000

D459

243001

78-1283

RENISON LIMITED

OPEN FILE

FEDERATION AREA

E.L. 11/76

ANNUAL REPORT 1977-78

MICROFILMED

Copies to:
Renison (2)
Tas. Mines Department (1)

By: K. Wells
Senior Geologist

July 1978

U01

243002

RENISON LIMITED

SUMMARY

Since the completion of the first seventeen hole drilling programme at the Sweeney's Mine in November 1977, the majority of the work on E.L. 11/76 has been undertaken in the Federation Plateau area. A 30 line km grid was established over the area and surveyed with gradient array I.P. Several anomalies were detected, coinciding with geologically favourable environments outlined by the detailed geological mapping programme.

Elsewhere in the licence area, further investigations have been undertaken at Sweeney's to delineate further drilling targets and the entire licence area has been flown with colour aerial photography and a photogeological interpretation undertaken.

Work to be undertaken in 1978-79 will involve one further diamond drill hole at Sweeney's, together with the diamond drilling of several targets outlined in the Federation Plateau area. Elsewhere several interesting structures have been located by the photogeological interpretation, and these will require further examination.

002

243003

RENISON LIMITED

CONTENTS

			Page
SUMMARY			
1.	INTRODUCTION		1
2.	SWEENEY'S MINE AREA		
	2.1	Introduction	2
	2.2	Geophysics	2
	2.3	Geology	3
3.	FEDERATION PLATEAU		
	3.1	Geophysics	5
	3.2	Geology/Geochemistry	6
4.	OTHER WORK		8
5.	COMMENTS		9
6.	RECOMMENDATIONS 1978-79		
	6.1	Sweeney's Mine Area	11
	6.2	Federation Plateau	11
	6.3	Other Areas	12
REFERENCES			14

APPENDIX 1 : Expenditure Breakdowns and Proposed Budget 1978-79

APPENDIX 2 : Petrographic Descriptions - Federation Plateau Area
C.M.S. Report 78/4/24

003

243004

RENISON LIMITED

LIST OF FIGURES

Fig. 1 · Locality Map

Fig. 2 · Geological Map - Sweeney's Mine Area

Fig. 3 · Federation Grid - Chargeability Contour Map

Fig. 4 · Federation Grid - Resistivity Contour Map

Fig. 5 · Geology Map - South Heemskirk

Fig. 6 · Diagram to show Relationships between Alteration/Mineralisation and Granite Types

Fig. 7 · Diagrammatic North - South Cross Section through South Heemskirk Tinfield In Text

004

243005

RENISON LIMITED

1. INTRODUCTION

Since the completion of the first seventeen hole drilling programme at the Sweeney's Mine in November 1977 (Wells 1977), the majority of the work has been undertaken in the Federation Plateau Area. Further investigations have also been carried out at Sweeney's and reconnaissance exploration of the entire Heemskirk Massif has commenced. All these investigations have been detailed in various reports, which have been circulated and only a summary is given here; together with conclusions and proposals for work in 1978-79.

Since November 1977 (Periods 1 - 5 exclusive) $96,060 has been spent on E.L. 11/76 and total expenditure for 1977-78 amounts to $184,019. This brings the total expenditure on the area, to date, to $201,305.

Work to be undertaken during 1978-79 will involve

(1) Diamond Drilling both at Sweeney's and in the Federation Plateau Area.

(2) Evaluation of other areas of interest outlined by the photogeological study.

Expenditure during 1978-79 is estimated at $110,881.

005

243006

2. SWEENEY'S MINE AREA

2.1 Introduction

Although significant mineralisation was intersected during the first drilling programme, which ended in November 1977, the shape(s), continuity and attitude(s) of the mineralisation was not resolved (Wells 1977) and further work, consisting mainly of geophysics, was undertaken to guide possible future diamond drilling.

2.2 Geophysics

The main geophysical survey consisted of surface and downhole I.P. surveys, together with a surface, applied potential survey. These surveys are described, in detail, in Scintrex report, TAS-052B, to which the reader is referred.

Gradient array I.P. was undertaken on line 40S from 00 to 200W and on line 150N from 185W to 285W. The results from previous work, on these lines, was considered suspect (due to rainwater in the I.P. receivers) and this check resulted in modifications to the line profiles and the geophysical contour maps. Diamond drill holes Swy 16 and Swy 17 were electrically logged, in a similar manner to the previous surveys of d.d.h.s Swy 7, 8 and 10 (Scintrex Report, TAS-050), to try and determine the distance of the mineralisation from the holes. Swy 16 was logged using 5m and 20m electrode spacings and lower resistivities/higher chargeabilities were detected, 5m to 8m from the hole, between 110m and 115m. Swy 17 was logged using three electrode

spacings: 2.5m, 10m and 20m; significant responses were recorded between 175m - 195m and 200m - 210m; the sources dipping away from the hole. Applied potential surveys, with electrodes in both these holes suggest that the source (mineralisation) is under and/or in part lateral to the holes.

An applied potential survey of the Sweeney's Mine Area was undertaken with an electrode emplaced within the mineralisation in d.d.h. Swy 15. The results of this survey, together with the downhole logging and surface I.P., appear to confirm the interpretation of the drilling results: the (more conductive sections of the) body strikes N.W. - S.E., crossing line 40S approximately 40m South of the I.P. maxima and pitches E.S.E., passing below the bottom half of d.d.h. Swy 17.

The Sweeney mineralisation was also checked for its E.M. reponse with the Crone Pulse E.M. System using a horizontal loop. Readings were taken at 25m intervals, across the mineralisation and I.P. anomaly along the Upper Road; however, no responses were recorded.

2.3 Geology

The Sweeney's Mine area was remapped on a scale of 1:500 (Fig. 2) in a combined attempt with the geophysics to define the shape, attitude and controls of the mineralisation.

The area consists essentially of coarse-grained, 'red' granite with numerous intrusions of fine-grained, 'white' granite which vary in size from <1m up to 20m

wide; the largest having numerous tourmaline nodules associated with extensive zones of argillic alteration, only minor quartz/topaz alteration 'dykes' occurring.

Examination of aerial photographs (Project No. 12419, Run 4) reveals two prominent lineaments crossing in the immediate vicinity of the mine. These lineaments are thought to be dipping South with their line of intersection plunging in a South Easterly direction. This line of weakness being the main control on the penetration and attitude of the alteration (Wells 1978).

3. FEDERATION PLATEAU

3.1 Geophysics

Mineralisation occurs extensively throughout the Federation Plateau Area and, like Sweeney's, is often associated with argillic alteration and pyrite. The Sweeney type mineralisation shows a strong response to I.P. and it was therefore recommended that the area be surveyed with gradient array I.P. (Wells 1977). To facilitate this survey, an access road and a 30 line km grid, comprising 22 lines 100m apart, pegged at 30m intervals, were established in the area. Subsequently, a further eight short, intermediate lines, totalling 2.6 line km were pegged in geophysically anomalous areas. The gradient array I.P. survey was undertaken, using 1600m current dipoles and 10m potential dipoles, in late November/early December 1977 and is described in detail in Scintrex report TAS-052, to which the reader is referred.

Examination of Figs 3 and 4 shows that, geophysically, the grid area breaks down into two broad zones: a high chargeability zone, associated in part with high resistivity, in the South, and a low chargeability/low resistivity zone in the North. These zones appear to correspond, in general, with the 'red' granites and 'white' granite respectively; anomalies occurring in both areas (see Section 5).

A detailed ground magnetic survey using two proton magnetometers, one acting as a base station monitor, has been partially completed. To date, lines 9W to

00 inclusive have been surveyed with readings at 10m intervals. The magnetic gradient across the area is fairly flat, readings ranging from 62470γ in the North to 62561γ in the South. Although the range is only small, the pattern of variation has similarities to the I.P. contour maps, and detailed contouring reveals a strong East - West trend across the Southern half of the area (see Section 5). The magnetic survey of the grid will have to be completed.

3.2 Geology/Geochemistry

The geological mapping/geochemical sampling programme commenced in 1976-77 (Wells 1977) has now been completed and the reader is referred to the report "Geology and Mineralisation in the South Heemskirk Tinfield, West Tasmania" for the details and results of this programme.

The more complete data now available has resulted in modification of some of the ideas expressed in 1977. The 'red' and 'white' granites are two "separate" intrusions (Fig. 5); the 'white' granite is not hydrothermally altered 'red' granite as previously thought and, although the mineralisation is associated with this contact as well as with the greisen veins (white dykes), it is not an 'alteration front' but an instrusive contact. The relationships of mineralisation /alteration and geology are summarised in Fig. 6.

Rock samples collected during the geological mapping programme were analysed for Sn, Li, Rb and TiO_2 to see if the 'tin' granite had a significant geochemical signature, as an aid to future exploration.

243011

The younger, 'white' 'tin' granite tends to have higher Sn, Li and Rb values and lower TiO_2 values than the older 'red' non-'tin' granite. However, the geochemical signature, to date, is not clear cut enough to identify the 'tin' granite on the assay data alone.

4. OTHER WORK

To facilitate work over the entire Heemskirk Massif, the area was flown with colour aerial photography in December 1977 (A.A.M. Pty Ltd, Job No. 12419). Five East - West lines and one North - South tie line were flown, comprising a total of 91 photographs on a scale of approximately 1:25000. Photogrammetry was undertaken over the Federation Plateau to produce a 1:5000 and six 1:2000 orthophoto and contour maps of the same area.

The photographs were also used to undertake a photogeological study of the entire Heemskirk area. The reader is referred to Loxton, Hunting and Associates' report G.A. 39/77, G.A. 11/78 for details. Several interesting "pipe-like" and other structures have been identified for future investigation.

5. COMMENTS

Although the Federation Grid has not been accurately located on the ground, the general location of the geophysical anomalies is known and some expected and unexpected results occur.

Anomalies E, G, I, N and O (Fig. 3) were expected and are located over known workings: Waxman & Westons's, Eastern, Black Face (Central Federation), Tributors (West Federation) and Coleman's respectively. A stronger anomaly was expected over the Tributor's workings. However, its weakness is attributed to the exceptional coarseness of the pyrite mineralisation, individual crystals being up to 25mm across (giving a relatively small surface area for the I.P. effect). The lack of an I.P. anomaly over similar coarse pyrite mineralisation at the Phar Lap workings may be due to the same cause.

The large area of high chargeabilities detected in the Southern half of the area was unexpected and initially unexplained. It appears to be separated from the low chargeability area to the North by a major East - West lineament and terminated in the West by a North West - South East lineament adjacent to Coleman's workings (compare Figs 3 and 5). The coarse grained 'red' granite, which outcrops throughout this area, has numerous intrusions of fine grained 'white' granite within it and several quartz/topaz greisen veins (Fig. 5) and it is considered to be only a very thin layer above the younger 'white' 'tin' granite. The greisen veins are thought to pass down into a mica greisen with sulphides, the margin of which outcrops at Waxman and Weston's workings (Wells 1978); and

the large area of chargeability is considered to be due to these sulphides (N.B. the I.P. survey was undertaken using 10m potential dipoles and the depth of detection would be limited). The intense alteration/mineralisation at the Black Face (Central Federation) is thought to be due to its being at the top of a cupola; while the lower temperature alteration/mineralisation at Phar Lap and Sweeney's is related to the penetration of hydrothermal 'fluids' up fault/joint and fault/fault intersections, respectively, from the main altered zone immediately below the 'red/white' granite contact. The relationships are summarised in Fig. 7.

The higher response and East - West alignment of the magnetics in the Southern part of the area coincides with the East - West lineament which passes through Sweeney's. Similar argillic alteration to that which occurs at Sweeney's occurs along the lineament; pyrrhotite mineralisation also occurs at Sweeney's and the higher, although still weak, magnetic response along the 'fault' may be reflecting further pyrrhotite mineralisation.

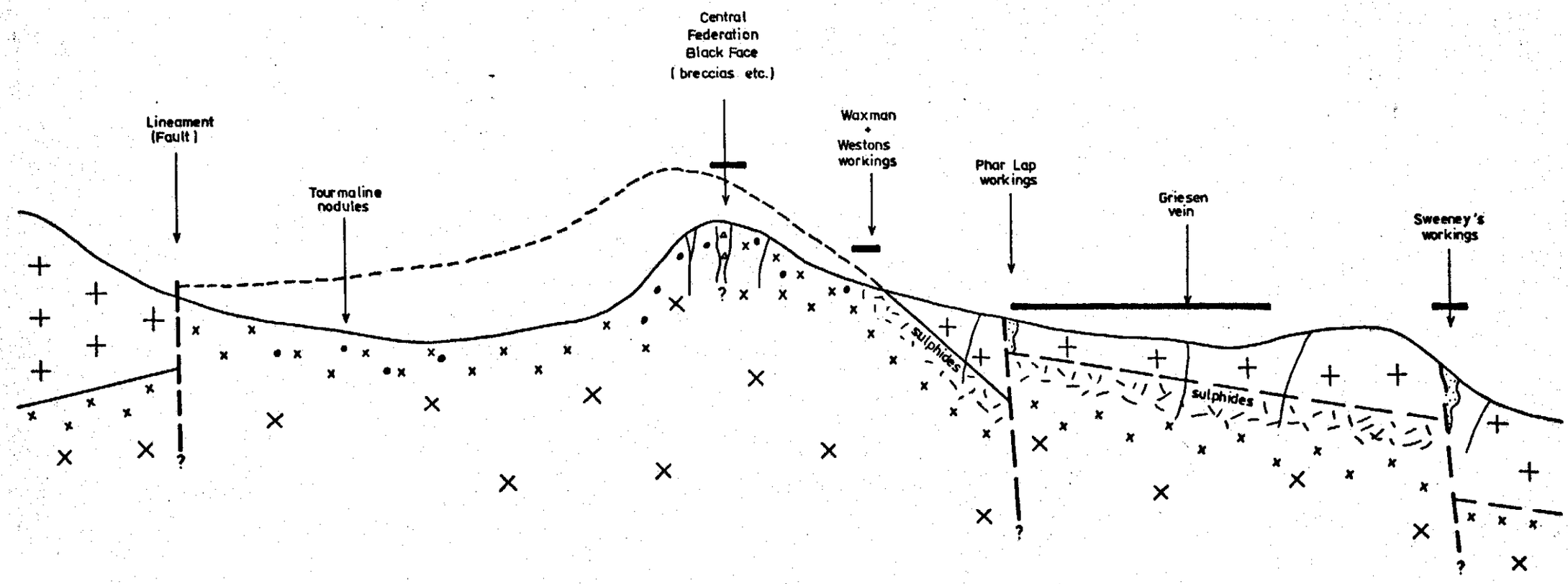


FIG. 7 DIAGRAMMATIC NORTH SOUTH CROSS SECTION THROUGH SOUTH HEENSKIRK TIN FIELD, WITH POSTULATED MICA/QUARTZ GREISEN

243015

6. RECOMMENDATIONS 1978-79

6.1 Sweeney's Mine Area

The occurrence of coarser-grained cassiterite (crystals up to 250μ) in d.d.h. Swy 15, the deepest intersection to date (in possibly a separate lens), is considered to be very encouraging. The size(s), shape and attitude(s) of the mineralisation is unclear; but the geological interpretation and the geophysical survey of Sweeney's both suggest a South-Easterly plunging zone of alteration/mineralisation and hole drilled in a North-Westerly direction, normal to this plunge, is recommended. This hole should be collared on the access road, 8m North of line 130S (5m from survey point B.B.11)

Bearing: 288° magnetic
Dip: -61°
Length: 300m (target approximately 230m)

To intersect the alteration/mineralisation, approximately 25m from the intersection in Swy 15, at about R.L. 80m (assuming the hole is straight). Any intersection should be approximately at right-angels to the Swy 15 intersection and not only give a further look at the mineralisation, but help to determine the shape and attitude of the body(s) as a guide to future work.

6.2 Federation Plateau

(a) The detailed ground magnetic survey is only partially finished and it is recommended that this survey be completed as an additional guide to the interpretation of the I.P. results and structure in the area. The survey could be undertaken by a contractor.

(b) The Federation grid has not yet been accurately located on the ground, therefore the geophysical results are not yet accurately correlated with the geological mapping. The grid will have to be located on the ground before drilling proposals can be finalised.

(c) Although detailed drilling proposals cannot yet be made, approximately 1000m of diamond drilling is recommended, involving holes 100 - 150m in length. Angled holes should be drilled to test geological features where they coincide with geophysical anomalies at Black Face, Tributor's and Coleman's and at least three vertical holes should be drilled to test 'peaks' in the zone of high chargeability in the Southern half of the area.

Due to the difficulties of access and environmental considerations, the location of drill rigs and supplies by helicopter (rather than by road construction) may be more desirable in this initial drilling programme.

6.3 Other Areas

Several altered/mineralised zones, generally exposed in old workings, occur elswhere on the granite, notably Peripatetic, Long's Iron Blow and the Globe. In addition, the photogeological survey has located several 'pipe-like' and other structures of interest, as well as some areas of quartz/topaz greisen veins. Preliminary examinations have already been undertaken of some of the old workings;

017

243018

but all the workings and areas of interest outlined by the photogeology, particularly those near the 'red/white' granite contact, will require further work involving geological mapping and geochemical sampling to define areas requiring more detailed investigations.

018

243019

REFERENCES

Boshier P.R.(?)	May 1978	A Photogeological Study of the Heemskirk Granite and the Area surrounding Zeehan, Western Tasmania. R.F. Loxton, Hunting & Associates Report G.A.39/77, G.A. 11/78.
Howland-Rose A.W.	October 1977	Additional E.I.P. and Magnetic Field Test Surveys over Sweeney's Mine. Scintrex Report TAS-050.
Howland-Rose A.W.	May 1978	A Report on a Gradient Array E.I.P. Survey over the Federation Grid, Trial Harbour Road, near Zeehan, Tasmania. Scintrex Report TAS-052.
Howland-Rose A.W.	March 1978	Some Comments on Further Electrical Geophysical Surveys over Sweeney's Mine. Scintrex Report TAS-052B.
Wells K.	November 1977	Progress Report, Federation Area, E.L. 11/76. Unpubl. Renison Limited Report.
Wells K.	June 1978	Geology and Mineralisation in the South Heemskirk Tinfield, West Tasmania. Unpubl. M.Sc. Thesis, J.C.U.N.Q.

243020

RENISON LIMITED

APPENDIX 1

Expenditure Breakdowns and Proposed Budget 1978-79

020

243021

RENISON LIMITED

Total Expenditure 1977-78

Item	Expenditure $	% of Total Expenditure
Salaries	14,880	8
Consumables	7,525	4
Diamond Drilling	103,912	57
Road Construction	7,208	4
Surveying	2,191	1
Outside Services (including Track Cutting, I.P. Survey, Aerial Photography, Photogrammetry, Photogeology)	48,302	26
Rounding	1	
TOTAL:	$184,019	100%

021

243022

RENISON LIMITED

Proposed Budget 1978-79

Item	Expenditure $	% of Total Expenditure
Salaries (inc. loading)	19,659	18
Consumables	5,354	5
Renison Services (Assaying, Surveying)	5,355	5
Diamond Drilling	60,000	54
Consultants & Contractors	20,513	18
TOTAL:	$110,881	100

022

243023

RENISON LIMITED

Total Expenditure to Date (June 1978)

Item	Expenditure $	% of Total Expenditure
Salaries	21,083	10
Consumables	7,806	4
Diamond Drilling	105,295	53
Road Construction	13,915	7
Surveying	2,191	1
Consultants	1,500	1
Travel and Accommodation	511	
Outside Services (Including Track Cutting, I.P. Survey, Aerial Photography, Photogrammetry, Photogeology)	49,002	24
Rounding	2	
TOTAL:	$201,305	100%

023

243024

RENISON LIMITED

APPENDIX 2

Petrographic Descriptions -

Federation Plateau Area

C.M.S. Report 78/4/24

Sample Details	Rock Type - Composition	Fabric	Minor Minerals	Comments
3/3 (TS 23789)	Porphyritic Biotite-Granite. Phenocrysts of orthoclase, oligoclase, in medium/coarse-grained quartz, orthoclase, biotite, minor oligoclase. Weakly argillised.	Rather variable grain-size range and inhomogeneous fabric.	Isolated zircons, primary opaques. Fine rutile needles in quartz.	Argillic alteration has bleached feldspars. Similar to 1/1 etc. but mor K-feldspar, therefore classified as granite.
4/8	Sodic Biotite-Microgranite. A few orthoclase, oligoclase phenocrysts in granular/subhedral mass of quartz, albite, orthoclase, biotite. Schorl patches.	Even-grained, grain-sizes verging on coarse range.	Metamict & fresh zircon. Pervasive argillic alteration. Trace apatite.	Slight shift in composition to more sodic rock-type. Patches of replacive schorl (dark green/black). Orthoclase microperthitic.
6/2	Biotite Granite. Occasional orthoclase phenocrysts in even-grained anhedral quartz, prismatic albite, microperthitic orthoclase, very minor dark biotite.	Typical granitic fabric.	Traces zircon, secondary anatase, with biotite. Trace green/brown tourmaline.	Pervasive weak argillic alteration of feldspars, sericitisation of albite. No rutile in quartz in this rock or 4/8
8/6	Porphyritic Biotite Granite. Large mantled orthoclase/oligoclase and quartz phenocrysts in granitic quartz-orthoclase-oligoclase mass with dark biotite.	Mantling of orthoclase by oligoclase and vice versa. Slightly stressed.	Trace zircon. Traces introduced muscovite. Argillised plagioclase.	Plagioclase strongly argillised, orthoclase weakly argillised; probably correlatable with 3/3, 1/1 etc.
3/7	Biotite Microgranite. Mainly medium-grained anhedral stressed quartz with rutile needles and orthoclase, minor albite, very minor chloritised biotite.	Even-grained medium fabric; patches of micrographic quartz/feldspar.	Traces of metamict zircon, ?xenotime.	Feldspar mainly orthoclase, lightly argillised. Micrographic textures are distinctive, not common in these rocks
5/11	Biotite Granite. Coarser patches of orthoclase (poikilitic, not strictly porphyritic), anhedral quartz with rutile, subordinate albite, minor dark biotite.	Grainsizes quite variable from medium to coarse.	Traces primary zircon, apatite; introduced muscovite, pale tourmaline, ?cassiterite.	Subtle traces of pneumatolysis - one grain of ?cassiterite seen; occasiona coarser patches schorl - replacive.
5/16	Biotite Granite. Coarse anhedral stressed quartz, subhedral microperthitic orthoclase, subordinate argillised albite, dark altered biotite.	Fairly normal granitic fabric with phenocrystic quartz.	Traces primary zircon. Introduced, replacive muscovite. Rutile in quartz.	Orthoclase is cloudy, incipiently argillised. Very little real differen between this rock and other granites.
6/10	Greisen. Medium to coarse interlocking quartz. Small random muscovite flakes, irregular patches of green tourmaline; traces of cassiterite.	No relict textures; fabric typical of greisen.	Some tourmaline is amber-brown, zoned. ?cassiterite(< 150μ).	Not a greisenised granite but a vein-t quartz-muscovite rock; no evidence of former feldspars. Tourmaline is pale.
6/11	Biotite Microgranite. Even-grained subhedral quartz, orthoclase, minor albite; micrographic intergrowths. Chloritised biotite shreds.	Average grainsize=0.3mm finer than other microgranites.	Replacive patches of pale tourmaline. Traces primary zircon. Muscovite.	Pervasive minor argillic alteration, a selective sericitisation of albite. Similar to 3/7, finer-grained.

Sample Details	Rock Type - Composition	Fabric	Minor Minerals	Comments
6/13	Greisen Medium/coarse interlocking quartz Patches, fine topaz needles, irregular patches of pale tourmaline; sericite replaces topaz. Trace cassiterite.	Greisen-type random fabric; no relict textures.	Scattered small cassiterite grains <100μ. Pyrite.	Very similar to 6/10 but with topaz - extensively replaced by later, separate sericitisation phase. Not gresienised granite.
8/9	Biotite Microgranite. Major subhedral orthoclase, anhedral quartz, very subordinate oligoclase, dark biotite. Incipient argillic alteration.	Even-grained medium-crystalline. Patches of micrographic intergrowths.	Isolated zircon crystals.	Similar to 3/7, and 6/11 in particular. Cloudy feldspars from incipient argillisation but fairly fresh rock.
8/10	Tourmalinised Microgranite Dominantly orthoclase, subordinate quartz, minor albite-oligoclase, shreds of chloritised biotite; replacive poikiloblastic tourmaline.	Medium-grained, some micrographitic patches. Coarser than 8/9.	Isolated zircon, ?fine cassiterite with tourmaline.	Fairly certain cassiterite identificati associated with blue-green zoned replac ive tourmaline. Similar rock to 8/9.
8/8	Topaz Greisen. Mainly interlocking quartz patches, granular/subhedral topaz, partly replaced by fine sericite.	Medium-grained, homogeneous fabric.	Semi-opaque anatase, traces of xenotime, zircon, ?monazite, ?cassiterite.	Similar to 6/13, but topaz more conspicuous. Variety of trace minerals present. Not greisenised granite.
5/22	Greisenised Granite. Coarse stressed interlocking quartz patches; feldspar replaced by quartz, topaz sheaves, minor mottled green/brown tourmaline.	Evidence of relict textures. Coarse-grained original rock.	Traces anatase, zircon, ?xenotime, ?cassiterite (<50μ).	Contrast with other greisens, because o evidence of pre-existing granitic textures. Cassiterite identification doubtful.
5/3 F.G.	Quartz-Tourmaline Rock. Medium/coarse subhedral quartz patches, prismatic blue/green tourmaline crystals and subradiating aggregates	Mostly > 1mm and thus coarse-grained, but relict textures absent.	Traces anatase, primary zircon; fluorite, xenotime.	Very thorough tourmalinisation has obliterated relict features; no eviden of feldspars. See notes.
5/3 C.G.	Quartz-Tourmaline Rock. Coarse, stressed subhedral quartz patches, coarse prismatic zoned brown-blue-green tourmaline aggregates.	Quartz, tourmaline patches up to 5mm +. No relict textures.	Traces zircon, ?xenotime, fluorite, anatase.	No tangible evidence in this rock (or previous one) of pre-existence of granitic minerals or textures. See notes.
5/3 Green	Quartz-Tourmaline Rock. Patches of fine, fibrous-radiating tourmaline aggregates; fine interlocking quartz aggregates. Tourmaline pale because fine-grained.	Relict textures suggest coarse feldspars, ?granitic fabric.	Semi-opaque leucoxene-anatase. Traces ?cassiterite (<60μ).	Quite different to 5/3 C.G./F.G.; good evidence of replacement of feldspars, thus granitic origin.
5/19	Quartz-Tourmaline Rock. Subradiating & matted aggregates of fine acicular tourmaline, vein-type euhedral quartz; quartz-lined cavities.	Vuggy. Vaguely banded in places. Fine-grained	Fine goethite throughout. Leucoxene-rutile. Isolated zircon, ?cassiterite.	Quite similar to 5/3 Green; cassiterit identification needs assay confirmation No evidence of relict features.

Sample Details	Rock Type - Composition	Fabric	Minor Minerals	Comments
W.F.25	Quartz-Hydromuscovite Rock. Granular quartz & interstitial small flakes & aggregates of yellowish hydromuscovite ("sericite").	Granular, medium-grained, homogeneous.	Zircon with xenotime overgrowths. Dark leucoxenic rutile. ?Cassiterite.	A type of greisen, formed at lower temperatures. No sign of topaz, tourmaline. C.P.2/17.
9/9 (TS 23808)	Granophyre. Medium-grained subhedral quartz, orthoclase, albite crystals, many micrographic quartz-orthoclase intergrowths. Minor chloritised biotite.	Pronounced medium/fine eutectic intergrowths. Occasional phenocrysts.	Replacive topaz, tourmaline, as isolated patches.	Similar to 3/7, 6/11 but much more abundant micrographic textures. Could be correlated with that group. Pervasive argillisation.
C.F.5 (TS 23808A)	Quartz-Tourmaline Rock. Matted and sub-radiating tourmaline needles, vein-type euhedral zoned quartz. Younger quartz veins.	Fairly homogeneous, fine-grained. No relict textures.	Zoned, metamict zircon. Fine goethite, leucoxene.	Closely similar to 5/19 in all respect No relict textures seen.

243027

RENISON LTD
E.L. 17/77

RENISON LTD
E.L. 18/73

ABERFOYLE
E.L. 21/63

RENISON LTD
E.L. 42/71

RENISON LTD
E.L. 42/71

FEDERATION AREA
E.L. 11/76

MT. LYELL MG & RLY Co Ltd
S.P.L. 129

Corinna

Pieman River

Granville Harbour

SOUTHERN OCEAN

Trial Harbour

Remine

Zeehan

Queenstown

Strahan

Renison Bell

Tullah

Rosebery

Mt. Heemskirk

Mt. Agnew

Mt. Zeehan

Mt. Dundas

Razorback

Merton Hill

Bregalnight

Pieman Camp

Cumberland Peak

Murchison River

Murchison Highway

Lyell Highway

Henty River

Linda Valley

Proposed H.E.C. Highway

H.E.C. Road

Queenstown Road

Corinna Road

Mackintosh Syncline

Zeehan Syncline

Renison Mine Camp

Renison Bell

Bregalnight

Dominion Hill

Razorback

Mt. Heemskirk

Mt. Agnew

Mt. Zeehan

Mt. Dundas

Cumberland Peak

Pieman Camp

Merton Hill

Tullah

Rosebery

Zeehan

Strahan

Queenstown

Trial Harbour

Remine

Granville Harbour

St. Dizier

Linda Valley

Henty River

Murchison River

Pieman River

Lyell Highway

Murchison Highway

H.E.C. Road

Queenstown Road

Corinna Road

Proposed H.E.C. Highway

Mackintosh Syncline

Zeehan Syncline

Razorback

243029

5 cm

RENISON LIMITED	
SWEENEY'S MINE	
INTERPRETATIVE GEOLOGY	
GEOLOGIST : K. Wells	SCALE 1: 500 METRES
DRAUGHTSMAN : F.A. Dalton	10 0 10 20
DATE : July '78	
REVISIONS	DRAWING No.
1015	FIG 2

78-1283

BOUNDARIES
ROCK TYPE
DEFINITE
APPROXIMATE (0.05 mm.)
INFERRED
ALTERATION
DEFINITE
APPROXIMATE (0.5 mm.)
INFERRED
NOTE N.E. = No Exposure

ALTERATION
Argillic alteration
Quartz / topaz
Sulphides
Tourmaline nodules

ROCK TYPES
X X Fine grained 'white' granite
Coarse grained 'red' granite

Major lineaments (approximate)

S101

5 cm

Line 9W
Line 8W
Line 7W
Line 6W
Line 5W
Line 4W
Line 3W
Line 2W
Line 1W
Line 00
Line 1E
Line 2E
Line 3E
Line 4E
Line 5E
Line 6E
Line 7E
Line 8E
Line 9E
Line 10E
Line 11E
Line 12E

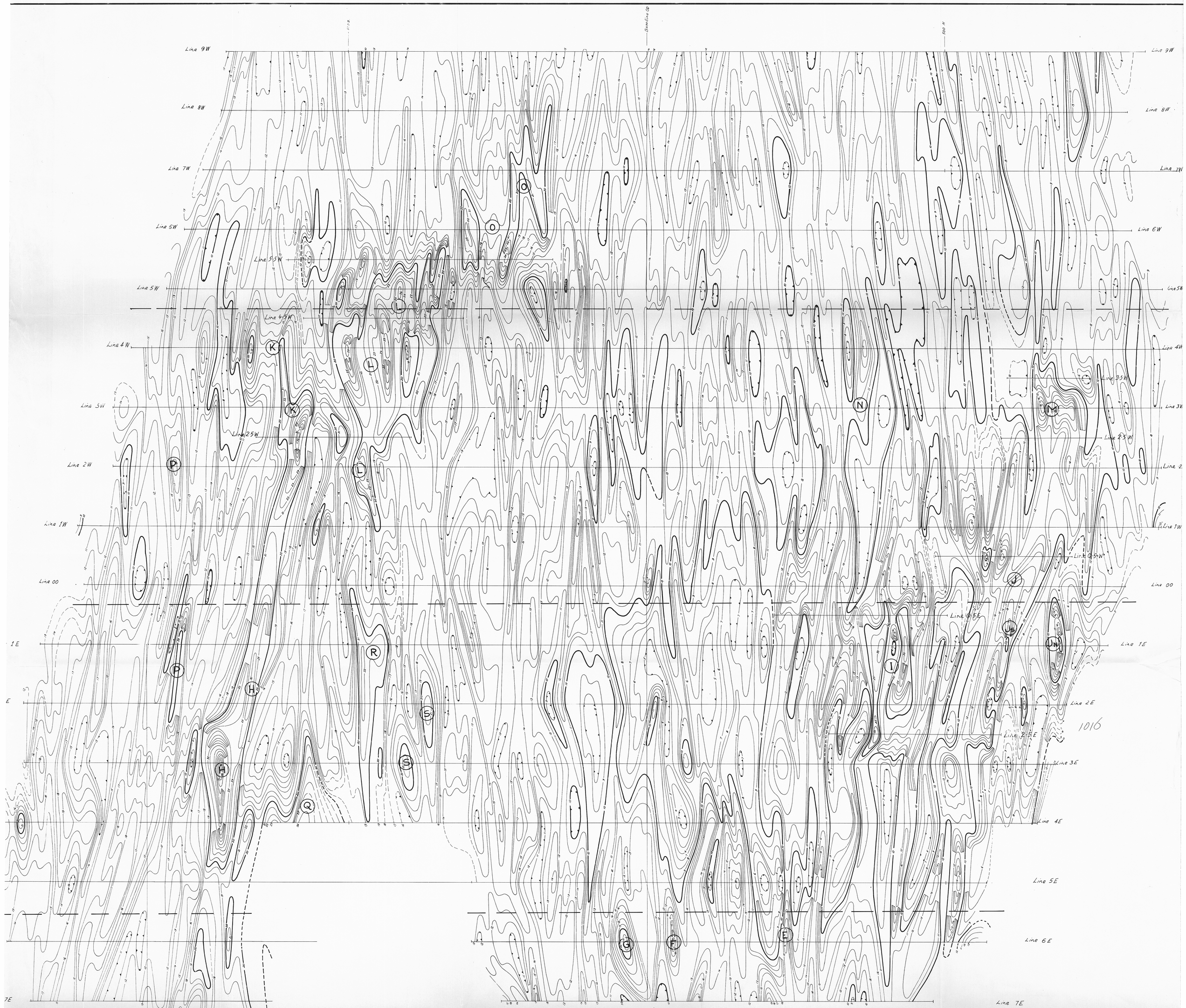
Sub base Line 840 S

Gradient Block Boundary shown thus :- — — — —

Significant Zone of Induced Polarization (Q)

W
S
N
E

5 cm



W

S N

E

Gradient Block Boundary shown thus :- —— —— —— ——

Significant Zone of Induced Polarization (Q)

5 cm

RENISON LIMITED

FEDERATION GRID

NEAR ZEEHAN - TASMANIA

GRADIENT ARRAY
ELECTRICAL INDUCED POLARIZATION

CHARGEABILITY CONTOUR PLAN

SURVEYED & COMPILED BY
SCINTREX

243030

NOVEMBER - DECEMBER 1977

5 cm

SCALE 1:2000 metres

Job. N° TAS -052 Sht 1 of 1 PLATE 1.

Fig. 3.

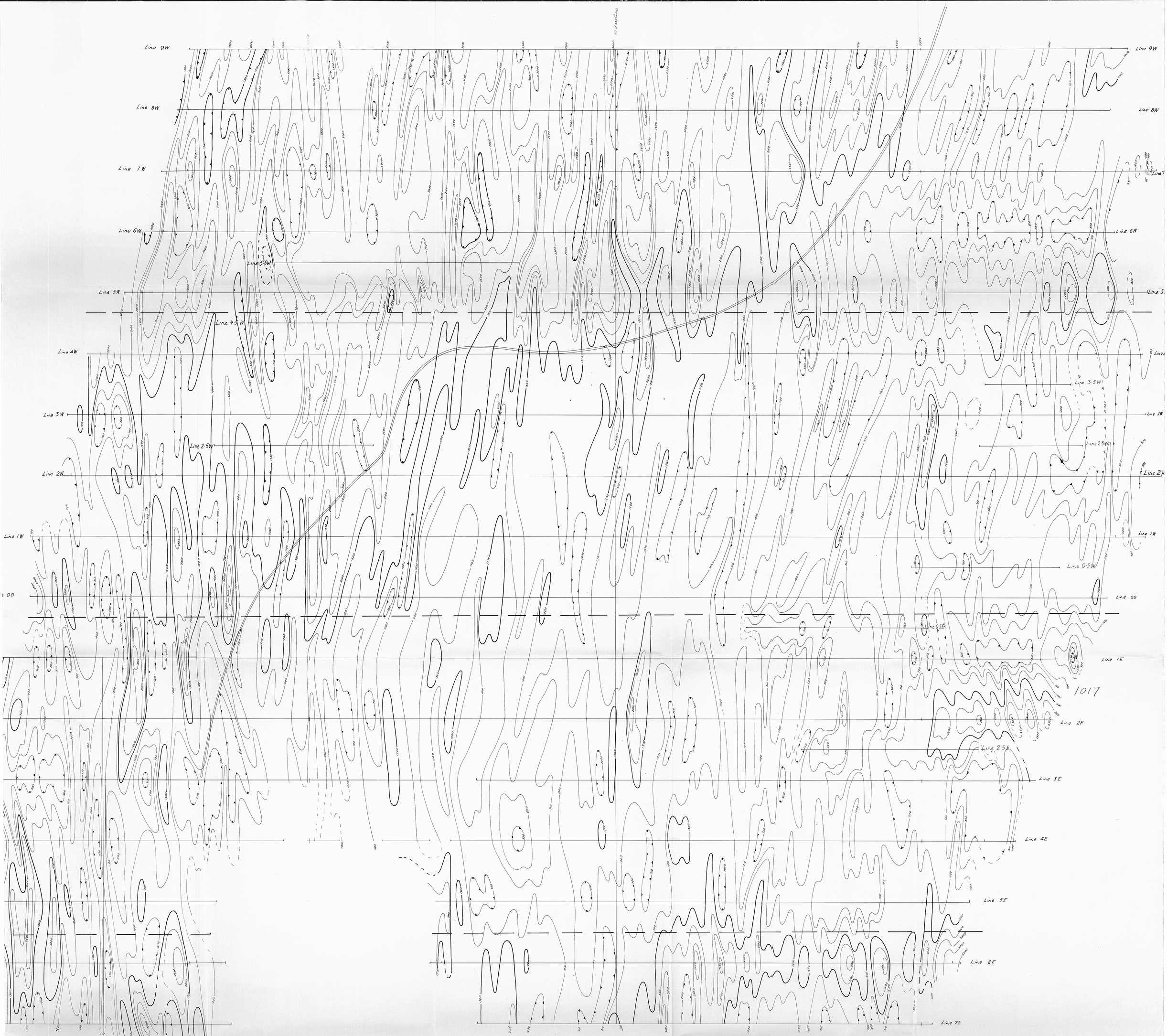
1016

78-1288

Line 9W
Line 8W
Line 7W
Line 6W
Line 5.5W
Line 5W
Line 4.5W
Line 4W
Line 3W
Line 2.5W
Line 2W
Line 1W
Line 00
Line 1E
Line 2E
Line 3E
Line 4E
Line 5E
Line 6E
Line 7E
Line 8E
Line 9E
Line 10E
Line 11E
Line 12E
Sub base Line 8W S

Gradient Block Boundary shown thus :- — — — —
Significant Change in Resistivity Level

5 cm



Gradient Block Boundary shown thus :- — — — —

Significant Change in Resistivity Level

5 cm

RENISON LIMITED

FEDERATION GRID

NEAR ZEEHAN - TASMANIA

GRADIENT ARRAY
ELECTRICAL INDUCED POLARIZATION

RESISTIVITY CONTOUR PLAN

SURVEYED & COMPILED BY
SCINTREX

NOVEMBER - DECEMBER 1977

5 cm

SCALE 1:2000 metres

243031

Job. N° TAS-052 Sht. 1 of 1 PLATE 2.

FIG 4. 1017

78-1283

348000mE

352000mE

5361500mN

5357000mN

1018

EASTERN WORKINGS

CENTRAL FEDERATION

WEST FEDERATION

WAXMAN & WESTONS

LONG ADIT

PHAR LAP

LAKE CUMBERLAND

COLEMAN'S

MONTAGUE

WAKEFIELD

SWEENEY'S

Numerous small microgranite intrusions

A few small microgranite intrusions

Some small microgranite intrusions

LEGEND

ALTERATION

- Argillic Alteration
- Quartz and Topaz and/or Tourmaline
- Total tourmalinization, occasionally with hematite
- Hydrothermal Breccias
- Collapse

White alteration 'Dykes' (Greisen Veins)

- Quartz - mica greisen
- Area of Tourmaline nodules

ROCK TYPES

- Fine grained
- Medium grained

'White' younger granite

- Medium grained, usually porphyritic
- Coarse grained

'Red' older granite

- Major Lineament
- 70 Joint with dip
- Joint, vertical
- Foliation
- Definite
- Approximate
- Inferred

Geological Boundaries

- Old mine or prospect

5 cm

243032

COMPILATION NOTE

This sheet is a composite of photogrammetric contours superimposed on a half tone reproduction of compiled orthophotos from aerial photography dated 12.12.77.

Orthophoto base mapping and photogrammetric contours by Australian Aerial Mapping Pty. Ltd.

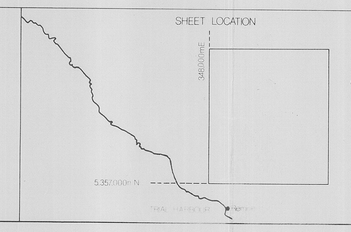
Aerial photography	Wild RC8
Aerial triangulation	Wild A8
Contouring	Wild B8
Orthophotos	Zeiss Topocart

REFERENCE

- 100 Contours
- Depressions
- * 60.5 Spot Heights
- RL 503.98 Control

N.B. Broken lines indicate lower reliability
Contour interval 10 metres
Spot heights to 0.5 metres
Reduced levels to Australian Height Datum
Co-ordinates Australian Map Grid
Grid interval 500 metres

SHEET LOCATION



RENISON LIMITED

HEEMSKIRK AREA

GEOLOGICAL INTERPRETATION

GEOLOGIST: K. Wells	SCALE: 1:5000 METRES
DRAUGHTSMAN: F. Colson	100 0 100 200
DATE: June 1978	
REVISIONS	DRAWING NO. 1018 Fig 5

79-1283

Coarse grained 'red' granite.

Griesen alteration vein / developed along a pre-existing joint / lineament.

Zone of strong argillic alteration may coincide with a microgranite intrusion e.g. Tributors Lode West Federation

Quartz / Topaz alteration 'Downwards' topaz gives way to tourmaline e.g. Black Face Lode

Older granite (adamellite) altered becomes more alkaline around margins of younger granite ?

Tourmaline nodules developed along joint / lineament Possibly a microgranite intrusion elsewhere on same structure.

Tourmaline veins subparallel to contacts

Quartz / white mica griesen e.g. Waxman and Westons

adamellite / granite ?

Griesen 'vein complex' dies away upwards and gradually merges with unaltered granite.

SULPHIDES & / OR HEMATITE

Collapse Breccia developed above intense hydrothermal alteration e.g. Black Face Lode, Central Federation

SULPHIDES

Zone of argillic alteration carrying sulphides on or near a major structure e.g. Sweeney's, Phar Lap.

Aplite microgranite intrusion occasionally associated with tourmaline nodules

Zone of argillic alteration sometimes includes silicified 'pods'

granite ? adamellite

Quartz / mica alteration

Total tourmalinisation.

Increase in Topaz / Tourmaline increases

Quartz / mica alteration

Total tourmalisation of griesen vein, including argillic zone Nodules developed e.g. Coleman's.

Quartz / Tourmaline alteration developed along joints e.g. Black Face, Central Federation

Hydrothermal Breccia - developed during tourmalisation e.g. Black Face, Central Federation

Fine grained 'white' granite

? SULPHIDES ?

Medium grained 'white' granite

Tourmaline nodules developed in 'fissure' in younger granite.

Tourmaline nodules and narrow tourmaline veinlets reach maximum development along contact within both granite types. 'Upwards' into older granite rapidly disappear 'Downwards' into younger granite, rapidly decrease in size and tourmaline occurs as individual grains / crystals. At depth tourmaline disappears. (?)

Younger, 'white' granite chilled against contact.

DIAGRAM TO SHOW RELATIONSHIPS BETWEEN ALTERATION / MINERALISATION AND GRANITE TYPES

FIG. 6

K. WELLS JUNE 1978

FIG 6

78-1283

243033

1019