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RGC EXPLORATION PTY. LIMITED

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AUTHORITY TO PROSPECT, QUEENSTOWN

REPORT ON EXPLORATION 1987-88

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SUMMARY

The Authority to Prospect, Queenstown covers 14 Mining Lease Applications, which total 1005 hectares, adjoining the Mt. Lyell Consolidated Mine Lease, 30M/80. The A to P is due to expire on 5th August, 1988. RGC Exploration Pty. Ltd. conducts exploration over the A to P as well as on the Mt. Lyell Mine Lease, away from the currently producing copper ore bodies. During 1987-88 exploration activity focused on two areas: the Little Owen area with the A to P south of the Mine Lease and the Comstock area at the northern end of the Mine Lease.

In the Little Owen Area, investigations were aimed at identifying structural controls on a gold mineralized zone located during 1986-87 in the vicinity of the Little Owen Adits and to test for possible strike extensions or repetitions of this mineralization. This work involved detailed geological mapping and systematic channel sampling of outcrops along grid lines across the projected strike extensions of the gold zone. In addition, four old prospect adits were located, re-opened and channel sampled using a pneumatic chipping hammer. The adits sampled were at the Great Lyell, Duke Lyell and Empress Lyell workings and a helicopter was used to support this program.

Unfortunately, the results of these investigations have failed to detect any extensions to, or repetitious of, the gold mineralized zone outlined at the Little Owen Adits area. However, potential still exists for the occurrence of high grade shoots of gold mineralization of sufficient tonnage to be attractive targets within the vicinity of the Little Owen Adits. It is recommended that two diamond drill holes, totalling 400m, be completed to test for high grade gold along strike and down plunge within the mineralized zone. This work should be preceeded by two short (max 20m. each) holes drilled from the Upper (No.1) Adit to test the continuity of gold mineralization (max. 6m at 6.2 g/t Au) in this vicinity. Additional geological and geochemical work is also recommended to investigate other untested gold targets within the Little Owen-Great Lyell area.

A 675m deep diamond drill hole (C69) was completed at Comstock to test for high grade copper-precious metal mineralization adjacent to the Comstock Chert. No such mineralization was intersected in the hole. Unfortunately, the proposed down-hole EM survey to test for significant off-hole conductors could not be carried out due to the failure to keep the hole open with PVC pipe. Consequently, this North Lyell-style ore target remains inadequately tested at Comstock.

Hole C69 did intersect a broad zone of anomalous gold and base metal mineralization which straddles the inferred SW margin of the Comstock Chert. The style of alteration and mineralization encountered in this hole is not typical of the main copper ore bodies at Mt. Lyell and highlights the potential for alternative gold and base metal-rich mineralization in the Comstock area.

It is recommended that further exploration is conducted at Comstock to fully evaluate the potential for high grade copper-precious metal ore deposits as well as economic gold-base metal mineralization. This work would involve systematic re-logging and re-assaying of previous drill core as well as a detailed assessment of existing exploration and mine development data in the Comstock area. It is expected that (deep?) drill targets would be identified by this work.

A budget of $110,000 has been proposed to carry out these recommendations during 1988-89. This budget does not allow for any deep diamond drilling in the Comstock area, which lies within the Mt. Lyell Mine Lease. The estimated total expenditure for the exploration completed during 1987-88 is $109,370.

1. INTRODUCTION

The Authority to Prospect, Queenstown covers an area of 1005 hectares, adjoining the Mt. Lyell Consolidated Mine Lease 30M/80. RGC Exploration Pty. Ltd. has carried out exploration over this area since the tenement was first granted to the Mt. Lyell Mining and Railway Co. Ltd. in 1984. RGC Exploration have also been responsible for mineral exploration within the Mine Lease, away from the currently producing ore bodies at Mt. Lyell. This report details those investigations carried out during July . 1987-June 1988 by RGC Exploration on the A to P and the Mine Lease.

During 1987-88 exploration has focussed over two main areas: the Little Owen area, immediately south of the Mt. Lyell Mine Lease within the A to P; and the Comstock area, within the northern part of the Mine Lease (see Figure 1).

The work at Little Owen was designed to investigate further, encouraging gold mineralization outlined in the vicinity of the Little Owen Adits during 1986-87 (FitzGerald, 1987a). This work involved: detailed mapping along the gold mineralization trend and other potentially mineralized structures; semi-continuous surface channel sampling of outcrop along extensions to the Little Owen Adits Grid; and helicopter-supported channel sampling of the Great Lyell, Duke Lyell and Empress Lyell adits using a pneumatic chipping hammer.

The potential for the occurrence of high grade Cu + Ag + Au mineralization at depth in the vicinity of the Comstock Chert body was discussed by Arnold (1985) and Komyshan (1985). In order to evaluate this potential a deep diamond drill hole was designed to test the downward extensions of the Comstock Chert and immediately underlying "Lyell Schists" in an area not covered by earlier drilling. Drill hole C69 was completed at 674m during 1987-88.

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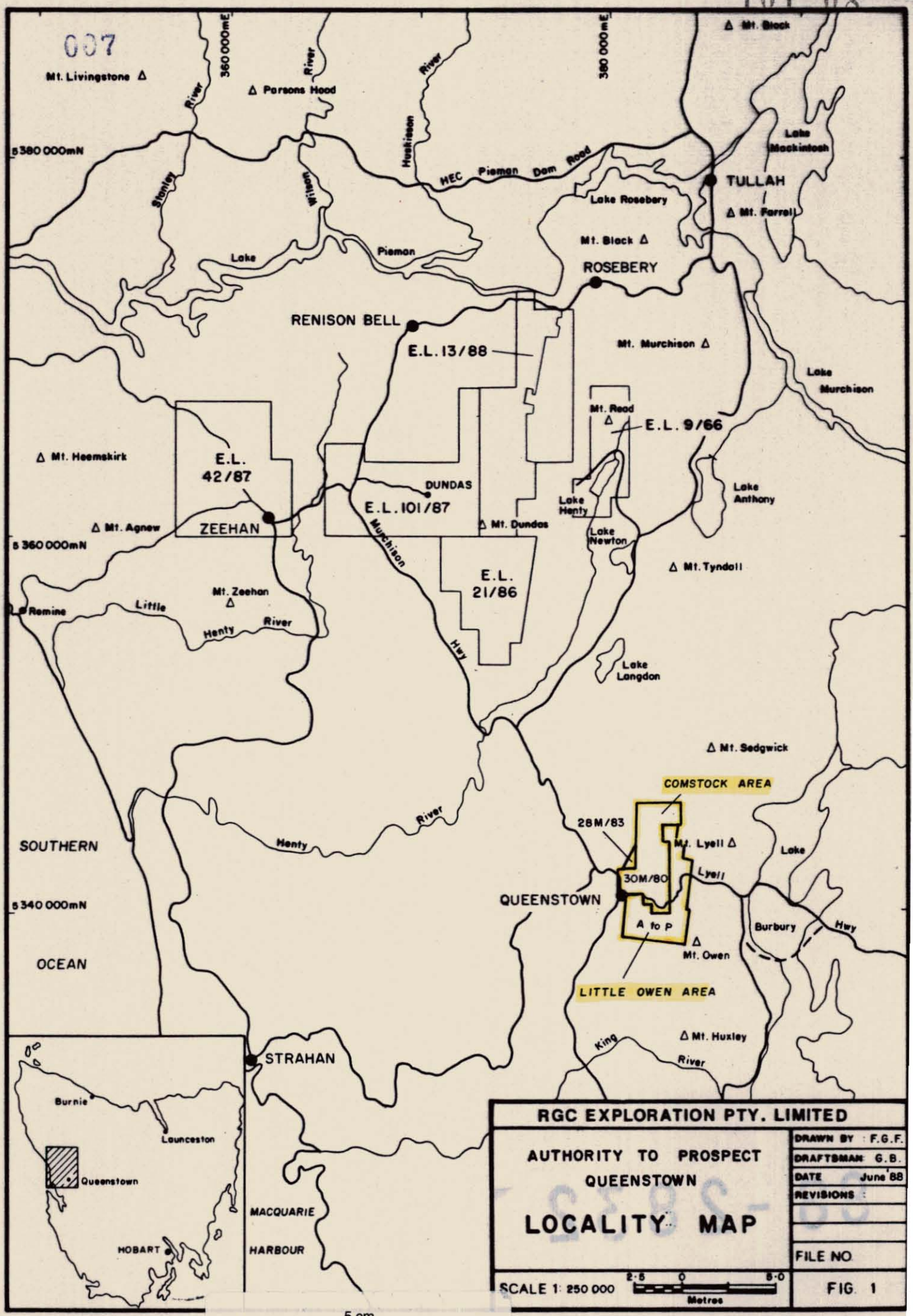

RGC EXPLORATION PTY. LIMITED

AUTHORITY TO PROSPECT
QUEENSTOWN

LOCALITY MAP

DRAWN BY : F.G.F.
DRAFTSMAN: G.B.
DATE June 88
REVISIONS :
FILE NO

SCALE 1: 250 000 — 2·5 0 5·0 Metres

FIG. 1

5 cm

2. LAND TENURE

The Authority to Prospect, Queenstown area, Western Tasmania was first granted to the Mt. Lyell Mining and Railway Company Limited on 5th January, 1984 to cover forty Mining Lease Applications surrounding the current Mt. Lyell Consolidated Mining Lease, 30M/80. The total area included in this A to P was 2961 hectares. The Company sought to renew fourteen of the MLA's covering 1005 hectares in June, 1987. The Mines Department subsequently granted an extension of the A to P until 5th August, 1988. The remainder of the MLA's were transferred back to EL 9/66 and relinquished on 5th August, 1987 (FitzGerald 1987b).

The area covered by the A to P was initially held by the Mt. Lyell Co. as part of Consolidated Mining Lease 15M/75. Mt. Lyell had carried out exploration over sections of this Mine Lease as part of their work program on the adjoining EL 10/69. Then, in 1980, the Mining Lease was reduced from 4912 ha to 1171 ha (30M/80) with the balance of the area, known as the "Buffer Zone", being incorporated into EL9/66 (itself an amalgamation of former EL's 9/66, 10/69, 41/71 and 21/76). The "Buffer Zone" was not included in the Joint Venture Agreement signed in 1976 with the Getty Oil Development Co. Ltd., over the rest of EL9/66. The Company sought to have the current A to P excluded from the EL area just prior to the major reduction in area of EL9/66 in 1984. This led to pegging of the Mining Lease Applications, 1M/84-40M/84.

3. PREVIOUS EXPLORATION

A comprehensive account of all the previous exploration, including a summary of all the available data from early prospecting activities, covering the A to P was presented by FitzGerald (1987a). Since 1984 RGC-Mt. Lyell have focussed attention on the potential for high grade Cu ± Ag ± Au ore bodies of the North Lyell, and parts of the Blow, deposit styles, as well as the potential for stand alone gold deposits, within the current Mine Lease and original A to P areas. The results of these investigations highlighted the gold potential of the Little Owen area and the potential for high-grade copper deposits, which remained untested by previous drilling, in the Comstock and Blow-South Lyell areas (Arnold 1985, Jones 1985 and Komyshan 1985).

During 1986 and 1987 detailed geological mapping was carried out by Herrmann (1986) and systematic rock geochemistry completed over the Little Owen-Great Lyell area. This lead to detailed channel sampling of outcrop in the vicinity of the Little Owen Adits and helicopter supported channel sampling of the Little Owen Nos. 1 and 2 Adits and the Little Owen South Adit. A zone of significant gold mineralization was outlined in the immediate vicinity of the Little Owen Adits, including a high grade section of 5.7m (true width) at 6.2 g/t Au in the No. 1 Adit. Two helicopter-supported drill holes (LO1 and LO2) were completed for a total of 310m to test this mineralized zone during March-April, 1987. The mineralized zone was intersected in both holes, but unfortunately the gold grades were rather subdued viz: 14m (down-hole) at 0.13 g/t Au in LO1 and 21m (down-hole) at 0.31 g/t Au, including a maximum of 1m at 1.98 g/t Au in LO2 (FitzGerald, 1987a).

Work in the Comstock area since 1985 has involved: a compilation of the existing data on the Comstock and Tasman and Crown Lyell Mine workings; re-assessment of all the previous drilling in the Comstock-Queen Lyell area, including both surface and underground exploration drilling; re-logging and re-assaying some of this previous drill core; and the development of structural contours outlining the extent of the Comstock Chert body and the Owen Conglomerate-Lyell Schists (Great Lyell Fault) contact. This work high-lighted the potential for significant high grade copper mineralization within altered volcanics adjacent to the structural footwall of the intensly silicified and hematitic Comstock Chert, by analogy with the North Lyell deposit model (Arnold 1985). This potential had not been tested at depth by any previous drilling.

4. WORK COMPLETED 1987-88

4.1 LITTLE OWEN AREA

Field work in the Little Owen area during 1987-88 was largely carried out by contract geologist W. Herrmann. A detailed report on this work was submitted as a memorandum by Herrmann and is presented in Appendix B. The results of the exploration program are briefly summarized below:

4.1.1 Geological Mapping

Detailed geological mapping with an emphasis on structure and mineralization was carried in the vicinity of the Little Owen Adits; along the projected strike extension of the gold mineralized zone and along the (largely inferred) Great Lyell Fault zone immediately east of the Little Owen area. The aim was to identify any structural control on the Little Owen Adits gold mineralization and to locate extensions and/or repetitions of this zone within the Great Lyell-Little Owen area.

These investigations were singularly unsuccessful. Herrmann could not find any significant structural controls on the gold zone. He could not identify any prominent changes in the structural trends of either primary layering or the regional cleavage. Similarly, no evidence for a major WNW trending fault zone could be discerned over areas of reasonable outcrop in the Little Owen area. Mapping to the east, particularly along the volcanics-conglomerate contact and along the inferred South Owen Fault (see Figure 2), also failed to elucidate controls on the gold zone. However, Herrmann now believes that much of the volcanics-conglomerate contact is not faulted and the distribution of these sequences is controlled largely by folding.

4.1.2 Geochemical Sampling

Two programs of geochemical sampling were completed, both aimed at locating extensions to the gold mineralized zone away from the immediate vicinity of the Little Owen Adits.

The first phase of activity involved extending the Little Owen Adits Grid base line along the strike of the gold zone both to the SE (to 230N) and to the NW (to 1200N). Four cross lines (430N, 600N, 800N and 1150N) were located to maximize the outcrop and marked out between 950E and 1050E. Outcrop along each line was channel sampled semi-continuously over

approximately 3 metre intervals and submitted to Analabs (Burnie) for copper and gold analyses by AAS. All sample locations are shown on Figures 3-8, the gold assays are shown on Figures 9-14 and details of each sample, including all assay results, are presented in Appendix C.

The results from the outcrop sampling were very disappointing: no significant Au or Cu values were obtained. All gold assays were below 0.01 g/t Au apart from 3 unconnected samples along line 1150N, which lie roughly along strike from the gold zone, and which assayed between 0.02 amd 0.04 g/t Au. Copper values were similarly subdued, ranging between 5-75 ppm Cu. It is worth noting that many of channel samples were deeply weathered and leached (as demonstrated by the very low copper assays). However, where less weathered outcrop was sampled, particularly along line 1150N, there was no systematic increase in assay values.

The second phase of geochemistry involved channel sampling all of the accessible openings in the Great Lyell, Duke Lyell and Empress Lyell Adits (see Figure 2 for locations) using a pneumatic chipping hammer. All of the adits required preparatory work, particularly draining them past caved blockages, and careful inspection of old timbers and the backs of drives. Only those areas deemed safe were cleared and marked for sampling. Two metre channel samples were collected and submitted to Analabs (Burnie) for copper and gold analyses by AAS (methods 101 and 329) with all samples >0.2 g/t Au being repeated by fire assay (method 309). All assay results are presented in Appendix C and the sample locations and gold assays are shown on Figures 3-8 and 9-14 respectively.

Once again, the assay results were rather disappointing. No significant zone of gold mineralization, similar to that outlined in the Little Owen Adits, was identified. Several zones of minor copper mineralization, which are sometimes accompanied by elevated gold values, were identified between the 4 adits sampled. The most significant assays came from the Duke Lyell Adits and from rock chip sampling along old trenches above the workings as follows:

Location	Distance	% Cu	g/t Au
Surface trenches	30m	0.60	0.08
No.1 (Upper) Adit	12m	0.50	0.22
No.2 (Lower) Adit	10m	0.27	0.08

These results, which may represent true widths of 3-5m, are fairly typical Mt. Lyell (Prince Lyell) copper gold ratios. They are clearly uneconomic and appear to be diminishing in grade with depth.

The maximum gold value of 0.38 g/t Au was obtained at Duke Lyell No. 1 Adit. Gold values at the Great Lyell Adit ranged from <0.01 to 0.08 g/t Au and at the Empress Lyell Adit from <0.01 to 0.11 g/t Au. Similarly, copper values ranged from <5 to 3400 ppm Cu at Great Lyell and from 15 to 95 ppm Cu at Empress Lyell.

Previous sampling of mullock out of old prospect trenches by Herrmann in 1986 had returned values as high as 1.5 g/t Au in the vicinity of Empress Lyell. Repeat sampling, however, could not reproduce such relatively high gold values, thus confirming the generally low tenor of gold outlined in the main adit here.

4.2 COMSTOCK AREA

4.2.1 Diamond Drilling

Diamond drill hole C69 was designed to test for high grade Cu ± Ag ± Au mineralization adjacent to the Comstock Chert at depth 100m to the north of the Comstock ore lenses between an RL of 100m and 0m. The hole was drilled during 1987 using a Longyear 44 rig sited on an existing mine and drill access track. Upon completion of drilling the hole was lined with PVC pipe to the end in preparation for a down-hole EM survey. Unfortunately, the PVC pipe separated at a join (s) during the recovery of the HW casing and the hole became blocked at 130m. Consequently no down-hole geophysical surveys could be carried out.

Details of drill hole C69 are as follows:

Collar co-ordinates: 7780.3MN, 5113.4mE (Mine Grid);
5345058.7mN, 382705.8mE (AMG)
Collar RL: 525.9m
Collar bearing: 081.1° (Mine Grid); 089.4° (AMG)
Collar dip: -64.6°
Length of hole: 674.0m
Hole commenced/completed: 27/8/87 - 22/11/87

The location of hole C69 is shown on the geological interpretation plan (Figure 16). A drill section showing major lithological units intersected and significant assay intervals is presented as Figure 17. The core was geologically logged by M. Arundell of Mt. Lyell and all zones of interesting alteration and mineralization were split and sampled over 1 or 2m intervals. These samples were submitted to Analabs

(Burnie) for analysis of Cu, Pb, Zn, Ag, Bi and Mo by AAS (methods 101 and 104) and Au by fire assay (method 309). The detailed log, including all assay results, is presented in Appendix D. In addition, Arundell submitted a suite of 14 samples of representative drill core to Dr. A.S. Joyce (Geochempet Services) for detailed petrographic descriptions. Joyce's report is included as Appendix E.

Drill hole C69 failed to intersect any high grade copper mineralization, in fact no significant base or precious metal mineralization was encountered in the hole. However, a broad zone of anomalous gold and base metal values was outlined between 461-524m and a second, much narrower zone was intersected between 636-641m. Highest assay intervals are:

466.0-479.0m,13m at 0.26g/t Au,0.17% Cu,0.34% Pb, 0.24% Zn;
516.0-524.0m, 8m at 0.22 g/t Au,0.12% Cu,0.04%Pb, 0.39% Zn,
and 638.0-641.0m 3m at 0.03g/t Au, 0.02%Cu, 0.31%Pb,1.22%Zn.
The maximum gold value is 0.86g/t Au over 1m between 473-474m.

The hole intersected a thin probable down-dip extension of the Comstock Chert between 476.5-482.5m. This sequence is characterized by intensly silicified and variably hematitic (jasperoid in part) silty to conglomeratic rocks with a distinctive "cherty" appearance, particularly within well rounded pebbles or clasts. The upper contact of the "Chert" appears to be faulted.

Up-hole from the "Chert", hole C69 traversed a sequence of intermediate volcanics, predominantly porphyritic andesitic lavas, which vary from relatively uniform massive units to strongly brecciated and disrupted units. This intermediate volcanic sequence is pervasively altered by chlorite-carbonate assemblages which increase in intensity down hole. Zones of strong quartz-sericite-pyrite hydrothermal alteration appear to over-print this assemblage, sometimes accompanied (?) by pervasive hematite and/or fuchsitic sericite. Late stage quartz-carbonate±chlorite±sericite veins, accompanied by pyrite and variable but minor chalcopyrite, galena, sphalerite, specularite and purple fluorite, occur particularly as the "Chert" is approached.

Down-hole from the "Chert", hole C69 traversed a sequence of inferred epiclastic lithologies, probably largely derived from intermediate composition volcaniclastics. Pervasive chlorite-carbonate-quartz-sericite alteration assemblages persist with minor patchy zones of hematite and green fuchsitic sericite. The sequence is quite strongly deformed, imparting a schistose fabric to the

core. Late stage veining with variable but generally quite minor sulphides occurs throughout. In general the intensity of alteration and mineralization decreases away from the "Cherty" unit.

The hole ended in Owen Conglomerate. The contact between the volcanics (Lyell Schists) and the conglomerate is at 653.1m and is marked by a narrow but fairly intense zone of shearing and hydrothermal alteration which probably represents the Great Lyell Fault. No significant mineralization occurs at this contact but the Owen Conglomerate is unusual in that the matrix has been chloritized.

4.2.2 Discussion

The broad zone of anomalous gold and base metal mineralization intersected in hole C69 straddles the inferred down dip extension of the Comstock Chert. Figure 18 shows a trace of the hole in plan with the structural contours of the Comstock Chert superimposed. It is apparent that the hole passed through the thin south-west margin of the "Chert" body and consequently did not thoroughly test the structural footwall of the main mass of the "Chert", where the North Lyell model predicted that a high-grade copper ore body could occur. It is tragic that the down hole EM survey could not be carried out due to the blockage of the hole since such off-hole high grade chalcopyrite-bornite massive sulphide bodies should be easily detected by this method. It is imperative that the technique of placing PVC casing down deep drill holes be modified to ensure that future holes can be kept open.

The styles of mineralization and alteration intersected in hole C69 are not typical of the normal Mt. Lyell ore zones. In particular, the abundance of carbonate, fuchsite and fluorite are striking and the elevated Au, Pb and Zn relative to Cu values are unusual. It is possible that this part of the Comstock area represents a zone of gold-rich base metal mineralization which is peripheral to the main copper ore zone at Mt. Lyell. Alternatively, the major structures, which are inferred to bound the somewhat enigmatic Comstock Chert body may have acted as conduits for mineralizing fluids, derived, in part, from different sources or through different processes to those which formed the copper-rich ore bodies within the Mt. Lyell field.

5. CONCLUSIONS AND RECOMMENDATIONS

Field investigations in the Little Owen area during 1987-88, including detailed structural mapping and systematic channel sampling of outcrop, have failed to locate any evidence for strike extensions to the gold mineralization zone previously outlined in the vicinity of the Little Owen Adits. Similarly, channel sampling of all accessible openings in the Great Lyell, Duke Lyell and Empress Lyell Adits has not identified other zones of gold-rich mineralization east of the Little Owen Adits.

A re-assessment of the adit channel sample and diamond drill core results from the Little Owen Adits area has confirmed that potential for shoots of high grade gold mineralization of sufficient tonnage to be attractive still remains untested. For example, the intersections in the No. 1 Adit of 6m at 6.2g/t Au and DDH LO2 of 17m at 0.3 g/t Au, including 1m at 2.0g/t Au and 1m at 1.25g/t Au are open along strike and at depth.

It is recommended that the gold zone be initially tested by drilling two short (20m maximum) horizontal holes from the Upper (No. 1) Adit to test the continuity of the gold-rich mineralization in this vicinity. This should be followed by completion of two diamond drill holes for a total of 400m to test the down plunge and along strike extensions of the gold zone for high grade intersections. The proposed intersections are shown on a longitudinal projection of the Little Owen Adits gold zone (see Figure 15). It is expected that one of the drill holes, (B) may need to be sited using helicopter support but the other (hole A) could be positioned on the crest of the Little Owen ridge using ground support off the existing track.

Elsewhere, within the Little Owen-Great Lyell area, it is recommended that a relatively low key gold exploration program be maintained. In particular: the Hematite Tunnel should be re-opened and channel sampled to test old reports of gold mineralization here; previous Mt. Lyell drill core from holes GL1-5 be re-logged in detail and systematically split and assayed for gold, to follow-up encouraging values obtained by Jones' (1985) "chip" sampling program; and scattered anomalous gold values located by the 1986-87 chip sampling program be investigated by geological mapping and more detailed rock geochemistry.

Completion of a deep diamond drill hole (C69) at Comstock during 1987-88 failed to intersect high grade copper-precious metal mineralization adjacent to the Comstock Chert. However, the inability to carry-out a proposed down-hole EM survey to test for significant off-hole conductors in the vicinity of hole C69 has meant that the original target has not been adequately evaluated. The broad zone of anomalous gold and base metal mineralization intersected in the hole across the inferred

margin of the Comstock Chert suggests that a different style of mineralization to that typical of the main Mt. Lyell ore bodies could occur at Comstock. The potential for gold-rich massive sulphide mineralization or structurally controlled high grade gold deposits presents an attractive exploration target in this area.

It is recommended that exploration for high grade copper-precious metals mineralization in the vicinity of the Comstock Chert and along extensions to the Great Lyell Fault be continued. An assessment of the available data from previous exploration and mining development, including the results from hole C69, is required. It is suggested that existing drill core should be systematically re-logged and re-assayed as part of this assessment. This work should also focus on the potential for gold rich mineralization to occur in the Comstock area, particularly associated with major-structures. It is expected that additional targets for (deep?) diamond drill testing will be identified by these investigations.

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APPENDIX A

SUMMARY OF EXPENDITURE: 1987-88

AND

PROPOSED BUDGET: 1988-89

RGC EXPLORATION PTY. LIMITED

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AUTHORITY TO PROSPECT, QUEENSTOWN

SUMMARY OF EXPENDITURE: 1987-88*

	$
Salaries, Wages and On Costs	19,000
Travel and Accommodation	1,160
Consultants and Contractors	16,175
Assaying	5,125
Drilling	60,860
Stores, Supplies	1,500
Vehicles Plant Equipment	3,100
Tenement Costs	50
Computing	0
Office Costs	2,400
TOTAL	$109,370

* Including estimated expenditure for June, 1988:

RGC EXPLORATION PTY. LIMITED

AUTHORITY TO PROSPECT, QUEENSTOWN

PROPOSED BUDGET: 1988-89

	$
Salaries, Wages and On Costs	35,000
Travel and Accommodation	4,000
Consultants and Contractors	6,000
Assaying	7,500
Drilling	42,000
Stores, Supplies	2,000
Vehicles, Plant, Equipment	3,500
Tenement Costs	500
Computing	500
Office Costs	9,000
TOTAL	$110,000

APPENDIX B

Geochemical Sampling in the Little Owen Area

Memo by W. Herrmann

G22

MEMORANDUM

To: F.G. FitzGerald, RGC Exploration Burnie.

From: W. Herrmann, RSD 1066 Devonport, 7310.

Date: 24th March 1988.

GEOCHEMICAL SAMPLING IN THE LITTLE OWEN AREA

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1. INTRODUCTION:

Previous exploration by GFEL in the Little Owen area (FitzGerald, June 1987) indicated that gold mineralisation occurred in a WNW trending zone which was recognised in surface rock chip channel samples over a strike length of 110m and was open ended beyond this. Significant gold was intersected within this zone at depth, in the Little Owen Adits No. 1 and No. 2 and drill holes LO1 and LO2.

As part of the further evaluation of this promising gold prospect a three part programme of sampling and mapping was carried out during the period November 1987 to January 1988. This comprised:

(i) Further outcrop channel sampling along the projected strike of the known mineralized zone to identify possible strike extensions.

(ii) Channel sampling of accessible adits in the Great Lyell, Duke Lyell and Empress Lyell workings which lie to the south east of the Little Owen prospect approximately along the projected strike of the anomalous gold zone.

(iii) Structural mapping of the Little Owen area and environs in an attempt to elucidate the apparent structural control on the known mineralization.

2. WORK UNDERTAKEN AND RESULTS ACHIEVED

2.1 Outcrop Channel Sampling

The Baseline (300° AMG) of the small grid established in 1986-87 for outcrop channel sampling in the Little Owen Adits area, was extended 150m. to the NW (to 1200N) and 720m to the SE (to 230N) with slope corrections applied. The initial intention was to channel sample outcrops on cross lines spaced at even 200m. intervals for distances of 50m. either side of the Baseline. However, the sampling pattern was modified in the field to accommodate areas of best outcrop so that the traverses ultimately sampled fell approximately on lines 430N, 600N, 800N and 1150N. These cross lines were cleared and pegged at 25m. intervals (slope corrected) between 950E and 1050E.

More or less continuous channel samples were collected approximately along these cross lines as permitted by outcrop with individual sample lengths generally of 3.0 metres. The channel samples were taken from in situ outcrops by the use of the pointed end of a geological hammer, or hammer and cold chisel, generally excavating a groove of a couple of centimetres depth which for a three metre run would produce a sample weight of about 2-3 kg. The outcrops typically showed some surface leaching and although efforts were made to penetrate below the extremely leached surface rind it must be acknowledged that many of the samples, particularly in areas of poor "sub" outcrop and over the more strongly weathered feldspar-phyric "dacite" unit encountered on lines 430N and 600N, consisted substantially of leached material. The samples were analysed by ANALABS for copper and gold using methods 101 and 329. (Analytical Reports 95.1.08.05005 and 05022).

The sample locations and gold and copper analytical values have been plotted on a series of six 1:500 scale plans.

The gold results are essentially negative. All samples from lines 430N, 600N and 800N returned values at or below the detection limit of 0.01 g/t Au. Three unconnected samples from line 1150N and roughly along strike from the Little Owen Adits anomalous zone, contain gold in the range 0.02 to 0.04 g/t Au which is considered to be barely anomalous. Copper values are uniformly low in the range 5-75 ppm Cu.

It must be concluded that the outcrop channel sampling has failed to indicate significant strike extensions of the gold anomalous zone beyond that previously defined in the Little Owen Adits area.

It is noted that the 300° AMG Baseline may be oriented slightly too far anticlockwise for a perfect test for extensions to the main gold zone (which trends about 308° AMG between lines 950N and 1050N) and therefore sampling traverses on lines 430N and 600N may not have been carried far enough south west to pick up the possible extensions. However, line 800N provided a reasonable cover without detecting any anomalous gold.

For completion's sake one might contemplate infill channel sampling traverses on line 1100N and down the gully draining northeastwards to the confluence about 70m. SE of the portal of the No. 1 Little Owen Adit.

However, the overall indications are that significant gold grades do not have a strike extent much greater than almost 100m.

2.2 Adit Wall Channel Sampling

The Great Lyell Adit, Duke Lyell No. 1 and No. 2 Adits and the Empress Lyell Adit were located, drained and channel sampled.

Samples representing 2m. continuous channels were obtained from one wall of all accessible openings by use of a pneumatic chipping hammer. The air compressor and sampling equipment

were transported to and from each site by helicopter. The sampling programme was accomplished by a three or four man team during four days in late January.

The samples, averaging 3 or 4 kg. each, were logged on site, bagged and submitted to ANALABS for analysis for copper and gold by methods 101 and 329 respectively. (samples with 0.2g/t Au or greater were reassayed by method 309). (Analytical Report No: 95.1.08.05096.)

Sample locations and analytical results are plotted on 1:500 scale sheets as for outcrop channel sampling data.

2.2.1 Great Lyell Adit

Gold values from this working ranged from <0.01 to 0.08 g/t Au. with only five samples (out of a total of fifty nine) containing 0.05g/t or greater.

The highest value of 0.08 g/t. Au occurred in hematite stained, sheared Owen Conglomerate but the several intervals previous to this from extremely sheared virtually unrecognizable "schist" presumably representing the contact equivalent to the Great Lyell Fault, contain only 0.04 g/t Au. Copper values in this zone are very low.

Zones of minor hematite veinlets in the main adit, at intervals 54-66m. and 72-76m. from the portal, are not associated with significantly anomalous gold or copper.

Copper values in the working are generally low (<5 to ≈300 ppm Cu) except for the 4.4m interval at the south western end of the southwest drive which gave an average of 0.24% Cu (and only 0.03 g/t Au) in chloritic schists with minor disseminated and veinlet chalcopyrite possibly adjacent to the contact of the (weathered) feldspar porphyritic "dacite" unit.

Although disappointing, these results are consistent with analyses of two mullock samples from this adit reported in Herrmann, 1986. However, my general conclusion (op cit, P.46) concerning the association between gold and hematite now appears to be invalid.

2.2.2 Duke Lyell Adits

Both adits were sampled as well as several short chip sample traverses over (fresh) outcrops above the workings.

No. 1 Adit: Gold values range from <0.01 to 0.38 g/t. with an 8.8m interval to the end of the adit averaging 0.26g/t Au. This interval also averages 0.56% Cu. Rocks in this zone are rather flinty grey siliceous-sericitic "schist" (ex felsic pyroclastic?) with irregular streaks, patches and veins? of dark chlorite imparting an irregular fine (1cm) poddy fabric. Chlorite content is locally highly variable but overall averages about 15% of the volume. Sulphides, consisting of disseminated specks, streaks and splashes of pyrite and chalcopyrite (in the ratio about 2:1 respectively) are principally associated with the intenstitial chlorite streaks and patches.

No. 2 Adit: Gold values range <0.01 to 0.11 g/t Au with only seven intervals carrying 0.05 g/t or greater. Lithologies throughout the inner part of the working (NE of the steeply SW dipping fault (or shear) which intersects the main adit at about 21-27m from the portal) are similar to the "poddy" schist hosting anomalous copper and gold in the No. 1 adit.

The short NE drive averaged 0.08 g/t Au and 0.27% Cu over 10.6m. and this more or less overlaps the presumed (regional) strike extension of the anomalous part of No. 1 adit.

The lower grades (and sulphide content) in the No. 2 Adit, which is about 15m. below the level of No. 1 Adit, might suggest a diminution of grade with increasing depth. However, the relatively low gold grades and variable copper grades in the outcrop samples (T10015 to T10018) rather suggests decreasing gold southwards or simply a rather patchy gold distribution.

An optimist might see potential for better gold grades northwards or eastwards from the end of the No. 1 Adit.

Taken overall, the gold/copper ratio in the Duke Lyell samples is quite variable but there appears to be a generally positive correlation. For the anomalous samples the ratio of (gold/copper) x 10^6 ranges from about 6 to 330. For the total of fortysix samples a calculated correlation co-efficient is about +0.46.

2.2.3 Empress Lyell Adit

Gold values in samples from the Empress Lyell Adit range from <0.01 to 0.11 g/t with six samples containing 0.05 g/t or greater but only one sample with greater than 0.1 g/t.

Samples from the interval 12-22m from the portal give an average (over 10m) of 0.07 g/t Au. This zone appears to be associated with slightly elevated disseminated pyrite content and high chlorite (30-50%) although similarly chloritic rocks further into the adit beyond 22m. contain only 0.02 g/t Au or less. Copper values are consistently low in the range 15-95 ppm. Cu.

Rock types here are similar to those of the Duke Lyell Area with the dominant lithology being a finely lenticular-poddy quartz+sericite schist with variable content of interstitial chlorite. Chlorite content increases from about 10% near the portal of the Empress Lyell Adit to greater than 30% beyond 12m. from the portal.

The precursor rock type was probably a variably grainsized, fine to coarse, lithic felsic pyroclastic with local strong chloritic alteration of the matrix material but not substantially affecting the lithic fragments.

At surface, the rock types in the vicinity are similar with locally very chloritic streaks and patches. These are most abundant around the three small surface cuts, particularly at the lower one located about 25m. south of the adit portal. A mullock sample of dark chloritic schist with 1% disseminated pyrite, collected from this lower cut during 1986 mapping (Herrmann, 1986) contained 1.5 g/t Au and 0.07% Cu. Outcrop in the area is fairly good and would allow some further surface rock chip sampling.

It is apparent that the workings have been developed on areas of high chlorite content. The style of mineralization seems to be similar to that at Duke Lyell. The observations suggest that copper (and by association gold) mineralization occurs within zones of strong chlorite alteration (?).

The best examples occur at surface in the small cuts above the No. 1 Adit at Duke Lyell (Rock chip samples T 10015-10018). Here, chlorite occurs as:

(a) wispy streaks interstitial to small lenticular "fragments" of siliceous material probably representing groundmass alteration of a former felsic lithic pyroclastic rock. The siliceous "fragments" contain only about 0.5% very fine disseminated pyrite.

(b) scattered veins and irregular anastomosing networks of fine chlorite containing abundant chalcopyrite and lesser pyrite. These "veins" range up to 100mm in thickness and are generally sub parallel to cleavage but sometimes run slightly oblique to cleavage and locally form irregular breccia infill zones up to 0.5m. in width. I have not been able to form a conviction on whether this development of chlorite and sulphide mineralization is pre, syn or post cleavage forming deformation.

Just uphill from the workings at Empress Lyell there are outcrops near 38800N/83175E which are (suddenly) more recognizably volcanic and fragmental with medium to coarse (10-50mm) fragments of pink felsic lava (?) in a greenish grey matrix. The fragments display relict plagioclase phenocrysts and accessory disseminated magnetite essentially similar to fresh examples of the feldspar-phyric dacite unit (Ecd) which outcrops to the west.

2.3 Structural Mapping

Approximately eight days were spent in remapping outcrops in the Little Owen Adits area at 1:5000 scale in an attempt to identify the structural control on the mineralizaiton. However, this work was largely unfruitful and I was unable to recognize any NW trending structural breaks which aligned with the known gold zone. In the Little Owen Adits area there are no significant changes in structural trends either of cleavage or layering and there are no recognizable offsets of stratigraphic units to suggest major NW fault displacement. Outcrop in places, along the projection of the gold zone, is fairly good but I could find no abnormal zones of shearing, brecciation, alteration or veining which might denote greater (palaeo) permeability along this zone.

Probably the only significant advances to the geological interpretation of the area, (which unfortunately do not elucidate the Little Owen gold mineralization) are:

(i) The contact between the epiclastic unit (of volcanic conglomerate, sandstone and shale) and the feldspar porphyritic dacite unit (Ecd) is rather irregular, apparently locally discordant to layening in the epiclastic unit, suggesting that the "dacite" may be partly intrusive. This is supported by recognition of a small outcrop similar to the epiclastic unit near the lower end of the Duke Lyell helicopter landing pad (i.e. east of the main body of Ecd) rather suggesting that the "dacite" may be a sill like body preferentially intruded along the epiclastic horizon.

(ii) Exposures near Empress Lyell and along the spur northwards to Duke Lyell, suggest that precursors for the poddy semichloritic schists at these workings were felsic fragmental pyroclastics of composition related to the "dacite" (Ecd) unit. Similar rocks may extend as far northwards as Great Lyell but are not well exposed. Chlorite alteration with associated copper (and most likely gold) mineralization has been locally developed within the felsic pyroclastic unit through the controls or timing of chloritization are not clear.

(iii) Mapping up the ravine entering the east branch of Conglomerate Creek 400m. east of Duke Lyell has led to recognition of a tight synclinal fold outlined by a unit of thinly bedded siliceous siltstones apparently interbedded within conglomerates. The near vertical southern wall of the ravine may represent a minor normal fault or simply the breakaway scarp above the siltstone unit which has been preferentially eroded. I am beginning to come around to the view that the irregular "digitate" conglomerate/volcanics contact is substantially controlled by fold structures.

The new mapping is plotted on overlays to the 1:5000 enlargement of colour air photograph. Considerable horizontal scale distortions are apparent.

3. CONCLUSIONS

The exploration programme described in this Memorandum has been unsuccessful:

(i) in detecting significant strike extensions of the Little Owen Adits gold mineralized zone in surface outcrops. Indications are that the mineralization has a restricted strike extent of a little over 100m.

The limited strike extension has been tested at moderate depths by drill holes L01 and L02 which intersected relatively low bulk grades.

It would seem that the only hope for extensions of the better grade mineralization is at depth below the zone intersected in the adits.

(ii) in finding comparably anomalous (to Little Owen) bulk grades of gold mineralization at Great Lyell, Duke Lyell and Empress Lyell. Weak gold mineralization occurs at the latter two prospects but bulk grades are more than an order of magnitude lower than the 5.7m wide zone @ 6.2 g/t Au found in the Little Owen Adits. At Duke and Empress Lyell there is a moderate positive correlation between gold and copper and the mineralization appears to be associated with zones of strong chloritization of which the distribution, controls and genesis are not clear.

(iii) in determining a structural control or elucidating a genetic model for the previously discovered gold mineralization in the Little Owen Adits.

Future exploration of this zone would perhaps be best focussed on testing for depth extensions of the Little Owen Adits gold zone.

4. REFERENCES

FitzGerald, F.G. 1987 — Authority to Prospect, Queenstown. Progress Report. 1986/87. GFEL Report No. T/87/8.

Herrmann, W. 1986 — Notes on Geological Mapping in the Queenstown Area. Feb-April 1986. GFEL Report No. T/86/4.

APPENDIX C

SAMPLE DESCRIPTIONS AND ASSAY RESULTS

LITTLE OWEN AREA

C.1 Little Owen Adits Grid - Surface Channel Samples

C.2 Great Lyell, Duke Lyell Nos. 1 & 2 and Emprell Lyell Adits - Channel Samples

C.3 Miscellaneous Rock Samples

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ABBREVIATIONS USED IN SAMPLE IN SAMPLE DESCRIPTION LEDGER

LITHOLOGICAL UNITS

(See Figure 2 for full description)

Ꞓsf	Felsic Schist
Ꞓsi	Intermediate Schist
Ꞓsm	Mafic Schist
Ꞓsu	Undifferentiated Schist
Ꞓcef	Fine-grained Epiclastics
Ꞓcec	Coarse-grained Epiclastics
Ꞓcf	Felsic Pyroclastics
Ꞓcr	Rhyolitic Lavas
Ꞓcd	Dacitic-Rhyolitic Lavas/Intrusives
Ꞓca	Andesitic Intrusives
Ꞓcm	Mafic-Intermediate Volcanics

ALTERATION/MINERALIZATION

carb	carbonate
chl	chlorite
cpy	chalcopyrite
epi	epidote
feld	feldspar
hem	hematite
mag	magnetite/magnetic
py	pyrite
qtz	quartz
ser	sericite
silif	silification
1°	primary
2°	secondary

ROCK DESCRIPTIONS

agglom	agglomerate
alt	altered/alteration
brn	brown
brx	breccia/brecciated
cg	coarse-grained
clvd	cleaved
detex	detextured
diss	disseminated
dk	dark
fg	fine-grained
frac	fracture
grn	green
ign	ignimbrite
lt	light
mass	massive
mg	medium-grained
mod	moderate
p&b	podded and banded
porph	porphyritic
pyrocl	pyroclastic
sandst	sandstone
sh	shale
siltst	siltstone
str	strong
text	texture
tr	trace
weath	weathered
wk	weak
xl	crystal
xlline	crystalline
yell	yellow

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GOLD FIELDS EXPLORATION PTY. LTD. **SAMPLE RECORD AND ANALYTICAL DATA SHEET**

COLLECTED BY: W. HERRMANN

PROJECT: LINDA VALLEY PROSPECT: LITTLE OWEN SAMPLE STORAGE REQ'D: LABORATORY: ANALABS DATE DISPATCHED: DEC '87

1:250.000 SHEET: TYPE OF SAMPLE: SURFACE CHANNEL SAMPLE PREP. REQ'D: ANALYSIS REQ'D: DATE RECEIVED:

SAMPLE NUMBER	LITTLE OWEN ADITS GRID LOCATION FROM	TO	DESCRIPTION	ANALYSES (PPM) Cu	Au(AAS)	Au(FA)
T9905	804N, 950E	803N, 953E	Gsf/Gcf ± pods Gsm wk-mod weath	65	<0.01	
T9906	803N, 953E	800N, 956E	Gcf? ± Gca? feld xl, chl rich, intrusive?	50	<0.01	
T9907	795N, 957E	797N, 960E	Gcf or Gca? feld xl, chl rich, wk-mod weath	40	<0.01	
T9908	800N, 960E	800N, 963E	Gcf? m-cg, feld xl, chl rich gdmass	40	<0.01	
T9909	788N, 966E	792N, 969E	Gcef, fg pale grey fissile siltst., weath	20	<0.01	
T9910	792N, 969E	796N, 972E	Gcef, siltst	20	<0.01	
T9911	796N, 972E	800N, 975E	Gcef, siltst, clvd 320/80 SW	20	<0.01	
T9912	800N, 975E	800N, 978E	Gcef, fg fissile siltst., ser	20	<0.01	
T9913	800N, 978E	800N, 981E	Gcef, fg pale grey siltst. clvd 330/80 SW	15	<0.01	
T9914	800N, 981E	800N, 983E	Gcef, fg pale grey fissile siltst	10	<0.01	
T9915	800N, 983E	800N, 985E	Gcef, fg pale grey siltst	10	<0.01	
T9916	800N, 985E	800N, 987E	Gcef, fissile // bedding 340/75 SW, clvd 310/80 SW	15	<0.01	
T9917	800N, 987E	800N, 989E	Gcef, siltst.	15	<0.01	
T9918	800N, 989E	800N, 991E	Gcef, siltst.	15	<0.01	
T9919	800N, 991E	800N, 994E	Gcef, siltst.	25	<0.01	
T9920	797N, 994E	800N, 997E	Gcef, fg pale grey ser siltst.	60	<0.01	
T9921	800N, 997E	997N, 1000E	Gcef, f-mg grn-grey siltst-sandst. bedding 350/80 W	35	<0.01	
T9922	836.5N, 1009E	836.5N, 1013E	Gcef, rel massive, unbedded	15	<0.01	
T9923	836.5N, 1013E	836.5N, 1016E	Gcef, rel mass, unbedded	15	<0.01	
T9924	836.5N, 1016E	836.5N, 1019E	Gcef, pale grey bedded 345/75 W siltst, clvd 315/80 SW	15	<0.01	
T9925	836.5N, 1019E	836.5N, 1022E	Gcef	10	0.01	

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GOLD FIELDS EXPLORATION PTY. LTD. **SAMPLE RECORD AND ANALYTICAL DATA SHEET**

COLLECTED BY: W. HERRMANN

PROJECT: LINDA VALLEY PROSPECT: LITTLE OWEN SAMPLE STORAGE REQ'D: LABORATORY: ANALABS DATE DISPATCHED: DEC '87

1:250.000 SHEET: TYPE OF SAMPLE: SURFACE CHANNEL SAMPLE PREP. REQ'D: ANALYSIS REQ'D: DATE RECEIVED:

A1996

SAMPLE NUMBER	LITTLE OWEN ADITS GRID LOCATION FROM	TO	DESCRIPTION	ANALYSES (PPM) Cu	Au(AAS)	Au(FA)						
T9926	836·5N, 1022E	836·5N, 1025E	Gcef 30% o/c	15	<0.01							
T9927	836·5N, 1025E	836·5N, 1028E	Gcef 50% o/c	75	<0.01							
T9928	836·5N, 1028E	836·5N, 1031E	Gcef, thin bedded siltst. bedding 340/80 W wk clvd	20	0.01							
T9929	836·5N, 1031E	836·5N, 1034E	Gcef, fissile // bedding 350/75 W, wk clvd 315/75 SW	25	<0.01							
T9930	836·5N, 1034E	836·5N, 1037E	Gcef, fg fissile thin bedded pale grey siltst.	25	<0.01							
T9931	836·5N, 1037E	836·5N, 1040E	Gcec mg epiclastic sandst, weath	50	<0.01							
T9932	836·5N, 1040E	836·5N, 1043E	Gcec, m-cg grn-grey lithic sandst, red mass, feld xl?	25	<0.01							
T9933	600N, 949E	600N, 952E	Gcef, pale grey fissile siltst. clvd 345/80 SW	5	<0.01							
T9934	597N, 954·5E	597N, 959E	Gcec, lithic sandst - congl, grn-grey, feld xl, chl	20	<0.01							
T9935	605N, 961E	601N, 964E	Gcec, cg lithic sandst-congl feld xl, chl matrix	20	<0.01							
T9936	601N, 964E	601N, 967E	Gcec, cg lithic sandst - congl, lithics to 1cm pink volc	20	<0.01							
T9937	605N, 967E	605N, 970E	Gcec, cg lithic sandst - congl, mass, lithics ≈ 3%	50	<0.01							
T9938	605N, 970E	605N, 973E	Gcec, cg lithic congl, lithics pale grey - pink felsic volcs	55	<0.01							
T9939	600N, 979E	600N, 982E	Gcd, mass grey feld xl lava? weath, clvd 315/90	10	<0.01							
T9940	600N, 982E	600N, 985E	Gcd, mass grey lava? weath	15	<0.01							
T9941	600N, 985E	600N, 988·5E	Gcd, mass grey feld xl lava? weath	15	<0.01							
T9942	583N, 988E	583N, 991E	Gcd, str weath, clvd 310/90, (qtz log gravel)	10	<0.01							
T9943	616N, 986E	616N, 989E	Gcd, grn-grey mass, wk clvd, surface leached	25	<0.01							
T9944	616N, 989E	616N, 992E	Gcd, grn-grey when fresh, weath surface	20	<0.01							
T9945	616N, 992E	616N, 995E	Gcd, grn-grey (fresh), mass, wk clvd	20	<0.01							
T9946	616N, 995E	616N, 998E	Gcd, grn-grey (fresh), mass, wk clvd	30	<0.01							

GOLD FIELDS EXPLORATION PTY. LTD. **SAMPLE RECORD AND ANALYTICAL DATA SHEET** COLLECTED BY: W. HERRMA

PROJECT: LINDA VALLEY PROSPECT: LITTLE OWEN SAMPLE STORAGE REQ'D: LABORATORY: ANALABS DATE DISPATCHED: DEC 87

1:250.000 SHEET: TYPE OF SAMPLE: SURFACE CHANNEL SAMPLE PREP. REQ'D: ANALYSIS REQ'D: DATE RECEIVED:

SAMPLE NUMBER	LITTLE OWEN ADITS GRID LOCATION FROM	TO	DESCRIPTION	ANALYSES (PPM) Cu	Au (AAS)	Au (FA)						
T9947	616N, 1001E	616N, 1004E	Gcd, str weath, clayey soil, sub o/c	15	<0.01							
T9948	616N, 1004E	616N, 1007E	Gcd, str weath, clayey soil, sub o/c	15	<0.01							
T9949	616N, 1007E	613N, 1010E	Gcd, str weath, clayey soil, sub o/c	10	<0.01							
T9950	613N, 1010E	613N, 1014E	Gcd, str weath, clayey B-C soil	10	<0.01							
T9951	613N, 1014E	615N, 1017E	Gcd, str weath clayey B-C soil	15	<0.01							
T9952	618N, 1017E	618N, 1020E	Gcd, str weath, mass feld xl?	15	<0.01							
T9953	618N, 1020E	618N, 1022E	Gcd, mod weath, mass feld xl, chl gdmass	25	<0.01							
T9954	584N, 1025E	586N, 1028E	Gcd, str weath	25	<0.01							
T9955	586N, 1028E	588N, 1031E	Gcd, str weath, clayey sub o/c	20	<0.01							
T9956	588N, 1031E	590N, 1034E	Gcd, str weath, clayey sub o/c	20	<0.01							
T9957	590N, 1034E	592N, 1037E	Gcd, str weath, mass	25	<0.01							
T9958	592N, 1037E	594N, 1040E	Gcd, str weath, mass, clvd 315/90	25	<0.01							
T9959	594N, 1040E	596N, 1043E	Gcd, str weath, minor "pink" kernals	25	<0.01							
T9960	596N, 1043E	598N, 1046E	Gcd, str weath, mass	25	<0.01							
T9961	598N, 1046E	600N, 1049E	Gcd, mod-str weath, clvd 310/90	20	<0.01							
T9962	434N, 950E	434N, 953E	Gcd, mod weath, grn-grey c̄ feld xl, chl matrix?	20	<0.01							
T9963	434N, 953N	434N, 956E	Gcd, mod weath, felsic lava?, wk clvd 315/90	25	<0.01							
T9964	430N, 956E	430N, 959E	Gcd, mod weath grn-grey mass lava?	20	<0.01							
T9965	430N, 959E	430N, 962E	Gcd, mod weath, mass, wk clvd 320/87 SW	25	<0.01							
T9966	434N, 962E	434N, 965E	Gcd, mod weath, mass	15	<0.01							
T9967	434N, 965E	434N, 968E	Gcd, mod weath, mass	20	<0.01							

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COLLECTED BY: W. HERRMANN

PROJECT LINDA VALLEY PROSPECT LITTLE OWEN SAMPLE STORAGE REQ'D: LABORATORY: ANALABS DATE DISPATCHED: DEC '87

1:250.000 SHEET: TYPE OF SAMPLE: SURFACE CHANNEL SAMPLE PREP. REQ'D: ANALYSIS REQ'D: DATE RECEIVED:

A19962

SAMPLE NUMBER	LITTLE OWEN ADITS GRID LOCATION From	To	DESCRIPTION	ANALYSES (PPM) Cu	Au (AAS)	Au (FA)						
T9968	434N, 968E	434N, 971E	Gcd shr weath, clayey subo/c	20	<0.01							
T9969	425N, 971E	427N, 974E	Gcd mod weath, grn-grey mass lava? feld x/l	20	<0.01							
T9970	427N, 974E	427N, 977E	Gcd mod weath, grn-grey mass lava? feld x/l wk chl	25	<0.01							
T9971	435N, 978E	435N, 981E	Gcd mod weath, grn-grey mass lava?	20	<0.01							
T9972	435N, 981E	435N, 984E	Gcd mod weath grn-grey mass lava? 50% o/c	15	<0.01							
T9973	435N, 994E	435N, 997E	Gcd mod weath grn-grey mass lava? 50% o/c	15	<0.01							
T9974	435N, 997E	435N, 1000E	Gcd mod weath grn-grey mass lava? 40% o/c	15	<0.01							
T9975	430N, 1000E	430N, 1003SE	Gcd wk-mod weath grn mass lava, feld ferromagnesian?	15	<0.01							
T9976	430N, 1003SE	430N, 1008E	Gcd wk-mod weath, grn mass lava, relict feld, f'mag x/l?	20	<0.01							
T9977	1148N, 952E	1148N, 955E	Gsf p&b schist cg volc brx-lithic tuff, banded	10	<0.01							
T9978	1143N, 955E	1143N, 958E	Gsf after Gcf, cg brx-lithic tuff, wk chl 30/87W 345/75W	10	<0.01							
T9979	1143N, 958E	1143N, 961E	Gsf after Gcf cg brx-lithic, wk banded 345/80W, wk chl	10	<0.01							
T9980	1150N, 961E	1150N, 964E	Gsf, after Gcf, wk weath chl 325/85SW	5	<0.01							
T9981	1150N, 964E	1150N, 967E	Gsf, wk weath, no py	10	<0.01							
T9982	1145N, 967E	1145N, 970E	Gsf after Gcf, weath, mg less fragmented, chl	10	<0.01							
T9983	1145N, 970E	1150N, 973E	Gsf after Gcf, weath, mg	40	<0.01							
T9984	1150N, 973E	1150N, 976E	Gsf, cg podded unit, chl 320/85 SW	10	<0.01							
T9985	1145N, 976E	1148N, 979E	Gsf, cg podded, weath, minor FeOx stain	20	<0.01							
T9986	1148N, 979E	1148N, 982E	Gsf, cg podded, weath, minor FeOx stain.	15	<0.01							
T9987	1148N, 982E	1149N, 985E	Gsf, cg podded, weath, minor FeOx stain	20	<0.01							
T9988	1149N, 985E	1150N, 988E	Gsf, wk weath, p&b, FeOx blebs to 2cm ≤ 2%	15	<0.01							

GOLD FIELDS EXPLORATION PTY. LTD. **SAMPLE RECORD AND ANALYTICAL DATA SHEET**

COLLECTED BY: W. HERRMANN

PROJECT: LINDA VALLEY PROSPECT: LITTLE OWEN SAMPLE STORAGE REQ'D: LABORATORY: ANALABS DATE DISPATCHED: DEC '87

250.000 SHEET TYPE OF SAMPLE: SURFACE CHANNEL SAMPLE PREP. REQ'D: ANALYSIS REQ'D: DATE RECEIVED:

A19962

SAMPLE NUMBER	LITTLE OWEN ADITS GRID LOCATION FROM	TO	DESCRIPTION	ANALYSES (PPM) Cu	Au (AAS)	Au (FA)						
T9989	1150N, 988E	1150N, 991E	Gsf, weath, p&b cg, FeOx stain/blebs ≃1%	20	<0.01							
T9990	1150N, 991E	1150N, 994E	Gsf, weath, p&b cg, FeOx stain/blebs <1%	20	<0.01							
T9991	1150N, 994E	1150N, 997E	Gsf, wk weath cg p&b, no FeOx stain.	20	0.01							
T9992	1150N, 997E	1150N, 1000E	Gsf, cg p&b	20	0.01							
T9993			STANDARD 1.51g/t Au	–	1.60							
T9994			STANDARD 6.9g/t Au	–	6.34							
T9995			STANDARD 0.43g/t Au	–	0.12							
T9996	1150N, 1000E	1150N, 1003E	Gsf/Gcf wk weath, FeOx stain/blebs, clvd 325/90	25	0.02							
T9997	1150N, 1003E	1150N, 1006E	Gsf/Gcf weath cg p&b, "lithics" felsic lava ≤3cm	20	<0.01							
T9998	1150N, 1006E	1150N, 1009E	Gsf/Gcf weath cg p&b, clvd 325/90	25	0.04							
T9999	1150N, 1009E	1150N, 1012E	Gsf/Gcf weath, cg p&b, clvd 320/85 SW	20	<0.01							
T10000	1150N, 1012E	1150N, 1015E	Gsf/Gcf, wk weath, cg p&b, FeOx stain/blebs	25	0.01							
T10001	1150N, 1015E	1150N, 1018E	Gsf/Gcf, wk weath cg p&b, FeOx stain minor blebs	15	<0.01							
T10002	1150N, 1018E	1150N, 1021E	Gsf/Gcf, wk weath cg p&b, wk FeOx, clvd	15	<0.01							
T10003	1150N, 1021E	1150N, 1024E	Gsf/Gcf, wk weath, cg p&b, clvd 320/85 NE	15	<0.01							
T10004	1150N, 1024E	1150N, 1027E	Gsf/Gcf, wk weath, cg p&b, lithics felsic lava ≤3cm	20	0.03							
T10005	1150N, 1027E	1150N, 1030E	Gsf/Gcf, wk weath, cg p&b, lithics	15	<0.01							
T10006	1150N, 1030E	1150N, 1033E	Gsf/Gcf, wk weath, p&b, banding 000/85E, clvd 330/90	15	<0.01							
T10007	1150N, 1033E	1150N, 1036E	Gsf/Gcf, wk weath, p&b, abundant "lithics", clvd	20	<0.01							
T10008	1145N, 1036E	1145N, 1039E	Gsf/Gcf, wk weath, p&b, lithics lava, clvd 320/87SW	15	<0.01							
T10009	1150N, 1040E	1150N, 1043E	Gsf/Gcf, str weath sub o/c	20	<0.01							

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250 000 SHEET: TYPE OF SAMPLE: SURFACE CHANNEL SAMPLE PREP. REQ'D: ANALYSIS REQ'D: DATE RECEIVED:

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SAMPLE NUMBER	LITTLE OWEN ADITS GRID LOCATION FROM	TO	DESCRIPTION	ANALYSES (PPM) Cu	Au (AAS)	Au (FA)						
10010	1146N, 1046.5E	1150N, 1050E	Egf/Gcf, weath, cg pyb, mass qtz veins 40%	15	<0.01							
10011	602N, 941E	602N, 944E	Gcef weath clayey 50% o/c	25	<0.01							
10012	602N, 944E	602N, 947E	Gcef pale grey fissile siltst weath, chl 320/90	30	<0.01							
10013	600N, 947E	600N, 950E	Gcef weath siltst, grey fissile	20	<0.01							
10014			STANDARD 0.13g/t Au	-	0.11							
10019	455N, 935E	455N, 938E	Gcd wk weath, mass fg feld xl "dacite" wk chl	25	0.01							
10020	455N, 938E	455N, 941E	Gcd wk weath, mass fg feld xl lava, chl 310/90	25	<0.01							
10021	455N, 941E	455N, 944E	Gcd wk weath, mass	30	<0.01							
10022	455N, 944E	455N, 947E	Gcd wk weath, mass, chl 320/90	30	<0.01							
10023	455N, 947E	455N, 950E	Gcd wk weath fg mass porph lava, wk chl	20	<0.01							
10024			STANDARD 0.64g/t Au	-	0.60							

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GOLD FIELDS EXPLORATION PTY. LTD. **SAMPLE RECORD AND ANALYTICAL DATA SHEET**

COLLECTED BY: W. HERRMANN

PROJECT: LINDA VALLEY PROSPECT: LITTLE OWEN SAMPLE STORAGE REQ'D: LABORATORY: ANALABS DATE DISPATCHED: JAN 88

1:250.000 SHEET: TYPE OF SAMPLE: ADIT CHANNEL SAMPLE PREP. REQ'D: ANALYSIS REQ'D: DATE RECEIVED:

A1996

SAMPLE NUMBER	LOCATION GREAT LYELL ADIT		DESCRIPTION	ANALYSES (PPM) Cu	Au(FA)	Au(AAS)
T10025			STANDARD 0.13g/t Au	<5	-	0.09
T10026	MAIN ADIT NORTH WALL	2-4m	Gcd? weath, pale orn-grey, mass feld porph?	115	—	<0.01
T10027		4-6m	Gcd? weath, pale orn-gray, minor diss hem? qtz veins	100	—	<0.01
T10028		6-8m	Gcd? weath, ser, foliated, dissem hem? FeOx stain	140	—	<0.01
T10029		8-10m	Gcd? weath, clay-ser, feld porph? < hem/FeOx stain	80	—	<0.01
T10030		10-12m	Gcd? weath, str ser, pink/red-grey	70	—	<0.01
T10031		12-14m	Gcd? weath, str ser, clvd	55	—	<0.01
T10032		14-16m	Gcd? weath, grey-olive clay-ser, tr diss py	125	—	0.02
T10033		16-18m	Gcd/Gsf? weath, pale buff-grey str ser-clay, silif pds	115	—	<0.01
T10034		18-20m	Gcd? weath, pale grn-grey str ser, clvd, feld x/?	85	—	0.03
T10035		20-22m	Gcd? weath, pale grn-gray str ser, clvd, feld x/, silif	65	—	0.03
T10036		22-24m	Gcd? weath, pale grn-grey str ser, clvd	45	-	0.02
T10037		24-26m	Gcd? weath, pale grn/grey str ser, silif pods	55	-	<0.01
T10038		26-28m	Gcd? weath, pale grn-grey mod ser, mass, fg porph?	5	-	0.03
T10039		28-30m	Gcf? grey-grn fg ser > chl (vitric pyroclastic?)	<5	-	0.03
T10040		30-32m	Gcf, grey-grn f-mg ser > chl, relict feld x	10	—	0.03
T10041		32-34m	Gcf, pale grey-grn relict feld x/, f-mg, ser-chl	5	-	0.03
T10042		34-36m	Gcf, pale-dk grey-grn, clvd, feld x/, chl frags.	20	-	0.04
T10043		36-38m	Gcf grn-grey chl > ser, str foliated	<5	-	0.02
T10044		38-40m	Gcf f-mg grn-grey, pink feld x/, chl, granular, tr py	15	-	0.02
T10045		40-42m	Gcf fg str foliated, mass ser > chl	<5	—	0.03

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GOLD FIELDS EXPLORATION PTY. LTD. **SAMPLE RECORD AND ANALYTICAL DATA SHEET** COLLECTED BY: N. HERRMANN

PROJECT: LINDA VALLEY PROSPECT: LITTLE OWEN SAMPLE STORAGE REQ'D: LABORATORY: ANALABS DATE DISPATCHED: JAN 88

250.000 SHEET TYPE OF SAMPLE: ADIT CHANNEL SAMPLE PREP. REQ'D: ANALYSIS REQ'D: DATE RECEIVED:

A19962

SAMPLE NUMBER	LOCATION GREAT WELL ADIT		DESCRIPTION	ANALYSES (PPM) Cu	Au (FA)	Au (AAS)
T10046	MAIN ADIT NORTH WALL	42 - 44m	Gcf, vfg str clvd pale grey, ser, pyroclastic text, tr py	10	–	0·02
T10047		44 - 46m	Gcf?, vfg str clvd, ser (Gsf near?)	<5	–	0·05
T10048		46 - 48m	Gcf?, vfg str clvd, pale grey, ser,	<5	–	0·04
T10049		48 - 50m	Gcf? vfg pink-grey, ser, minor hem? clvd	<5	–	0·04
T10050			STANDARD 6.9g/t Au	10	–	5·68
T10051		50 - 52m	Gcf? fg pale pink-grey, ser, tr py, hem?	10	–	0·04
T10052		52 - 54m	Gcf? f-mg tuffs, ser, patches str hem.	75	–	0·03
T10053		54 - 56m	Gcf?/Gsi chl-ser schist, hem stringers to 2% // clv	250	–	0·03
T10054		56 - 58m	Gcf? fg grn-grey (Gsi?) chl-ser, hem stringers	50	–	0·04
T10055		58 - 60m	Gcf? grey ser & chl stringers ± hem	125	–	<0·01
T10056		60 - 62m	Gcf? semi Gsm chl > ser, stringers hem common	70	–	<0·01
T10057		62 - 64m	Gcf? chl-ser, stringers hem, py - gpy?, qtz-carb veins	55	–	0·02
T10058		64 - 66m	Gcf/fg chl-ser mixed, str clvd, minor hem	40	–	0·02
T10059		66 - 68m	Gcf fg pink-grn ser > chl, MnOx	25	–	0·02
T10060		68 - 70m	Gcf fg mixed ser + chl (Gsm), x/luft?	110	–	0·02
T10061		70 - 72m	Gsm, chl > ser, str clvd, tr py dis.	125	–	0·03
T10062		72 - 74m	Gsm, chl > ser, str clvd, minor hem stringers	45	–	0·03
T10063		74 - 76m	Gsm, chl > ser, str clvd, 20% hem stringers	150	–	0·03
T10064		76 - 78m	Gsm/Gcf chl & qtz-ser mixed, MnOx frac	130	–	0·06
0065		78 - 80m	? str brx/clvd grn-purple, chl, relict feld, MnOx	315	–	0·05
T10066		80 - 82m	? str brx/clvd ltk grey ser-silif > chl, str hem	<5	–	0·04

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GOLD FIELDS EXPLORATION PTY. LTD. **SAMPLE RECORD AND ANALYTICAL DATA SHEET**

COLLECTED BY: W. HERRMANN

PROJECT: LINDA VALLEY PROSPECT: LITTLE OWEN SAMPLE STORAGE REQ'D: LABORATORY: ANALABS DATE DISPATCHED: JAN '88

1:250.000 SHEET: TYPE OF SAMPLE: ADIT CHANNEL SAMPLE PREP. REQ'D: ANALYSIS REQ'D: DATE RECEIVED:

A19962

SAMPLE NUMBER	LOCATION GREAT LYELL ADIT		DESCRIPTION	ANALYSES (PPM) Cu	Au(FA)	Au(AAS)
T10067	MAIN ADIT NORTH WALL	82-84m	Owen Congl? clvd dk purple-grey sil schist, perv. hem	<5	–	0.04
T10068		84-86m	Owen Congl? str clvd purple ± chl schist, str perv. hem	10	–	0.04
T10069		86-88m	Owen Congl., str clvd sil/f, wk ser, hem stained	5	–	0.08
T10070	(AND ACROSS END FACE)	88-90.4m	Owen Congl, foliated sil/f congl.	<5	–	0.03
T10071	SE. DRIVE WEST WALL	0-2m	Gcd? grn-grey mass, wk ser, feld x/, str clvd	30	–	<0.01
T10072		2-4m	Gcd? grn-grey mass, wk ser, feld x/, str clvd	20	–	0.02
T10073		4-6m	Gcd? grn-grey, relict pink feld x/, str clvd	40	–	0.04
T10074		6-8m	Gcd? grn-grey relicts feld x/,	40	–	0.02
T10075			STANDARD 0.0 Au g/t	10	–	0.03
T10076		8-10m	Gcd? grn-grey mass, relict feld x/	55	–	0.02
T10077		10-12m	Gcf? pale grn-grey, ser, felsic lithics? clvd	130	–	0.01
T10078		12-14m	Gcf? pale grn-grey mg lithic tuff, str clvd	20	–	0.02
T10079		14-16.3m	Gcf? grn-grey chl-ser, str clvd	40	–	0.02
T10080	S.W. DRIVE NORTH WALL	0-2m	Gcf? pale grn-grey, minor granular text, wk chl, clvd	55	–	0.03
T10081		2-4m	Gcf grn-grey chl > ser, sil/f lithics, clvd	35	–	<0.01
T10082		4-6m	Gcf/fg grey uniform, tr py	55	–	0.02
T10083		6-8m	Gcf/Esm, mixed chl, q/z-ser, disem fg-tr cpy in chl	1250	–	0.03
T10084	(AND ACROSS END FACE)	8-10.5m	Esm/Gcd? mixed chl, q/z-ser var. minor cpy in chl	3400	–	0.03
T10085	NE DRIVE NORTH WALL	0-2m	Gcf, grn-grey chl, relict granular text	40	–	<0.01
T10086		2-4m	Gcf, grn-grey chl, relict granular text	35	–	<0.01
T10087	(AND ACROSS END FACE)	4-5.5m	Gcf? grn-grey, wk chl, v granular	25	–	<0.01

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GOLD FIELDS EXPLORATION PTY. LTD. **SAMPLE RECORD AND ANALYTICAL DATA SHEET**

COLLECTED BY: W. HERRMANN

PROJECT: LINDA VALLEY PROSPECT: LITTLE OWEN SAMPLE STORAGE REQ'D: LABORATORY: ANALABS DATE DISPATCHED: JAN '88

1:250.000 SHEET: TYPE OF SAMPLE: ADIT CHANNEL SAMPLE PREP. REQ'D: ANALYSIS REQ'D: DATE RECEIVED:

A1996

SAMPLE NUMBER	LOCATION		DESCRIPTION	ANALYSES (PPM)								
	DUKE WELL NO2 ADIT			Cu	Au (FA)	Au (AAS)						
T10088	MAIN ADIT NORTH WALL	0-2m	Csf grn-grey silif -ser> chl streaks // clvg	25	-	<0.01						
T10089		2-4m	Csf grn-grey silif-ser>chl streaks, str clvg, tr py	70	-	<0.01						
T10090		4-6m	Csf bnds grn-grey silif ser>chl, tr diss py	45	-	<0.01						
T10091		6-8m	Csf grn-grey silif-ser>chl, tr diss py	35	-	<0.01						
T10092		8-10m	Csf grn-grey silif-ser>chl, tr diss py	30	-	<0.02						
T10093		10-12m	Csf grn-grey qtz-ser>chl, tr py	25	-	<0.01						
T10094		12-14m	Csf grn-grey hard qtz-ser>chl, ~0.1% diss py	55	-	<0.01						
T10095		14-16m	Csf grn-grey qtz-ser>chl, tr diss py	15	-	0.02						
T10096		16-18m	Csf grn-grey mod chl-ser, diss py 0.1-0.2%	20	-	0.02						
T10097		18-20m	Csf grn-grey hard qtz-ser>chl, diss py, qtz chl-py-cpy veins	65	-	<0.01						
T10098	MAIN ADIT SOUTH WALL	20-22m	Csf grn-grey hard qtz-ser>chl, veins minor py cpy	95	-	<0.01						
T10099		22-24m	Csf chl>ser, str clvg, stringers cpy, veins qtz-chl-tr cpy	780	-	0.02						
T10100			STANDARD 2.90 g/t Au	15	-	1.90						
T10101		24-26m	Csf chl>ser, str clvg, fau/ft zone, stringers cpy in chl	1450	-	0.02						
T10102		26-28m	Csf qtz-ser>chl, str clvg, stringers cpy in chl, diss py	390	-	0.02						
T10103		28-30m	Csf qtz-ser>chl, diss py, minor cpy	520	-	0.04						
T10104		30-32m	Csf qtz-ser>chl, chl wispy & minor cpy, 0.5% py	595	-	0.09						
T10105		32-34m	Csf qtz-ser>chl, minor cpy in chl, 0.4% py	610	-	0.04						
T10106		34-36m	Csf qtz-ser>chl, minor cpy, 0.4% py diss	270	-	0.04						
T10107		36-38m	Csf qtz-ser>chl, minor cpy, 0.4% py diss	155	-	0.03						
T10108		38-40m	Csf qtz-ser>chl, minor cpy, 0.4% py diss	105	-	0.03						

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250 000 SHEET: TYPE OF SAMPLE: ADIT CHANNEL SAMPLE PREP. REQ'D: ANALYSIS REQ'D: DATE DISPATCHED: JAN '88

DATE RECEIVED: A19962

SAMPLE NUMBER	LOCATION		DESCRIPTION	ANALYSES (PPM) Cu	Au (FA)	Au (AAS)
	DUKE LYELL No.2 ADIT					
T10109	MAIN ADIT SOUTH WALL	40-42m	Csf, qfz-ser>chl, minor cpy, 0.4% py	340	–	0.04
T10110		42-44m	Csf, qfz-ser>chl, minor cpy, 0.4% py	140	–	0.05
T10111		44-46m	Csf, qfz-ser>chl, tr cpy, 0.4% py	20	–	0.04
T10112		46-48m	Csf, qfz-ser>chl, tr cpy. 0.3% py	25	–	0.04
T10113		48-50m	Csf, qfz-ser>chl (wisps) tr cpy 0.3% py	25	–	0.02
T10114		50-52m	Csf, qfz-ser>chl, 0.5% dissem py	80	–	0.03
T10115		52-54m	Csf, qfz-ser>chl, 0.5% dissem py	65	–	0.03
T10116	(ACROSS END FACE)	54.1m	Csf, qfz-ser>chl, 0.5% dissem py	75	–	0.03
T10117	NE. DRIVE S.E. WALL	4-6m	Csf, grey-grn poddy qfz-ser>chl, splashes cpy-py	1850	–	0.08
T10118		6-8m	Csf, poddy qfz-ser>chl, splashes cpy-py in chl	1300	–	0.11
T10119		8-10m	Csf, poddy qfz-ser>chl, tr cpy! 0.3% py	8250	–	0.05
T10120		10-12m	Csf, poddy qfz-ser>chl, tr cpy 0.5% py	270	–	0.09
T10121	(AND ACROSS END FACE)	12-14.6m	Csf, poddy qfz-ser-chl, 0.3% cpy, 0.5% py in chl	1700	–	0.09
T10122	DUKE LYELL No.1 ADIT NORTH WALL	0-2m	Ccf, mg grn-grey granular, ser chl. feld x/?	110	–	0.04
T10123	"	2-4m	Csm, qtz chl fg schist, mag	115	–	0.06
T10124		4-6m	Csm, qtz chl fg schist, mag, tr diss py	295	–	<0.01
T10125			STANDARD 0.13g/t Au	10	–	0.09
T10126		6-8m	Csm/Ccf mixed chl schist/grn-grey ser feld x/l pyroc.	240	–	0.03
T10127		8-10m	Csm dk grn fg chl, non mag, minor granular text., py	1100	–	0.05
T10128		10-12m	Csm? chl ser altd, minor stkf 1-2% py 1% cpy pods	13000	–	0.15
T10129		12-14m	Csf/Csm grey hard qfz-ser schist, pods chl stringers + dissem py-cpy ≈ 1%	3700	0.310	0.22

GOLD FIELDS EXPLORATION PTY. LTD. **SAMPLE RECORD AND ANALYTICAL DATA SHEET**

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SAMPLE NUMBER	LOCATION		DESCRIPTION	ANALYSES (PPM)							
				Cu	Au (FA)	Au (AAS)					
T10130	DUKE LYELL No. 1 ADIT NORTH WALL	14-16m	Csf/Csm qtz-ser-chl, stringers py(2%) cpy (1%)	5850	0.180	0.20					
T10131		16-18m	Csf qtz-ser-chl flinty/hard. py(2%) cpy (1%)	3800	0.390	0.38					
T10132	(AROUND END FACE)	18m-	Csf qtz-ser>chl, silif? streaks py(1%) cpy (0.5%)	1450	0.330	0.32					
T10133	NTH EAST WALL OF CUDDY	3.2m	Csf qtz-ser chl, podded silif, streaks/pods py & cpy 2%	3600	-	0.12					
T10134	SE WALL OF CUDDY	2.5m	Csf qtz-ser-chl, podded, pods py (5%) cpy (1%)	7050	-	0.07					
T10135	SW WALL OF CUDDY	3.2m	Csf, str chl>qtz-ser poddy py (1%) cpy (1%)	3400	-	0.07					
T10136	EMPRESS LYELL ADIT NORTH WALL	2-4m	Csf weath, pale grey ser alvd, felsic feld x1	60	-	0.02					
T10137		4-6m	Csf grn-grey ser, alvd, silif, tr diss py	95	-	0.04					
T10138		6-8m	Csf mod ser-chl, alvd, diss py 0.5-1%	35	-	0.05					
T10139		8-10m	Csf/Csm mod-str chl>ser diss py 1-2%	40	-	0.04					
T10140		10-12m	Csf/Csm mod-str chl>ser diss py 1-2%	20	-	0.02					
T10141		12-14m	Csm str chl, diss py 1-2%	20	-	0.07					
T10142		14-16m	Csm, str chl, non mag, diss py 1-2%	35	-	0.07					
T10143		16-18m	Csm, str chl, non mag, diss py 1-2%	45	-	0.11					
T10144		18-20m	Csm? str chl > silif hard-flinty 1% py	30	-	0.06					
T10145		20-22m	Csm str chl, diss py 1%	20	-	0.06					
T10146		22-24m	Csm fg str chl, silif pods diss py 1%	20	-	<0.01					
T10147		24-26m	Csm fg str chl, diss py 0.5%	40	-	<0.01					
T10148		26-28m	Csm fg str chl, silif pods diss py 1%	20	-	<0.01					
T10149		28-30m	Csm fg str chl, diss py 0.5%	40	-	<0.01					
T10150			STANDARD 1.51 g/t Au	65	-	1.30					

647

101-48

GOLD FIELDS EXPLORATION PTY. LTD. **SAMPLE RECORD AND ANALYTICAL DATA SHEET**

COLLECTED BY: N. HERRMANN

PROJECT: LINDA VALLEY PROSPECT: LITTLE OWEN SAMPLE STORAGE REQ'D: LABORATORY: ANALABS DATE DISPATCHED: JAN '88

1:250.000 SHEET: TYPE OF SAMPLE: ADIT CHANNEL SAMPLE PREP. REQ'D: ANALYSIS REQ'D: DATE RECEIVED:

A1

SAMPLE NUMBER	LOCATION		DESCRIPTION	ANALYSES (PPM)								
	EMPRESS LYELL ADIT			Cu	Au (FA)	Au (AAS)						
T10151	NORTH WALL	30-32m	Csm fg str chl, diss py 0.5%	25	-	0.02						
T10152		32-34m	Csm fg str chl, diss py<0.5%	15	-	0.02						

GOLD FIELDS EXPLORATION PTY. LTD. **SAMPLE RECORD AND ANALYTICAL DATA SHEET**

COLLECTED BY: W. HERRMAN

PROJECT: LINDA VALLEY PROSPECT: LITTLE OWEN SAMPLE STORAGE REQ'D: LABORATORY: ANALABS DATE DISPATCHED:

1:250.000 SHEET: TYPE OF SAMPLE: ROCK CHIP SAMPLE PREP. REQ'D: ANALYSIS REQ'D: DATE RECEIVED:

A1996

SAMPLE NUMBER	LOCATION		DESCRIPTION	ANALYSES (ppm)								
				Au	Cu	Pb	Zn	Ag	Mo	Sn	W	As *
T9901	≈20m N LO2	LITTLE OWEN ADITS	Gsf, ox, 2-5% dissem py in qtz-ser schist	<0.01	35	55	50	<0.5	10	4	<20	8 *
T9902	≈95m S LITTLE OWEN N° ADIT		pod of qtz-hem-py in str chl Gsm, 5-10% py	0.07	50	45	35	<0.5	20	10	160	570 *
T9903	≈105m S LITTLE OWEN N° ADIT		Gsm, dissem + stringer hem (1%) 1-2% py, qtz veins	<0.01	140	70	440	<0.5	30	7	30	62 *
T9904			Qtz vein, mass-vuggy, minor dk blue-grey metallic min	<0.01	10	20	10	<0.5	40	3	<20	7 *
T10015	old trench above Duke Lyell		4m chip sample; Gsm, fresh, cpy minor py // clv.	0.06	12000							
T10016	"	" Adits	3m chip sample; Gsi fresh cpy-py (poddy Gsf & chl)	0.02	2700							
T10017	"	"	4m chip sample; Gcf(?) minor chl, dissem cpy-py ± shoots	0.09	1200							
T10018	"	"	4m chip sample; Gcf(?) minor chl, dissem + shoots cpy-py	0.14	3250							
											*	Bi
											T9901	<10
											9902	<10
											9903	<10
											9904	<10
											method	101
			Analytical Method	329	101	101	101	104	101	401	401	114

APPENDIX D

DIAMOND DRILL HOLE LOG

HOLE C69, COMSTOCK

C69

101 51

GOLD FIELDS EXPLORATION PTY. LIMITED

DRILL CORE RECORD

HOLE NO.	C69
STATE	TAS

ULV. PRESS

PROJECT	LINDA VALLEY
DESIGNED BY	P.A. ROBERTS
LOGGED BY	M.C. ARUNDELL
COMMENCED	27-8-87
COMPLETED	22-11-87

PURPOSE

To test for high grade Cu-Ag-Au mineralization adjacent to the Comstock Chert at depth to the north of the Comstock Workings between 0 and 100m RL.

LOG SUMMARY / GENERAL COMMENTS

The hole intersected a thin probable down dip extension of the Comstock Chert between 476.5-482.5m. A broad anomalous zone of gold and base metal mineralization, which is not typical of Mt Lyell mineralization, was intersected within hydrothermally altered and brecciated volcaniclastics straddling the "Chert". The hole ended in altered Owen Conglomerate with a faulted contact at 653.1m

ASSAY SUMMARY

INTERVAL From	INTERVAL To	Au(g/t)	Cu(%)	Pb(%)	Zn(%)	Ag(g/t)	COMMENTS
461.0	463.0 (2m)	0.02	0.15	0.94	0.83	12	
466.0	479.0(13m)	0.26	0.17	0.34	0.24	3.9	
incl. 472.0	476.0 (4m)	0.52	0.18	0.39	0.25	4.9	
and 475.0	480.0(5m)	0.18	0.27	0.85	0.54	9	
516.0	524.0(8m)	0.22	0.12	0.04	0.39	4	
638.0	641.0(3m)	0.03	0.02	0.31	1.22	3	

LOCATION

NORTHING	7780.3
EASTING	5113.4
R.L.	525.9
GRID	Lyell mine
LENGTH	674.0m

HOLE CONDITION

SIZE Hole Size	SIZE Depth
HW(ream)	77.0m
HQ	346.7m
NQ	674.0m

SIGNIFICANT CORE LOSS INTERVALS From	To	% Lost
14.0	29.0	47
66.0	77.0	37

POOR GROUND CONDITION ZONES From	To	Condition

HOLE CONDITIONS AFTER COMPLETION

PVC pipe (32mm) inserted to end of hole (674m) but lost hole upon recovering dril casing.
NB: hole tested 19/1/88 and found to be accessible only to 130m.

SURVEY DATA (Note: Bearing type must be same as Project Grid Type)

SURVEY Depth	SURVEY Bearing	SURVEY Dip	INTERVAL From	INTERVAL To	INTERVAL Distance	VERTICAL D.Sin.Dip	VERTICAL R.L.	HORIZONTAL D.Cos.Dip	HORIZONTAL Prog.Total
Collar	81.1°	-64.6°	0.0	11.0	11.0	9.9	516.0	4.7	4.7
22m	81.5°	-65°	11.0	31.5	20.5	18.6	497.4	8.7	13.4
41m	82°	-64.75°	31.5	50.0	18.5	16.7	480.7	7.9	21.3
59m	82°	-64°	50.0	66.5	16.5	14.8	465.9	7.2	28.5
76m	82°	-63.75°	66.5	85.5	19.0	17.0	448.9	8.4	36.9
97m	80.5°	-63.25°	85.5	110.5	25.0	22.3	426.6	11.3	48.2
124m	81.5°	-62°	110.5	138.5	28.0	24.7	401.9	13.1	61.3
153m	81°	-61.5°	138.5	158.5	20.0	17.6	384.3	9.5	70.8
164m	81.5°	-61.7°	158.5	173.5	20.0	17.6	366.7	9.5	80.3
193m	80.0°	-59.7°	173.5	205.0	26.5	22.9	343.8	13.4	93.7
217m	80.5°	-57.5°	205.0	222.5	17.5	14.8	329.0	9.4	103.1
228m	81.5°	-57.5°	222.5	236.5	14.0	11.8	317.2	7.5	110.6

SURVEY Depth	SURVEY Bearing	SURVEY Dip	INTERVAL From	INTERVAL To	INTERVAL Distance	VERTICAL D.Sin.Dip	VERTICAL R.L.	HORIZONTAL D.Cos.Dip	HORIZONTAL Prog Total
245m	081°	-56.7°	236.5	259.5	23.0	19.2	298.0	12.6	123.2
274m	085°	-54.5°	259.5	287.5	28.0	22.8	275.2	16.3	139.5
301m	084.5°	-52°	287.5	310.0	22.5	17.7	257.5	13.9	153.4
319m	085.5°	-51.3°	310.0	331.0	21.0	16.4	241.1	13.1	166.5
343m	085.5°	-50.7°	331.0	357.0	26.0	20.1	221.0	16.5	183.0
370m	086.5°	-49.3°	357.0	395.0	38.0	28.8	192.2	24.8	207.8
421m	088.5°	-46°	395.0	439.0	44.0	31.7	160.5	30.5	238.3
457m	089.5°	-44°	439.0	475.0	36.0	25.0	135.5	25.9	264.2
493m	090.5°	-43°	475.0	515.5	40.5	27.6	107.9	29.6	293.8
538m	088.5°	-41°	515.5	557.5	42.0	27.6	80.3	31.7	325.5
577m	088.0°	-39.7°	557.5	601.0	43.5	30.3	50.0	36.5	362.0
625m	093.0°	-38°	601.0	648.5	47.5	29.2	20.8	37.4	399.4

C69

THE MOUNT LYELL MINING AND RAILWAY COMPANY LIMITED

101 52

Form 211

Page

DIAMOND DRILL RECORD

A 12513

Hole Number	C69
Location	COMSTOCK
Level	SURFACE
Co-ordinates	7780.327N 5113.397E
Collar R.L.	525.947
Length	674m

Purpose: To test extensions of the Comstock Cu-Au mineralisation between 0 and 100m R.L. east of the Comstock Workings.

Survey Depth																		
Bearing	81°	8'	43"															
Inclination	-64°	33'	29"															

Rod Size	0 - 347m : HQ 347 - 674m : NQ
Machine	LONGYEAR 44 Contractor: DD TASMANIA
Logged by	MARK C. ARUNDELL
1:500 Plans	
1:500 Sections	
Core Location	O.C.S.

Comments: Drillers encountered difficulties to 230m mainly due to cavities. Chrome barrel used to 450m. Hole stopped 21m into Owen Conglomerate.

Commenced	28th August, 1987
Completed	21st November, 1987

ADVANCE		RECOVERY		ROD		ASSAYS (all in ppm)								BULK ASSAYS										
From	To	m	%	m	%	From	To	m	Au	Cu	Pb	Zn	Ag	Mo	Bi	To	m	%Cu	%FeS2	Au g/mT	Ag g/mT	SG		
0	3	—	—			385	387	2	0.010	105	295	950	2.5	10	<10									
	5	120	60				389		<0.005	65	305	420	3.0	<10	<10									
	8	268	89				391		<0.005	230	435	1000	3.5	<10	<10									
	11	274	91				393		0.010	80	185	1950	3.0	<10	<10									
	14	243	81				395		0.010	55	120	530	1.5	10	<10									
	17	136	45				397		<0.005	65	130	600	1.5	<10	<10									
	20	80	27				399		<0.005	60	200	590	3.5	20	<10									
	23	200	67				401		<0.005	70	220	995	2.0	10	<10									
	26	19	6				403		<0.005	55	155	900	2.5	10	<10									
	29	115	38				405		<0.005	90	135	800	2.5	<10	<10									
	32	270	90				407		<0.005	65	1725	2350	9.0	<10	20									
	35	219	73				409		<0.005	55	675	3950	6.0	10	<10									
	38	257	86				411		<0.005	55	800	7350	7.0	10	<10									
	41	291	97				413		<0.005	60	7900	2625	6.0	10	<10									
	44	165	55				415		<0.005	70	490	1475	1.0	10	<10									
	47	260	87				417		<0.005	70	485	1550	2.0	<10	<10									
	50	306	102				419		0.010	65	225	1500	2.5	<10	<10									
	53	280	93				421		0.010	350	210	1250	2.5	<10	<10									
	56	235	78				423		<0.005	75	745	1245	3.0	<10	<10									
	59	290	97				425		<0.005	85	235	855	3.5	<10	<10									
	62	294	98				427		<0.005	70	375	1700	4.5	10	10									
	65	268	89				429		<0.005	70	160	1925	4.5	10	<10									
	68	285	95				431		<0.005	75	590	1600	2.5	<10	10									
	71	100	33				433		<0.005	75	910	2050	2.0	<10	<10									
	74	320	107				435		0.010	100	900	1650	2.0	10	20									
	77	143	48				437		<0.005	60	340	1040	3.0	10	<10									
	80	315	105				439		<0.005	50	325	1715	0.5	<10	<10									
	83	291	97				441		<0.005	30	95	520	0.5	10	<10									
	86	286	95				443		<0.005	50	100	740	0.5	<10	<10									
	89	318	106				445		0.010	50	330	1450	2.0	<10	<10									
	92	296	99				447		<0.005	55	250	1215	2.0	<10	<10									
	95	305	102				449		<0.005	70	650	1425	1.5	10	<10									
	98	255	85				451		<0.005	65	310	600	3.0	<10	<10									
	101	310	103				453		<0.005	70	570	750	3.5	<10	<10									
	104	308	103				455		<0.005	90	530	1030	3.5	<10	<10									
	107	300	100				457		<0.005	90	335	1125	4.5	<10	<10									
	110	290	97				459		<0.005	100	1200	4500	7.0	<10	<10									
	113	283	94			459	461	2	<0.005	90	400	1250	3.0	<10	<10									
	116	310	103			461	462	1	0.020	1950	15300	3000	15.0	10	<10									
	119	265	86				463		0.010	1050	3550	7300	10.0	40	20									
	122	306	102				464		0.080	715	530	1645	5.5	<10	20									
	125	295	98				465		0.010	1030	230	625	4.5	10	<10									
	128	295	98				466		0.010	1225	105	300	2.5	10	30									
	131	300	100				467		0.100	850	60	520	3.0	20	<10									
	134	303	101				468		0.240	600	150	650	2.0	<10	<10									
	137	310	103				469		0.140	580	150	620	2.0	20	<10									
	140	310	103			469	470	1	0.150	965	285	900	1.5	10	<10									

ADVANCE		RECOVERY		ROD		ASSAYS (all in ppm)									BULK ASSAYS											
From	To	m	%	m	%	From	To	m	Au	Cu	Pb	Zn	Ag	Mo	Bi	To	m	%Cu	%FeS2	Au g/mT	Ag g/mT	SG				
140	143	305	102			470	471	1	0.070	610	175	550	2.0	10	<10											
	146	288	96				472		0.170	700	95	445	0.5	20	<10											
	149	276	92				473		0.340	610	120	760	0.5	20	<10											
	152	282	94				474		0.360	2575	95	255	4.5	20	<10											
	155	313	104				475		0.510	1790	255	2510	4.5	30	<10											
	158	287	96				476		0.370	2000	13100	9900	10	30	<10											
	161	294	98				477		0.160	2625	3800	9100	9	30	<10											
	164	300	100				478		0.150	2725	21700	3225	16	60	<10											
	167	295	98				479		0.160	3700	1800	5800	4	50	<10											
	170	297	99				480		0.030	2600	425	1000	7	20	<10											
	173	311	104				481		0.040	850	405	665	4.0	10	<10											
	176	290	97				482		0.060	895	650	2275	5.5	20	<10											
	179	287	96				483		0.060	1350	575	2750	14	10	<10											
	182	315	105				484		<0.005	1795	1425	9100	3	10	<10											
	185	284	95				485		<0.005	145	110	3550	1.0	20	<10											
	188	298	99				486		<0.005	130	975	2360	3.0	10	<10											
	191	297	99				487		<0.005	65	245	1300	<0.5	20	<10											
	194	295	98				488		<0.005	130	275	595	0.5	10	<10											
	197	300	100				489		<0.005	95	450	1975	2.0	10	<10											
	200	285	95				490		0.010	110	580	3285	<0.5	10	<10											
	203	300	100				491		<0.005	655	455	1500	3.0	10	<10											
	206	294	98			491	492	1	0.060	650	100	670	0.5	10	<10											
	209	283	94			492	494	2	0.020	225	140	560	<0.5	<10	<10											
	212	300	100				496		0.060	325	150	580	<0.5	<10	<10											
	215	296	99				498		0.060	575	190	780	1.0	<10	<10											
	218	263	88				500		0.010	275	245	1500	0.5	<10	<10											
	221	287	96			500	502	2	0.050	820	450	1600	0.5	10	<10											
	224	297	99																							
	227	290	97			516	518	2	0.270	1360	540	7450	3.0	10	<10											
	230	288	96				520		0.280	1000	210	3590	5.5	<10	<10											
	233	298	99				522		0.140	1535	65	1775	3.0	20	<10											
	236	286	95				524		0.180	1025	710	2775	3.0	10	<10											
	239	282	94				526		0.040	250	790	2275	1.5	<10	<10											
	245	581	97				528		0.020	245	295	1900	0.5	20	<10											
	248	296	99				530		0.030	220	495	1100	0.5	10	<10											
	251	299	100				532		0.020	140	305	1065	0.5	10	<10											
	254	292	97			532	534	2	0.010	90	240	2000	0.5	10	<10											
	257	286	95																							
	260	294	98			550	552	2	<0.005	70	185	600	0.5	40	<10											
	263	291	97				554		0.020	400	350	900	1.0	<10	<10											
	266	295	98				556		0.040	495	700	1835	3.0	10	<10											
	269	300	100				558		0.010	235	625	1825	1.5	<10	<10											
	272	309	103				560		0.010	95	495	2350	0.5	<10	<10											
	275	300	100				562		0.020	125	935	4800	1.5	<10	<10											
	278	298	99				564		<0.005	125	650	1675	<0.5	<10	<10											
	281	310	103			564	566	2	0.010	160	760	2675	2.5	10	<10											
	284	298	99																							

THE MOUNT LYELL MINING AND RAILWAY COMPANY LIMITED

ADVANCE		RECOVERY		ROD		ASSAYS (all in ppm)									BULK ASSAYS											
From	To	m	%	m	%	From	To	m	Au	Cu	Pb	Zn	Ag	Mo	Bi	To	m	%Cu	%FeS2	Au g/mT	Ag g/mT	SG					
284	287	283	94			604	606	2	<0.008	60	340	715	<0.5	<10	<10											
	290	310	103			606	608	2	<0.008	75	625	1875	<0.5	<10	<10											
	293	304	101																							
	296	299	100			636	638	2	0.060	120	275	2575	1.5	<10	40											
	299	296	99			638	639	1	0.090	195	2700	5700	4	<10	<10											
	302	299	100				640	1	0.070	245	2300	11700	3	10	<10											
	305	299	100			640	641	1	0.010	130	4425	19200	2	<10	<10											
	308	297	99																							
	311	297	99																							
	314	291	97																							
	317	295	98																							
	320	296	99																							
	323	293	98																							
	326	299	100																							
	329	294	98																							
	332	295	98																							
	335	317	106																							
	338	285	95																							
	341	278	93																							
	344	307	102																							
	347	270	90																							
	350	305	102																							
	353	307	102																							
	356	220	73																							
	359	309	103																							
	362	300	100																							
	365	305	102																							
	368	296	99																							
	371	300	100																							
	374	297	99																							
	377	298	99																							
	380	282	94																							
	383	310	103																							
	386	291	97																							
	389	297	99																							
	392	295	98																							
	395	303	101																							
	398	296	99																							
	401	296	99																							
	404	303	101																							
	407	291	97																							
	410	291	97																							
	413	297	99																							
	416	309	103																							
	419	297	99																							
	422	301	100																							
	425	291	97			ANALYTICAL METHOD:			309	101/104	101/104	101/104	101/104	101	101											

C69

THE MOUNT LYELL MINING AND RAILWAY COMPANY LIMITED

10156

ADVANCE		RECOVERY		ROD		ASSAYS									BULK ASSAYS											
From	To	m	%	m	%	From	To	m	%Cu	%FeS2	%S				From	To	m	%Cu	%FeS2	Au g/mT	Ag g/mT	SG				
425	428	301	100																							
	431	298	99																							
	434	297	99																							
	437	302	101																							
	440	298	99																							
	443	299	100																							
	446	306	102																							
	449	299	100																							
	452	288	96																							
	455	298	99																							
	458	307	102																							
	461	277	92																							
	464	310	103																							
	467	284	95																							
	470	265	88																							
	473	299	100																							
	476	307	102																							
	479	284	95																							
	482	290	97																							
	485	294	98																							
	488	284	95																							
	491	282	94																							
	494	287	96																							
	497	288	96																							
	500	291	97																							
	503	284	95																							
	506	295	98																							
	509	296	99																							
	512	291	97																							
	515	295	98																							
	518	299	100																							
	521	286	95																							
	524	277	92																							
	527	293	98																							
	530	295	98																							
	533	291	97																							
	536	300	100																							
	539	294	98																							
	542	305	102																							
	545	280	93																							
	548	301	100																							
	551	294	98																							
	554	295	98																							
	557	277	92																							
	560	282	94																							
	563	297	99																							
	566	301	100																							

ADVANCE		RECOVERY		ROD		ASSAYS									BULK ASSAYS											
From	To	m	%	m	%	From	To	m	%Cu	%FeS2	%S				From	To	m	%Cu	%FeS2	Au g/mT	Ag g/mT	SG				
566	569	292	97																							
	572	306	102																							
	575	286	95																							
	578	296	99																							
	581	297	99																							
	584	288	96																							
	587	301	100																							
	590	304	101																							
	593	288	96																							
	596	304	101																							
	599	291	97																							
	602	301	100																							
	605	297	99																							
	608	298	99																							
	611	297	99																							
	614	300	100																							
	617	304	101																							
	620	296	99																							
	623	294	98																							
	626	302	101																							
	629	299	100																							
	632	290	97																							
	635	290	97																							
	638	265	86																							
	641	310	103																							
	644	291	97																							
	647	287	96																							
	650	294	98																							
	653	302	101																							
	656	291	97																							
	659	277	92																							
	662	303	101																							
	665	296	99																							
	668	287	96																							
	671	297	99																							
	674	300	100																							

	DESCRIPTION	REMARKS
0 - 2m	Pre collar - no core.	
2 - 6m	Intensely weathered and partly ferruginised sericitic(?)chloritic and quartzose rock. Grey yellow green in colour. Kaolinitic with a vuggy weathered texture.	
6 - 54m	Green fine to medium grained weakly foliated volcanic. Chlorite, quartz, sericite. Some coarsed grained chlorite between 33 and 35m. Siderite veinlets and stringers are present between 35 and 37.5m. Milky quartz veins at 22.3m and 38.2m. Disseminated pyrite occurs virtually throughout the unit and as thin stringers especially along the foliation (≈2% total).	
	Structural Log. 10.9 - 11m, 13.6 - 13.9m, 18.4 - 20m, 20.7 - 21.5m, 22 - 22.6m, 26 - 28m, 31.4 - 32.9m, 34.8 - 35.1m - Broken core. 10.2 - 10.4m - Quartz (milky) veinlets with iron staining. 23.3m, 38.1 - 38.3m - Milky quartz ± chlorite veins. 23 - 29m - Cavity - major core loss. 26.2 - 26.6m - Quartz sericite breccia?? 35 - 37.5m - Siderite veinlets and stringers.	
	SCA ≈ 40° Contact Transitional from 51 to 57m.	
54 - 70m	Green yellow coarse to very coarse grained fragmental volcanic. Quartz, chlorite, sericite. Quartz "clasts" (≤1.2cm) in a sericite, chlorite ± quartz groundmass. Chlorite blebs, stringers and veinlets common throughout unit. Well developed foliation but unit not really schistose. Siderite veinlets and stringers ± quartz present between 62.5 and 68.5m. Milky to translucent quartz vein (ing?) between 68.7 and 69.8m. Pyrite occurs predominantly with chlorite in veinlets and stringers throughout the unit with some disseminated pyrite associated with sericite (?). (≈1% total).	
	Structural Log. 55 - 55.5m, 57.7 - 57.9m, 58.5 - 58.7m, 59.5 - 59.7m, 61 - 61.2m, 61.8 - 62m, 64.4 - 64.7m, 65.9 - 66.1m, 68 - 70m - Broken core. 67 - 67.2m - Quartz, siderite, chlorite vein. 68.7 - 69.8m - Milky quartz, chlorite vein.	
	SCA≈40°	
70 - 75.7m	Yellow green medium grained weakly foliated volcanic. Sericite, chlorite, quartz, siderite, Kaolin (?). Siderite and chlorite occur both as belbs and stringers and veinlets. Chlorite is also disseminated. Quartz siderite vein at 71.5m. Pyrite occurs with chlorite in stringers and veinlets. (≈0.5% total).	

	DESCRIPTION	REMARKS
70 - 75.7 (cont.)	Structural Log.	
	70.5 - 71.5m - Siderite ± milky quartz veinlets and veins. 75 - 75.7m - Broken puggy core-sheared.	
	SCA ≈40°	
75.7 - 100m	Green yellow medium to very coarse grained fragmental volcanic. Chlorite, sericite, quartz, siderite. Quartz fragments (< 1cm; rose, milky and translucent) and chlorite blebs (< 8mm) and sediment (?) inclusions (< 1cm) in a chlorite, sericite, quartz groundmass. Siderite occurs in veins (with quartz), veinlets, stringers and as blebs. Milky quartz veins with pale siderite (?) at 91 - 91.3m, 91.8 - 92m, and 94.6 - 95.1m. Pyrite occurs disseminated throughout the unit and, to a lesser extent, as small blebs (<5mm) and in chlorite stringers and veinlets.	
	Structural Log. 75.7 - 76.4m, 77.4 - 78.3m, 90.9 - 91.2m, 91.7 - 92m, 94.5 - 95.1m, 95.6 - 95.9m - Broken core. 80.8 - 80.9m - Quartz siderite chlorite pyrite vein. 91 - 91.3m, 91.8 - 92m, 94.6 - 95.1m - Milky quartz, pale siderite veining ± chlorite ± sericite.	
100 - 189.7m	Green yellow grey fine to medium grained volcanic. Chlorite, quartz, sericite, feldspar, siderite, fuchsite (?). Occasional pink quartz fragments (<3cm) and sediment inclusions (<1.5cm) in a chlorite sericite quartz groundmass. Small feldspars (angular; <0.5cm) between 163 - 189.7m. Siderite occurs throughout unit ± quartz in veins, veinlets and stringers. Chlorite blebs (<0.5cm) also - possibly devitrified volcanic glass. Zones of hydrothermal alteration associated with pyrite veins and veinlets between 100 - 101.4m, 114.5 - 116m, 117.5 - 118.3m, 131.8 - 133.3m, 154.5 - 155.3m, 161.2 - 162.7m, 181.4 - 181.5m. Pyrite occurs disseminated, as veins and veinlets and stringers (0.5 - 10%). Very fine to fine grained.	
	Structural Log. 104.4 - 104.7m, 116 - 117.5m, 132.9 -135.5m, 138.5 - 140.2m, 147 - 147.5m, 160 - 160.8m - Quartz ± siderite, chlorite, fuchsite (?) veining - similar to flat faults. 115.5 - 118m, 139 - 139.5m, 143 - 143.5m, 146.5 - 147.2m, 157.4 - 157.8m, 162.7 - 163.3m, 181.5 - 182m - Broken core.	
	SCA ≈ 30°(122m) ≈40°(179m)	
189.7 - 207.6m	Green yellow grey coarse to very coarsely grained fragmental volcanic to 201.8m "underlain" by yellow-green fine grained (ash fall?) volcanic. Chlorite, quartz, sericite, feldspar, siderite, fuchsite (?). Volcanic fragments (chloritised; sub-angular; <4cm) in a sericite/chlorite, quartz, pyrite groundmass to 201.8m. Chlorite "blebs" (<0.7cm), very dark green - possible devitrified glass-throughout although not many after 201.8m. Fuchsite (?) occurs virtually throughout unit	

	DESCRIPTION	REMARKS
189.7 - 207.6m (cont.)	(<0.7cm). Siderite occurs ± quartz to 201.8m as veinlets and stringers often parallel to schistosity. Pyrite occurs disseminated and as veinlets and stringers to 201.8m (0.5 - 2%). Fine grained sub unit is sericite, chlorite quartz with a few chlorite "blebs". Foliated but schistosity not well developed.	
	Structural Log. 201 - 201.4m, 205 - 206.1m - Broken core.	
	SCA ≃ 25°	
207.6 - 247.8	Green yellow grey fine to medium grained intermediate volcanic. Quartz, chlorite, sericite, feldspar siderite, pyrite. Volcanoclastic (?) sub-unit from 221 - 228m. Chlorite and volcanic clasts in a sericite, chlorite, quartz ± pyrite groundmass. Siderite ± quartz occurs as veinlets and stringers. Hydrothermally altered volcanoclastic sub-unit from 243 - 245.3m. Pink quartz (<1cm), sediment (<1.5cm) clasts in a chlorite, quartz, sericite, pyrite groundmass. Pyrite occurs disseminated predominantly and occasionally as veinlets and stringers (≈ 1%).	
	Structural Log. 215.7 - 216.4m, 217.2 - 218m, 231.5 - 231.9m, 242.6 - 242.9m - Broken core. 237.6 - 237.8m - Broken puggy, clayey core - shear.	
	SCA ≈ 30°	
247.8 - 299.9m	Green-grey coarse to very coarse grained felsic volcaniclastic. Quartz, sericite, chlorite, siderite, feldspar, pyrite. Unit becomes fine-medium grained from 296 - 298.9m. Felsic volcanic clasts (pink quartz, chlorite, feldspar) in a chlorite quartz groundmass. Clasts to 8cm. Intense silicification between 262.4 - 262.8m. Hydrothermal brecciation between 264.5 - 269.5m with siderite ± quartz introduction (?). Hydrothermally altered bed 270.5 - 272m with chlorite and pyrite introduction. Quartz veins and veinlets between 281 and 284m. Pyrite occurs mainly in hydrothermally altered bed (<1%). From 296 to E.O.U. clay alteration (?).	
	Structural Log. 263.6 - 264m, 267.3 - 267.6m, 269.0 - 269.7m, 281 - 284m - Quartz ± siderite veins and veinlets 266 - 266.5m, 267.3 - 267.6m, 269 - 269.5m - Broken Core	
	SCA ≈60°	
299.9 - 328.9m	Green yellow grey fine to medium grained volcanic. Chlorite, quartz, sericite, feldspar. Intermediate ignimbritic flow (?). Some evidence of banding with feldspars (<0.5cm) in a chlorite, quartz, sericite groundmass. Unit strongly sericitic between 303 - 303.4m and 304.9 and 307.4m. Quartz, siderite and chlorite veins between 309.1 - 310m and 311.8 - 312.4m. Pyrite occurs	

	DESCRIPTION	REMARKS
299.9 - 328.9m (cont.)	occasionally as stringers and veinlets. Very fine grained (≤0.5%).	
	Structural Log. 299.9 - 300.1m, 301.2 - 301.3m, 327.1 - 327.5m - Broken core - brittle fracture. 302.8 - 302.9m, 309.1 - 310m, 311.8 - 312.4m, 325.5 - 325.6m - Milky quartz, siderite, chlorite veins. 325.6 - 326 - Broken puggy core - brittle shear fracture.	
	SCA ≈ 60°	
328.9 - 361.4m	Green yellow medium to very coarse grained fragmental volcaniclastic. Chlorite, sericite, quartz, feldspar (?), pyrite. Felsic to intermediate brecciated volcaniclastic. Quartz and feldspar (?) clasts (to 3cm) in a chlorite, quartz, sericite, feldspar groundmass. Clasts sub-rounded to angular. Zone of strong hydrothermal alteration from 340.7 - 353.5m. Sericite and pyrite introduced with brecciation of original rock. Some clasts show distinct foliation, others very random. Small quartz vein shows brecciation - pre-alteration. Pyrite (4 - 10%) within zone. Between 359.3 and 361.4m, alteration less intense but brecciation greater. Possibly tuffaceous clasts in a quartz, sericite pyrite groundmass. Chlorite replacement of glass or mafic minerals.	
	Structural Log. 330 - 330.8m, 333.4 - 335.2m, 335.4 - 335.6m - Massive milky quartz, siderite, chlorite, ± haematite (?) veins. 353.6 - 354.5m, 355 - 355.1m, 355.6 - 355.9m - Broken (puggy) core - brittle/shear fracture.	
361.4 - 384.2m	Green fine to medium grained volcanic. Chlorite, quartz, feldspar, sericite. Weakly foliated. Chlorite occurs as "blebs" (<3mm) and appears to be replacement of glass or mafic phenocrysts. Quartz ± siderite veins and veinlets occur throughout. Quartz appears to be late stage - possibly remobilized from groundmass. Pyrite occurs as veinlets and stringers through part of unit (381 - 383.1m). Fine to very fine grained (0.1 - 1%).	
	Structural Log. 380 - 380.2m - Broken core - brittle fracture. Generally good ground throughout.	
	SCA ≈ 60°	
384.2 - 457.5m	Green-grey-yellow fine to medium grained volcanic. Chlorite, quartz, sericite, feldspar, pyrite. Unit is similar in basic composition to last unit but is weakly to very strongly hydrothermally altered and brecciated. Intense alteration zones contain angular rock fragments in a groundmass of chlorite, pyrite, sericite quartz. Fragments are chlorite, quartz ± sericite with a distinct pinkish rim - possibly indicating an original felsic composition. Unit possibly contains intermediate volcanic sub-units but alteration makes distinction very doubtful.	

	DESCRIPTION	REMARKS
384.2 - 457.5m	Some quartz, siderite veins show remobilized and re-growth textures, i.e. massive quartz gone to fibrous. Some veins show an affinity with sulphides especially at 409.7m where quartz-siderite occurs with molybdenite (?) and with molybdenite (?) as a "halo" around the veins. Pyrite occurs throughout the unit as stringers and veinlets and fine grained disseminations. Intimately associated with alteration, pyrite "blebs" grow to ≈ 3mm (0.5 - 5%). Chalcopyrite is virtually non-existent. Very small crystals in a quartz vein (439.6m < 0.1%). Haematite also present in trace amounts, especially at 421.2m, 425.9 - 426.7m (<0.1%). Molybdenite (?) is restricted to 409.7 - 410.5m.	
	Structural Log. 409.7 - 409.9m, 431.2 - 431.5, 447.5 - 447.9m - Quartz, siderite, chlorite ± molybdenite (?) veins. Excellent ground throughout.	
	SCA ≈ 55°	
457.5 - 472.9m	Green-grey-yellow very fine to medium grained volcanic. Unit to 463.7m is well foliated green-grey chlorite, quartz, sericite feldspar (intermediate ?) volcanic. Evidence of hydrothermal replacement but no brecciation. From 463.7 - 468.1m grey-yellow very fine to fine grained quartz, sericite, chlorite, fluorite fuchsite (?) (ash fall?) volcanic. From 468.1m to end of unit, similar to first part plus fuchsite, fluorite. Pyrite occurs throughout the unit predominantly as veinlets and stringers in the first sub-unit (0.5 - 3%), disseminated in the second (2 - 5%) and as stringers and veinlets in the third (0.1 - 1%). Chalcopyrite is present between 461.4 and 462.6m (≈ 0.5%). Molybdenite (?) is present between 461.4 and 461.7m (1 - 15%). Specularite and haematite are noted between 461.4 and 463.7m (1 - 5%). Two distinct phases of quartz veining are noted. An earlier phase is brecciated by chlorite and haematite/specularite alteration. A late phase with quartz siderite and purple fluorite seems to cut earlier structures.	
	Structural Log. 458.7 - 459.5m - Broken core with pug at 458.7m. Shear to core angle 40° - Brittle shear fracture. Major fault in chlorite schist. 464.3 - 464.5m - Broken core - brittle fracture. 467.2 - 469.2m - Broken core including pug from 468.6 - 468.8m. Zone changes from silicic volcanic to fuchsitic (?) schist at 468.1m. Brittle shear fracture. Major fault.	
	SCA ≈ 60°	
472.9 - 488m	Mauve grey green fine to very coarse grained sediment (?). Quartz, chlorite, siderite, fuchsite, pyrite, chalcopyrite. Quartz clasts (0.5 - 5cm) in a quartz, chlorite matrix. Quartzite to 479.2m. From 479.2 - 482.2m, brecciated quartzite in a chlorite, quartz, feldspar groundmass. Well foliated with clast size and number decreasing with depth. From 482.2 to end of unit, fine grained well foliated pyrite sandstone with grain size decreasing with depth and volcanic	

	DESCRIPTION	REMARKS
472.9 - 488m (cont.)	(chlorite) content increasing from 485m. Pyrite occurs throughout unit as veinlets, stringers and disseminated in first sub-unit (1 - 10%), veinlets and stringers in the second (0.5 - 8%) and as veinlets and veins in the third (10 - 25%). Chalcopyrite occurs as stringers in the first sub-unit (<0.5%). Molybdenite (?) also occurs in the first sub-unit (<0.5%). Fluorite is present in the first sub-unit (<1.0%).	
	Structural Log. 484.9 - 485.1m - Broken core - brittle-shear fracture. Good ground overall.	
	SCA ≈ 50°	
488 - 503.9m	Green grey fine to medium grained volcanic. Chlorite, quartz, sericite, feldspar, fuchsite. Numerous feldspar or chlorite phenocrysts (<3mm) indicating devitrification of mafics and/or glass. Unit becomes less schistose with depth indicating reduced sericite and pyrite content. Quartz vein dislocation and remobilization overprint each other. Pyrite occurs throughout unit as veinlets and stringers (1 -15%).	
	Structural Log. 489 - 489.1m, 494.1 - 494.2m, 503.4 - 504.5m - Broken core - brittle fracture.	
	SCA ≈ 60°	
503.9 - 527.2m	Yellow grey green medium to coarse grained fragmental (?) volcanic. Quartz, chlorite, sericite, feldspar. Unit displays silicification/hydrothermal alteration between 519.2 and 522.5m. Felsic (to intermediate) volcanoclastic. Unit increases in grain size (overall) as depth increases. Sub-angular to sub-rounded quartz clasts in a chlorite quartz, sericite groundmass from 515m to end of unit. From 503.9 - 515m, feldspar and chlorite phenocrysts predominate over quartz clasts. Quartz veins contain some rose quartz (517.6m) and haematite. Pyrite occurs disseminated throughout the unit and occasionally as veinlets and stringers (0.5 - 3%).	
	Structural Log. 520.3 - 521.2m - Minor broken core - brittle fracture. 522.4m - Minor broken core and pug - brittle shear fracture.	
	SCA ≈ 60°	
527.2 - 556.5	Green fine to medium grained volcanic. Chlorite, quartz, feldspar, sericite. Intermediate volcanic. Occasional clasts of fragmental material. Alteration minimal - occasional quartz, haematite ± siderite veins and veinlets. Pyrite occurs intermittently throughout the unit mostly as veinlets and veins (massive) and as "blebs" (0.2 - 2%). Haematite occurs with quartz and becomes more abundant with depth.	

	DESCRIPTION	REMARKS
527.2 - 556.5m (cont.)	Structural Log. 543.1 - 543.2m - Broken core - brittle fracture. Very good ground. SCA ≈ 55°	
556.5 - 573.3m	Grey yellow fine to very coarse grained fragmental (?) volcanic. Quartz, siderite sericite, chlorite. Felsic volcanoclastic (?). Intense carbonate alteration virtually throughout unit. Quartz and volcanic clasts (<1cm) in a quartz, sericite, chlorite groundmass. Pyrite occurs intermittently throughout the unit as stringers and veinlets (0.1 - 1.5%). Molybdenite (?) occurs in quartz, siderite ± pyrite veins from 570.3 - 571.6m (0.1 - 0.3%). Haematite is present at 569.8m (<0.2%). Structural Log. Excellent ground throughout. SCA ≈ 50°	
573.3 - 635.5m	Green yellow fine to medium grained volcanic. Quartz, chlorite, feldspar, sericite. Intermediate volcanic. Feldspar, chlorite, quartz, phenocrysts (<0.7cm) in a chlorite, quartz, ± feldspar, ± sericite groundmass. Zone of moderate to intense hydrothermal alteration from 588.8 - 593m with carbonate and pyrite introduced and minor brecciation. Minor zone between 595.3 - 595.6m with pyrite, fuchsite (?) (→ phlogopite), quartz. Fine grained (ash fall (?)) zone from 599.2 -601m. Zone of hydrothermal brecciation with sericite and pyrite introduced from 608.9 - 614.5m (approx.). Pyrite occurs as veinlets and stringers through altered zones (1 - 5%). Through rest of unit, there is little disseminated pyrite (<0.5%). Haematite occurs in veins with quartz, ± siderite, ± specularite, especially between 604.9 - 605.3m. Structural Log. 573.3 - 578.4m - Quartz, siderite, chlorite ± pyrite, ± haematite veining (all <5cm). 607.3 - 607.4m - Quartz, siderite, haematite, specularite, chlorite vein. 633.9 - 634.1m - Broken core with pug at 633.9m. Shear to core angle ≈ 50° brittle fracture - fault. 635.2 - 635.5m - Broken core - brittle fracture - major fault. SCA ≈ 35°	
635.5 - 637.2m	Pink grey medium to very coarse grained quartzite. Quartz, fuchsite (?), chlorite sericite. Foliation poorly developed. Small zone (5 - 10cm) of pyrite-sericite. Pyrite occurs throughout unit as veinlets and stringers (2 - 8%). Structural Log. 635.5 - 637.0m - Broken core - brittle fracture. 637.0 - 637.2m - Puggy broken core - shear fracture - major shear/fault.	

	DESCRIPTION	REMARKS
637.2 - 653.1	Green grey yellow fine to medium grained volcanic. Quartz, chlorite, feldspar, sericite. Intermediate volcanic. Zones of sericite-pyrite hydrothermal (?) alteration between 638 - 638.7m, 639.6 - 639.7m, and 640.4 - 641.2m. Unit becomes progressively more folicated (sheared), and to a lesser extent, brecciated, with depth. Pyrite is virtually restricted to the alteration zone (10 - 20%) with some veinlets and stringers in the rest of the unit (0.1 - 4%). Haematite appears at 650m and increases with depth (0.2 - 5%).	
	Structural Log. 645.1 - 645.3m - Broken core - brittle fracture - minor fault. 653.1m - Pug - core to shear angle 30°. Major shear/fault - conglomerate contact.	
	SCA ≈ 30°	
653.1 - 674m	Owen conglomerate. Pink green interbedded fine to medium grained sandstone with very coarse grained clast supported conglomerate. Quartz, chlorite, haematite, ± siderite. Quartzite, quartz, sandstone, shale (?), granitic (?), volcanic pebbles (rounded to sub-angular; 0.3 - 10cm) in a quartz, chlorite, haematite matrix.	
	E.O.H.	

RGC EXPLORATION PTY. LIMITED

APPENDIX E

PETROGRAPHIC REPORT ON SAMPLES FROM DDH C69

by

DR. A.S. JOYCE

101 67

Geochempet Services

PETROLOGICAL and GEOCHEMICAL CONSULTANTS

REGISTERED IN QUEENSLAND

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PETROLOGICAL REPORT ON

FOURTEEN SAMPLES OF DRILL CORE

FROM COMSTOCK, TASMANIA

prepared for

GOLD FIELDS EXPLORATION PTY. LTD.

Ref : F.G. Fitzgerald

Order No. : E 12501

A. S. Joyce, B.Sc.(Hons), Ph.D.

8th March, 1988.

GENERAL COMMENTS

1. All of the rocks are interpreted to show heavy to intense alteration of hydrothermal style and most show at least some sulphide mineralization.

   Silicification and varying degrees of chloritization and/or sericitization are typical and some are impregnated with fine pyrite. Carbonation varies from nil to intense : the carbonate seems to be variously calcite, ferroan calcite or dolomite, but not siderite.

2. Many of the rocks carry deformed fissure veins. Thin, early veins carry mainly pyrite, quartz and chlorite. Thicker and generally later veins are dominated by carbonate and quartz, but zoning is common and the total assemblage involves chlorite, carbonate, quartz, hematite, pyrite, sphalerite, galena, chalcopyrite and baryte. The paragenetic sequence is best displayed in T 10315 and involves early quartz-chlorite-pyrite, then jasperoidal hematite and quartz, then carbonate, then quartz and finally baryte, sphalerite and galena.

   Purple fluorite occurs with pyrite-quartz-chlorite in replacement style veins in T 10312. Colourless fluorite occurs with pyrite and sericite in veins in T 10312.

3. All of the rocks display tectonic foliation and in some cases tectonic brecciation superimposed on the alteration. Nevertheless, remnant textures do permit satisfactory interpretation of the nature of the precursor rock for most of the samples. They seem to include lavas, arenites and a turbidite, all of apparently intermediate volcanic derivation.

   Only the sample T 10313 lacks interpretable primary textures. It is a "cherty" siliceous rock with a deformed network of sericite-fluorite-pyrite veins.

Sample Number : T 09801

Identification : Intensely sericitized, silicified and pyritized intermediate lava with deformed fissure veins of quartz-pyrite-dolomite-chlorite

Description :

The sample is a drill core specimen of medium light grey, schistose, finely sericitic rock with brecciated or coarsely fragmental textures and disseminated and vein pyrite.

A staining test revealed no K-feldspar.

In thin section the sample displays moderately preserved primary textures of abundantly porphyritic, intermediate volcanic style : phenocrysts were mainly about 0.3 to 1mm in size. Inferred phenocrysts of plagioclase have been completely sericitized and sparse inferred mafic silicate phenocrysts have altered to leucoxene-quartz-sericite; there are a very few quartz phenocrysts and moderately abundant microphenocrysts of completely leucoxenized oxides. The groundmass is now sericite and fine quartz. Tiny cubes of pyrite (mainly 0.01 to 0.02mm) are disseminated abundantly throughout the rock.

Additional coarser cubes of pyrite (ranging up to 0.5mm) occur abundantly with rhombs of probable dolomite, a few grains of chlorite, and much strained and finely recrystallized quartz in contorted and disrupted fissure veins about 1 to 5mm thick.

An approximate mode is :

50-55%	sericite
20-30%	host rock quartz
8-10%	fine disseminated pyrite
3-4%	leucoxene
6-8%	vein quartz
2-3%	vein pyrite
2-3%	vein dolomite
0.2-0.3%	vein chlorite

Comments and Interpretations :

This rock is interpreted to have originated as intermediate lava, with many phenocrysts of plagioclase and ilmenite or titaniferous oxide, some pyroxene and a trace of quartz. It has experienced intense sericitization, silicification and pyritization and fissure veining by quartz-dolomite-pyrite-chlorite. It was then brecciated and foliated by shearing.

No feldspar has survived the alteration.

Sample Number : T 09802

Identification : Intensely sericitized and silicified intermediate volcaniclastic arenite with deformed, zoned fissure veins carrying carbonate, quartz, pyrite, chlorite and sericite

Description :

The sample is a drill core specimen which displays greenish grey, stretched clasts up to a few millimetres in size set in a light olive, schistose matrix. There are prominent, contorted, thick fissure veins with major outer zones of carbonate (white when fresh, greyish yellow when incipiently oxidized) and a core of quartz; fine pyrite forms thin outermost zones in the veins.

A staining test revealed no K-feldspar.

In thin section the host rock displays remnant textures which seem to be consistent with former lithic clasts (up to about 4mm) and smaller phenoclasts set in a fine matrix : there has been complete alteration to sericite, fine quartz, minor carbonate and leucoxene, and traces of chlorite.

Contorted and disrupted fissure veins, about 1 to 10mm thick, have thin outermost zones (0.2 to 0.5mm) of pyrite with quartz and minor chlorite and sericite, thick inner zones of dolomite or ferroan calcite and a discontinuous core of coarse quartz. Very fine pyrite appears to have mobilized from the coarse veins into adjacent fractures of apparently late, tectonic style.

Earthy red pigment, apparently hematite, occurs locally in the veins and in the host rock.

An approximate mode is :

70-75%	host rock sericite
15-20%	host rock quartz
0.3-0.5%	host rock carbonate
tr	host rock chlorite
tr	host rock leucoxene
8-10%	vein carbonate (probably dolomite or ferroan calcite)
1-2%	vein quartz
0.8-1%	pyrite, in and near the veins
0.3-0.4%	vein chlorite
0.1-0.2%	vein sericite
tr	hematite

Comments and Interpretations :

This rock seems to have originated as an intermediate volcaniclastic rock, although there is a small possibility that it was porphyritic lava. It has been intensely sericitized and silicified and thickly fissure veined, with early zones involving pyrite-quartz-chlorite-sericite, then dolomite or ferroan calcite, then quartz. There has been subsequent brecciation by shearing and mobilization of some fine pyrite.

Green chlorite is a minor component in the veins and elsewhere. Earthy hematite occurs sparsely in the veins and elsewhere; the possibility of cinnabar was considered, but the colour seems wrong. The carbonate shows some zonal variation but seems to be essentially dolomite or ferroan calcite.

Sample Number : T 09803

Identification : Unwelded vitric crystal tuff with intense carbonation and fuchsitic sericitization and deformed pyritic fissure veins

Description :

The sample is a drill core specimen which displays greyish green, altered, unwelded former vitric clasts disseminated abundantly through a yellowish grey, schistose matrix. A thin vein of whitish carbonate and quartz is cut by a finely pyritic vein.

A staining test revealed no K-feldspar.

In thin section the sample displays remnant textures consistent with unwelded vitric shards (about 0.2 to 5mm) and phenoclasts (about 0.1 to 1.5mm) scattered abundantly through a fine matrix.

The vitric shards and phenoclasts of feldspar style have been completely altered to sericite (presumably fuchsitic in view of its hand specimen colour) and minor fine carbonate. There are some recrystallized, small quartz phenoclasts. The fine matrix consists of subhedral rhombs of carbonate, fine quartz, minor sericite and specks of leucoxene.

A disrupted 1mm wide vein of ferroan calcite or dolomite is cut by a deformed, pinching and swelling fissure vein which has outer pyrite-sericite zones (with a few specks of chlorite) and an intermittent core of quartz and carbonate.

An approximate mode is :

45-55%	host rock carbonate
30-35%	host rock sericite (fuchsitic)
15-20%	host rock quartz
0.1-0.2%	host rock leucoxene
0.8-1%	vein carbonate
0.2-0.3%	vein quartz
0.1-0.2%	vein pyrite
0.1-0.2%	vein sericite
tr	vein chlorite

Comments and Interpretations :

This rock is regarded as unwelded vitric crystal tuff of acid or quartzose intermediate origin. It has been intensely altered to carbonate (probably ferroan calcite or dolomite) and fuchsitic sericite, fissure veined by carbonate-quartz then pyrite-sericite-chlorite-carbonate-quartz, and finally mildly deformed by shearing.

Sample Number : T 09804

Identification : Heavily carbonated, albitized and sericitized porphyritic andesite with chloritized sheared regimes

Description :

The sample is a drill core specimen which displays large ovoid clasts (30 to at least 80mm) of mainly greyish orange pink, altered, abundantly porphyritic volcanic rock dispersed through a dark greenish grey, schistose matrix.

A staining test revealed no K-feldspar.

In thin section the ovoid clasts reveal internal textures of abundantly porphyritic, volcanic style, modified by heavy hydrothermal alteration and incipient foliation. Phenocrysts were mainly 0.5 to 2mm in size and dominantly plagioclase : albite with rhombs of carbonate and foliated strain shadows of sericite persist now. Other phenocrysts of inferred mafic silicate have altered to carbonate-sericite-chlorite and inferred oxides have altered to leucoxene. The groundmass has altered to fine carbonate (now faintly pigmented by (?)hematite), minor sericite and traces of chlorite and leucoxene.

The more foliated, greenish regime between the large clasts is richer in chlorite and carries coarser carbonate, but seems to be essentially more deformed rock derived from the same precursor as the rest of the sample.

There is a late, thin, only very mildly strained fissure vein of calcite.

An approximate mode for the whole section is :

45-55%	carbonate
20-25%	sericite
15-20%	albite
8-10%	chlorite
1-2%	leucoxene

Comments and Interpretations :

This rock is considered to have originated as porphyritic andesite. It experienced heavy alteration to carbonate, albite, sericite and minor chlorite and leucoxene, then brecciation by shearing. Additional chlorite formed in the most sheared regimes. There was late development of a barren carbonate vein.

The carbonate throughout the rock seems likely to be ferroan calcite. It has been faintly pigmented by very fine (?)hematite.

298.0m

Sample Number : T 09805

Identification : Vuggy, intensely carbonated, mildly siliceous rock with some late veinlets of sericite

Description :

The sample is a drill core specimen of intensely altered rock with patchy yellowish grey, light grey and moderate orange pink colours and cut by irregular, thick veins of whitish carbonate with large vugs lined by fine quartz.

A staining test revealed no K-feldspar.

In thin section the sample displays small remnants (1 to 8mm) of finely silicified rock enveloped by semi-massive, subhedral carbonate (dolomitic or ferroan calcite), commonly 0.2 to 0.3mm, with a few interstitial flecks of sericite. Carbonate involved in the vuggy veins is coarser, but otherwise similar in optical properties; it is intergrown with some quartz and both minerals show mild strain. There are rare grains of pyrite in the veins. Foliated sericite forms a few irregular thin veins.

An approximate mode of the whole section is :

85-90%	carbonate (dolomite or ferroan carbonate)
10-15%	quartz
0.3-0.4%	sericite
rare	pyrite
1-2%	vugs

Comments and Interpretations :

This sample represents intensely carbonated rock, the original nature of which has been completely overprinted.

There are grey finely silicified remnants, orange pink carbonated patches or clasts, pervasive yellowish grey carbonate and vuggy whitish carbonate veins. All of the carbonate displays optical properties consistent with either dolomite or ferroan calcite; there is apparently a range of compositions.

Sericite occurs as inconspicuous, disseminated interstitial flakes, but it also occurs as late veinlets.

101 75 651.8m

Sample Number : T 10308

Identification : Foliated, heavily carbonated, sericitized and chloritized andesite with deformed quartz-carbonate-chlorite-hematite fissure veins

Description :

The sample is a drill core specimen of dark greenish grey, schistose rock containing deformed and disrupted segments of dusky red, finely hematitic veins which range up to at least 10mm in thickness. Cross-fractures in the red veins are occupied by whitish carbonate.

A staining test revealed no K-feldspar.

In thin section the host rock displays remnant textures of porphyritic volcanic style, modified by shearing and heavy alteration. Phenocrysts of plagioclase, ranging up to 2mm in size, are heavily sericitized, carbonated, chloritized and fractured. Microphenocrysts of opaque oxide survive with only minor leucoxenization. Mafic silicate phenocrysts are completely chloritized and carbonated. The groundmass is now carbonate and foliated chlorite and sericite.

The contorted, strained and fractured thick fissure veins display "cherty" fine quartz, fine hematite, chlorite and carbonate of varied composition(probably calcite and ferroan calcite).

An approximate mode is :

25-30%	host rock carbonate
25-30%	host rock sericite
10-15%	host rock chlorite
5-8%	host rock albite
1-2%	opaque oxide and leucoxene
10-15%	vein quartz
4-6%	vein hematite
5-8%	vein carbonate
1-2%	vein chlorite

Comments and Interpretations :

This rock has remnant textures consistent with porphyritic andesitic lava but it has been heavily carbonated, sericitized and chloritized, fissure veined by fine quartz with hematite, chlorite and carbonate, and then foliated by shearing.

The hematite appears to be a hydrothermal component of the veining. There are some albitized remnants of host rock plagioclase phenocrysts. There are no sulphides.

G15

101 76 409.8m

Sample Number : T 10309

Identification : Intensely carbonated, chloritized, silicified and sericitized intermediate volcanic rock with deformed thin pyritic fissure veins and thick carbonate dominated veins

Description :

The sample is a drill core specimen of dark greenish grey, altered rock with thin pyritic veins and with contorted, disrupted segments of thick, whitish carbonate and quartz veins with thin selvedges of a silvery grey, opaque mineral.

A staining test revealed no K-feldspar.

In thin section the host rock displays moderately preserved abundantly porphyritic, intermediate volcanic textures. In places the phenocrysts (up to about 0.5mm) have been replaced by quartz and chlorite and the groundmass by sericite and fine rutile. Elsewhere the phenocrysts have altered to chlorite, carbonate and quartz and the groundmass to chlorite, quartz, sericite and carbonate. Primary oxides have been completely leucoxenized.

Thin, deformed fissure veins (0.5mm) carry quartz, chlorite, pyrite and traces of sphalerite (translucent purplish grey in section). Other thicker and apparently later, deformed fissure veins (up to 5mm thick) are composed mainly of coarse calcite and a core of quartz, but there are thin outer zones (about 0.5mm) carrying calcite, quartz, probable galena, traces of spalerite and locally some fine specular hematite. A thinner outermost zone carries chlorite.

An approximate mode is :

25-30%	host rock carbonate
20-25%	host rock quartz
15-20%	host rock chlorite
15-20%	host rock sericite
0.5-1%	host rock leucoxene and rutile
1-2%	veins of pyrite-quartz-chlorite-sphalerite
10-12%	veins of carbonate-quartz-chlorite-galena-sphalerite-hematite

Comments and Interpretations :

This rock seems to have been abundantly porphyritic intermediate lava but it has been intensely hydrothermally altered to carbonate-quartz-chlorite-sericite-leucoxene-rutile, thinly fissure veined by pyrite-quartz-chlorite-sphalerite veins, then thickly fissure veined by carbonate-quartz veins with outer zones of carbonate-quartz-galena-sphalerite-hematite and of chlorite. There was subsequent deformation.

Most of the carbonate in the host rock and in the veins appears to be calcite, but there are a few grains of vein carbonate with refractive indices high enough for ferroan calcite.

101 77 413.5m

Sample Number : T 10310

Identification : Intensely chloritized, silicified and sericitized, fissure veined, intermediate volcanic, now rendered schistose

Description :

The sample is a drill core specimen of foliated rock with lenticular banding in dark greenish grey and pale reddish colours. Fine pyrite is concentrated in dark, chloritic clasts.

A staining test revealed no K-feldspar.

In thin section the sample displays disrupted, vermiform segments of fissure veins and stretched, altered phenocrysts set in a schistose matrix.

Phenocrysts ranging up to about 2mm in size were abundant. Within a 15mm wide band they are altered to sericite, quartz and minor chlorite and sit in a schistose matrix of sericite, prominent but quite fine hematite and minor chlorite. Elsewhere the phenocrysts are now mainly chlorite-quartz-calcite and their matrix is schistose chlorite-sericite-fine pyrite. Heavily leucoxenized small phenocrysts of former opaque oxide occur throughout.

The disrupted vein segments consist variously of carbonate (calcite to ferroan calcite) and minor chlorite or thinner segments of pyrite with chlorite and minor calcite and quartz.

A crude mode is :

45-55%	host rock sericite
20-25%	host rock quartz
10-15%	host rock chlorite
2-3%	host rock carbonate
2-3%	host rock hematite
1-2%	host rock leucoxenized oxide
0.5-1%	host rock pyrite
5-10%	dismembered segments of veins, variously rich in carbonate or rich in pyrite

Comments and Interpretations :

It seems likely that this rock originated as abundantly porphyritic andesite or similar intermediate lava but it has been intensely hydrothermally altered, fissure veined and rendered schistose by shearing.

The pervasive alteration involves sericite-quartz-chlorite and there are banded distributions of carbonate with pyrite or of fine hematite. The present banded distributions may be sheared products of originally patchy distributions of the alteration minerals.

Dismembered veins appear to represent two styles. One is thin and dominated by pyrite and chlorite, but with some quartz and calcite. The other type is thicker and dominated by carbonate with compositions probably in the calcite-ferroan calcite range.

Sample Number : T 10311

Identification : Schistose breccia of intensely silicified, finely pyritized, variably sericitized intermediate volcanic rock with deformed sulphidic and hematitic, quartz fissure veins

Description :

The sample is a drill core specimen of schistose, light olive grey to greenish grey rock with brecciated to clastic textures and much fine pyrite.

A staining test revealed no K-feldspar.

In thin section the sample displays lenticular clasts of intensely altered rock (up to 40mm in size) set in a schistose matrix : they appear to be products of shearing.

Within the clasts remnant textures indicate abundant former phenocrysts up to 1.5mm in size. Those with shapes suggestive of plagioclase have altered to quartz and traces of chlorite and very fine sericite, others of pyroxene style are now quartz with a clouding of tiny opaques, and opaque oxides have been heavily leucoxenized. The groundmass is quartz, very fine pyrite, leucoxene and traces of sericite. The schistose matrix between the siliceous clasts is richer in aligned sericite.

Within the siliceous clasts, and dismembered within the schistose regimes, there are deformed fissure veins ranging up to about 1mm thick and composed of quartz, traces of chlorite and variable but substantial amounts of galena, pyrite, translucent purplish grey sphalerite, chalcopyrite and specular hematite. The vein minerals range in size from about 0.05 to 0.5mm.

A crude mode of the sample is :

70-80%	host rock quartz
10-15%	host rock sericite
8-10%	host rock pyrite
1-2%	host rock leucoxene
tr	host rock chlorite
1-2%	fissure veins of quartz-pyrite-galena-sphalerite-hematite-chalcopyrite-chlorite

Comments and Interpretations :

Remnant textures suggest that this rock was abundantly porphyritic andesite or similar intermediate lava, but it has been intensely silicified, abundantly pyritized and variably sericitized. It was also fissure-veined by quartz with pyrite, galena, sphalerite, hematite, chalcopyrite and traces of chlorite.

Subsequent shearing strained and contorted the veins and brecciated the rock to result in lenticular remnants of the most rigid, siliceous rock set in a schistose matrix of the most sericitic style.

618

464.8m

Sample Number : T 10312

Identification : Intensely sericitized and silicified intermediate volcanic rock with replacement veining by pyrite-quartz-fluorite-chlorite and by calcite

Description :

The sample is a drill core specimen of light olive grey, finely sericitic rock with patches of very light grey carbonate, patches and crude veins of fine pyrite and specks of purple fluorite.

A staining test revealed no K-feldspar.

In thin section the host rock is seen to consist of quartz, mildly foliated sericite and some patches of fine rutile. There are poorly preserved textures suggestive of formerly porphyritic volcanic rock, with phenocrysts of about 0.5 to 1.5mm.

Pyrite is unevenly distributed as subhedral grains (0.02 to 0.2mm), patches and crude veins of replacement style. Cloudy anhedral calcite forms other patches and irregular veins of replacement style. Chlorite which is almost colourless in section occurs very sparsely with the pyrite and it is accompanied in some cases by vein quartz (now strained). Anhedral, purple fluorite (less than 0.5mm) is also a sparse associate of the pyrite.

An approximate mode is :

45-55%	sericite
30-35%	quartz
10-15%	calcite
4-6%	pyrite
0.1-0.2%	rutile
0.1-0.2%	fluorite
tr	chlorite

Comments and Interpretations :

There are some textural indications that this rock originated as porphyritic intermediate lava, and none consistent with tuff.

The rock has been pervasively intensely sericitized and silicified and subjected to two different types of replacement veining. One type involved pyrite, accompanied by traces of quartz, chlorite and purple fluorite. The other involved calcite. There is no clear indication of the relative timing of the two replacement events.

There has been mild subsequent deformation.

101 80 476.4m

Sample Number : T10313

Identification : "Cherty" siliceous rock with a deformed network of sericite-fluorite-pyrite

Description :

The sample is a drill core specimen displaying light grey, siliceous rock cut into rhomboid to lenticular clasts by a light olive grey network of sericite with some pyrite.

A staining test revealed no K-feldspar.

In thin section the clasts (mainly 1 to 10mm) are seen to be sutured mosaics of fine quartz (0.02 to 0.03mm grainsize) with a few patches of very fine rutile and a few anhedral grains of colourless fluorite.

The criss-cross network between the clasts displays sericite and a substantial amount of anhedral, colourless fluorite (not obvious in hand specimen). Many of the sericitic aggregates have a cross-fibre style of foliation, consistent with induction of foliation in veins, rather than shear production of the sericitic network.

Pyrite (0.05 to 0.5mm grainsize) is localized within the sericitic network.

An approximate mode is :

70-80%	quartz
15-20%	sericite
3-5%	fluorite
2-3%	pyrite
tr	rutile

Comments and Interpretations :

This rock seems to have originated as a finely siliceous, "cherty" mosaic with a few clusters of fine rutile; there are no recognisable remnant textures of volcanic, tuffaceous or epiclastic style.

The siliceous mosaic seems to have been net veined by sericite with fluorite and pyrite, then deformed to induce a foliation in the sericite and some strain and recrystallization in the quartz.

101 81 5630m

C30

Sample Number : T 10314

Identification : Intensely silicified, sericitized and pyritized volcanolithic arenite with broad zones of replacement by carbonate

Description :

The sample is a drill core specimen which displays moderately sorted, densely packed medium grey and olive grey clasts of about sand size. There are 10 to 20mm wide zones of yellowish grey carbonation.

A staining test revealed no K-feldspar.

In thin section the sample is confirmed to consist of densely packed, subrounded clasts, about 0.3 to 0.5mm in size, all now intensely altered and mildly deformed.

The clasts appear to be mainly of intermediate volcanic style, with phenocrysts commonly sericitized or silicified and the groundmass finely silicified. Some probable feldspar phenoclasts have been completely sericitized and they are now stretched and foliated. Many silicified clasts are finely and abundantly impregnated with pyrite and less commonly with sphalerite (translucent purplish grey); hematite pigment accompanies the pyrite in most cases.

Within broad zones there is semi-massive replacement by fine carbonate with properties suggestive of dolomite or at least ferroan calcite. Within such zones there is also a greater development of sericite, less quartz and little pyrite.

An approximate mode is :

50-60%	quartz
25-35%	sericite
10-15%	carbonate
2-3%	pyrite
0.1-0.2%	rutile
0.1-0.2%	sphalerite
0.1-0.2%	hematite

Comments and Interpretations :

This rock is thought to have originated as volcanolithic arenite of probably andesitic derivation, but it has since been intensely hydrothermally altered and deformed. The alteration involved silicification, sericitization and impregnation by pyrite with minor associated hematite and sphalerite. Broad zones of more intense sericitization were then heavily replaced by dolomite or ferroan calcite. Such zones are generally lacking in sulphide.

607.4m

Sample Number : T 10315

Identification : Chloritized, sericitized, silicified and hematized, volcaniclastic turbidite with deformed, complexly zoned, thick fissure veins

Description :

The sample is a drill core specimen of dark greenish grey rock with contorted and disrupted thick veins (up to at least 10mm thick) which consist mainly of whitish carbonate and very light grey quartz, but which also have banded outer zones of moderate red hematite and dark green chlorite

A staining test revealed no K-feldspar.

In thin section the host rock displays abundant altered phenoclasts and altered intermediate volcanic lithic clasts set in a foliated matrix of chlorite and minor sericite. Most of the clasts have altered to quartz and sericite and minor chlorite, but oxide phenocrysts and clasts have altered to hematite and stumpy crystals of rutile.

Contorted and deformed, thick fissure veins have well developed symmetrical zoning. The outermost zones (about 0.5mm) display fine quartz with chlorite, calcite and minor pyrite. There is then a 2 to 3mm zone of somewhat jasperoidal, colloform banding which involves fine quartz and hematite and minor carbonate. The thick cores (5 to 10mm) of the veins carry coarse carbonate (calcite to ferroan calcite) and central quartz, accompanied by minor baryte, galena and translucent grey sphalerite. Some of the core minerals have mobilzied into cross fractures in the deformed veins.

Extending about 20mm into host rock adjacent to the thickest, most carbonate-rich vein there is partial replacement of some phenoclasts by calcite.

A crude mode of the specimen is :

50-55%	host rock chlorite
15-20%	host rock sericite
8-10%	host rock quartz
2-3%	host rock hematite
0.3-0.4%	host rock calcite
0.1-0.2%	host rock rutile
8-10%	carbonate within the zoned veins
7-9%	quartz within the zoned veins
2-3%	hematite within the zoned veins
0.2-0.3%	baryte within the zoned veins
0.1%	pyrite, sphalerite and galena within the zoned veins

Comments and Interpretations :

This rock is interpreted to represent a muddy volcaniclastic arenite (probably a turbidite) generated from intermediate source rocks.

2/...

It has been heavily chloritized and moderately silicified, sericitized and hematized and thickly fissure veined by zoned assemblages involving early quartz-chlorite-pyrite-calcite, subsequent jasperoidal quartz-hematite-calcite, and a core of carbonate and quartz culminating with baryte, galena and sphalerite. The veins are deformed and the host rock is foliated.

101 84

635.9m

Sample Number : T 10316

Identification : Pyritic sericite-quartz schist (probably intensely silicified and sericitized volcaniclastic arenite)

Description :

The sample is a drill core specimen of schistose rock, dominated by medium light grey quartz and light olive grey sericite, but with disseminated fine pyrite.

A staining test revealed no K-feldspar.

In thin section the sample is seen to be sericitic and schistose, but there are indications of lithological layering (concordant with the schistosity) and sorted, sandy textures. The lithological layering involves variations in sericite content and in the sizes of apparently detrital (but now silicified) clasts. The layers are variously 2 to 15mm thick and silicified clasts range up to about 1mm. There are a few patches of fine rutile.

Subhedral pyrite (about 0.03 to 0.5mm in size) is disseminated throughout the rock, but there are also suggestions of sheared and dismembered quartz-pyrite-sericite veins, carrying the coarsest pyrite.

An approximate mode is :

50-55%	quartz
40-45%	sericite
4-6%	pyrite
tr	rutile

Comments and Interpretations :

In a general sense this sample may be described as a pyritic, sericite-quartz schist. In more detail it seems to represent laminated volcaniclastic arenite which has been intensely hydrothermally silicified and sericitized, impregnated with disseminated fine pyrite and veined by coarser pyrite with quartz and sericite, then sheared.

There is little evidence of the original nature of the silicied clasts, but they seem likely to have been feldspathic and possibly lithic. A very few have shapes suggestive of β quartz (now recrystallized to sutured mosaics).



LEGEND

QUATERNARY

- Qt — Recent talus
- Qm — Pleistocene moraine

JURASSIC

- Jdl — Dolerite

PERMIAN

- Pt — Tillite

SILURIAN — EARLY DEVONIAN

- S-D — Eldon Group: undifferentiated sedimentary rocks

ORDOVICIAN

- Ogl — Gordon Limestone
- Oop — Pioneer Beds

LATE CAMBRIAN — EARLY ORDOVICIAN

- €Oos — Owen Conglomerate: predominantly hematitic sandstone and shale
- €Ooc — Owen Conglomerate: interbedded siliceous conglomerate and sandstone with minor shale, often hematitic

CAMBRIAN

Mt. Read Volcanics:— Tyndall Group

- €tj — Jukes Breccia (Incl Dora Conglomerate): volcanic breccias and conglomerates
- €tc — Comstock Tuff: felsic tuffs, agglomerates, lavas and minor quartz-mucovite porphyry
- €ts — Tuffaceous fine grained sediments: including pelitic ash, calcareous sediment and fossiliferous limestone beds

Mt. Read Volcanics:— Lyell Schists

- €sf — Felsic Schist: quartz podded and banded sericitic schists principally derived from felsic volcanics
- €si — Intermediate Schist: chloritic schists with quartz pods and bands intermediate between €sf and €sm
- €sm — Mafic Schist: chloritic schists derived from mafic-intermediate volcanics and intrusives
- €su — Undifferentiated Schist: felsic to mafic, often unrecognizable due to intense leaching and weathering

Mt. Read Volcanics:— Central Sequence

- €cef — Fine-Grained Epiclastics: predominantly shales and siltstones, minor sandstones
- €cec — Coarse-Grained Epiclastics: predominantly mass debris deposits and volcanic conglomerates, minor shales and siltstones
- €cf — Felsic Pyroclastics: ignimbrites, tuffs and agglomerates
- €cr — Rhyolitic Lavas: often flow banded, ± quartz-phyric, minor associated pyroclastics
- €cd — Dacitic-Rhyolitic Lavas: often endogenous domes with breccias, some sub-volcanic intrusives
- €ca — Andesitic Intrusives: minor lavas and breccias
- €cm — Mafic-Intermediate Volcanics: pyroclastic tuffs, agglomerates and lavas
- €cu — Undifferentiated Volcanics: mostly unrecognizable pyroclastics and epiclastics due to intense leaching and weathering

Mt. Read Volcanics:— Western Sequence (Q'town Pyroclastics)

- €wf — Felsic Pyroclastics: ignimbrites, tuffs and agglomerates
- €wm — Mafic-Intermediate Volcanics: predominantly intrusives, minor lavas and breccia tuffs
- €ws — Sediments: interbedded vitric tuffs, shales, sandstones and greywackes, dominantly marine sequence, including Miners Ridge Sandstone (mrs)
- €wp — Quartz-Feldspar Porphyry: mostly high level intrusives

ALTERATION AND MINERALISATION

- Intense hematite — (silica-barite) alteration eg North Lyell and Comstock "chert" bodies
- Silica Heads, large and small pods or boudins of silica-pyrite within Lyell Schists, pyrite content 0–20%, boundaries approximate
- Boudinaged beds of massive pyrite, observed and inferred, boundaries approximate
- Disseminated sulphides exceeding 5%, mostly pyrite, minor chalcopyrite and bornite
- Massive sulphide, copper (gold, silver) orebodies showing level of projection
- Galena present

PROSPECTS AND WORKINGS

- Trench or costean
- Adit
- Shaft
- Alluvial workings
- Open cut
- Waste dump
- Surface exploration diamond drill hole NB. not all holes shown in areas of dense drilling, now mined out

SYMBOLS

- Lithological boundary: — position accurate, approximate or inferred
- Unconformity: — definite or inferred
- Fault: — position accurate, approximate or inferred, teeth indicate dip of fault plane
- Cover: — showing limit of significant glacial moraine or scree cover
- Bedding: — showing strike and dip
- Bedding: — showing facing direction
- Cleavage: — showing strike and dip
- Cleavage: — showing differentiated phase
- Anticline: — showing axial trend
- Syncline: — showing axial trend

SOURCE GEOLOGICAL DATA

ML	GA	ML
PB/KC	WH	

P. BROPHY 1977
K.D. CORBETT 1978
G.O. ARNOLD 1985
W. HERRMANN 1986
MT. LYELL miscellaneous mapping

SHEET INDEX

Diamond	Mine	Lyell
Airport	TOWNSHIP	Princess
Lynchford	Owen	Tolth

GRID CONVERGENCE 0°44'

GRID MAGNETIC ANGLE 14°

The relationship between True North (T.N.), Grid North and Magnetic North is shown diagrammatically. Magnetic value is correct for 1982. Annual change is 0.0° 51' (minus) Easterly

88-2832

101 85 7795

GOLD FIELDS EXPLORATION PTY. LIMITED

MT LYELL AREA
TOWNSHIP SHEET

GEOLOGICAL INTERPRETATION

DRAWN BY	F.G.F.
DRAFTSMAN	T.G.D.S.
DATE	May 1986
REVISIONS	
FILE NO.	

5 cm

SCALE 1:5000

100 80 0 50 100 150 200 METRES

FIG 2

7796

LITTLE OWEN RIDGE

LITTLE OWEN ADITS

1150 N

1050 N

1000 N

LO 1

LO 2

5 339 500mN

382 000mE

LEGEND

- Surface channel sample
- 6492 6502 — Adit wall channel sample (N°1 Adit)
- 6627 6649 — Adit wall channel sample (N°2 Adit)
- x — Rock outcrop sample
- ⊗ — Rock float or dump sample

SHEET LAYOUT

5 338 000mN

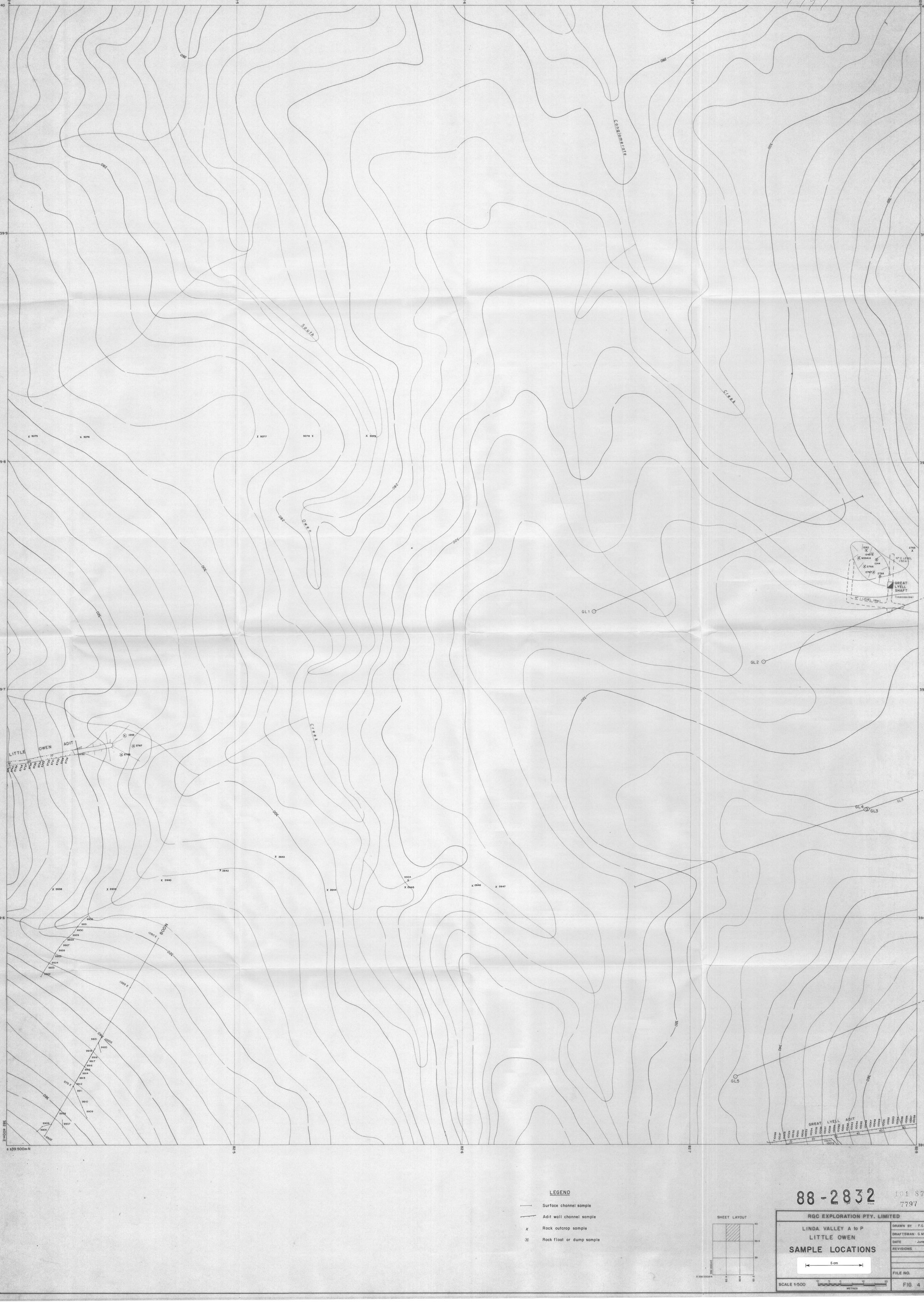
382 000mE

88-2832

101 86 7796

RGC EXPLORATION PTY. LIMITED	
LINDA VALLEY A to P LITTLE OWEN SAMPLE LOCATIONS 5 cm	DRAWN BY F.G.F. DRAFTSMAN G.M.B. DATE June '88 REVISIONS FILE NO.
SCALE 1:500 METRES	FIG. 3

7797



LEGEND

- Surface channel sample
- Adit wall channel sample
- x Rock outcrop sample
- ⊗ Rock float or dump sample

SHEET LAYOUT

88-2832

101 87

7797

RGC EXPLORATION PTY. LIMITED

LINDA. VALLEY A to P

LITTLE OWEN

SAMPLE LOCATIONS

5 cm

DRAWN BY : F.G.F.

DRAFTSMAN : G.M.B.

DATE : June '88

REVISIONS :

FILE NO.

SCALE 1:500

METRES

FIG. 4

7798

82.8 82.9 83.0 83.1 83.2

40 39.9 39.8 39.7 39.6 5 339 500mN

300 320 340 360 380 400 420 440

GL2

Conglomerate

GL3

Creek

GL5

GREAT LYELL ADIT

10059 10060 10061 10062 10063 10064 10065 10066 10067 10068 10069 10070

70 80

382 800mE 383 200mE

LEGEND

- Surface channel sample
- Adit wall channel sample
- × Rock outcrop sample
- ⊗ Rock float or dump sample

SHEET LAYOUT

40 39.5 39 5 338 000mN 382 000mE 82.4 82.8 83.2

88-2832

7798
101 88

RGC EXPLORATION PTY. LIMITED

LINDA VALLEY A to P
LITTLE OWEN

SAMPLE LOCATIONS

5 cm

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DATE : June '88
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FILE NO.

SCALE 1:500

15 5 0 10 20 METRES

FIG. 5

7799

GREAT LYELL ADIT

Conglomerate

South Owen Creek

Creek

LEGEND

- Surface channel sample
- Adit wall channel sample
- x Rock outcrop sample
- ⁂ Rock float or dump sample

SHEET LAYOUT

88-2832 101 89

7799

RGC EXPLORATION PTY. LIMITED

LINDA VALLEY A to P
LITTLE OWEN

SAMPLE LOCATIONS

DRAWN BY :
DRAFTSMAN :
DATE : June '88
REVISIONS :
FILE NO.

SCALE 1: 500

METRES

FIG. 6

7800

82.8 | 82.9 | 83 | 83.1 | 83.2

39.5 | 39.4 | 39.3 | 39.2 | 39.1

360 380 400 420 440 460 480 500

x 2822 x 2671 x 2719 x 1249 x 1250 x 1248 x 5008 x 5007 x 5005 5004 x x 5003 5002 x 5001 x

DUKE LYELL ADITS

LEGEND

- Surface channel sample
- Adit wall channel sample
- x Rock outcrop sample
- Rock float or dump sample

SHEET LAYOUT

382 800mN | 383 200mN

5 339 000 mN | 5 338 000mN

88-2832

101 907800

RGC EXPLORATION PTY. LIMITED

LINDA VALLEY A to P
LITTLE OWEN

SAMPLE LOCATIONS

5 cm

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SCALE 1:500 — METRES

FIG. 7

7801

5006 X

EMPRESS LYELL ADIT

10m 20m 30m

2799 X 5037 Pits

2798 X 5041 Shallow Cut

LEGEND

- Surface channel sample
- Adit wall channel sample
- × Rock outcrop sample
- ⊗ Rock float or dump sample

SHEET LAYOUT

88-2832

7801

101 91

RGC EXPLORATION PTY. LIMITED

LINDA VALLEY A to P
LITTLE OWEN

SAMPLE LOCATIONS

5 cm

SCALE 1: 500

METRES

DRAWN BY	
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DATE	June '88
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FILE NO.	

FIG. 8

7802

LEGEND

- Surface channel sample
  Only those assays > 0·01 g/t Au shown
- Adit wall channel sample (N°·1 Adit)
  Only those assays > 0·05 g/t Au shown
- Adit wall channel sample (N°· 2 Adit)
- x Rock outcrop sample
- ⊗ Rock float or dump sample

SHEET LAYOUT

101 92 88-2832

7802

RGC EXPLORATION PTY. LIMITED	
LINDA VALLEY A to P LITTLE OWEN GOLD GEOCHEMISTRY 5 cm	DRAWN BY F.G.F DRAFTSMAN G.M.B. DATE June '88 REVISIONS FILE NO.
SCALE 1:500 METRES	FIG. 9

7803

82·4 82·5 82·6 82·7 82·8

40 39·9 39·8 39·7 39·6 39·5

280 300 320 340 360

conglomerate

South Creek

Owen Creek

LITTLE OWEN ADIT

3·72 0·05 3·40

BOON

1050 E 1025 E 1000 E 975 E 950 E

GL1 GL2 GL3 GL4 GL5

1·06 0·12 0·08 0·46 0·92 0·22 0·16 0·70

N° 2 LEVEL (52m)

GREAT LYELL SHAFT (inaccessible)

N° 1 LEVEL (88m)

GREAT LYELL ADIT

382 400m E

5 339 500m N

LEGEND

- Surface channel sample
- Adit wall channel sample
- x Rock outcrop sample
- Rock float or dump sample

88-2832

101 93

7803

SHEET LAYOUT

RGC EXPLORATION PTY. LIMITED	
LINDA VALLEY A to P LITTLE OWEN GOLD GEOCHEMISTRY 5 cm	DRAWN BY DRAFTSMAN DATE June '88 REVISIONS FILE NO.
SCALE 1:500 METRES	FIG. 10

7804

82.8 82.9 83.0 83.1 83.2

40 39.9 39.8 39.7 39.6

300 320 340 360 380 400 420 440

GL2

Conglomerate

GL3

Creek

GL5

GREAT LYELL ADIT

0.02 0.02 0.03 0.03 0.06 0.06 0.04 0.04 0.04 0.03 0.03 0.02

382 800mE

383 200mE

5 339 500mN

LEGEND

- 0.01 — Surface channel sample
- 0.01 0.02 — Adit wall channel sample
- x — Rock outcrop sample
- ⊗ — Rock float or dump sample

SHEET LAYOUT

40 39.5 39

382 000mE

5 338 000mN

82.4 82.8 83.2

88-2832 101 94

7804

RGC EXPLORATION PTY. LIMITED

LINDA VALLEY A to P
LITTLE OWEN

GOLD GEOCHEMISTRY

5 cm

DRAWN BY :
DRAFTSMAN :
DATE : June '88
REVISIONS :
FILE NO.

SCALE 1:500 — 10 5 0 10 20 METRES

FIG. 11

7805

GREAT LYELL ADIT

600N

430N

975E

1025E

950E

South Creek

Owen Creek

Conglomerate

360

340

320

400

82·4 82·5 82·6 82·7 82·8

39·5 39·4 39·3 39·2 39·1

382 400mE 382 800mE

5 339 000mN

LEGEND

- 0·01 — Surface channel sample
- 0·01 0·02 — Adit wall channel sample
- x — Rock outcrop sample
- ⊗ — Rock float or dump sample

SHEET LAYOUT

88-2832] 101 95

7805

RGC EXPLORATION PTY. LIMITED

LINDA VALLEY A to P
LITTLE OWEN

GOLD GEOCHEMISTRY

5 cm

DRAWN BY :
DRAFTSMAN :
DATE : June '88
REVISIONS :
FILE NO.

SCALE 1:500 — METRES

FIG. 12

7806

82.8 82.9 83 83.1 83.2

39.5 39.4 39.3 39.2 39.1

382 800mN

5 339 000mN

383 200mN

5 339 000mN

360 380 400 420 440 460 480 500

DUKE LYELL ADITS

LEGEND

- Surface channel sample
- Adit wall channel sample
- Rock outcrop sample
- Rock float or dump sample

SHEET LAYOUT

40 39.5 39 382 000mE 5 338 000mN 82.4 82.8 83.2

88-2832

101 96

7806

RGC EXPLORATION PTY. LIMITED	
LINDA VALLEY A to P LITTLE OWEN GOLD GEOCHEMISTRY 5 cm	DRAWN BY: DRAFTSMAN: DATE: June '88 REVISIONS: FILE NO.
SCALE 1:500 10 5 0 10 20 METRES	FIG. 13

7807

EMPRESS LYELL ADIT

LEGEND

- Surface channel sample
- Adit wall channel sample
- Rock outcrop sample
- Rock float or dump sample

SHEET LAYOUT

88-2832 | 101 97
7807

RGC EXPLORATION PTY. LIMITED

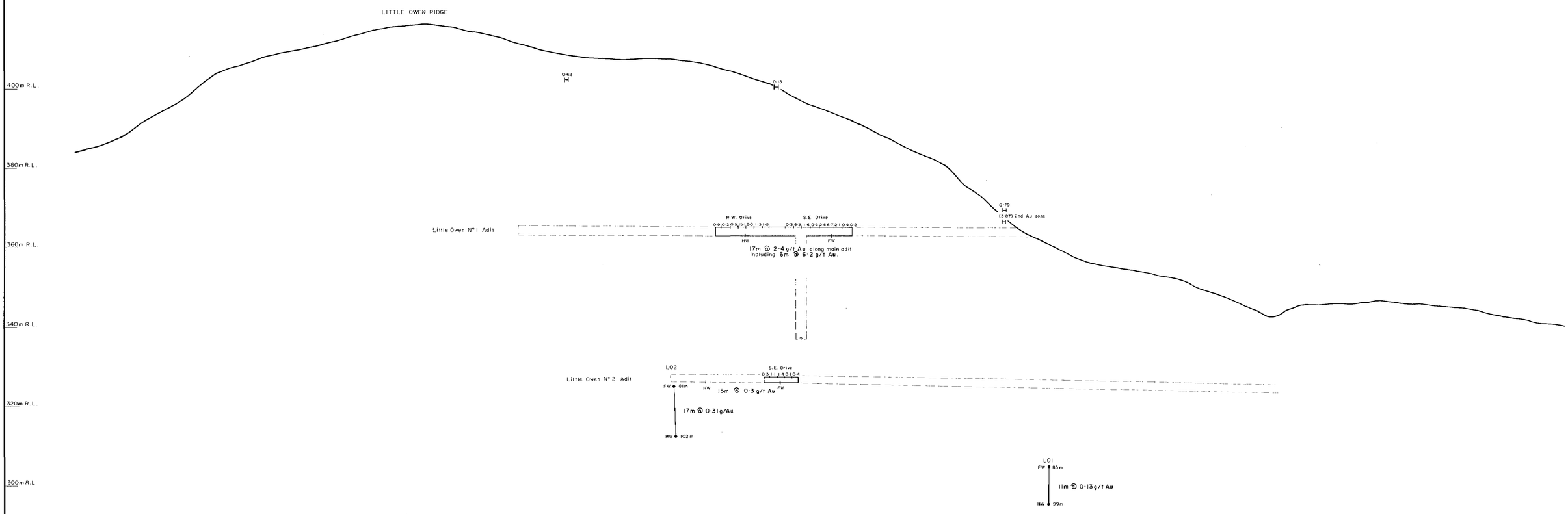
LINDA VALLEY A to P
LITTLE OWEN

GOLD GEOCHEMISTRY

DRAWN BY
DRAFTSMAN
DATE June '88
REVISIONS
FILE NO.

SCALE 1:500 METRES

FIG. 14



SECTION LOOKING N.E.

88-2832

● Proposed Drill Hole

NOTES

1. Average thicknesses of both drill intersections and main adits through the mineralized zone are true horizontal widths.
2. Assays shown along drives are from channel samples taken from one wall of the drive only, all in g/t Au.
3. Surface samples show highest assay from the gold zone.
4. The limits of the anomalous gold zone are defined by a cut off grade of 0·1 g/t Au.
5. Surface trace is along the projection reference line which is approximately mid way through the gold mineralized zone. (see 1:500 Au geochem. plan for location)
6. The longitudinal projection bearing is 300° AMG.

101 88 7808

5cm

GOLD FIELDS EXPLORATION PTY. LIMITED

LINDA VALLEY A to P
LITTLE OWEN

LONGITUDINAL PROJECTION

GOLD MINERALIZED ZONE
LITTLE OWEN ADITS

SCALE 1:500 (10 5 0 10 20 METRES)

DRAWN BY : F.G.F
DRAFTSMAN: G.M.B
DATE : June '88
REVISIONS :

FILE NO.

FIG. 15



LEGEND

QUATERNARY

- Qt — Recent talus
- Qm — Pleistocene moraine

JURASSIC

- Jdl — Dolerite

PERMIAN

- Pt — Tillite

SILURIAN – EARLY DEVONIAN

- S-D — Eldon Group: undifferentiated sedimentary rocks

ORDOVICIAN

- Ogl — Gordon Limestone
- Oop — Pioneer Beds

LATE CAMBRIAN – EARLY ORDOVICIAN

- €Oos — Owen Conglomerate: predominantly hematitic sandstone and shale
- €Ooc — Owen Conglomerate: interbedded siliceous conglomerate and sandstone with minor shale, often hematitic

CAMBRIAN

Mt. Read Volcanics:– Tyndall Group

- €tj — Jukes Breccia (incl Dora Conglomerate): volcanic breccias and conglomerates
- €tc — Comstock Tuff: felsic tuffs, agglomerates, lavas and minor quartz–muscovite porphyry
- €ts — Tuffaceous fine grained sediments: including pelitic ash, calcareous sediment and fossiliferous limestone beds

Mt. Read Volcanics:– Lyell Schists

- €sf — Felsic Schist: quartz podded and banded sericitic schists principally derived from felsic volcanics
- €si — Intermediate Schist: chloritic schists with quartz pods and bands intermediate between €sf and €sm
- €sm — Mafic Schist: chloritic schists derived from mafic–intermediate volcanics and intrusives
- €su — Undifferentiated Schist: felsic to mafic, often unrecognizable due to intense leaching and weathering

Mt. Read Volcanics:– Central Sequence

- €cef — Fine–Grained Epiclastics: predominantly shales and siltstones, minor sandstones
- €cec — Coarse–Grained Epiclastics: predominantly mass debris deposits and volcanic conglomerates, minor shales and siltstones
- €cf — Felsic Pyroclastics: ignimbrites, tuffs and agglomerates
- €cr — Rhyolitic Lavas: often flow banded, ± quartz–phyric, minor associated pyroclastics
- €cd — Dacitic–Rhyolitic Lavas: often endogenous domes with breccias, some sub–volcanic intrusives
- €ca — Andesitic Intrusives: minor lavas and breccias
- €cm — Mafic–Intermediate Volcanics: pyroclastic tuffs, agglomerates and lavas
- €cu — Undifferentiated Volcanics: mostly unrecognizable pyroclastics and epiclastics due to intense leaching and weathering

Mt. Read Volcanics:– Western Sequence (Q'town Pyroclastics)

- €wf — Felsic Pyroclastics: ignimbrites, tuffs and agglomerates
- €wm — Mafic–Intermediate Volcanics: predominantly intrusives, minor lavas and breccia tuffs
- €ws — Sediments: interbedded vitric tuffs, shales, sandstones and greywackes, dominantly marine sequence, including Miners Ridge Sandstone (mrs)
- €wp — Quartz–Feldspar Porphyry: mostly high level intrusives

ALTERATION AND MINERALISATION

- Intense hematite – (silica–barite) alteration eg North Lyell and Comstock "chert" bodies
- Silica Heads, large and small pods or boudins of silica–pyrite within Lyell Schists, pyrite content 0–20%, boundaries approximate
- Boudinaged beds of massive pyrite, observed and inferred, boundaries approximate
- Disseminated sulphides exceeding 5%, mostly pyrite, minor chalcopyrite and bornite
- Massive sulphide, copper (gold, silver) orebodies showing level of projection
- Galena present

PROSPECTS AND WORKINGS

- Trench or costean
- Adit
- Shaft
- Alluvial wokings
- Open cut
- Waste dump
- Surface exploration diamond drill hole NB. not all holes shown in areas of dense drilling, now mined out

SYMBOLS

- Lithological boundary:– position accurate, approximate or inferred
- Unconformity:– definite or inferred
- Fault:– position accurate, approximate or inferred, teeth indicate dip of fault plane
- Cover:– showing limit of significant glacial moraine or scree cover
- Bedding:– showing strike and dip
- Bedding:– showing facing direction
- Cleavage:– showing strike and dip
- Cleavage:– showing differentiated phase
- Anticline:– showing axial trend
- Syncline:– showing axial trend

SOURCE GEOLOGICAL DATA

K.D. CORBETT 1981
G.O. ARNOLD 1985
P. KOMYSHAN 1985
W. HERRMANN 1986
MT. LYELL miscellaneous mapping

SHEET INDEX

YOLANDE	MARGARET	BEATRICE
DIAMOND	MINE	LYELL
AIRPORT	TOWNSHIP	PRINCESS

GRID CONVERGENCE 0°06'
GRID MAGNETIC ANGLE 12°

The relationship between True North Grid North and Magnetic North is shown diagrammatically. Magnetic value is correct for 1980. Annual change is 0° 10'9 mins Easterly

88-2832

7809

GOLD FIELDS EXPLORATION PTY. LIMITED

MT. LYELL AREA
MINE SHEET
GEOLOGICAL INTERPRETATION

5 cm

DRAWN BY	F.G.F.
DRAFTSMAN	T.G.D.S.
DATE	May 1986
REVISIONS	
FILE NO.	

SCALE 1:5000 — METRES

FIG. 16

101 99

WEST

EAST

7810

C 69

COLLAR - 64·6°, 81·15° M.G.

500m R.L.

400m R.L.

300m R.L.

200m R.L.

100m R.L.

00

100m

200m

300m

400m

500m

600m

0 - 384m
PREDOMINANTLY ANDESITIC LAVA SEQUENCE
Often brecciated, locally intermediate volcaniclastics (epiclastic?)
variable, pervasive chlorite - sericite - carbonate alteration
local zones of intense quartz - sericite - pyrite and carbonate - sericite alteration
minor fuchsitic sericite

384 - 468m INCREASINGLY ALTERED AND SCHISTOSE INTERMEDIATE VOLCANIC SEQUENCE ± chlorite ± sericite
strongly - intensely altered to carbonate ± chlorite ± sericite
with increasing pervasive silicification
zones of pervasive hematite common
local hydrothermal (?) breccias with up to 10% py
quartz - pyrite ± galena ± sphalerite ± chalcopyrite ± hematite
veins - relatively common ± specularite ± fuchsite
similarly, fluorite ± galena ± sphalerite ± chalcopyrite ± hematite
fracture - fill increases down hole

468 - 488m
CHERTY CONGLOMERATE - SANDSTONE
intensely - moderately siliceous rock with cherty clasts, locally jasperoid breccia with common veins of pyrite - chalcopyrite - galena - sphalerite - fluorite
zones of strong fuchsitic sericite, chlorite
increasing down hole

488 - 653m
PREDOMINANTLY EPICLASTIC SEQUENCE
derived from intermediate (andesitic) volcanics
moderate - strongly altered and deformed;
pervasive chlorite - quartz - sericite alteration;
locally intense carbonate ± hematite alteration;
minor zones of carbonate ± hematite ± fuchsite scattered pyrite ± galena ± sphalerite veins
narrow zones of quartz - sericite - pyrite schist increasing down hole

653 - 674m
OWEN CONGLOMERATE
interbedded siliciclastic conglomerate and sandstone
common chloritic groundmass
sheared at contact (Great Lyell Fault?)

VOLCANICS

ANDESITIC

COMSTOCK

CHERT

SCHISTOSE

CONGLOMERATE

VOLCANICLASTICS

OWEN

C 27

II LEVEL STOPES
100m SOUTH IN F.W.
OF CHERT BODY

461 - 463m
2m @ 0·02 Au, 0·15% Cu
0·94% Pb, 0·83% Zn, 12 Ag

466 - 479m
13m @ 0·26 Au, 0·17% Cu
0·34% Pb, 0·24% Zn, 3·9 Ag

516 - 524m
8m @ 0·22 Au, 0·12% Cu
0·04% Pb, 0·39% Zn, 4 Ag

638 - 641m
3m @ 0·02 Au, 0·02% Cu
0·31% Pb, 1·22% Zn, 3 Ag

E.O.H. 674·0m

SECTION BEARING 081·2° MINE GRID, 089·8° AMG, 077·9° MAGNETIC.

LOOKING NORTH

88 - 2832

7810

THE MOUNT LYELL MINING & RAILWAY COMPANY LTD.

COMSTOCK

SECTION DRILL HOLE C 69

5 cm

SCALE 1:1000 | DRAWN BY F.G.F.

DATE JUNE 1988 | DRAFTSMAN T.G.D.S.

REVISIONS

FIG. 17

101 - 100

400 - 200 m Variable but steeply dipping and overhanging.

LEGEND

- COMSTOCK CHERT INTERSECTION
- OWEN CONGLOMERATE INTERSECTION
- Cu ASSAYS < 0.1%
- Cu ASSAYS 0.1 - 0.5%
- > 0.5% Cu
- GREAT LYELL FAULT INTERSECTION

88-2832

7811

THE MOUNT LYELL MINING & RAILWAY COMPANY LTD.

COMSTOCK
DRILL PLAN
STRUCTURAL CONTOURS

5 cm

SCALE 1:1000	DRAWN BY A.C.
DATE July 1986	DRAFTSMAN T.D.S.

REVISIONS
F.G.F June 1988

FIG. 18

101-101