granules and granular aggregates are also present. Irregular 5-8mm patches of colourless fluorite are associated with the sulphide-rich half.

In the sulphide-poor half, coarse rods and rod aggregates, up to 3mm long, of zoned apatite comprise 15 to 20% by volume of the matrix (Plate 13a). These apatite rods are set in a matrix of coarse-grained turbid, strongly sericitised and partially scapolitised plagioclase feldspar. Isolated plates of epidote and carbonate are commonly associated with interstitial fluorite and scapolite. Strongly zoned epidote crystals, exhibiting both normal and Berlin-blue birefringence, are intergrown with fluorite, scapolite, apatite and sphene. Sphene forms coarse zoned crystals up to 8mm long while coarse clinopyroxene plates, up to 8 x 4mm in size, are intimately associated with sulphide- and/or fluorite-rich areas of the rock matrix. Elsewhere, clinopyroxene is finer grained and granular and is intergrown with sericitised plagioclase, fluorite and scapolite (Plate 13b). Carbonate is commonly intimately associated with fluorite. Fluorite comprises about 15% of the matrix of the sulphide-poor half. In the sulphide-rich section, fluorite comprises about 30% by volume. Clinopyroxene and sericitised plagioclase are sub-equal overall and together comprise about 40% while scapolite, carbonate, epidote and sphene collectively amount to about 10%. Sulphide, while locally concentrated, amounts to about 15% overall.

Sample 10 486.2 - Sphene-quartz-amphibole-plagioclase-clinopyroxene rock

In polished thin section, the matrix is broadly divisible into two halves on the basis of mineralogical constitution. One half is dominated by relatively coarse-grained, essentially fresh polygonised plagioclase in the size range 0.25 to 1.0mm. Plagioclase is associated with coarse-grained clinopyroxene plates, up to 2mm. The clinopyroxene is partially replaced by very pale green amphibole and less common carbonate plates. Plagioclase is flecked by sericite up to about 5%. Extinction angles on albite twins in grains having x' $\perp a$ yield compositions appropriate to basic andesine. Elsewhere in the band, fresh clinopyroxene occurs as ovoid, equant sub-polygonal grains and granular aggregates set in a polygonised matrix dominantly of plagioclase (Plate 14a) with lesser quartz. Throughout the matrix, quartz is subordinate to plagioclase.

The second half consists of ovoids of fresh clinopyroxene set in an almost completely sericitised plagioclase matrix. Here, coarse irregular plates and finer granules of epidote, together with carbonate and pale green amphibole are relatively abundant. In this case, amphibole is not a secondary alteration product after clinopyroxene. Clinopyroxene in this half ranges in grainsize from 0.1 to 0.5mm while sericitised plagioclase is of comparable dimensions.

Strongly pleochroic, pink to orange-pink sphene granules and subidioblasts in the size range 0.1 to 2.0mm are relatively abundant and are dispersed throughout the matrix. Sparse sulphide is pyrrhotite.

Sample 10 487.8 - Sphalerite ore with gangue sulphide,scapolite, fluorite and clinopyroxene

The polished thin section comprises about 25% sulphide of which about 20% is pale red, apparently low-iron sphalerite. The sphalerite contains sparse emulsion blebs of chalcopyrite and somewhat more abundant pyrrhotite. Elsewhere, pyrrhotite, as coarse splashes and granules, is intergrown with the sphalerite. Apart from the sparse exsolution emulsion in sphalerite, chalcopyrite is absent from the section. The apparent low-iron sphalerite in this sample, and in other sections where sphalerite has been noted, has implications for sphalerite petrogenesis, and hence the petrogenesis of the sulphide assemblage contained within the rock matrices. Published and unpublished work (e.g. Herbert, 1981; 1983; 1987) strongly indicates that sphalerite, genetically related to felsic volcanic processes, has a low to very low contained FeS content (<1.0 wt% FeS), whereas sphalerite petrogenetically linked to granitoid emplacement generally has FeS in the 4 to 20 wt% range. Optically, the colour of the sphalerite, considered to be a measure of iron (and manganese) content, would here suggest quite low iron contents consistent with those anticipated from volcanic, rather than plutonic processes. Should measured iron contents be low, some support for a volcanic exhalative origin of the sphalerite would be provided.

The non-opaque component of the polished thin section comprises about 30 modal per cent fluorite, ~30% clinopyroxene and ~15% scapolite. All components are coarse-

grained. Scapolite forms coarse plates up to 4mm in size in which ovoids of clinopyroxene are dispersed (Plate 14b). Scapolite is partially, and variably, altered to an indefinite secondary mineral product possibly related to chlorite (Plates 14 b and 15a). Fluorite forms as very large plates up to 1.0cm long, interstitial to the other phases present (Plate 15b), and as included patches within sphalerite, scapolite and clinopyroxene. Clinopyroxene forms granoblastic polygonal intergrowths with other phases, and sphalerite and pyrrhotite form a coarse interstitial network.

The fabric and mineral textural relations are incompatible with recrystallisation in a ductile deformation zone. The form of clinopyroxene inclusions in scapolite and other phases, that is ovoid grains clearly controlled by interfacial free energy constraints, is characteristic of elevated temperature regimes with associated low directed pressure. As with sample 10 477, mineral textural relations strongly support contemporaneous recrystallisation and growth of the constituent phases, probably under amphibolite facies conditions. Hence, phases such as fluorite and scapolite, together with sphalerite and other sulphide, are "metamorphic" mineral products.

Sample 10 488 - Sulphidic sphene-apatite-zircon-fluorite-scapolite-clinopyroxene rock

In polished thin section, the rock matrix is coarse-grained and consists of about 20% fluorite by volume, ~40% clinopyroxene, ~25% strongly growth zoned scapolite (and its alteration product) (Plate 16a), ~5% strongly idioblastic zircon (Plate 16b) and ~1% apatite; pyrrhotite and very pale honey-yellow to pale red sphalerite granules, together with epidote and carbonate, make up the remainder of the sample. Strongly zoned, ladder prisms of scapolite, 3-5mm long, containing regular rectangular ladder-step infills of clinopyroxene, are common, as are other zoned scapolite prisms intergrown with clinopyroxene and fluorite. Unlike other fluorite-bearing sections examined, the fluorite in this sample is characterised by patchy development of pale mauve to purple colouration (Plate 16a). Scapolite has been partially to completely transformed, often zonally controlled, to an orange to green mineraloid very close to isotopic, or completely so, between crossed polars.

Clinopyroxene occurs as a very coarse, essentially monomineralic aggregate in which individual plates are several millimeters long; elsewhere clinopyroxene forms finer grained granular aggregates and infills with, and within, other phases, particularly scapolite. The coarse-grained "monomineralic" clinopyroxene aggregate is the host for dispersed crystals and crystal clusters of zircon (Plate 16b) together with uranium-rich apatite. Zircon crystals are typically about 0.5 in size.

The entire rock matrix illustrates a superimposed turbidity represented by intense, very closely spaced, dense, sub-parallel fracture "sheeting" superimposed upon all mineral constituents (Plates 16a and b). Notwithstanding, this sheeting has not caused any translation and/or disruption of mineral constituents, irrespective of their relative plasticities and, hence, is unlikely to represent ductile deformation. The effect appears to be quite localised, and has not been noted in the examined samples immediately above and below the present sample, nor has a similar structure been noted in any

other sample examined during this study. The mechanism whereby the rock matrix has been so intensely sheeted, without any translation or disruption, is speculative.

Sample 10 493 - Sulphidic sphene-quartz-amphibole-biotite-feldspar rock

In polished thin section, the rock matrix is coarsely banded with banding being depicted by relative variations in the proportions of dispersed sulphide granules. The sulphide granules are of pyrrhotite with minor chalcopyrite commonly forming composite grains. Grainsize is relatively uniform and does not exceed 0.5mm.

The rock matrix is essentially composed of ~ 15% decussate, brown biotite laths, relatively fresh granoblastic polygonal feldspar (~50%) and quartz (~10%), together with sulphide (~15%) (Plate 17). Feldspar illustrates incipient patchy alteration expressed as flecking by sericite. The feldspar is essentially untwinned and where twinning is developed, it is polysynthetic. Isolated granules of carbonate are present as are minor patches of pale green chlorite. Minor epidote is also present together with irregular patches of wispy pale green amphibole locally comprising about 5 to 10% by volume. Whereas the felsic matrix is strongly polygonised equant, and the biotite is coarsely stumpy, the wispy amphibole appears to be a superimposed retrograde product on a high-temperature granoblastic matrix. However, what it is retrograde after is not at all clear.

About 3-4% by volume of strongly pleochroic, deep pinkish brown sphene grains of moderately uniform size up to 0.3mm are dispersed throughout, but are noticeably more concentrated in select bands.

Textural and mineralogical characteristics of this matrix are consistent with recrystallisation under amphibolite facies conditions in a regime of high temperature and little directed stress. The matrix exhibits characteristics incompatible with ductile deformation.

Sample 10 500.5 - Quartz-chlorite veined, biotite (chlorite)-feldspar rock

In polished thin section, the matrix is compositionally crudely banded and is traversed parallel to, but with transgressive projections into, banding by a 0.5 to 1cm wide composite quartz-chlorite vein. The vein is medially disposed within the examined section. It is composed of very coarse-grained "tabular", strained quartz grains as well as clots of chlorite rosettes. The chlorite is very pale emerald green to colourless and possesses anomalous 1st order grey-brown birefringence. Trains of leucoxenised sphene granules occur within the chlorite or at vein margins where the rosettes have been sheared out to parallel wisps. Quartz "wedges" and lozenges are up to 3mm long and are highly strained as indicated by undulose extinction and strain domains. Quartz-chlorite projections penetrate out into the rock matrix (Plate 18a).

The rock matrix consists of stumpy foxy orange-brown to palest brown, strongly pleochroic biotite which exhibits very crude lepidoblastic alignment defining a slight foliation. Radiogenic damage haloes are fairly common with biotite being partially

replaced along cleavage by chlorite, generally up to 50% of the primary biotite. The matrix is dominated by granoblastic equant polygonised feldspar showing some alteration flecking by sericite. The feldspar is untwinned to mildly twinned and, as far as can be determined, is largely plagioclase. Grainsize is uniformly around 0.2mm. Quartz has not been recognised as a component of the matrix. The chlorite replacing biotite appears optically similar to "vein" chlorite (Plate 18b).

Trace sphene and sulphide granules are dispersed throughout the matrix, together with minor magnetite and ilmenite granules. Sulphide is pyrrhotite. The coexistence of sphene and ilmenite, as separate individuals, rather than as composites reflecting arrested metamorphic transformation, is of academic interest.

The sample appears to have been derived from a zone that has sustained some past disruption with consequent introduction of quartz-chlorite vein material. However, the quartz and chlorite provide quite conflicting evidence on vein relations and it would appear necessary to postulate two separated episodes of vein emplacement - early quartz of probable pre-deformation and recrystallisation age, and late, post-recrystallisation superimposed chlorite. As noted above, the vein quartz matrix is highly deformed and strained. Relative to chlorite, quartz is a much harder matrix and requires a far greater energy input to deform it. In contrast, the bulk of the chlorite vein material is as massive interfelted rosettes showing, for the most part, total absence of deformational features. Locally , however, chlorite at rock and/or quartz interfaces is sheared out, in keeping with some very late-stage differential movement exhibited by many of the samples examined.

Ignoring the vein material, and allowing for essential absence of quartz, lesser sphene and sulphide, and slightly more sericitisation of feldspar, the bulk matrix is not all that dissimilar in overall characteristics to sample 10 493.

Sample 10 503.8 - Banded, sulphidic sphene-zircon-fluorite-biotite-amphibole-plagioclase-microcline-quartz rock

Within the examined polished thin section, a number of coarse compositional bands are evident.

One band consists of partially chloritised plates of pale brown biotite (~15%), ~10% sulphide granules (up to 0.3mm), partly turbid, sericitised and clay-altered plagioclase (~20%), microcline (~20%) and quartz (~35%) (Plate 19a). Felsic components form a granoblastic polygonal equant aggregate. Dispersed sphene granules are not uncommon.

Another band is essentially free of potash feldspar, contains ~50% turbid plagioclase and a much higher concentration of granular sphene (~3%). This band passes to a narrow band comprising ~80% coarse, partially chloritised biotite flakes, ~ 0.5mm in size, with abundant pink sphene granules and ~10% interstitial quartz. Biotite is about 50% chloritised. This band passes to another narrow band composed of coarse plates of plagioclase (~1mm), amphibole (~1mm) and sulphide together with minor

fine-grained biotite, sparse sphene granules and occasional zircon grains. The amphibole is pale green and somewhat turbid due to indeterminate alteration products.

Finally, a mixed band of granoblastic quartz, turbid plagioclase, sphene, amphibole and biotite is present in the section. Biotite is about 10% replaced by pale green chlorite. This band contains about 1 to 2% interstitial patches of fluorite associated with coarse plagioclase, amphibole and sulphide. This amphibole is poikiloblastic in quartz and sulphide and the sulphide throughout the section is pyrrhotite.

Sample 10 507.2 - Pyrrhotite-quartz-plagioclase-tourmaline laminate

In polished thin section, this sample is a compositionally well banded rock characterised by relatively sulphide-rich brown coloured bands interbanded with sulphide-poor, colourless felsic bands ranging from 1cm to >2cm wide.

Brown bands derive their colour from ~50% equant prisms of foxy orange-brown tourmaline of very uniform grainsize in the range 0.05 to 0.1mm. These are associated with dispersed sulphide granules in the size range 0.1 to 0.2mm. Both tourmaline and sulphide are set in a felsic matrix of partially sericitised feldspar with lesser quartz in the ratio ~5:1.

The felsic bands contain about 10% tourmaline of much finer grainsize (~0.05mm) and only sparse sulphide. Pale pink sphene granules up to 0.05mm are common. These bands are predominantly composed of feldspar with minor quartz in the ratio ~10:1. Feldspar grainsize is somewhat coarser than in the tourmaline- and sulphide-rich bands. Feldspar is partially sericitised with about 5% fine flecking. All feldspar is largely untwinned although some areas contain mildly developed deformation twins.

The overall fabric of the rock is granoblastic polygonal equant. Sulphide consists of fresh pyrrhotite, as single grains, with rare chalcopyrite blebs.

Given the nature and distribution of the tourmaline, it is difficult to visualise the mineral as being the result of selective metasomatic replacement. Rather, the tourmaline appears to have sustained metamorphic recrystallisation along with the matrix that hosts it and, hence, appears to indicate primary boron enrichment. Again, there is nothing in the textural and fabric relations to suggest that the matrix has sustained ductile deformation.

DISCUSSION AND CONCLUSIONS

Overall fabric and mineralogical associations are consistent with metamorphic recrystallisation under amphibolite facies conditions as the term is customarily understood. However, the metamorphic event appears to have done little to modify and homogenise the gross chemistry of individual bands within a given thin section,

that is, short-range diffusional equilibrium has not been attained despite common approximation to textural, and hence, free energy equilibrium within a wide range of matrices representing rocks from FEN10. By way of contrast, samples from drill holes MP228, MP230 and MP231 illustrate textural features and mineralogies compatible with low-to mid-greenschist facies conditions and are more analogous to equivalent rocks from Cosmo Howley. These features emphasise the dominant role of precursor domain chemistry in determining derivative mineralogy; pressure and temperature are simply factors impacting upon thermal energy and partial pressure of volatiles necessary to cause structural reordering within given chemical domains thereby leading to metamorphic recrystallisation.

The rocks of the FEN10 series do not appear to strictly represent a garnet-biotite-chlorite transition. Metamorphic recrystallisation has led to the development of primary garnet and biotite in rocks of appropriate composition. However, while chlorite is commonly intergrown with biotite, various textural and mineralogical relations support the view that the chlorite is generally retrogressive within the examined samples. The alternative that chlorite-biotite relations represent arrested prograde transition at the biotite isograd cannot be sustained.

Quartzo-feldspathic rocks within the series are overwhelmingly dominated by plagioclase, at least in part, of intermediate andesine composition, compatible with almandine amphibolite grade metamorphism. Quartz is very much subordinate to feldspar in almost all cases examined, or absent altogether. Potash feldspar, in the form of microcline, is only occasionally locally developed.

Plagioclase in the feldspar-bearing assemblages is ubiquitously partially sericitised with commonly associated clay alteration. The extent of sericitisation and clay alteration, while showing some extremes in degree, is nevertheless relatively constant. In overall appearance, the general character of the alteration appears more appropriate to a weathering event or hydrothermal overprint. If the sericitisation is a response to a hydrothermal fluid flux, then the alteration appears to have been selectively pervasive within quartzo-feldspathic units in that other silicate phases highly susceptible to hydrothermal modification within intercalated units are quite fresh. Furthermore, given that many of the FEN10 series rocks contain alteration clots and late-stage veinlet assemblages of albite -epidote-carbonate-chlorite-quartz, compatible with low greenschist facies mineral assemblages, it is interesting that the plagioclase has not been saussuritised. The fact that albite-epidote alteration of plagioclase is minimal within the series is consistent with the perceived absence of dynamothermal ductile deformation.

The FEN10 series differs markedly in plagioclase content with respect to examined lithologies from Cosmo Howley. Relatively speaking, examined Cosmo Howley rocks contain infinitely less plagioclase. While this difference would appear to rule out equivalence of rock type recrystallised under differing metamorphic regimes, the extent of lateral stratigraphic variation is unknown.

With the exception of sample 10 411, a chaotic breccia, muscovite- and graphite-bearing assemblages are absent from FEN10 series samples. Whereas graphitic MP

samples, and graphitic laminates at Cosmo Howley, appear to be the host lithologies for tourmaline occurrence, no such tourmaline-graphite association occurs within the FEN10 series rocks. Notwithstanding, tourmaline is a common, and often abundant to dominant phase in many quartzo-feldspathic, biotite-bearing lithologies within the examined series. Textural and structural characteristics of many of these tourmaline-bearing matrices support the view that the tourmaline is, at least in part, a reflection of primary pre-metamorphic boron enrichment of the host matrix.

A well-defined zone in the interval 477 to 488 meters is marked by variable and often strong enrichment in fluorite, scapolite, zircon, and apatite often with abundant low-iron sphalerite. This interval, together with a stratigraphically higher interval represented by sample 10 312.2, is rich in clinopyroxene and plagioclase. The 312.2m sample, however, does not appear to be enriched in any of fluorite, scapolite, zircon or apatite while the interval represented by sample 10 503.8, while essentially quartzo-feldspathic and free of clinopyroxene, contains minor fluorite and some zircon. Hence, while abundantly developed in the interval 477 to 488 meters, fluorite does not appear to be lithologically specific. However, much more work is required to fully evaluate this proposition. As well, sample FW229 54.9 is of a scapolite-rich skarn. Notwithstanding, textural relations in the fluorite-bearing rocks are compatible with the constituent phases having been recrystallised during the metamorphic event affecting the rock matrices. Hence, the fluorite and associated phases appear to be early in the history of the rocks and not compatible with derivation from superimposed fluid fluxes arising from late-stage granitoids.

Garnet is not extensively developed in the FEN10 series rocks examined. However, its occurrence is not restricted to amphibolite but also occurs in tourmaline-bearing biotititic quartzo-feldspathic lithologies. Sphene, often very strongly coloured in shades of pink and red, is common, and often moderately abundant in many lithologies represented by FEN10 series rocks.

Sphalerite appears optically to be of low-iron type. Such low-iron sphalerite is more typically of felsic volcanic, rather than granitoid association allowing the inference that some or all the contained sulphide may be of volcanic exhalative derivation.

Evidence of gross late-stage hydrothermal overprinting of the FEN10 series rocks is wanting. Certainly, there has been an episode of minor late-stage brittle rupture with invasion of sulphide-bearing fluids along the micro-fracture arrays. Further, there is the general partial sericitisation of plagioclase, variable chloritisation of biotite introduction of albite-epidote-chlorite-carbonate-quartz veinlets, and localised alteration of scapolite to be considered. However, these features are not particularly intense as might be expected from a strong fluid flux.

Finally, the FEN10 series rocks do not display the same alteration and paragenetic complexity exhibited by Cosmo Howley lithologies, nor do they appear to have sustained the same intensity of superimposed fluid interaction.

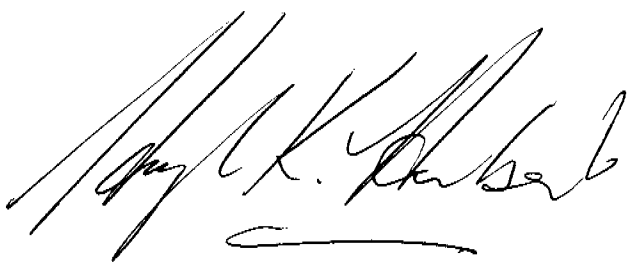
REFERENCES

HERBERT, H.K. (1981): *Origin and Evolution of Cyprus-type Ores and Associated Metabasites in Western and Southern new England, New South Wales.* Ph.D. thesis, University of new England, Armidale, New South Wales.

HERBERT, H.K. (1983): Gold-silver mineralisation within the Drake Volcanics of northeastern New South Wales. ***In*** Permian Geology of Queensland. *Geol. Soc. Aust, Qld Div.*, 410-412.

HERBERT, H.K. (1987): Minor element compositions of sphalerite and pyrite as petrogenetic indicators. ***In*** [Proceedings] Pacific Rim Congress 87. *Austral. Inst. Mining Metall.* 831-841.

This report pertains solely to the samples submitted, and to the polished thin sections prepared, and examined, from them.



Dr Hugh K. Herbert
Managing Director

H.K. Herbert & Associates Pty Ltd
PO Box 318
Como WA 6152

30 October 1996

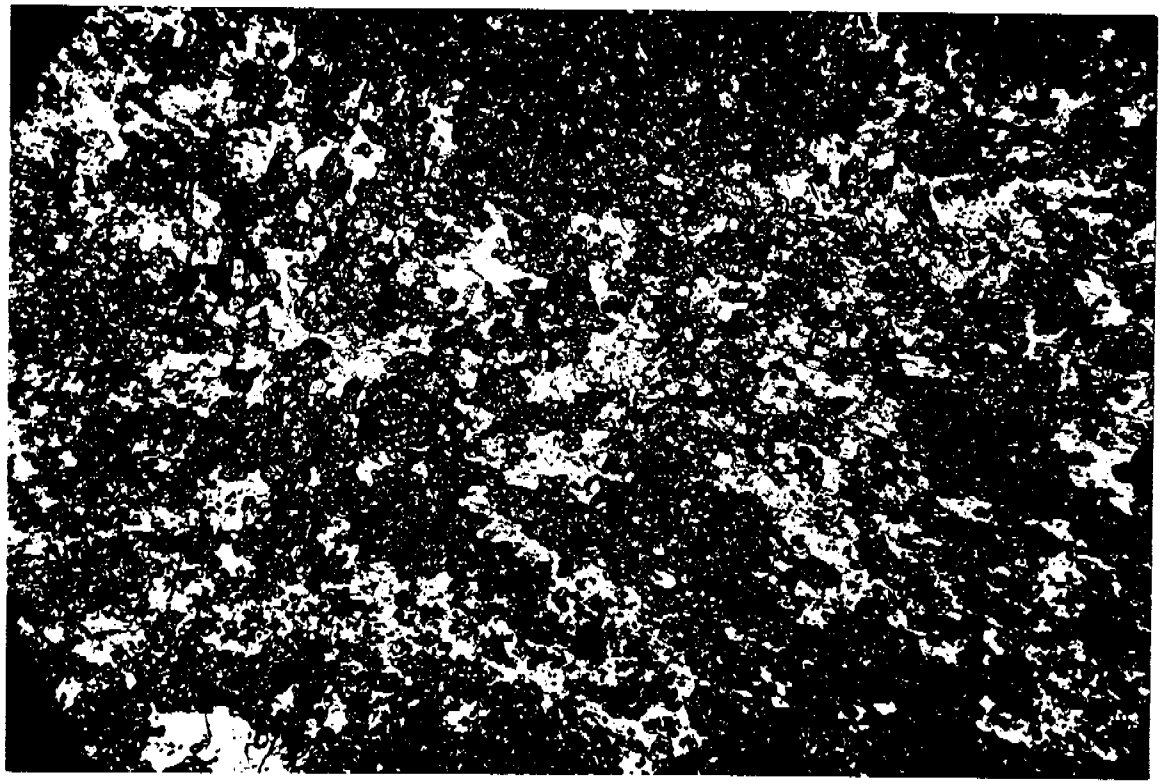


PLATE 1a: Sample FW 229 54.9 - Plane polarised light photomicrograph of an area of polished thin section FW229 54.9 showing granular clinopyroxene (greenish brown, high relief) in a matrix of scapolite (colourless) with associated minor feldspar. 4.5mm

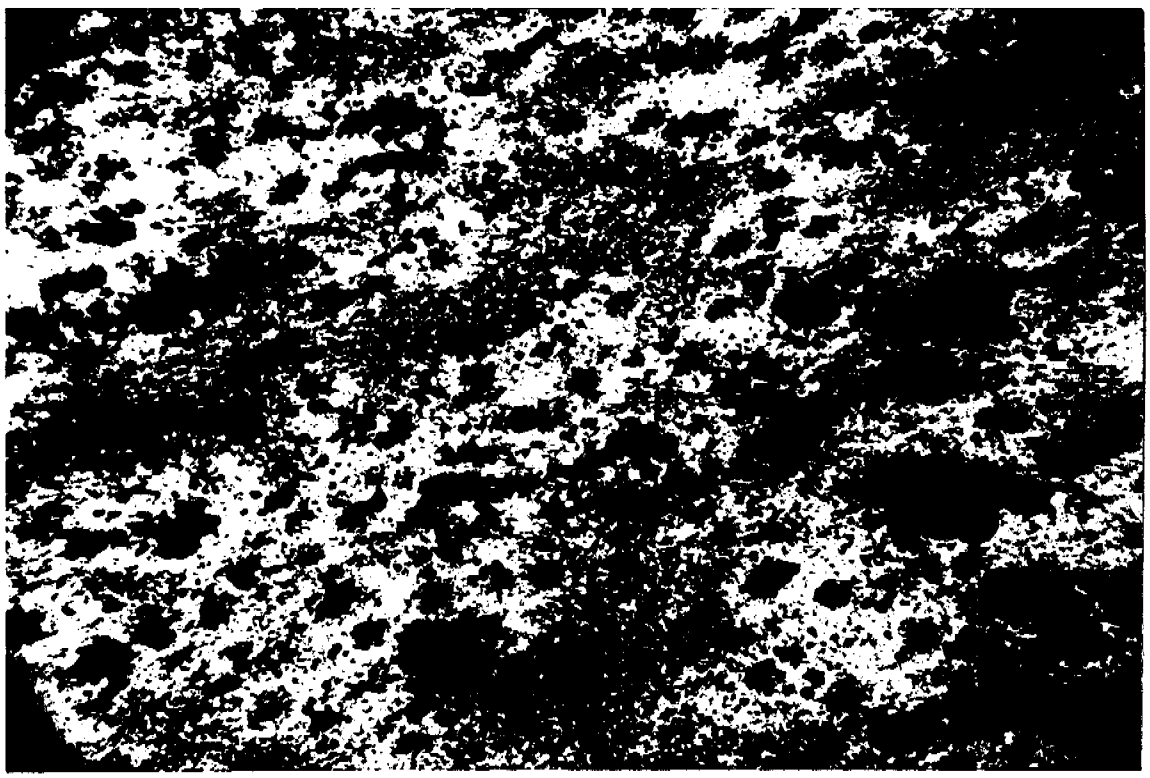


PLATE 1b: Sample MP 228 195.5 - Plane polarised light photomicrograph of an area of polished thin section MP 228 195.5 illustrating very fine-grained biotite flecks (dark brown smudges), micro-crystalline felsics (colourless) and associated sulphide granules (black). 2.25mm.

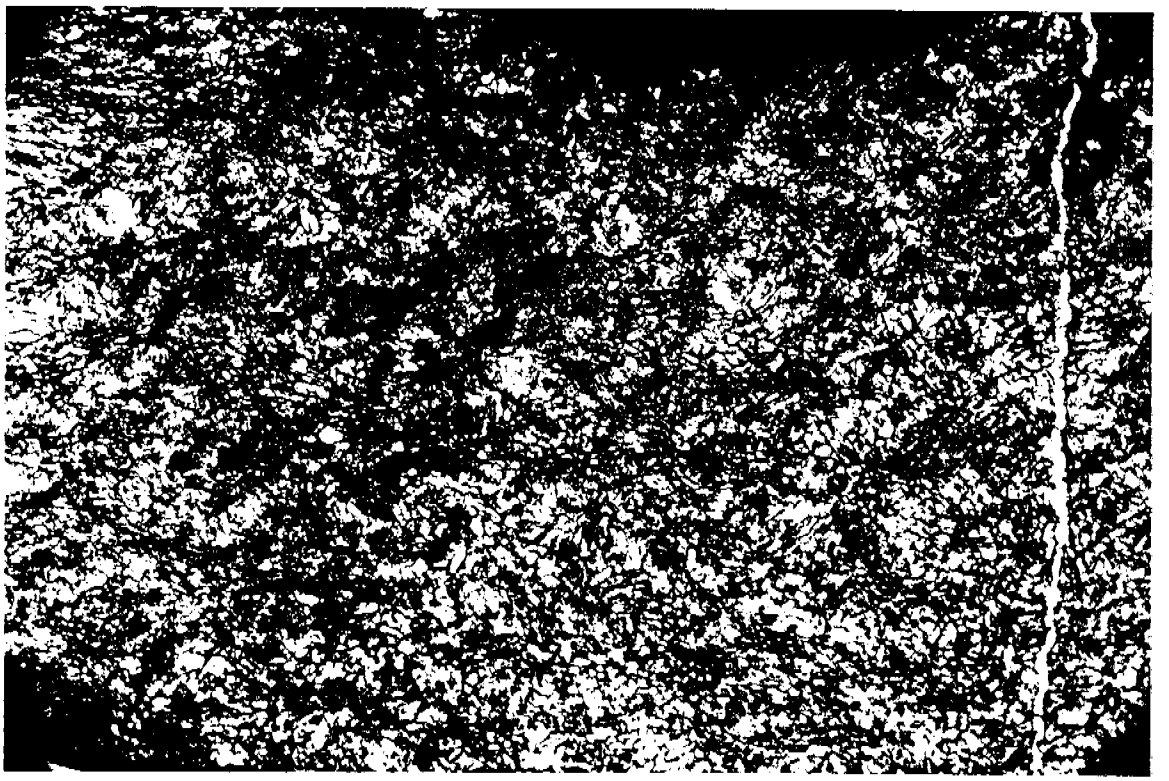


PLATE 2a: Sample MP 230 131 - Plane polarised light photomicrograph of an area of polished thin section MP 230 131 showing massive decussate interfelted rosettes of green amphibole, traversed by a narrow quartz veinlet and enclosing a lone garnet idioblast. Sparse granules of quartz are also present. 4.5mm

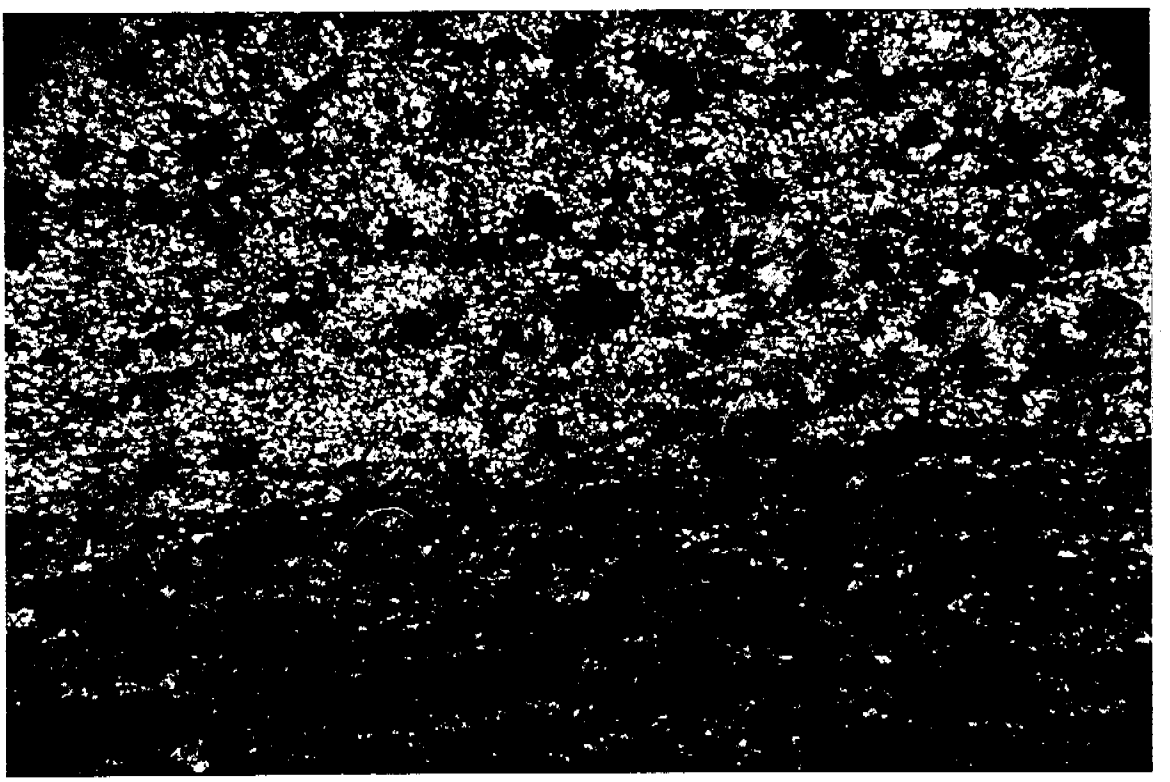


PLATE 2b: Sample MP 231 315 - Plane polarised light photomicrograph of an area of polished thin section MP 231 315 showing the interface between graphite-rich (black, stringy) and graphite-poor laminae emphasising decussate biotite plates (orange-brown) in a very fine-grained felsic matrix dominated by quartz. 2.25mm.

PLATE 3a: Sample MP 231 231.7 - Plane polarised light photomicrograph of an area of polished thin section MP 231 231.7 illustrating typical radial and sector zoned, relatively uniform-grained tourmaline prisms (coloured) occurring in graphite-rich laminae (black). Note the inclusion core of dusty graphite and associated radial septa emanating from the centre of the prisms. Partial fringing of the tourmaline prisms by filamentous quartz (colourless) is also shown. 4.5mm

PLATE 3b: Sample MP 231 231.7 - Plane polarised light photomicrograph of an area of polished thin section MP 231 231.7 showing details of sector and radially zoned tourmaline prisms (coloured), with graphite cores and radial septa, and associated massive rims of graphite (dense black) and filamentous quartz (colourless). Note that growth of tourmaline prisms has not perturbed "bedding" (laminated area). 2.25mm.

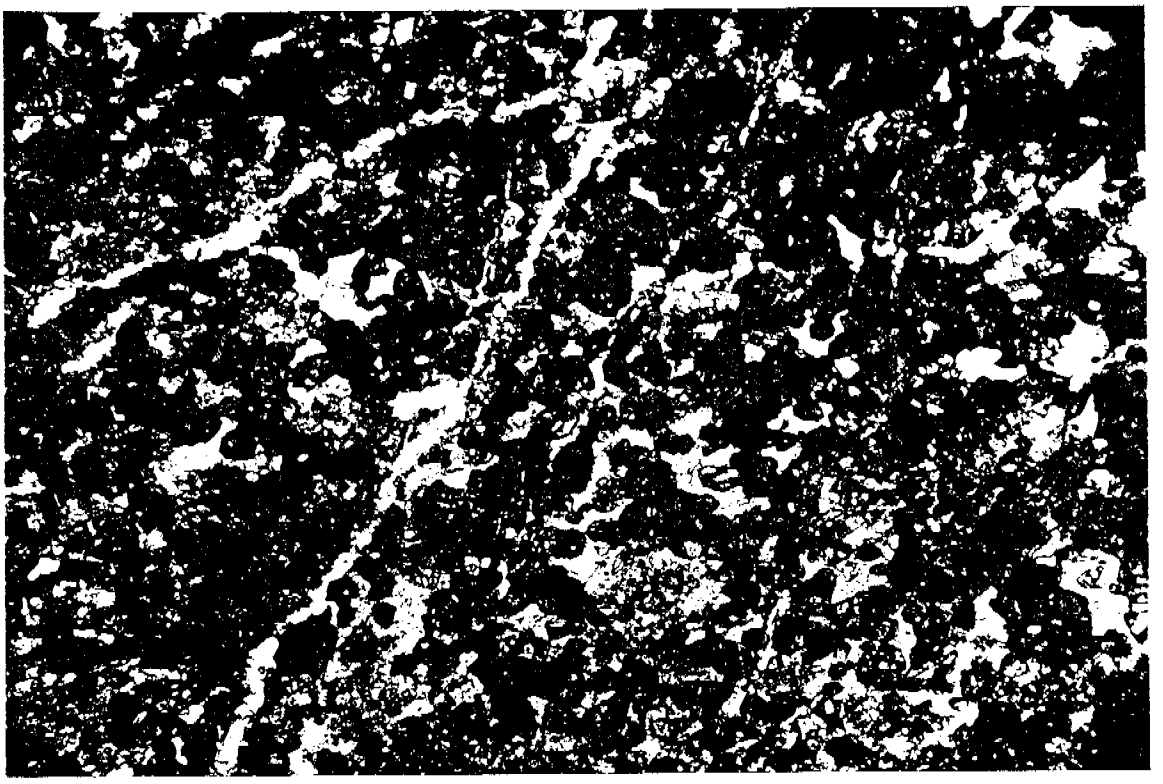


PLATE 4a: Sample FEN11 266 - Plane polarised light photomicrograph of an area of polished thin section FEN11 266 showing a dense tourmaline (brown-black, high relief) granules set in a turbid matrix of feldspar, with associated interstitial quartz (colourless) and veined by sub-parallel stringers of quartz. 4.5mm

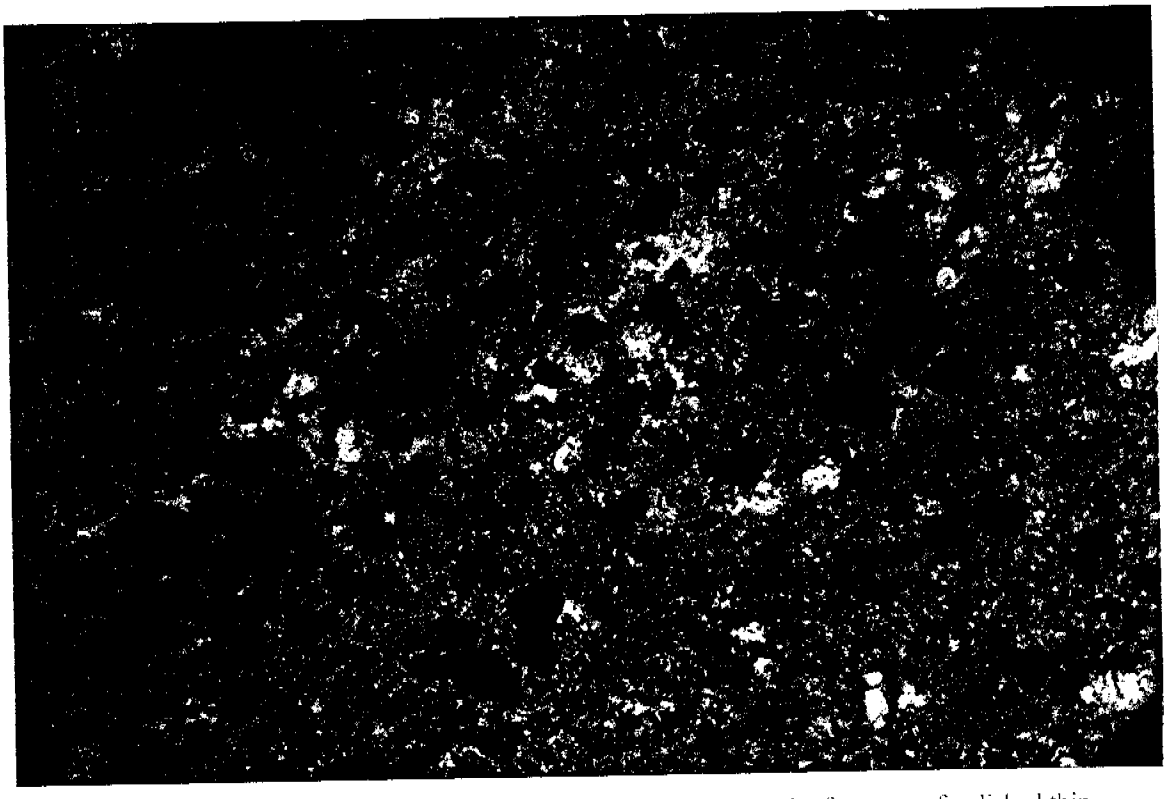


PLATE 4b: Sample FEN11 266 - Plane polarised light photomicrograph of an area of polished thin section FEN11 266 showing dispersed tourmaline grains (shades of brown, high relief) in a turbid matrix of sericitised feldspar. 2.25mm.

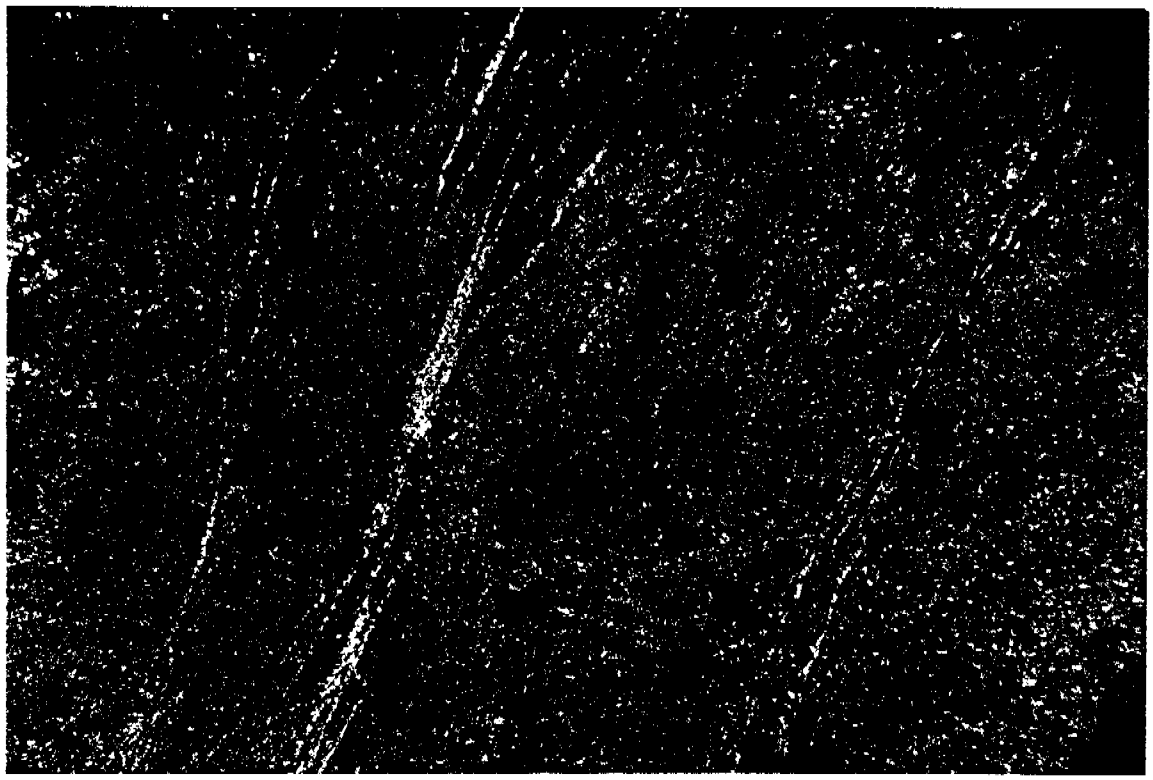


PLATE 5a: Sample FD10 266 - Plane polarised light photomicrograph of an area of polished thin section FD10 266 illustrating turbid, coarse-grained, clay- and sericite-altered plagioclase sheeted by narrow chlorite-albite-epidote-carbonate veinlets. 4.5mm

PLATE 5b: Sample FEN10 300.5 - Plane polarised light photomicrograph of an area of polished thin section FEN10 300.5 showing garnet ("colourless" idioblasts) and sparse tourmaline (dark olive brown) prisms set in a matrix of partially chloritised lepidoblastic biotite (pale green and orange-brown) with associated granoblastic quartz (colourless) and sulphide (black). 4.5mm.

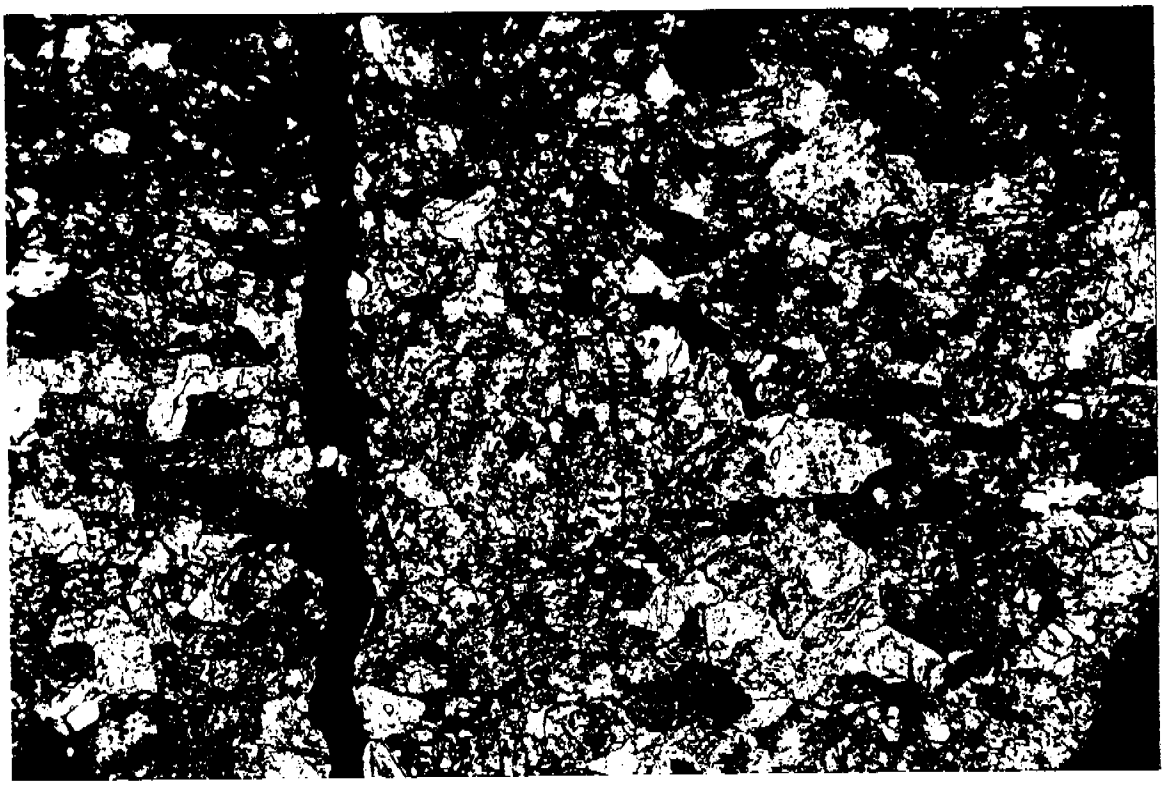


PLATE 6a: Sample FEND10 310.3 - Plane polarised light photomicrograph of an area of polished thin section FEND10 310.3 illustrating granoblastic polygonal equant amphibole (shades of green) with associated amoeboid, sulphide-poikiloblastic garnet grains and granules (colourless, high relief, flecked with black) and dispersed sulphide (black). Note the thin massive sulphide veinlet traversing the matrix. 4.5mm

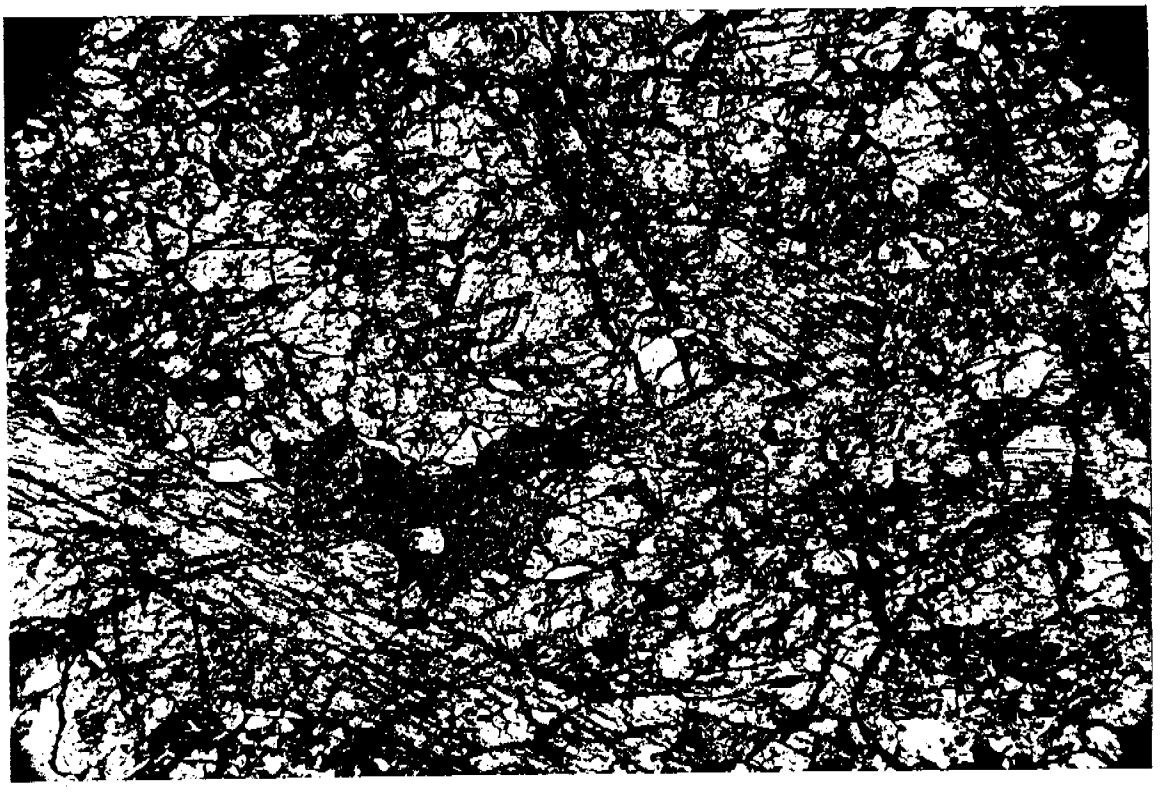


PLATE 6b: Sample 10 312.2 - Plane polarised light photomicrograph of an area of polished thin section 10 312.2 showing coarse-grained clinopyroxene with associate interstitial, turbid sericitised plagioclase (low relief). 4.5mm.

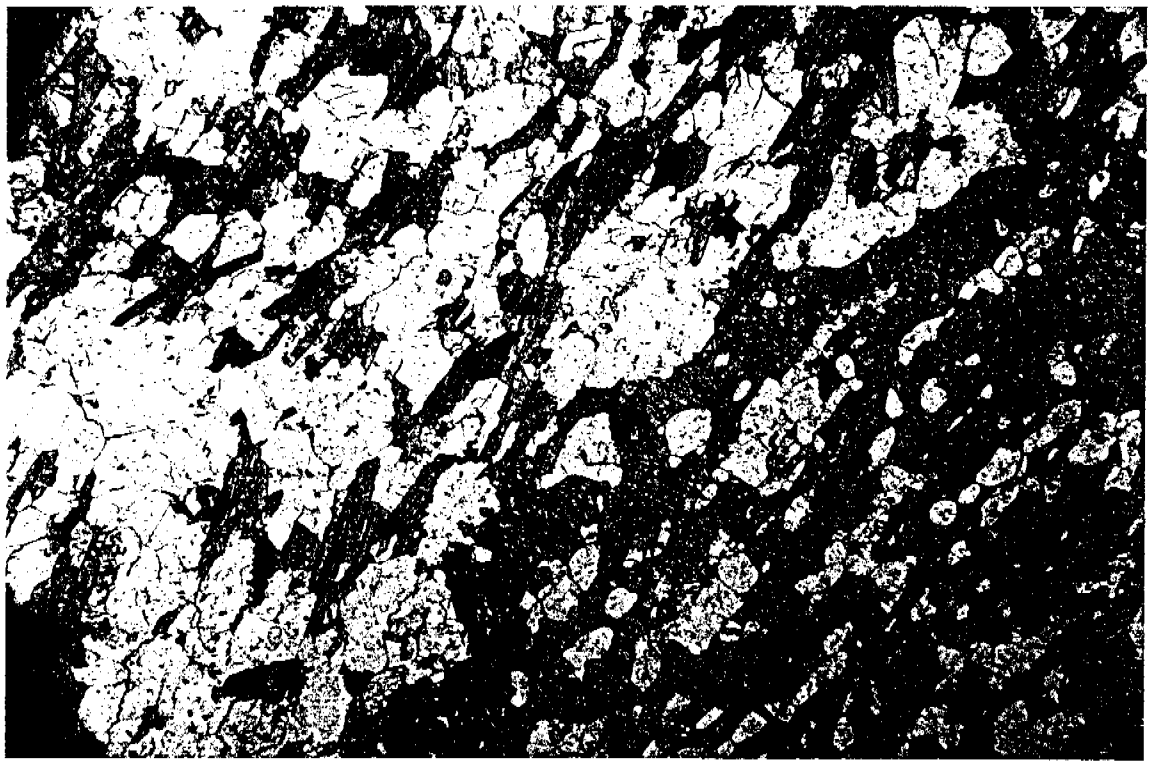


PLATE 7: Sample FEN10 339 - Plane polarised light photomicrograph of an area of polished thin section FEN10 339 illustrating part of a coarse-grained, quartz poikiloblastic amphibole plate (green) in a matrix of lepidoblastic biotite (brown laths) and relatively fresh, granoblastic feldspar and quartz (colourless). 4.5mm

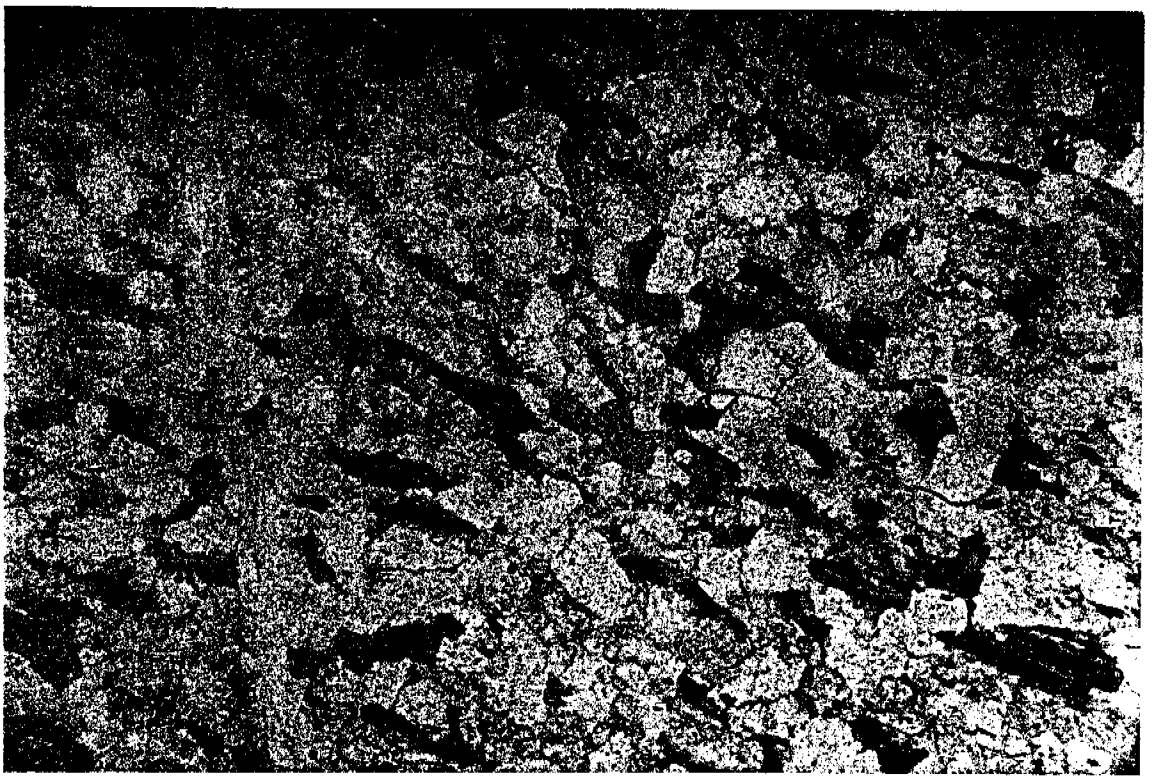


PLATE 8a: Sample F10 344 - Plane polarised light photomicrograph of an area of polished thin section F10 344 showing lepidoblastic biotite (orange-brown) granoblastic quartz (colourless) with associated, slightly turbid, sericitised feldspar. A lone nematoblastic tourmaline prism aggregate (pale brown, high relief) is centrally disposed. The illustrated matrix is traversed by a narrow quartz veinlet. 2.25mm

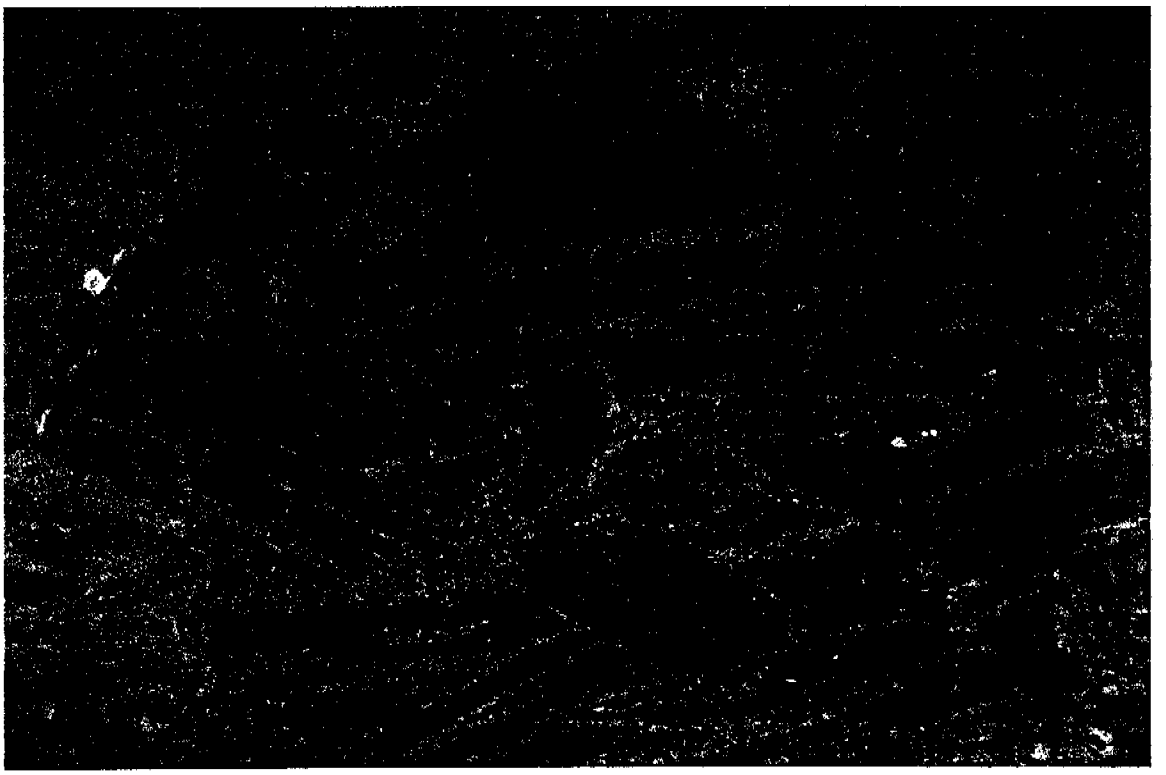


PLATE 8b: Sample F10 344 - Plane polarised light photomicrograph of an area of polished thin section F10 344 showing part of a massive layer of partially chloritised biotite and illustrating extensive exsolution of rutile granules, a product of the chloritisation process. 2.25mm.

PLATE 9a: Sample FEN10 357 - Plane polarised light photomicrograph of an area of polished thin section FEN10 357 tourmaline (orange-brown prisms) and decussate amphibole (pale buff) relations together with interstitial quartz (colourless) and sulphide (black) granules fringed with quartz. 4.5mm

PLATE 9b: Sample FEND10 358.8 - Plane polarised light photomicrograph of an area of polished thin section FEND10 358.8 illustrating dispersed tourmaline crystals and ribbon aggregates (brown, idioblastic, high relief), set in a partially chloritised matrix of biotite plates (brick-red to pale brown), sphene granules (dark brown-black, high relief) and localised areas of interstitial quartz (colourless). 4.5mm.

PLATE 10a: Sample 10 374.5 - Plane polarised light photomicrograph of an area of polished thin section 10 374.5 illustrating a composite clot comprising ragged tourmaline granules (orange-brown), amphibole prisms (pale buff elongated prisms), sulphide (black) and minor quartz (colourless) set in a matrix of sulphide grains, sphene granules, amphibole prisms, quartz and turbid sericitised plagioclase. 4.5mm

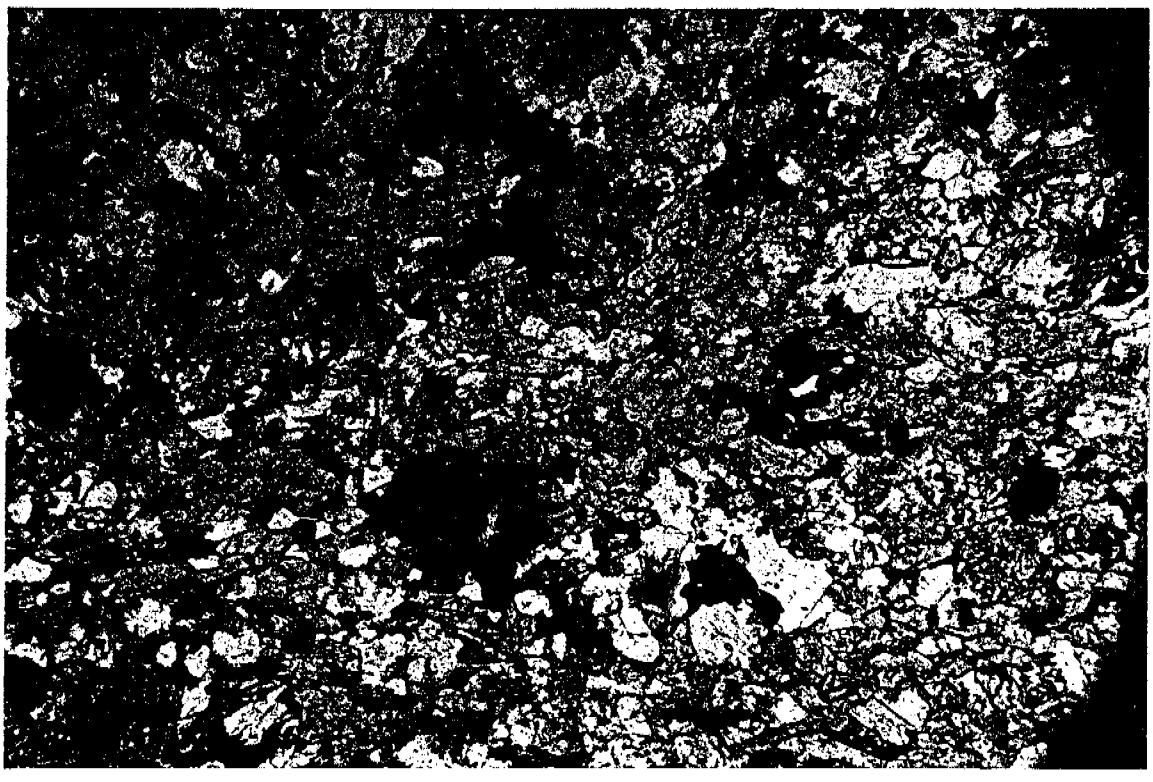


PLATE 10b: Sample 10 374.5 - Plane polarised light photomicrograph of an area of polished thin section 10 374.5 showing dispersed amoeboid sphene grains and granules (dark brown, high relief) and ragged sulphide patches (black) in a matrix of amphibole prisms (pale buff, high relief), turbid sericitised plagioclase (dusty pale brown) and lesser quartz (colourless). 4.5mm.

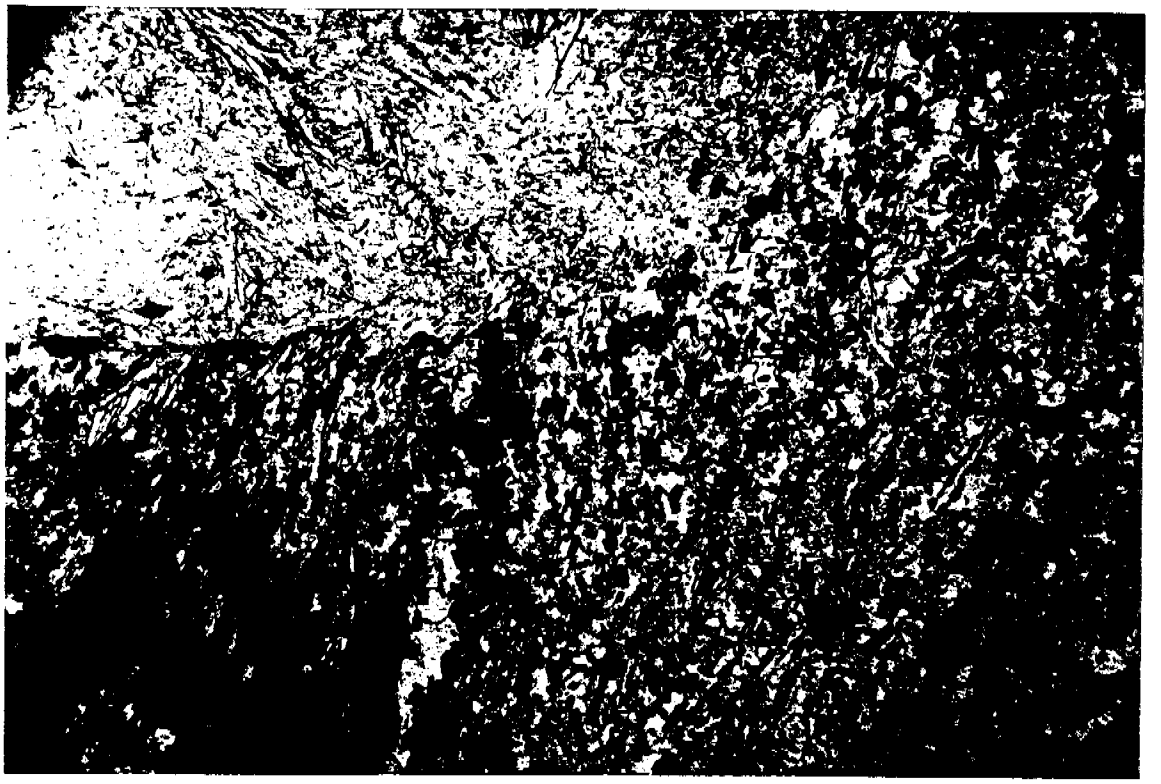


PLATE 11a: Sample 10 411 - Plane polarised light photomicrograph of an area of polished thin section 10 411 showing details of contrasting breccia fragments. One fragment is composed essentially of deformed muscovite (colourless area) while the second consists of a moderately well laminated, graphite-sulphide (both black)-tourmaline (brown prisms)-muscovite (colourless laths and plates)-quartz (clean, colourless) matrix. 4.5mm

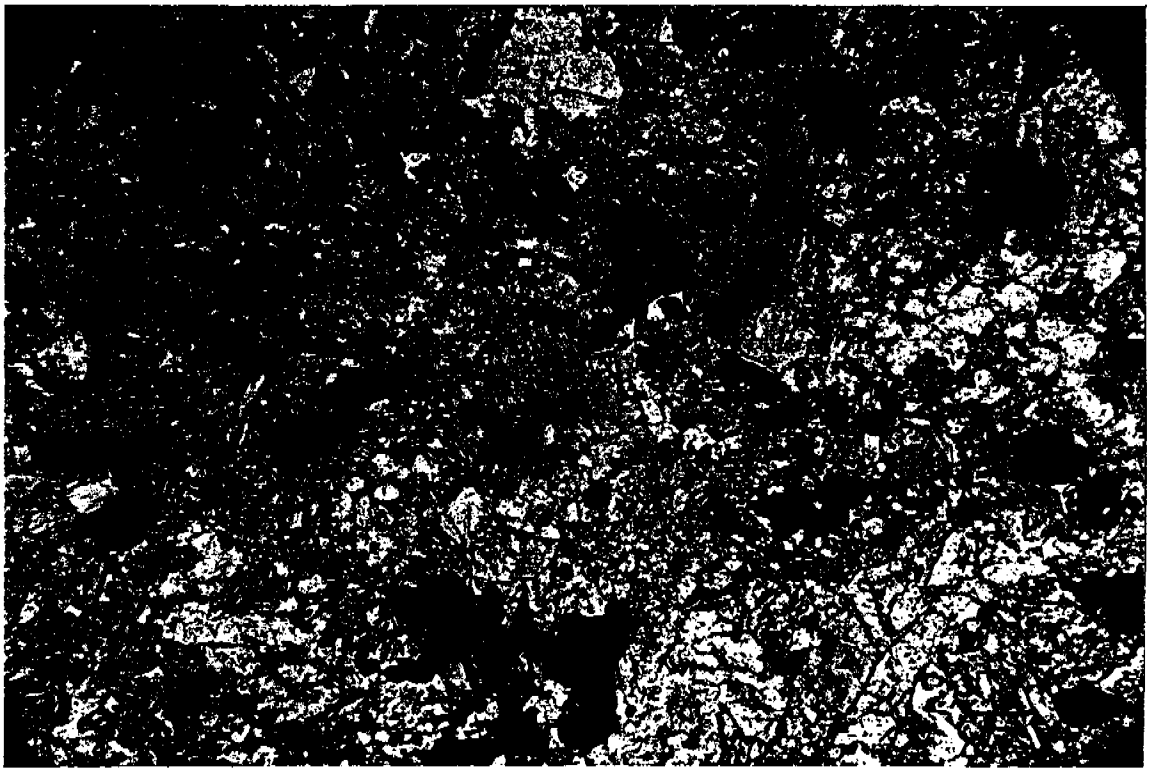


PLATE 11b: Sample FEN10 448.5 - Plane polarised light photomicrograph of an area of polished thin section FEN10 448.5 illustrating decussate ragged biotite/phlogopite flakes (pale orange-brown), amphibole granules and plates (pale buff, high relief), granular sphene (dark reddish brown, high relief), pyrrhotite granules (black), turbid sericitised plagioclase and minor quartz (colourless). 4.5mm.

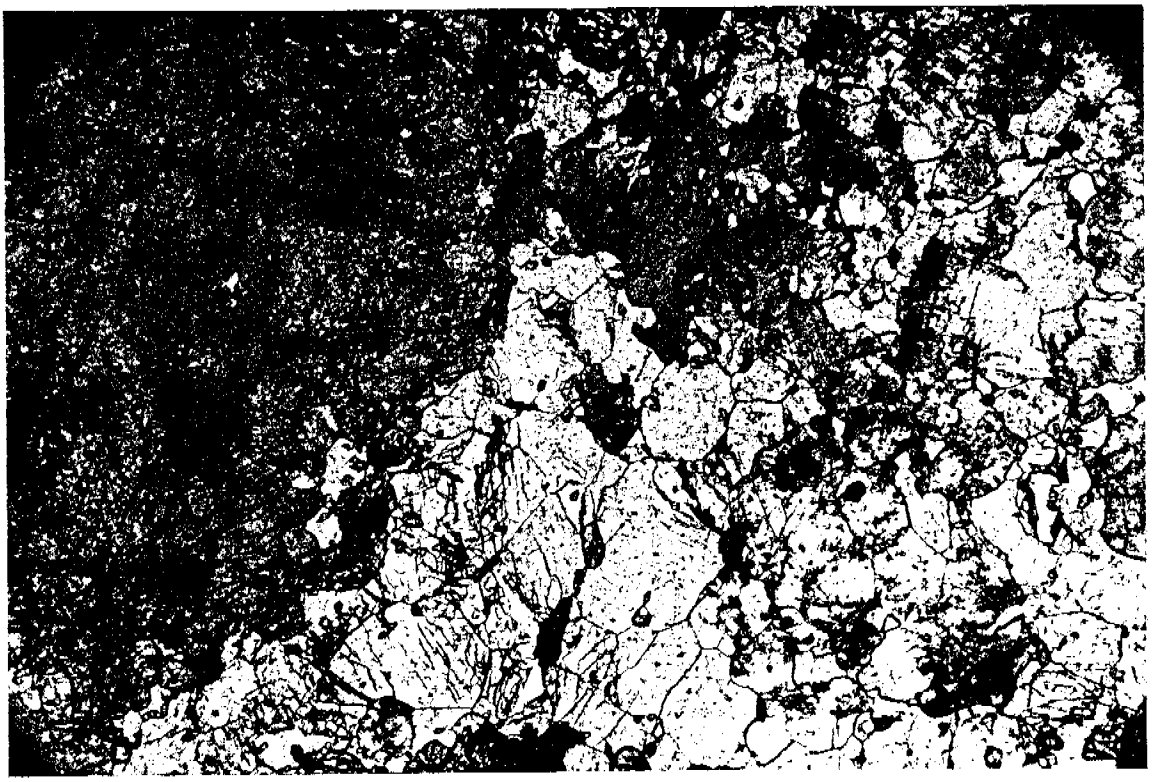


PLATE 12a: Sample 10 477 - Plane polarised light photomicrograph of an area of polished thin section 10 477 illustrating part of a coarse clinopyroxene plate (brown, high relief) with associated granular aggregate of partially turbid sericitised plagioclase (patchy dusty brown), sphene granules (dark brown-black, high relief) and granoblastic polygonal fluorite (clean, colourless). 4.5mm

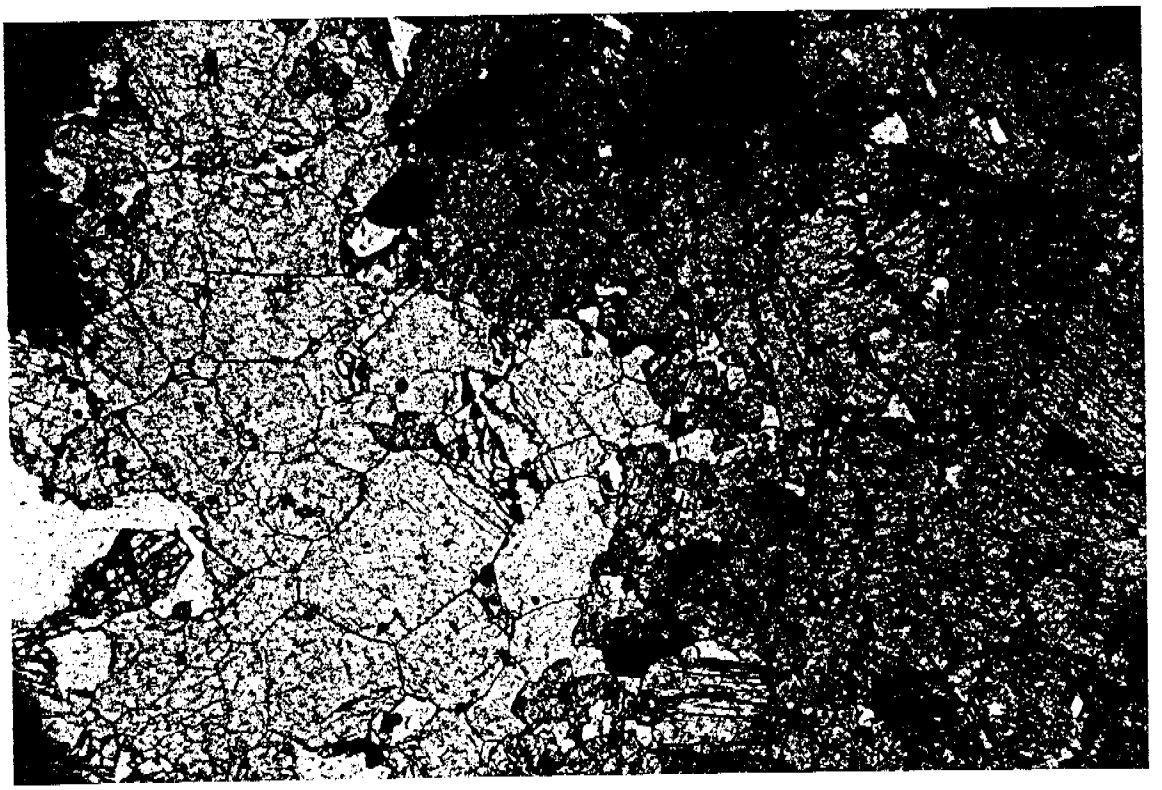


PLATE 12b: Sample 10 477 - Plane polarised light photomicrograph of an area of polished thin section 10 477 illustrating an area of granoblastic polygonal fluorite (colourless) associated with a coarse granular intergrowth of clinopyroxene (brown, high relief) and turbid sericitised plagioclase (brown, lower relief). 4.5mm.

PLATE 13a: Sample FEND10 484.5 - Plane polarised light photomicrograph of an area of polished thin section FEND10 484.5 illustrating coarse apatite rods and rod aggregates in a turbid, clay- and sericite-altered plagioclase matrix with associated minor epidote. 4.5mm

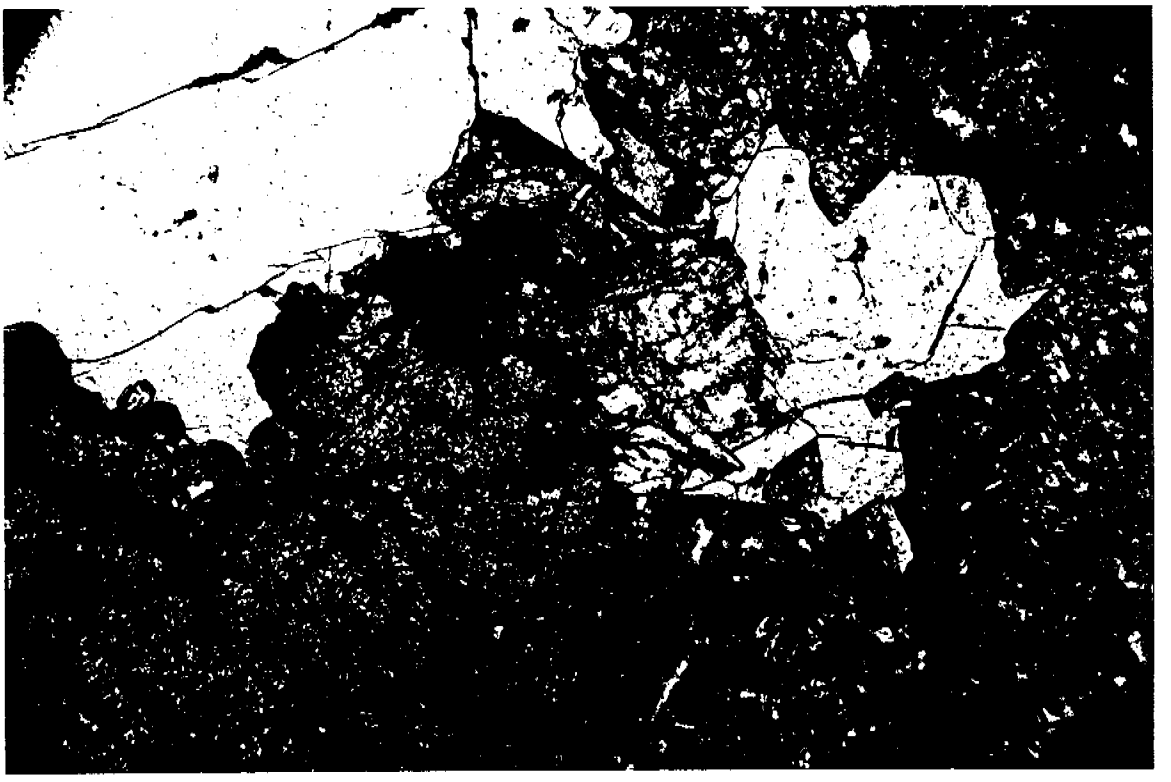


PLATE 13b: Sample FEND10 484.5 - Plane polarised light photomicrograph of an area of polished thin section FEND10 484.5 showing details of fluorite plates (colourless) associated with very coarse-grained clinopyroxene (cleaved, high relief), strongly sericitised and clay-altered, turbid plagioclase and minor epidote. 4.5mm.

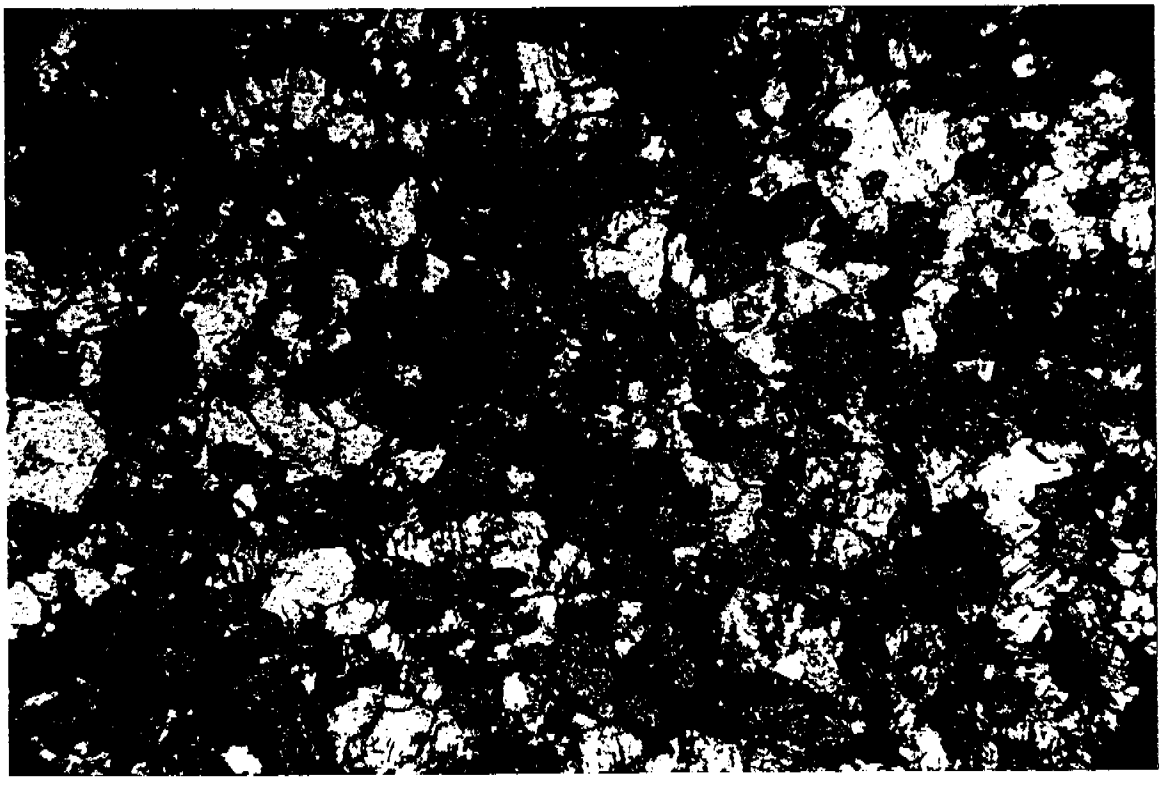


PLATE 14a: Sample 10 486.2 - Plane polarised light photomicrograph of an area of polished thin section 10 486.2 showing granular clinopyroxene (high relief) in a matrix of patchily sericitised plagioclase ("colourless"). 4.5mm

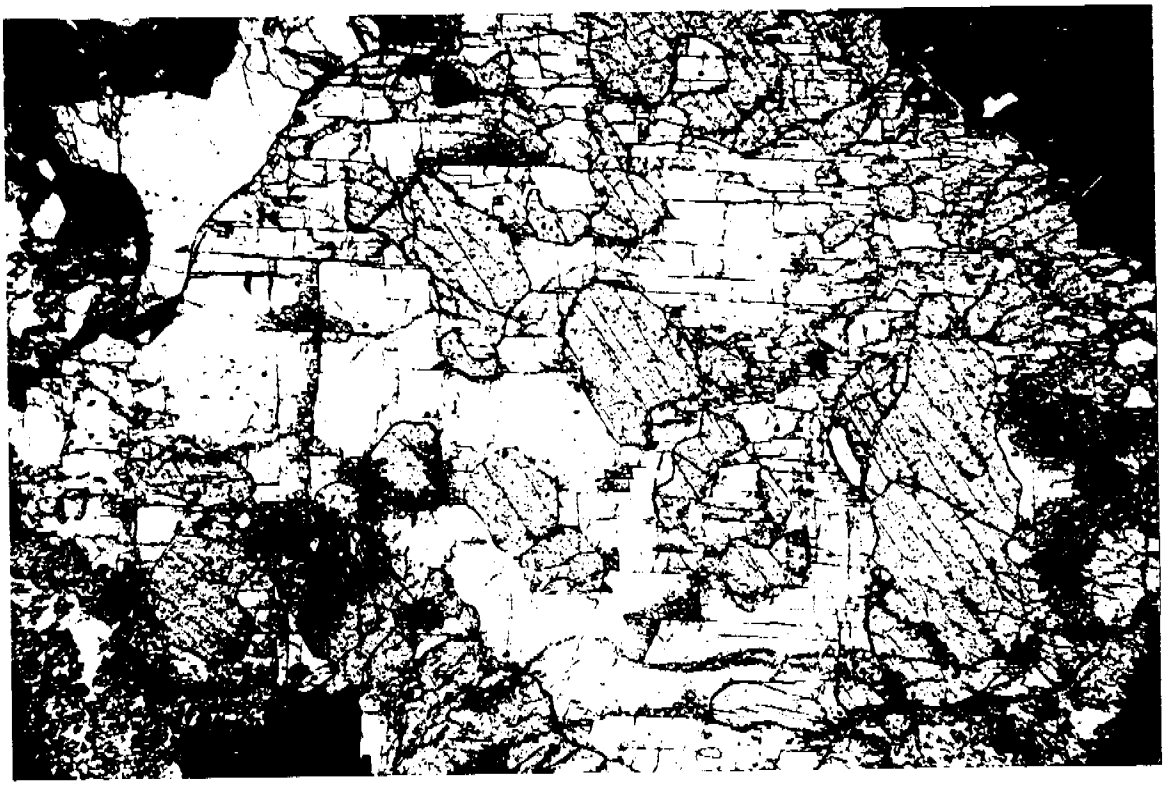


PLATE 14b: Sample 10 487.8 - Plane polarised light photomicrograph of an area of polished thin section 10 487.8 illustrating clinopyroxene ovoids (pale buff, high relief) in a coarse plate of scapolite (colourless, intersecting cleavage at right angles) showing incipient alteration along cleavage with associated fluorite (colourless) and sphalerite (opaque). 4.5mm.

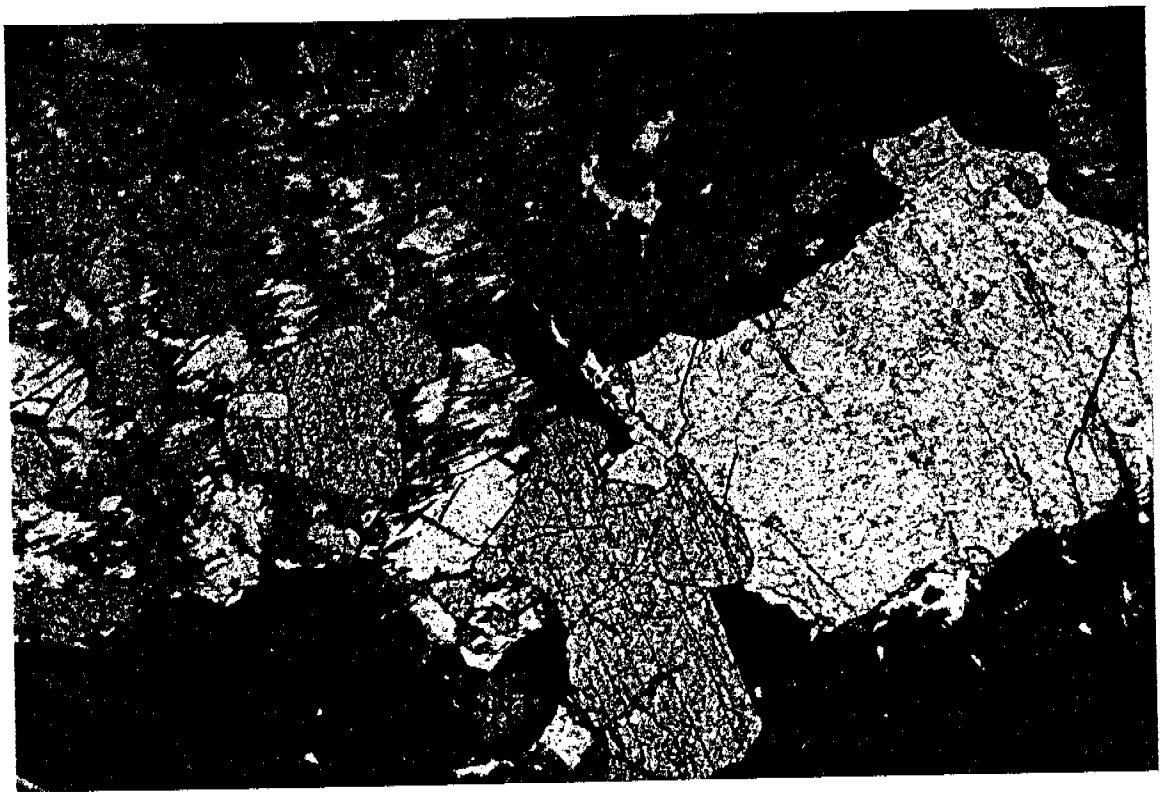


PLATE 15a: Sample 10 487.8 - Plane polarised light photomicrograph of an area of polished thin section 10 487.8 showing clinopyroxene ovoids (pale buff, cleaved) in an extensively altered scapolite matrix (feathery green and colourless) with associated coarse fluorite (colourless), pyrrhotite and sphalerite (opaque). 4.5mm

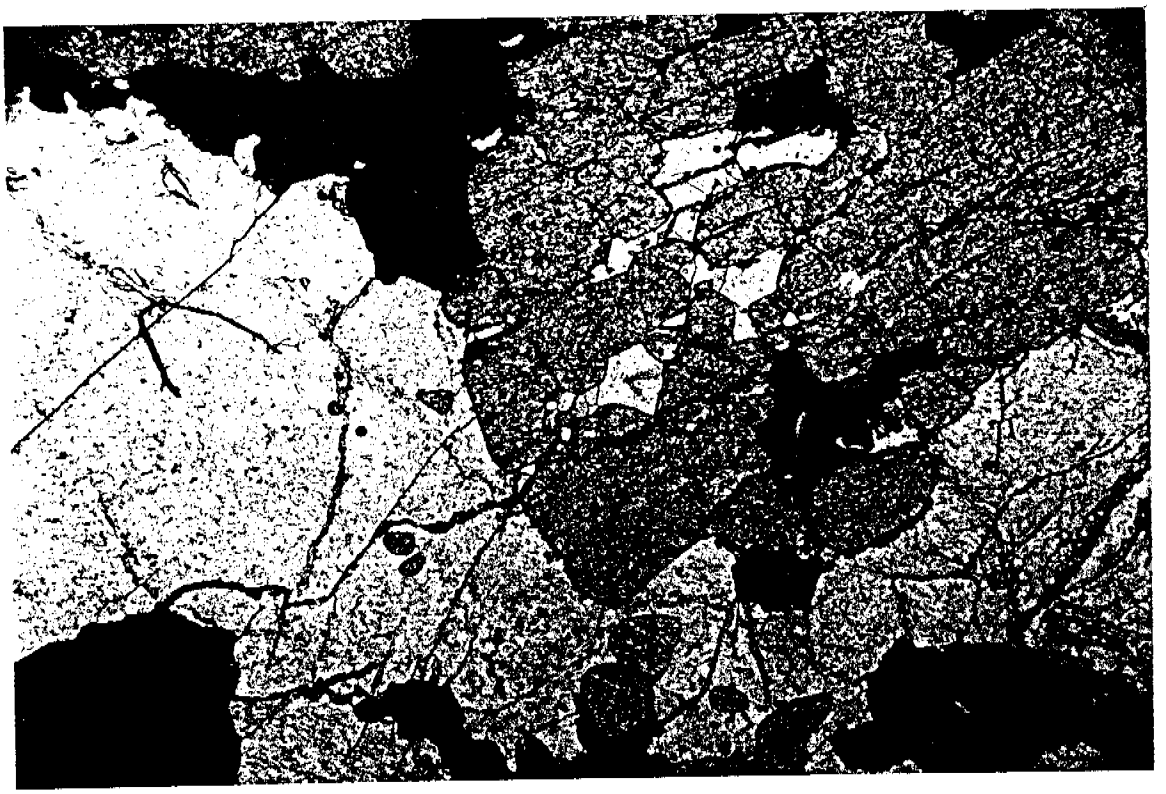


PLATE 15b: Sample 10 487.8 - Plane polarised light photomicrograph of an area of polished thin section 10 487.8 showing details of clinopyroxene (pale buff, high relief), fluorite (colourless) and sphalerite (opaque) relations. 4.5mm.

PLATE 16a: Sample 10 488 - Plane polarised light photomicrograph of an area of polished thin section 10 488 illustrating strongly zoned, partially altered scapolite crystals in a matrix of colourless to pale mauve-purple fluorite. Note the superimposed, dense fine sheet fracturing traversing the matrix but with no accompanying translation or disruption. 4.5mm

PLATE 16b: Sample 10 488 - Plane polarised light photomicrograph of an area of polished thin section 10 488 illustrating strongly idioblastic dispersed zircon crystals and crystal clusters in a matrix of massive coarse-grained clinopyroxene. Note the intense sheet fracturing of the matrix but with no apparent translation or disruption. 4.5mm.

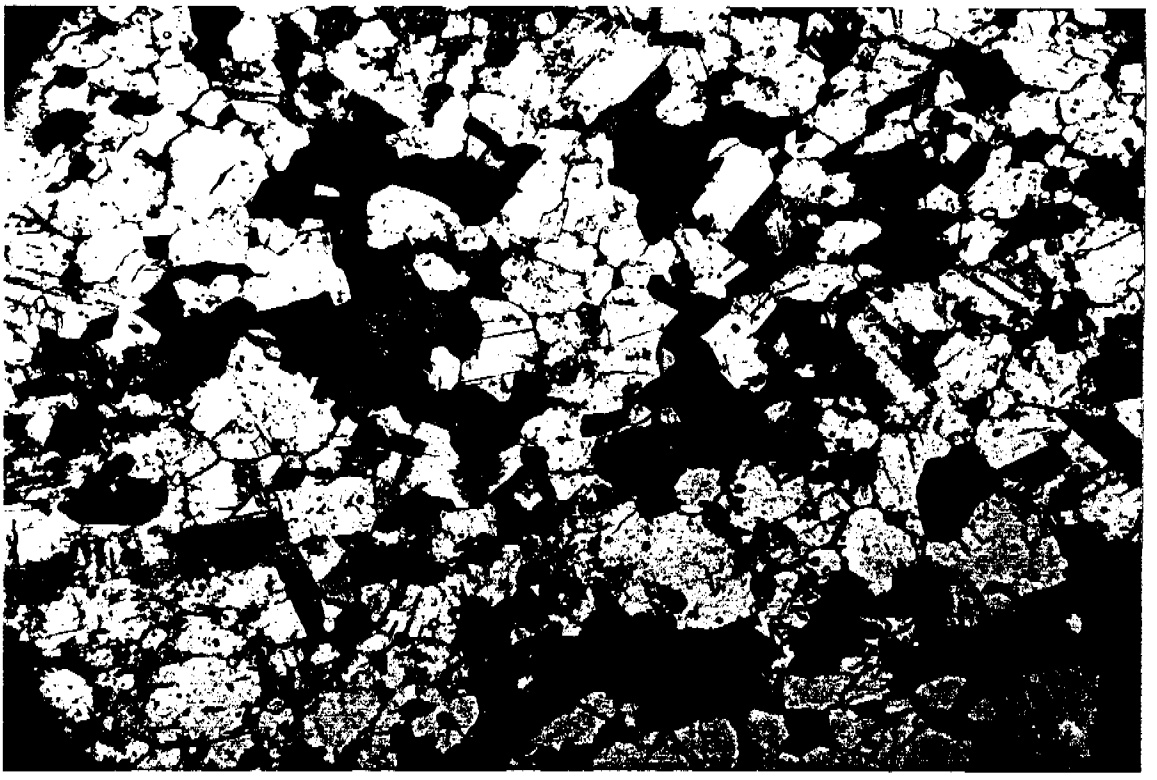


PLATE 17: Sample 10 493 - Plane polarised light photomicrograph of an area of polished thin section 10 493 showing decussate biotite laths (brown), together with dispersed sphene granules and granular aggregate (dark brown, high relief) and sulphide grains (black) set in a uniform-grained granoblastic polygonal matrix of quartz and feldspar (colourless). 4.5mm

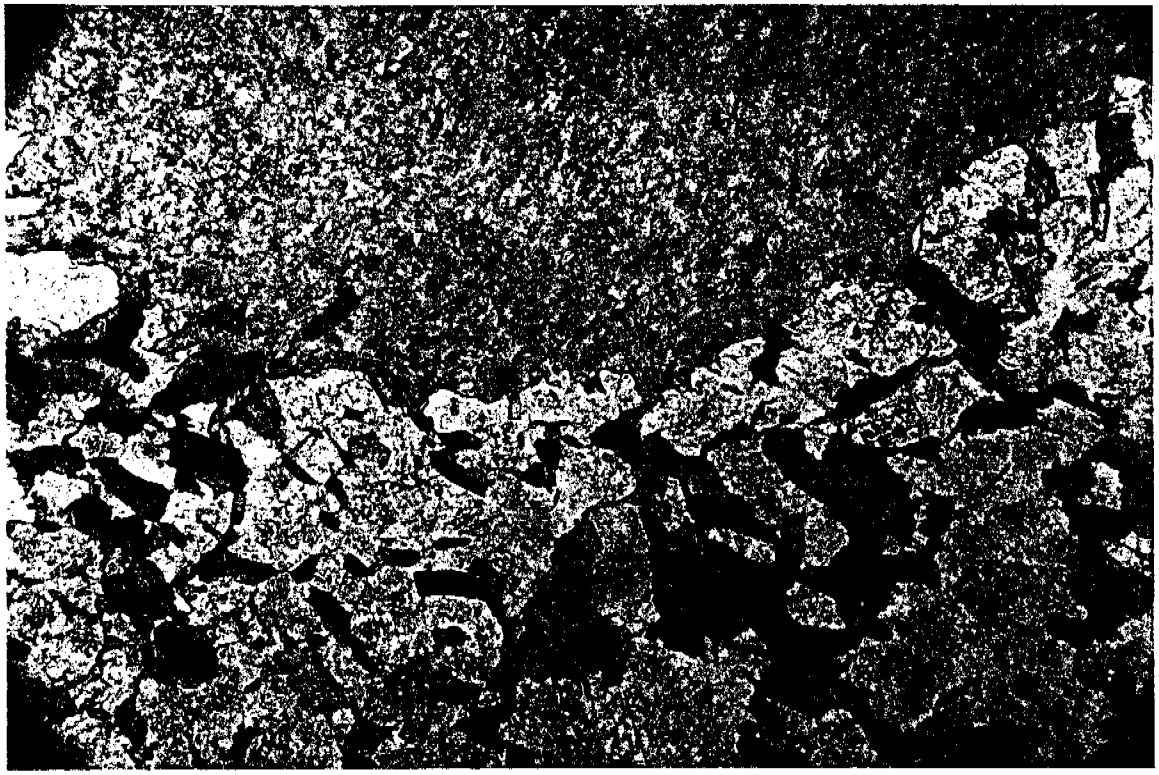


PLATE 18a: Sample 10 500.5 - Plane polarised light photomicrograph of an area of polished thin section 10 500.5 illustrating a rock matrix composed of intergrown decussate biotite-chlorite laths (brown and green) set in a turbid granoblastic polygonal matrix of partially sericitised plagioclase and invaded by a massive, monomineralic vein of chlorite composed of decussate rosettes. 4.5mm

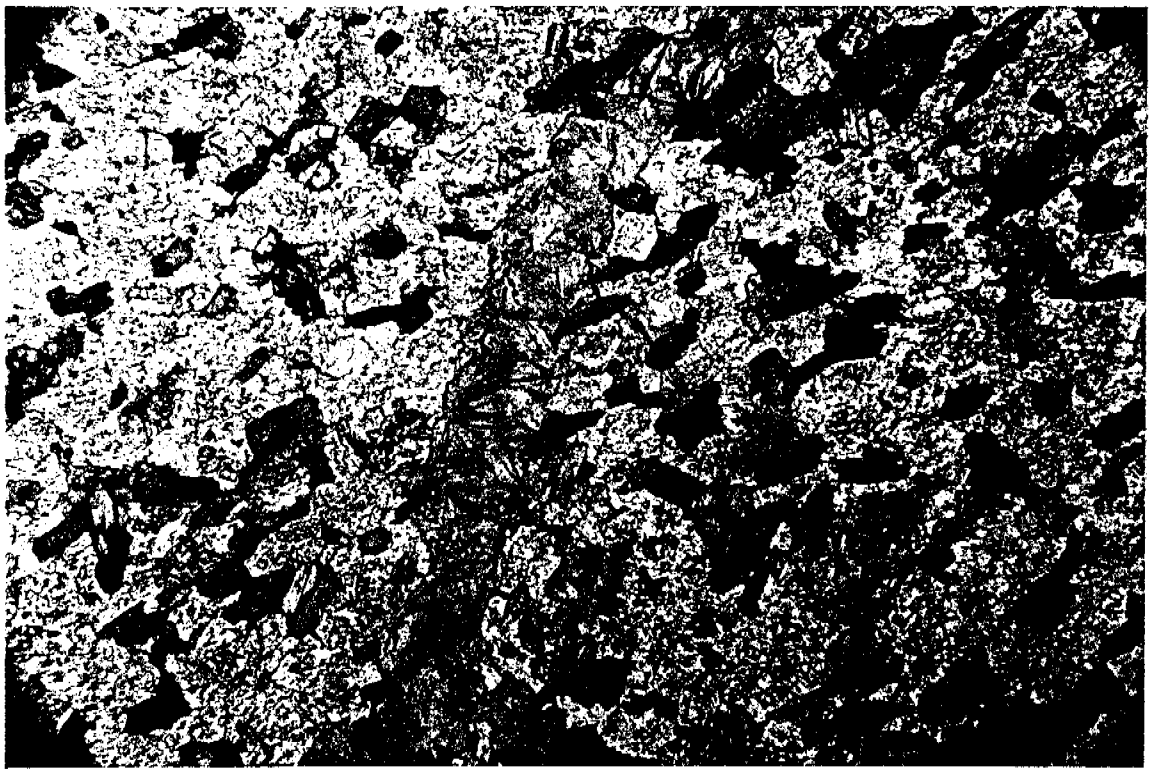


PLATE 18b: Sample 10 500.5 - Plane polarised light photomicrograph of an area of polished thin section 10 500.5 showing crudely lepidoblastic biotite (brown) and chlorite (green) laths set in a matrix of turbid, granoblastic polygonal equant aggregate of sericitised plagioclase. The illustrated matrix is traversed by a narrow chlorite vein composed of decussate rosettes. 4.5mm.

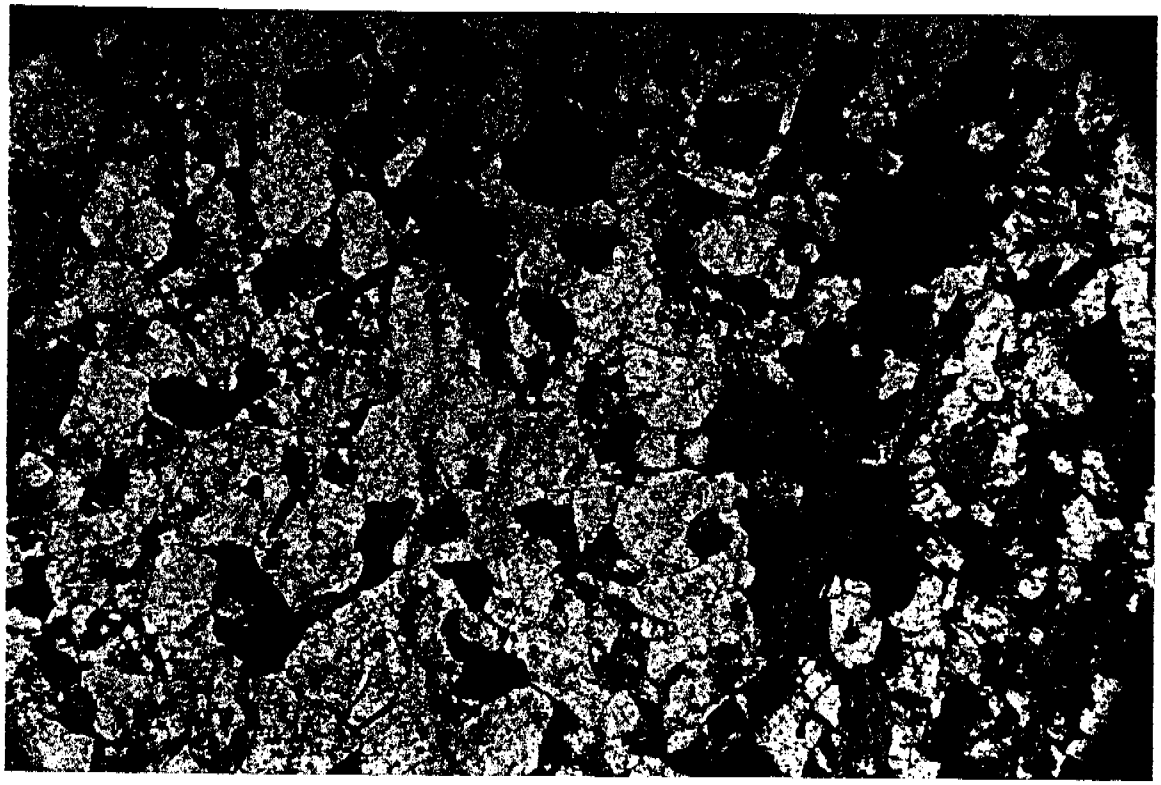


PLATE 19a: Sample 10 503.8 - Plane polarised light photomicrograph of an area of polished thin section 10 503.8 showing partially chloritised lepidoblastic biotite laths (green and brown) with associated sulphide grains (black) set in a granoblastic polygonal equant matrix of microcline, turbid, partially sericitised plagioclase and lesser quartz. 4.5mm

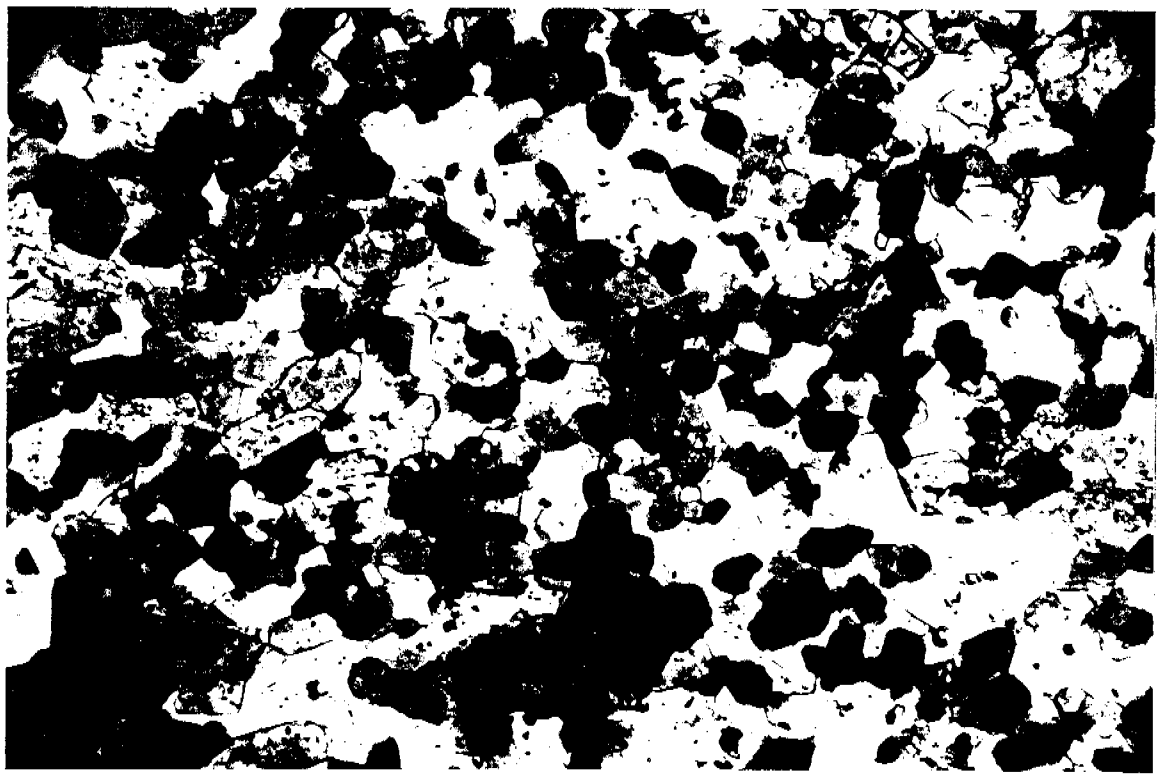


PLATE 19b: Sample 10 507.2 - Plane polarised light photomicrograph of an area of polished thin section 10 507.2 illustrating foxy brown prismatic tourmaline prisms, with associated sulphide (black) set in a granoblastic polygonal equant, quartzo-feldspathic matrix. 2.25mm.