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CRA EXPLORATION PTY. LIMITED
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Second Annual Report
For The Period Ending 3 May 1996
EL 4/94 Balfour, Tasmania

EL 4/94
See folio 56

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Accepted by: *[Signature]*

96-3912

ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES

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CRAE Report No. 22155

Abstract

Conclusions and recommendations:

- Structurally controlled, mineralised shoots are expected to have limited surface expression. Hence testing should commence in known higher grade mineralisation. The ACI diamond hole DDH 16 (21.7m at 1.40% Cu from 62.5m) should be redrilled and detailed structural measurements from oriented core and downhole geophysics (mise-ala-masse) utilised to locate follow-up holes.
- The discrete 1m Gal gravity anomaly east of Murray's Reward should be verified by conducting a small gravity survey over the area. If the anomaly exists it may represent a mineralised body of the target type and should be drill tested.
- IP may not be the appropriate electrical exploration tool for the target mineralisation style (ie. the mineralisation may be conductive). Mineralisation intersected in the proposed hole (DDH16 redrill) should be electrically tested to determine the most appropriate electrical exploration technique.
- The quartz stockwork hosted Sn (W) mineralisation at Specimen Hill has been well explored. Although some potential exists to improve grades with larger diameter drilling/larger bulk samples, the grade would have to increase dramatically for the deposit to become viable.
- Relevant CRAE and Geopeko reports should be reviewed to determine the nature of the mineralisation associated with the strike parallel Zn anomaly south-west of Specimen Hill

During the past permit year CRAE's exploration focus has changed from stratabound mineralisation in the Proterozoic quartzites, siltstones and shales west of the Balfour Copper Trend (Nelson Prospect) to the Balfour Copper Trend itself.

The primary target in the Murrays Reward - Specimen Hill area comprises broad, steeply plunging shoots with limited lateral extent, but great depth continuity within more extensive zones of low grade, stratabound mineralisation.

Work undertaken during the second permit year of the Balfour licence includes:

- A review of mineralisation styles in the Balfour area
- Examination of available data from the Specimen Hill area to determine if the quartz stockwork hosted Sn-W mineralisation at Specimen Hill had been adequately tested
- Creation of drillhole sections and correlations across the Balfour Copper Trend in the Murray's Reward and The Clump areas
- Assessment of a high frequency gravity anomaly east of Murray's Reward
- Re-interpretation of aeromagnetic data acquired by CRAE in 1993 to incorporate the geological mapping carried out by Nic Turner since the aeromagnetic data was acquired
- Re-interpretation of available IP data for the Murray's Reward - Specimen Hill area to identify untested IP anomalies
- Assessment of strike parallel Zn (soil/bedrock) geochemical anomalies in the Murrays Reward - Specimen Hill area to determine the prospectivity for stratabound Zn deposits.

Contents

	Page No.
Abstract	
List of Plans	
List of Appendices	
List of Tables	
1. Conclusions and Recommendations	1
2. Introduction	1
3. Review of Previous Work	1
3.1 Prior to Current Tenement	2
3.2 During Current Tenement	3
3.2.1 General	3
3.2.2 Nelson Prospect	3
4. Exploration Completed in the 12 Month Period Ending 3 May, 1996	4
4.1 Review of Mineralisation Styles (TM Porter)	4
4.2 Murrays Reward Copper Prospect	4
4.2.1 Drillhole Correlation (TM Porter)	4
4.2.2 Gravity Data Review (S Rajagopalan)	5
4.3 Specimen Hill Tin-Tungsten Prospect (GB Patterson)	5
4.3.1 Review of Exploration	5
4.4 The Clump Prospect	6
4.4.1 Drillhole Correlation (TM Porter)	6
4.5 Balfour Copper Trend General	6
4.5.1 Rockchip Sampling	6
4.5.2 Re-interpretation of Aeromagnetic Data (S Rajagopalan)	7
4.5.3 Re-interpretation of IP Data (T Aravanis)	7
4.5.4 Soil/Bedrock Zn Anomalies	7
5. Discussion of Results	8
6. Rehabilitation	9
7. Expenditure	9

8.	References	10
9.	Location	10
10.	Keywords	10
11.	DPO Register	10

List of Plans

Plan No.	Title	Scale
✓ Tv 1036	EL 4/94 Balfour Location Plan	1:100,000
✓ Tv 1074	EL 4/94 Balfour Murrays Reward Drillhole Location Plan	1:2,500
✓ Tv 1086	Murrays Reward : Drillhole Cross-section F	1:1,000
✓ Tv 1087	Murrays Reward : Drillhole Cross-section G	1:1,000
✓ Tv 1088	Murrays Reward : Drillhole Cross-section H	1:1,000
✓ Tv 1089	Murrays Reward : Drillhole Cross-section I	1:1,000
✓ Tv 1090	Murrays Reward : Drillhole Cross-section J	1:1,000
✓ Tv 1091	Murrays Reward : Drillhole Cross-section K	1:1,000
✓ Tv 1092	Murrays Reward : Drillhole Cross-section L	1:1,000
✓ Tv 1093	Murrays Reward : Drillhole Cross-section M	1:1,000
✓ Tv 1094	Murrays Reward : Drillhole Cross-section N	1:1,000
✓ Tv 1095	Murrays Reward : Drillhole Cross-section O	1:1,000
✓ Tv 1096	Murrays Reward : Drillhole Cross-section P	1:1,000
✓ Tv 1097	Murrays Reward : Drillhole Cross-section Q	1:1,000
✓ Tv 1098	EL 4/94 Balfour The Clump Drillhole Location Plan	1:2,500
✓ Tv 1099	The Clump: Drillhole Cross-section A	1:1,000
✓ Tv 1100	The Clump: Drillhole Cross-section B	1:1,000
✓ Tv 1101	The Clump: Drillhole Cross-section C,D	1:1,000
✓ Tv 1102	The Clump: Drillhole Cross-section E	1:1,000
✓ Tbn 2	Murray's Reward - Specimen Hill Area Lithomagnetic Interpretation	1:5,000
✓ Tv 897	EL 18/92 Mt Frankland, EL 4/94 Balfour Geological Setting of the Murray's Reward Copper Mineralisation	1:5,000
✓ Tv 1103	EL 4/94 Balfour ACI IP Interpretation Plan, Murrays Reward - Specimen Hill Area	1:5,000

✓ Tv 1038	EL 4/94 Balfour CRAE/Peko IP Interpretation Plan	✓	1:5,000
✓ Tv 1104	Murrays Reward - Specimen Hill Area : Zn (ppm) in Soils and Bedrock	✓	1:5,000

List of Appendices

Appendix 1	Memorandum TM Porter to S Menpes entitled "Balfour"
Appendix 2	Interpretation of Gravity and Aeromagnetic Data in the Balfour Area
Appendix 3	Report by G W Patterson entitled "A Review of Exploration at Specimen Hill, Balfour, Tasmania"
Appendix 4	Rockchip Sample Ledger and Geochemical Assays

List of Tables

Table 1	DPO Register
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1. Conclusions and Recommendations

- Structurally controlled, mineralised shoots should be targeted in the Murrays Reward - Specimen Hill area. As this style of mineralisation is expected to have limited surface expression testing should commence in known higher grade mineralisation. The ACI diamond hole DDH 16 (21.7m at 1.40% Cu from 62.5m) should be redrilled and detailed structural measurements from oriented core and downhole geophysics (mise-ala-masse) utilised to locate follow-up holes.
- The discrete 1m Gal gravity anomaly east of Murray's Reward should be verified by conducting a small gravity survey over the area. If the anomaly exists it may represent a mineralised body of the target type and should be drill tested.
- IP may not be the appropriate electrical exploration tool for the target mineralisation style (ie. the mineralisation may be conductive). Mineralisation intersected in the proposed hole (DDH16 redrill) should be electrically tested to determine the most appropriate electrical exploration technique.
- The quartz stockwork hosted Sn (W) mineralisation at Specimen Hill has been well explored. Although some potential exists to improve grades with larger diameter drilling/larger bulk samples, the grade would have to increase dramatically for the deposit to become viable. The Specimen Hill prospect should be considered an opportunistic target only.
- Relevant CRAE and Geopeko reports should be reviewed to determine the nature of the mineralisation associated with the strike parallel Zn anomaly south-west of Specimen Hill

2. Introduction

CRA Exploration Pty Limited (CRAE) was granted the Balfour EL 4/94 on June 3 1994. The lease is contained within the pre-existing Mount Frankland EL 18/92 at Balfour in north-western Tasmania, and covers 25 sq km (Plan Tv 1036).

CRAE's principal commodity of interest in the area is copper. Studies of the copper potential of Australian Proterozoic sequences by CRAE highlighted the Rocky Cape Group and the Smithton Trough of north-western Tasmania. The Proterozoic Rocky Cape Group was considered prospective for stratiform replacement copper deposits analogous to the Kupferschiefer and White Pine because:

- numerous small vein-hosted copper workings along a 30 km NNW trend (the 'Balfour Copper Trend') centred on Balfour indicate that copper bearing fluids have accessed the area
- a basal quartzite unit and several major interpreted faults were considered possible fluid conduits
- potential "chemical traps" occur within a pyrrhotitic siltstone horizon overlying the basal quartzite, and at the contact of carbonaceous and iron-oxide bearing chloritic siltstones (see Veska, 1993)

This report details all exploration activities conducted within EL 4/94 Balfour by CRAE during the second permit year ending 3 May 1996.

3. Review of Previous Work

3.1 Prior to Current Tenement

Significant exploration efforts within the Balfour area prior to current tenement are summarised below:

BHP *SPL 392 and 410* *1964-1970?*

BHP drill tested the Specimen Hill Sn-W prospect (1 km south-west of Balfour) with seven vertical diamond holes. No results are available for the three angle holes planned to test Cu mineralisation at Murrays Reward Prospect (immediately west of Balfour).

Pickands Mather & Co International *EL 12/65* *1965-1971*

Pickands Mather & Co geochemically sampled an extensive area of the Rocky Cape Group and drilled a number of strong magnetic anomalies (mainly discordant magnetite lodes) in the sequence west of Balfour. The magnetite lodes were thin (10 to 15m) with no significant base metals, although minor low grade Pb, Ag, Zn and Cu mineralisation was encountered in places.

Australian Consolidated Industries Ltd (ACI) *EL 16/68* *1968-1974*

ACI tested Cu prospects centred on old Cu workings along a 17 km strike length of the Balfour Cu Trend. In total 37 diamond holes were drilled at eight prospects. However a majority of the holes were drilled to test the Cu mineralised quartz lode at Murrays Reward. A resource of 0.5 mt @ 0.8% Cu was defined.

Esso Australia Ltd *EL 2/73* *1973-1974*

Esso flew a Catalina borne INPUT EM survey on 800m spaced lines over most of the Rocky Cape Group south of the Arthur River. A cursory helicopter based follow up of a wide selection of anomalies was carried out. Most anomalies were dismissed as being due to pyritic and/or graphitic shales and no drilling was undertaken.

CRA Exploration Pty Limited *EL's 1/77, 1/79* *(1977-1983)*
12/80, 36/80,
4/83 and 61/83

CRAE (later joined in joint venture by Geopeko Limited) carried out regional panned concentrate sampling for Sn over much of the Rocky Cape Group. Follow up work involved:

- Eight diamond holes at Specimen Hill and one at Mt Hazelton (10 km SSE of Balfour) to test magnetic targets with accompanying geochemical responses
- Two diamond holes to test strong magnetic anomalies in Proterozoic quartzites and mudstones near the coast west of Balfour (the Little Eel and Possum Creek prospects). The best intersection was 3m @ 2% Pb and 13 g/t Ag
- Surface testing of other magnetic anomalies within the Rocky Cape Group, particularly those to the east of the Interview Granite. No positive results were returned.

In the early 1980's attention was focussed on the base metal potential of the region, particularly Pb-Zn within the Cowrie Siltstone unit east of Balfour. One diamond hole was drilled to test a coincident magnetic and EM response with associated weak base metal soil geochemistry (the Red Prospect near the Arthur River, 25 km NNW of Balfour). Results were not encouraging.

3.2 During Current Tenement

Exploration carried out during the first permit year is summarised below.

3.2.1 General

- A review of previous exploration undertaken by ACI and CRAE in the Balfour area
- Recovery and duplication of the IP profiles from test surveys carried out by ACI
- Appraisal of all pre-existing IP profiles for the Balfour area. The profiles show major conductors with a high percentage frequency effect (PFE) apparently corresponding to lithological boundaries. These lithological contacts are known to be Cu anomalous at The Clump and Specimen Hill
- Compilation of pre-existing CRAE and competitor rock and soil geochemistry
- Detailed 1:10 000 scale mapping of The Clump and Murrays Reward prospects by a contract geologist. The mapping supported the interpretation of previous workers that Cu mineralisation near The Clump and at Murrays Reward is structurally controlled
- Acquisition and analysis (Cu, Pb, Zn, Ag, Co, Ni, Fe, Mn by AAS-aqua regia/perchloric acid digest, As by hydride generation-AAS-aqua regia/perchloric acid digest, Sn and W by XRF and Au by Fire Assay) of 80 rock chip samples from locations along the Balfour Cu trend and Specimen Hill. Metals content, uniformity and regional extent discriminate the Balfour Cu Trend mineralisation from the complex, variable and regionally restricted Sn-W mineralisation around Specimen Hill. The two types of mineralisation were considered to have different evolutions with the Specimen Hill style being fairly directly granite-related
- Orientation soil and wacker geochemical traverses over The Clump Prospect. Results indicated that the Balfour Cu Trend at this location is completely leached at surface, with Cu values in soil and wacker samples all less than 50 ppm, with no coherent pattern.
- Rockchip sampling at Murrays Reward. The samples showed that mineralisation is confined to quartz-sulphide veins within otherwise barren siltstones.

3.2.2 Nelson Prospect

Following initial investigations an area of approximately 16 sq km (6 sq km of which lie within the Balfour EL 4/94), with potential for sediment hosted Cu deposits in a range of lithological and structural settings, was defined (the "Nelson Prospect"). A comprehensive programme of gridding, geological mapping, ground magnetometry, soil and wacker geochemical sampling and IP was carried out over the area. The work pertinent to the Balfour EL 4/94 included:

- The establishment of seven grid lines at 400 to 800m spacing totalling 10.2 line km

- Acquisition of ground magnetic data along the grid lines
- Detailed geological mapping and outcrop sampling (52 samples) along grid lines, the Heemskirk Road and Cassiterite Creek
- Soil and wacker geochemical sampling at 25m sample spacing along five of the grid lines (120 hand auger samples and 142 wacker samples)
- Acquisition of three lines of IP data totalling 5.4 line km (50m dipole spacing)

No significant geochemical values were returned from outcrop, hand auger soil and wacker bedrock samples.

4. Exploration Completed in the 12 Month Period Ending 3 May, 1996

Work undertaken during the second permit year of the Balfour licence predominantly involved the review and re-interpretation of existing geological, geophysical and geochemical data. Much of the work was carried out by a specialist geologist and geophysicists from CRAE's ET & I (Exploration Technology and Information) Group.

4.1 Review of Mineralisation Styles (T M Porter)

A review of mineralisation styles in the Balfour area was carried out by T M Porter, a specialist geologist from ET & I. Porter described five forms of mineralisation as summarised below:

- Mixed massive sulphide (covellite-chalcopyrite-pyrite) and quartz lodes within the Balfour Cu Trend. Textures indicate tectonic remobilisation and are similar to the textures found in ore grade lodes at Dugald River.
- Brecciated quartz veins with fine sulphide (mainly chalcopyrite and pyrite), coarse crystalline dolomite and angular fragments of country rock suggesting post emplacement tectonism. This form of mineralisation is generally intermixed with the first style
- Massive sulphide-quartz lodes containing pyrite-marcasite, pyrrhotite, chalcopyrite, sphalerite, arsenopyrite, cassiterite etc
- Disseminated pyrite with associated weak sphalerite (up to 1% Zn) and chalcopyrite within carbonaceous siltstones and sandstones
- Quartz stockwork with coarse cassiterite and/or wolframite commonly hosted by tourmaline rich sediments

A memorandum summarising Porter's thoughts on the prospectivity of, and potential targets in the Balfour area is included as Appendix 1.

4.2 Murrays Reward Copper Prospect

4.2.1 Drillhole Correlation (T M Porter)

In the late 1960's and early 1970's ACI drilled 37 diamond drillholes to test eight prospects along the Balfour Cu Trend. 19 holes were drilled at the Murrays Reward prospect returning the most significant intersections along the Balfour Cu Trend as summarised below:

- 13.2m at 0.62% Cu from 42.05m in DDH20, 21 (north of Central Mt Balfour)
- 21.7m at 1.40% Cu from 62.5m in DDH16 (between Central Mt Balfour and Murrays Reward)
- 25.5m at 0.77% Cu from 195.8m in DDH36 (between Central Mt Balfour and Murrays Reward - results from CRAE core grinds)
- 21.2m at 0.94% Cu from 84.43m in DDH14 (Murray's Reward - Four intervals > 1.74% Cu in zone of low grade mineralisation)

All assay results with corresponding drillhole and surface geology are presented as a series of drill sections (plans Tv 1086 to Tv 1097 by T M Porter). Hole locations are shown on Plan Tv 1074.

Plans Tv 1092 and Tv 1093 are NE-SW sections crossing the mapped lode north of the main Murrays Reward area. The plans show that:

- a discordant quartz-dolomite-sulphide lode is developed 100 to 150m west of the mapped Balfour Cu Trend. The lode appears to trend and plunge to the NW. Mineralised intersections include 21.7m at 1.40% Cu from 62.5m in DDH16 and 25.5m at 0.77% Cu from 195.8m in DDH36.
- the mapped Balfour Cu trend lode appears to be untested in this area

4.2.2 Gravity Data Review (S Rajagopalan)

In 1992 semi-detailed gravity surveys were carried out at Murrays Reward and The Clump by a Tasmanian Mines Department field crew on behalf of Soloriens Mining Pty Limited. The survey undertaken at Murray's Reward identified a small but significant gravity anomaly east of the old workings. As the anomaly could represent a discrete, high grade, structurally controlled mineralised body as described in section 4.1 the data was reviewed by a geophysicist from CRAE's Exploration Technology and Information Group (ET & I).

The geophysicist concluded that the 1m Gal anomaly looked odd because of its high frequency and could be the result of elevation errors. Nevertheless the anomaly cannot be ignored and a repeat survey is recommended to confirm or disprove the existence of the anomaly.

The gravity anomaly straddles the boundary between EL 4/94 and the mining lease 1M/76 held by Laan and Langsford. Hence a joint venture agreement is being negotiated with the lease holders at present. A repeat gravity survey will be commissioned if a joint venture agreement is secured.

The gravity data review and details of the recommended repeat gravity survey are included as Appendix 2.

4.3 Specimen Hill Tin-Tungsten Prospect (G B Patterson)

4.3.1 Review of Exploration

Available data from the Specimen Hill area was examined to determine if the quartz stockwork hosted Sn-W mineralisation at Specimen Hill had been adequately tested. In summary:

- Costeaming by BHP was at best only partially effective due to the failure of earthmoving equipment to excavate cemented gravels and penetrate fresh bedrock
- The 15 kg channel samples acquired and assayed by CRAE may have been insufficiently large considering the coarse nature of the cassiterite mineralisation
- It is unlikely that the NQ core drilling by CRAE recovered a truly representative sample given the erratic distribution of quartz veins and the generally coarse cassiterite
- A tonnage potential of 10 million tonnes of unknown grade to 100m was calculated. At current metal prices (Sn and W approximately equal to \$US6200-6300 per tonne) a grade of 0.6% Sn or combined Sn-W would be required for a 10 million tonne resource equal to a 1 million oz Au resource (ie. at 3 g/t Au)
- CRAE calculated a quartz vein content of 0.66% at an estimated quartz grade of 0.81% Sn and 1.02% W, based on drill core assays

The following recommendations were made:

- Bulk sampling by costeaming and/or RC drilling, or large diameter drilling should be considered to obtain more representative samples
- If further work is undertaken at Specimen Hill, other drill targets such as Tatlows and Peter's Hill should be considered

A report by G W Patterson entitled "A Review of Exploration at Specimen Hill, Balfour, Tasmania" is included as Appendix 3.

4.4 The Clump Prospect

4.4.1 Drillhole Correlation (T M Porter)

In the late 1960's and early 1970's ACI drilled 37 diamond drillholes to test eight prospects along the Balfour Cu Trend. 7 holes were drilled at 'The Clump' prospect.

All assay results with corresponding drillhole and surface geology are presented as a series of drill sections (plans Tv 1099 to Tv 1102 by T M Porter). Hole locations are shown on Plan Tv 1098.

4.5 Balfour Copper Trend General

4.5.1 Rockchip Sampling

Six rockchip and mullock samples were acquired from various locations in the Balfour EL 4/94. Samples were sent to Analabs in Burnie and analysed for Cu, Pb, Zn, Ag, Fe, Mn by aqua regia/perchloric acid digest, AAS determination, Sn, W by XRF and Au by fire assay.

A sample of mineralised lode quartz from Tatlow's Costean returned 1.1% Cu, 0.4% Zn, 0.3% Sn, 0.2% W, > 50 ppm Ag and 0.03 ppm Au. A sample ledger and geochemical assays are included as Appendix 4.

4.5.2 Re-interpretation of Aeromagnetic Data (S Rajagopalan)

Aeromagnetic data acquired by CRAE in 1993 has been re-interpreted to incorporate the geological mapping carried out by Nic Turner since the aeromagnetic data was acquired. The area of focus was the prospective Murrays Reward - Specimen Hill area.

In the Murrays Reward - Specimen Hill area a number of linear magnetic anomalies can be correlated with Turner's interpreted geology (see plans Tbn 2 and Tv 897). A very weak magnetic trend appears to correlate with the Balfour Cu Trend, particularly north of Murray's Reward.

A report summarising the work completed is included as Appendix 2.

4.5.3 Re-interpretation of IP Data (T Aravanis)

Available IP data for the Murray's Reward - Specimen Hill area were re-interpreted to identify untested anomalies that may indicate blind mineralisation. The data includes frequency domain IP data acquired by ACI (Australian Consolidated Industries) in the late 60's and time domain IP data acquired by CRAE/Peko in the early 80's. Details are summarised below:

ACI IP Data Interpretation:

- ACI frequency domain data from the Murrays Reward - Specimen Hill area was examined and an interpretation plan prepared (Plan Tv 1103)
- A moderate strength IP feature with a 1650' (\approx 500m) strike extent coincides with the Murrays Reward mineralisation. The feature is open to the south beyond line 600'S and appears to be terminated near 900'N
- Weak IP features (2-5% percentage frequency effect - PFE) dominate the ACI data north of the 900'N line
- A moderate strength IP feature interpreted on three traverses west of Murrays Reward appears to coincide with Peter's Flat (ie. west of Peter's Ridge)

CRAE/Peko IP Data Interpretation:

- Pseudosections were prepared for 19 lines of IP/resistivity data and an interpretation plan prepared (Plan Tv 1038)
- Patterns exhibited in pseudosections indicated a combination of poor data quality and complex IP and resistivity sources
- Raw data for lines 9200N, 9300N and 9400N and extensions to lines 8600N, 8800N and 10000N do not appear could not be located. Although the pseudosections are referred to in CRAE report 11207, they were not attached
- An IP feature similar to that observed in the ACI data coincident with Peter's Flat appears to be located to the east of Peter's Ridge indicating a discrepancy in the order of 100-150m

4.5.4 Soil/Bedrock Zn Anomalies

Strike parallel Zn (soil/bedrock) anomalies occur in the Murrays Reward - Specimen Hill area as indicated by data downloaded from CRAE's database (see Plan Tv 1104). Significant locational errors in the database records exist as a computer programme was used to convert erratic grid lines from local co-ordinates to AMG space. Hence original plans must be used to accurately determine the location of Zn anomalous soil/bedrock samples.

Eastern Anomaly:

The eastern linear Zn anomaly has a strike extent of approximately 800m. The anomaly coincides with the Peter's Flat area where disseminated pyrite with associated weak sphalerite (up to 1.4% Zn) and chalcopyrite is recorded in sandstones and quartzites (CRAE Report 11959).

Western Anomaly:

The western linear Zn anomaly lies south-west of Specimen Hill and has a strike extent of approximately 900m. The anomaly appears to be offset by a NE-SW trending fault mapped by N Langsford (CRAE Report 11959).

5. Discussion of Results

Geological Model:

During the past permit year CRAE's exploration focus has changed from stratabound mineralisation in the Proterozoic quartzites, siltstones and shales west of the Balfour Cu Trend (Nelson Prospect) to the Balfour Cu Trend itself.

The Balfour Cu Trend appears to be a multiply reactivated, NNW-SSE trending fault zone and may initially have been a major growth fault active during Proterozoic sedimentation. Ore grade examples of the mineralisation styles described in section 4.1 occur where the NW-SE trending Balfour Transform (a fundamental structure interpreted from regional aeromagnetic data) crosses the Balfour Cu Trend. This area includes the Cu mineralisation at Murrays Reward, the Cu-Sn mineralisation at Tatlow's Costean and the Sn-W mineralisation at Specimen Hill.

A model that may explain the mineralisation styles in the Murrays Reward - Specimen Hill area involves:

- the introduction of mineralising fluids to sediments adjacent to the Balfour Cu Trend, possibly in the waning stages of Adelaidean sedimentation, resulting in low grade, stratabound mineralisation
- structural upgrading of mineralisation through transverse movement of the Balfour Cu Trend fault and/or the Balfour Transform creating en-echelon dilation zones

Hence the target in the Murrays Reward - Specimen Hill area comprises broad (20-30m), steeply plunging shoots with limited lateral extent (a few hundred metres), but extensive depth continuity ($\geq 1000\text{m}$) within more extensive tabular zones of low grade mineralisation.

This target type has limited surface extent and is more difficult to locate and delineate than larger, lower grade, stratabound deposits.

IP Data:

- As stated in section 4.5.3 a CRAE-Peko IP feature west of Peter's Ridge is similar to an ACI IP feature coincident with Peter's Flat. Drillholes cannot be sited to explore untested IP anomalies until this 100-150m discrepancy is resolved.
- In the 1973 ACI annual report, McIntyre reported that the significant mineralisation intersected in DDH16 and DDH36 is defined by possible, probable and definite IP anomalies whereas apparently lower grade cupriferous mineralisation in this and other areas is commonly defined by definite anomalies. He concluded that it is possible that pyrite and graphitic material are the major contributors to IP anomalies in the Balfour area and that cupriferous ore bodies could be overlooked because of the lack of surface expression and because of an apparently insignificant IP response.

6. Rehabilitation

No field exploration other than rockchip and mullock sampling was carried out during the second permit year. Hence no rehabilitation was undertaken.

7. Expenditure

Expenditure during current term: \$119,112

Total Expenditure: \$231,632

8. References

- | | | |
|----------------|------|---|
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| Veska, L.T. | 1993 | GEOLOGY, MINERALISATION AND STRUCTURE OF THE BALFOUR COPPER OCCURRENCE, NW TASMANIA. UNPUBLISHED HONOURS THESIS, UNIVERSITY OF TASMANIA |

9. Location

Burnie	1:250000	SK55-3
Sandy Cape	1:100000	7815
Bluff Point	1:50000	7815N
Balfour	1:50000	7815S
Dempster	1:25000	3243
Balfour	1:25000	3242

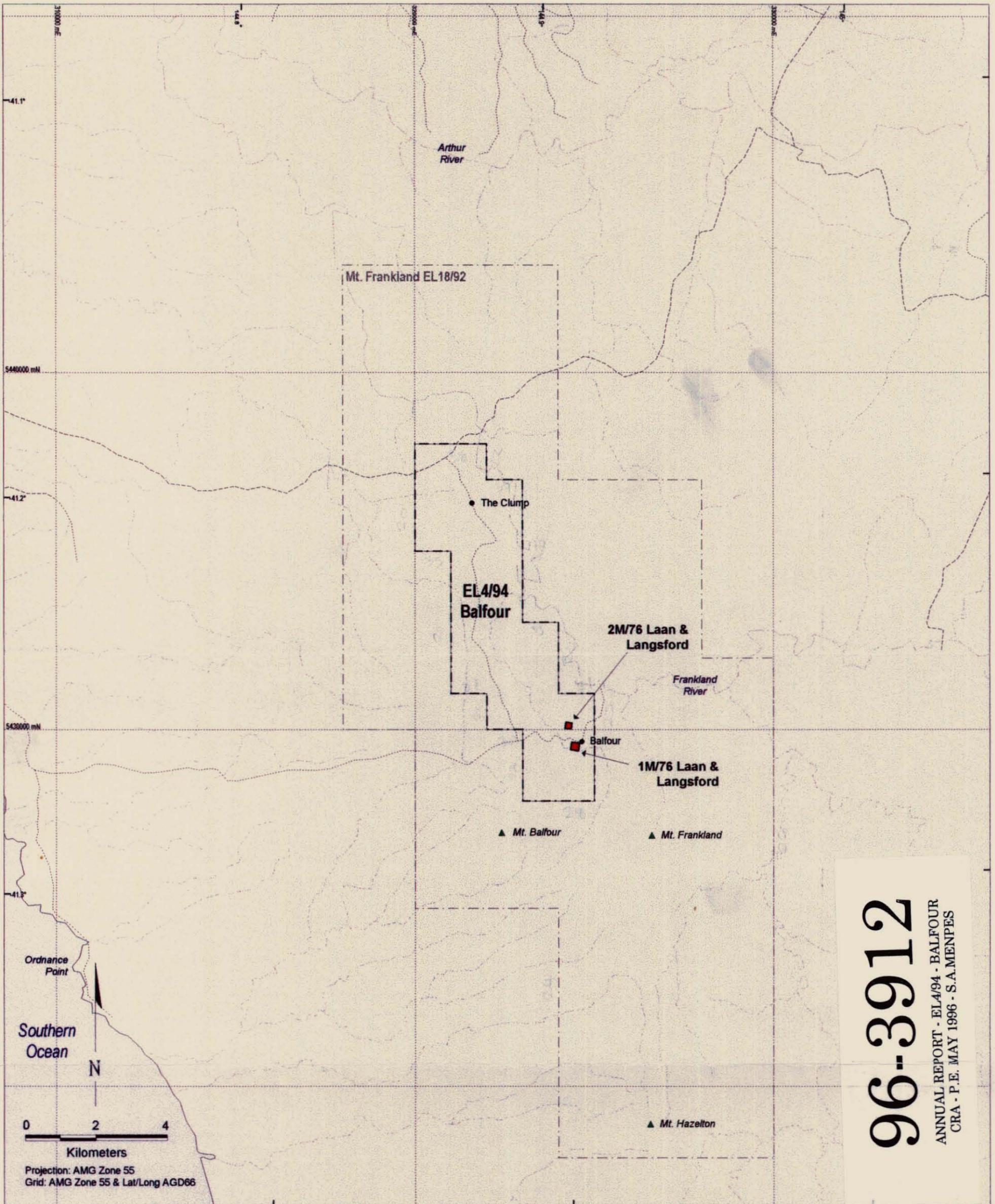
10. Keywords

Tasmania, Proterozoic, Rockchip Sampling, Data Review, Copper, Tin, Zinc.

11. DPO Register

Table 1
DPO Register

DPO Number	Lab Batch Number	Lab	Lab Location	DPO Date	Office	Geologist	Tenement Name	Tenement Number	Sample Type	Number of Samples	250 000 Mapsheet	100 000 Mapsheet
77188	104165.60.11264	Analabs	Burnie	20/9/95	Preston	S Menpes	Balfour	EL 4/94	RKCHIP	6	Burnie SK55-3	Sandy Cape 7815

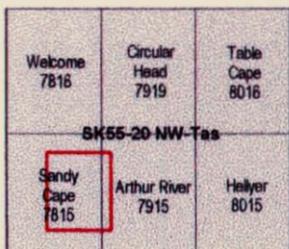


96-3912

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CRA - P. E. MAY 1996 - S.A.MENPES



Location Diagram



Mapsheet Reference

Legend

- Town
- ▲ Mountain
- - - EL Boundary
- Perennial Drainage
- - - Non-Perennial Drainage
- Highway
- - - Secondary Road
- - - Minor Road
- - - Track
- Railway
- Lake
- Swamp
- Urban

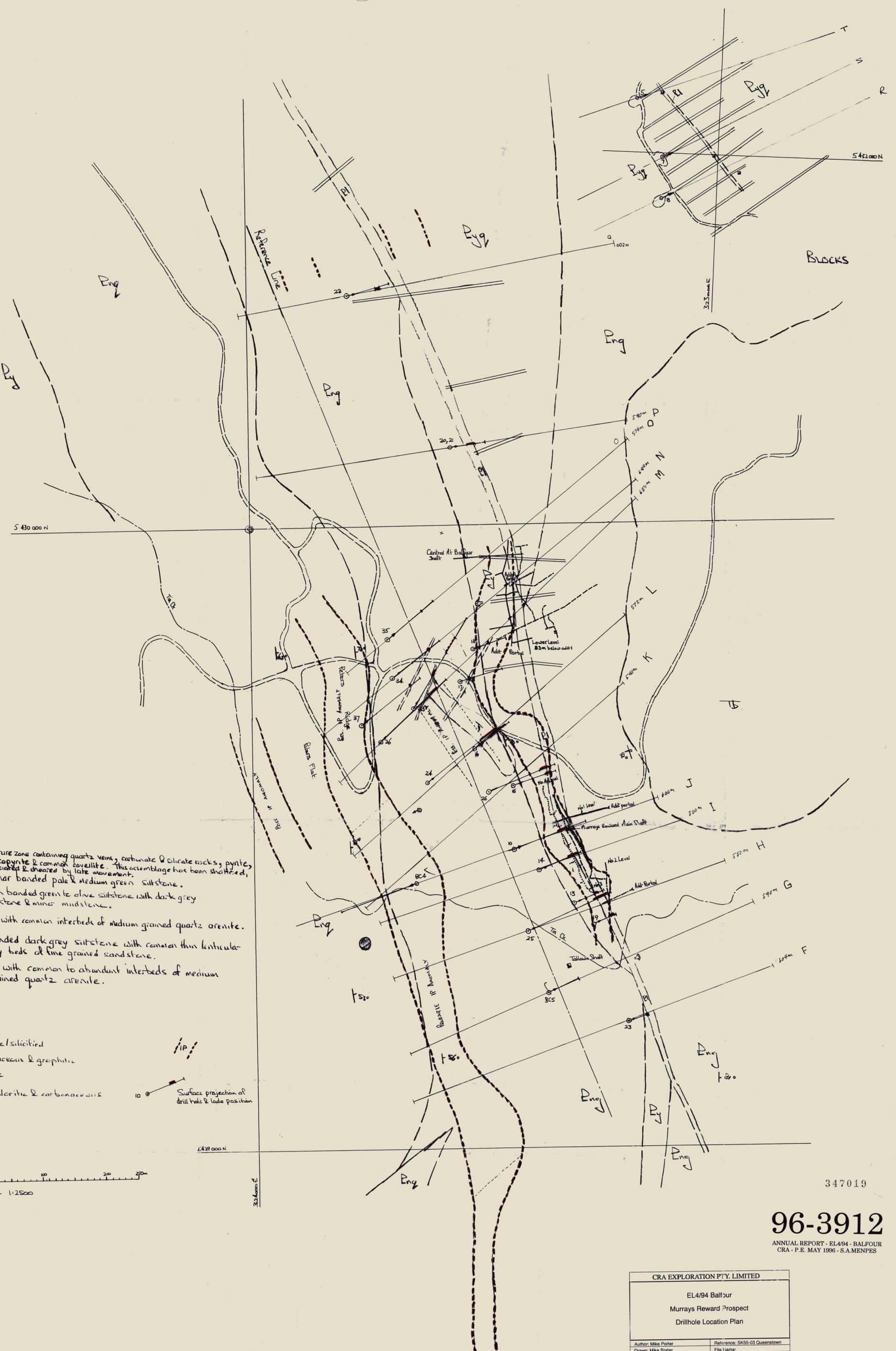
CRA EXPLORATION PTY. LIMITED

347018

EL4/94 Balfour

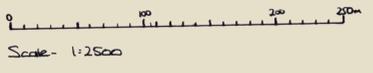
Location Plan

Author: Simon Tear	Reference: NW Tasmania SK55-20
Drawn: Tony Sargeant	File Name: Tv1036.wor
Date: February 1996	Report No: 22155
Scale: 1:100,000	Plan No: Tv1036



- Pg - Fracture zone containing quartz veins, carbonate & silicate rocks, pyrites, chalcopyrite & common covellite. This assemblage has been shattered, brecciated & sheared by late movement.
- Png - Planar banded pale & medium green siltstone.
- Eng - Thin banded green to olive siltstone with dark grey siltstone & minor mudstone.
- Eng - Eng with common interbeds of medium grained quartz arenite.
- By - Banded dark grey siltstone with common thin lenticular grey beds of fine grained sandstone.
- Pgg - By with common to abundant interbeds of medium grained quartz arenite.

- Lode
 - Quartzite/silicified
 - Carbonaceous & graphitic
 - Chloritic
 - Mixed chloritic & carbonaceous
- Surface projection of drill hole & lode position

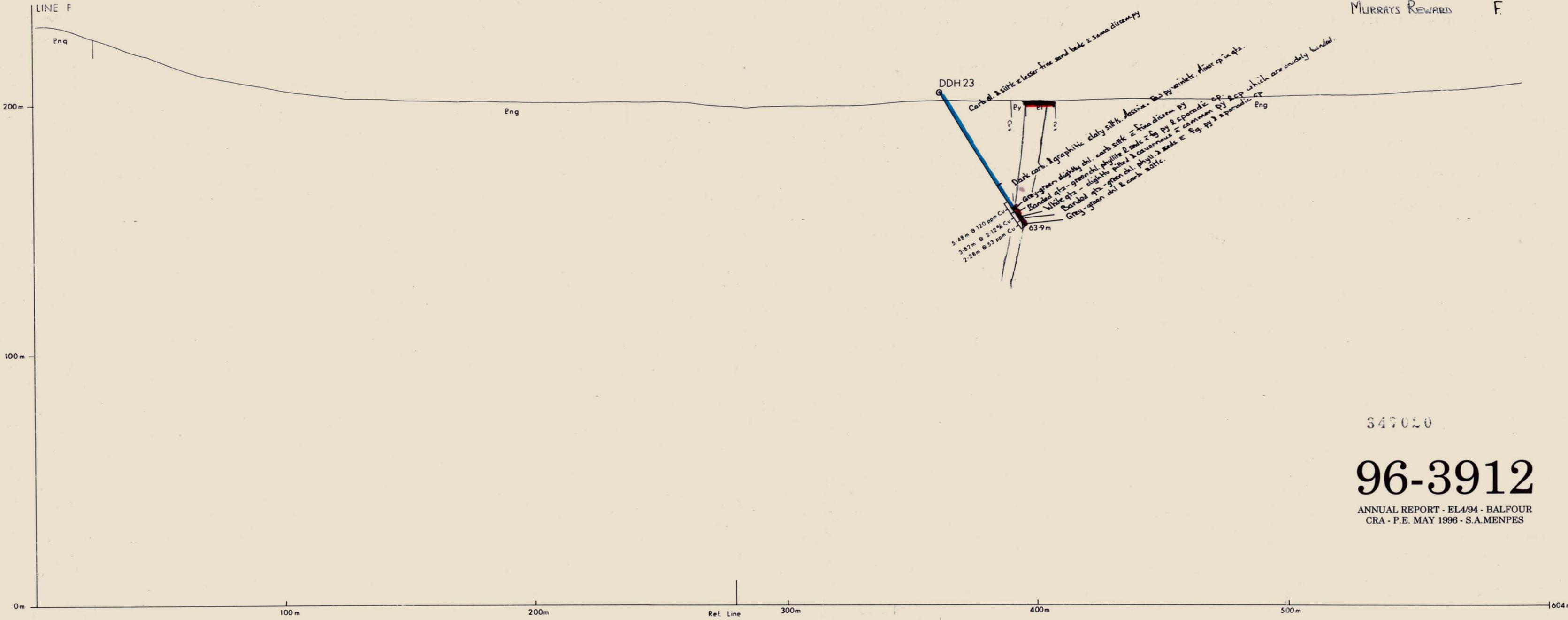


347019

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CRA - P.E. MAY 1996 - S.A.MENPES

CRA EXPLORATION PTY. LIMITED	
EL4/94 Balfour Murrays Reward Prospect Drillhole Location Plan	
Author: Mike Porter	Reference: SK55-03 Queenstown
Drawn: Mike Porter	File Name:
Date: June 1996	Report No: 22155
Scale: 1:2,500	Plan No: Tv1074



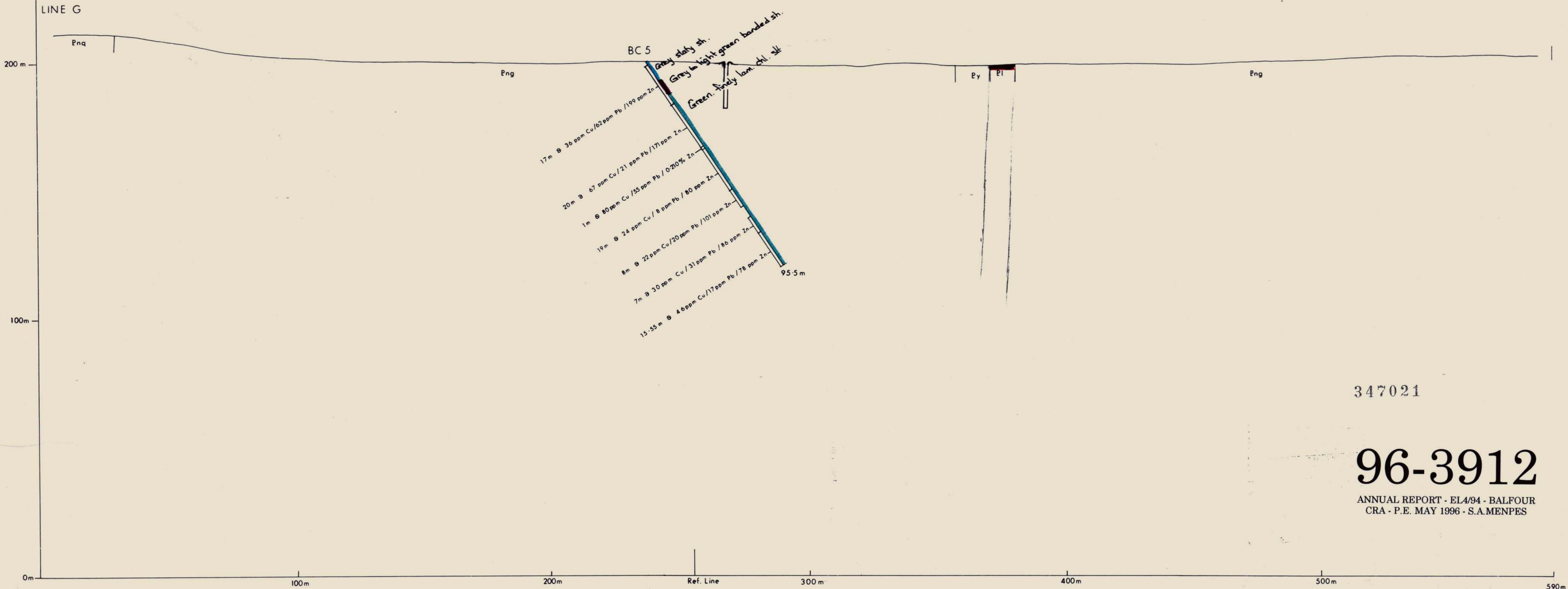
347020

96-3912

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CRA - P.E. MAY 1996 - S.A.MENPES



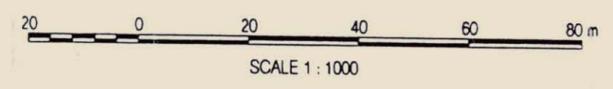
CRA EXPLORATION PTY. LIMITED	
EL4/94 Balfour	
Murrays Reward Prospect	
Drillhole Cross-Section 'F'	
Author: Mike Porter	Reference: SK55-03 Queenstown
Drawn: Mike Porter	File Name:
Date: June 1996	Report No: 22155
Scale: 1:1,000	Plan No: Tv1086



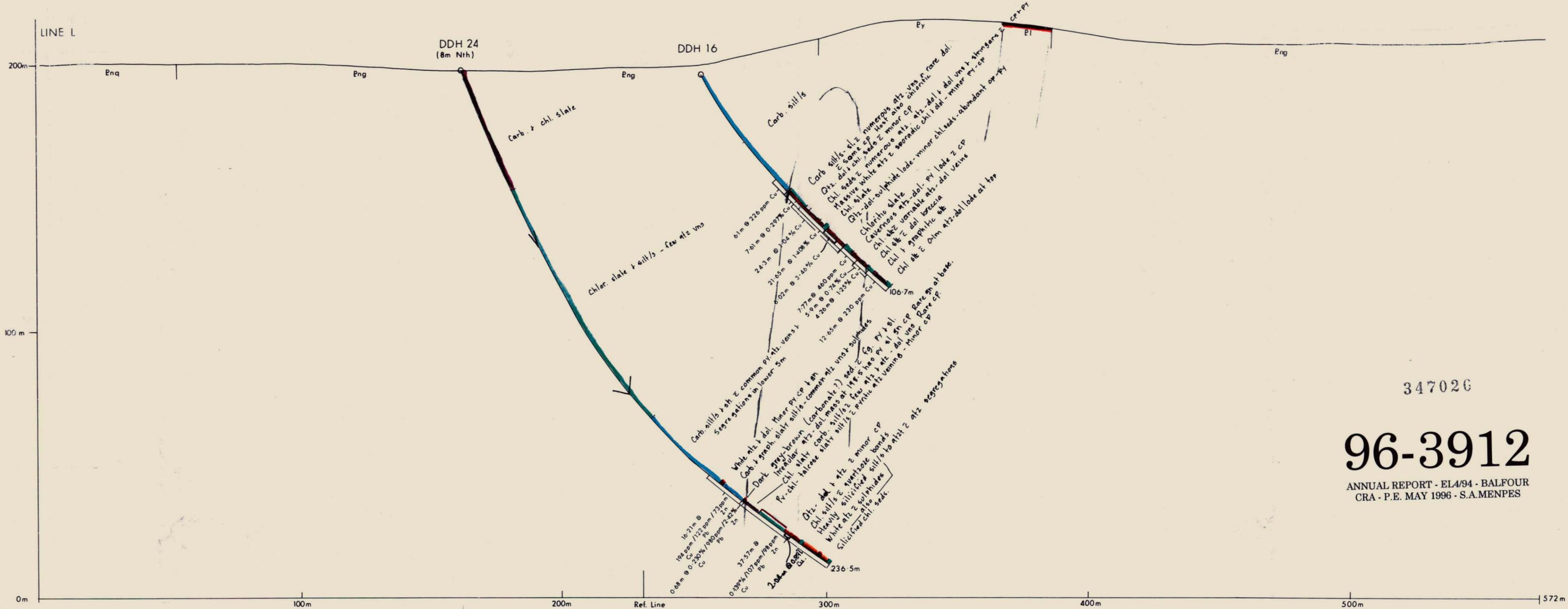
347021

96-3912

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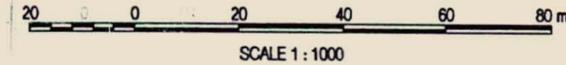
CRA EXPLORATION PTY. LIMITED	
EL4/94 Balfour	
Murrays Reward Prospect	
Drillhole Cross-Section 'G'	
Author: Mike Porter	Reference: SK55-03 Queenstown
Drawn: Mike Porter	File Name:
Date: June 1996	Report No: 22155
Scale: 1:1,000	Plan No: Tv1087



347026

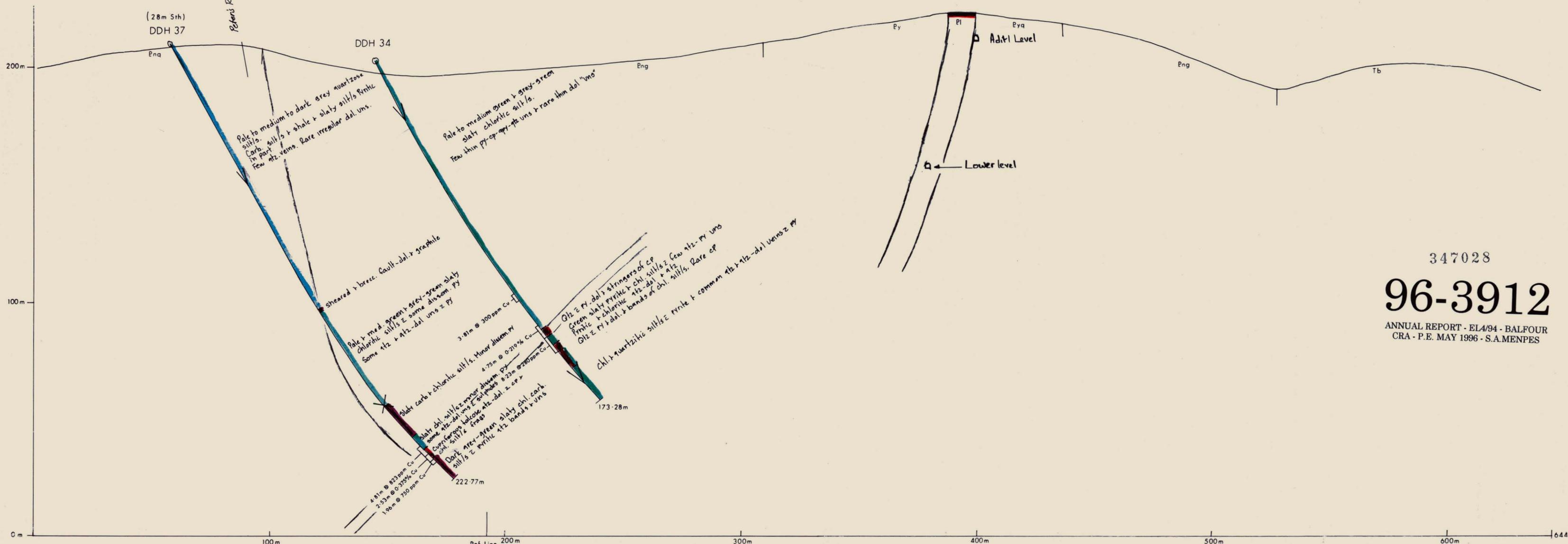
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CRA EXPLORATION PTY. LIMITED	
EL4/94 Balfour	
Murrays Reward Prospect	
Drillhole Cross-Section 'L'	
Author: Mike Porter	Reference: SK55-03 Queenstown
Drawn: Mike Porter	File Name:
Date: June 1996	Report No: 22155
Scale: 1:1,000	Plan No: Tv1092

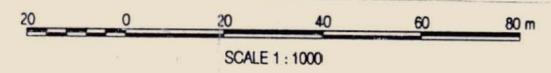
LINE N



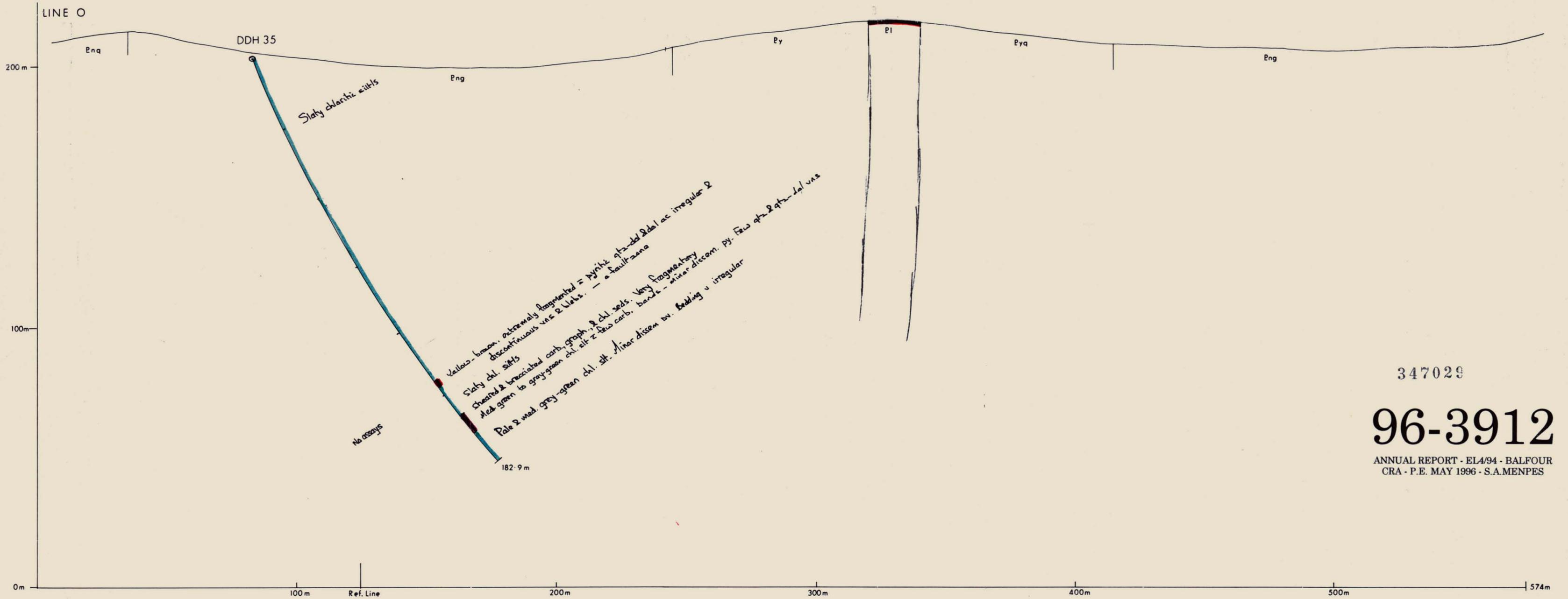
347028

96-3912

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CRA - P.E. MAY 1996 - S.A.MENPES



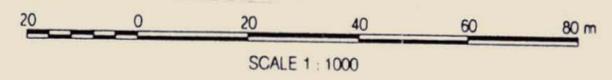
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EL4/94 Balfour	
Murrays Reward Prospect	
Drillhole Cross-Section 'N'	
Author: Mike Porter	Reference: SK55-03 Queenstown
Drawn: Mike Porter	File Name:
Date: June 1996	Report No: 22155
Scale: 1:1,000	Plan No: Tv1094



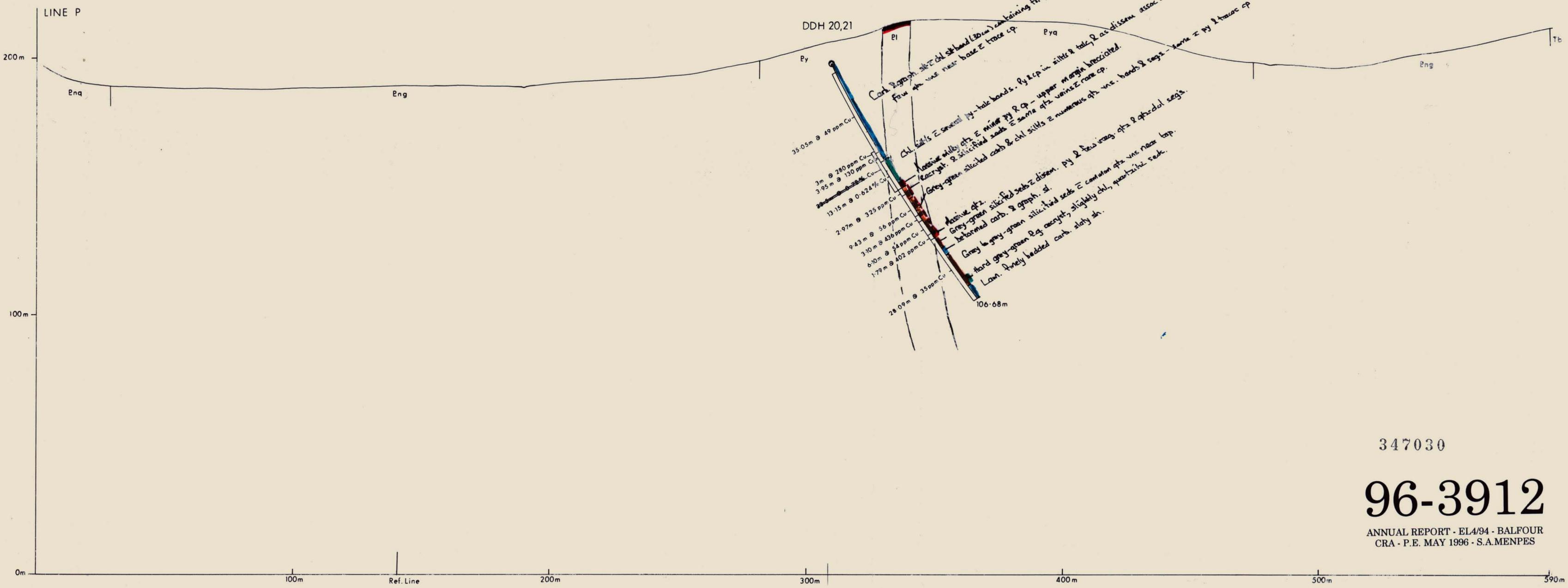
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CRA - P.E. MAY 1996 - S.A.MENPES



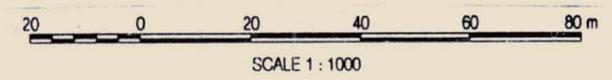
CRA EXPLORATION PTY. LIMITED	
EL4/94 Balfour	
Murrays Reward Prospect	
Drillhole Cross-Section 'O'	
Author: Mike Porter	Reference: SK55-03 Queenstown
Drawn: Mike Porter	File Name:
Date: June 1996	Report No: 22155
Scale: 1:1,000	Plan No: Tv1095



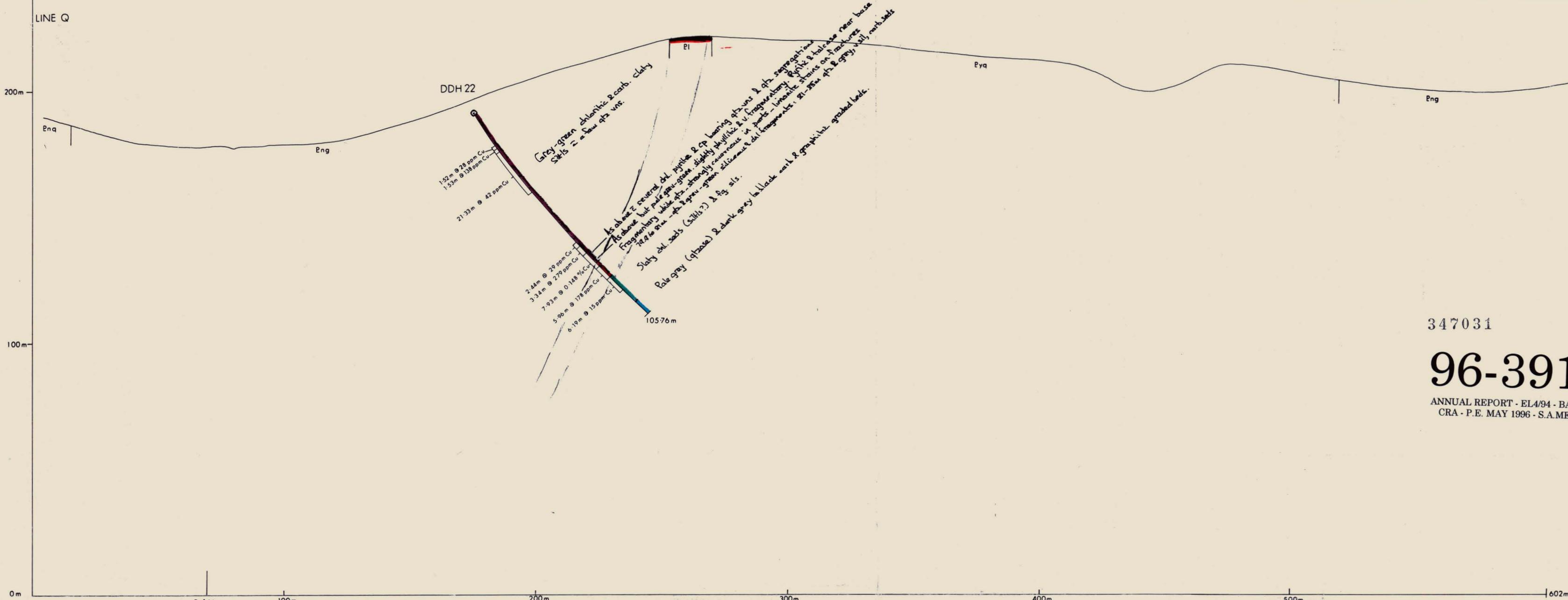
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ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES



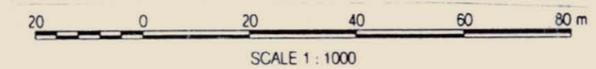
CRA EXPLORATION PTY. LIMITED	
EL4/94 Balfour	
Murrays Reward Prospect	
Drillhole Cross-Section 'P'	
Author: Mike Porter	Reference: SK55-03 Queenstown
Drawn: Mike Porter	File Name:
Date: June 1996	Report No: 22155
Scale: 1:1,000	Plan No: Tv1096



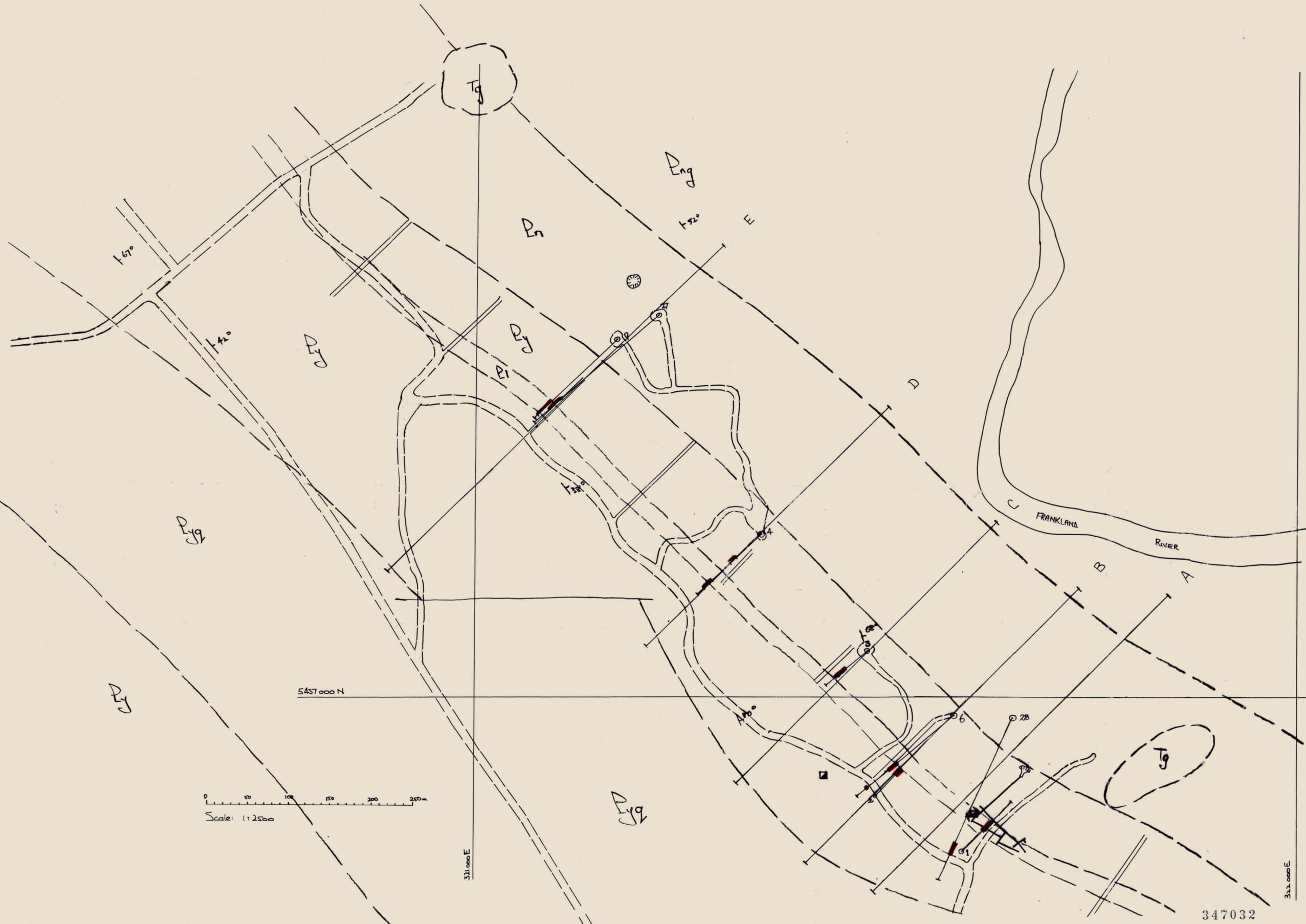
347031

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ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES



CRA EXPLORATION PTY. LIMITED	
EL4/94 Balfour	
Murrays Reward Prospect	
Drillhole Cross-Section 'Q'	
Author: Mike Porter	Reference: SK55-03 Queenstown
Drawn: Mike Porter	File Name:
Date: June 1996	Report No: 22155
Scale: 1:1,000	Plan No: Tv1097



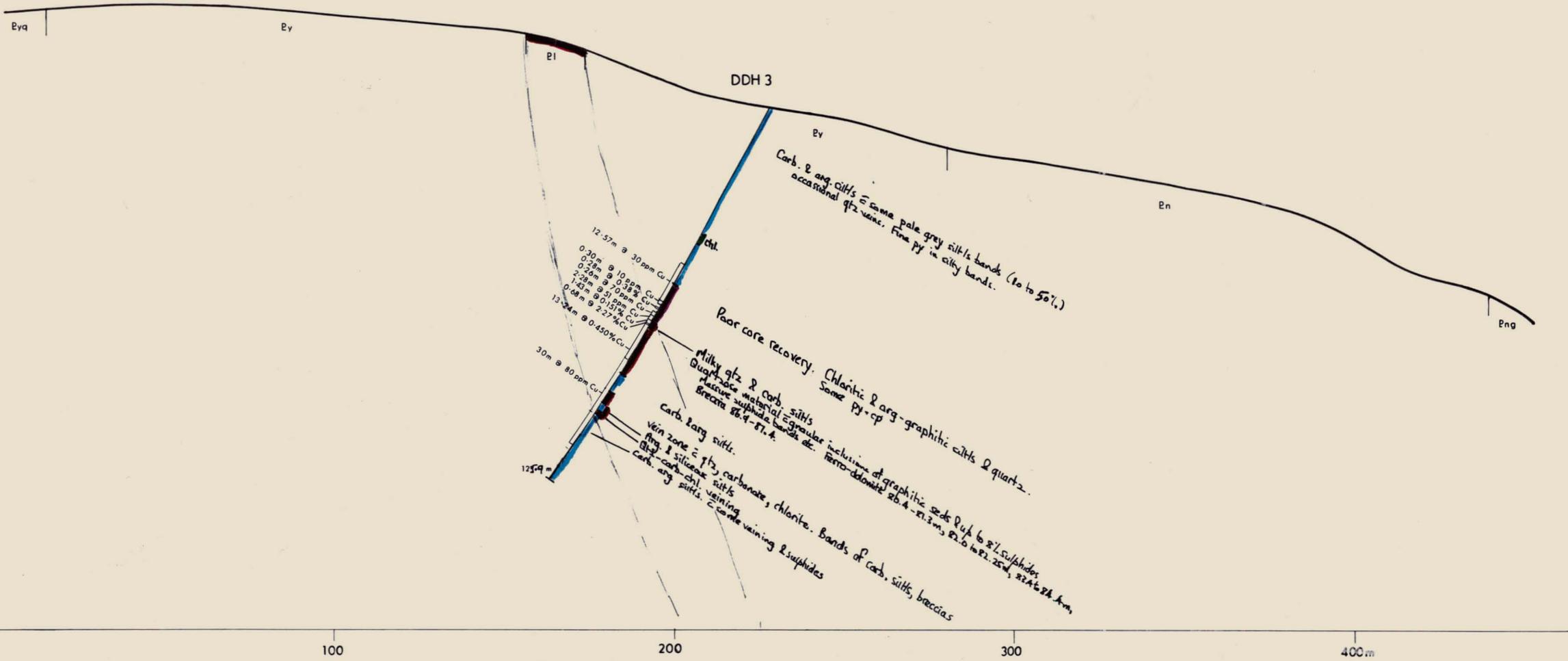
96-3912

ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES

CRA EXPLORATION PTY LIMITED	
EL4/94 Balfour	
The Clump Prospect	
Drillhole Location Plan	
Author: Mike Porter	Reference: SK55-03 Queensland
Drawn: Mike Porter	File Name:
Date: June 1996	Report No: 22155
Scale: 1:2,500	Plan No: Tv1098

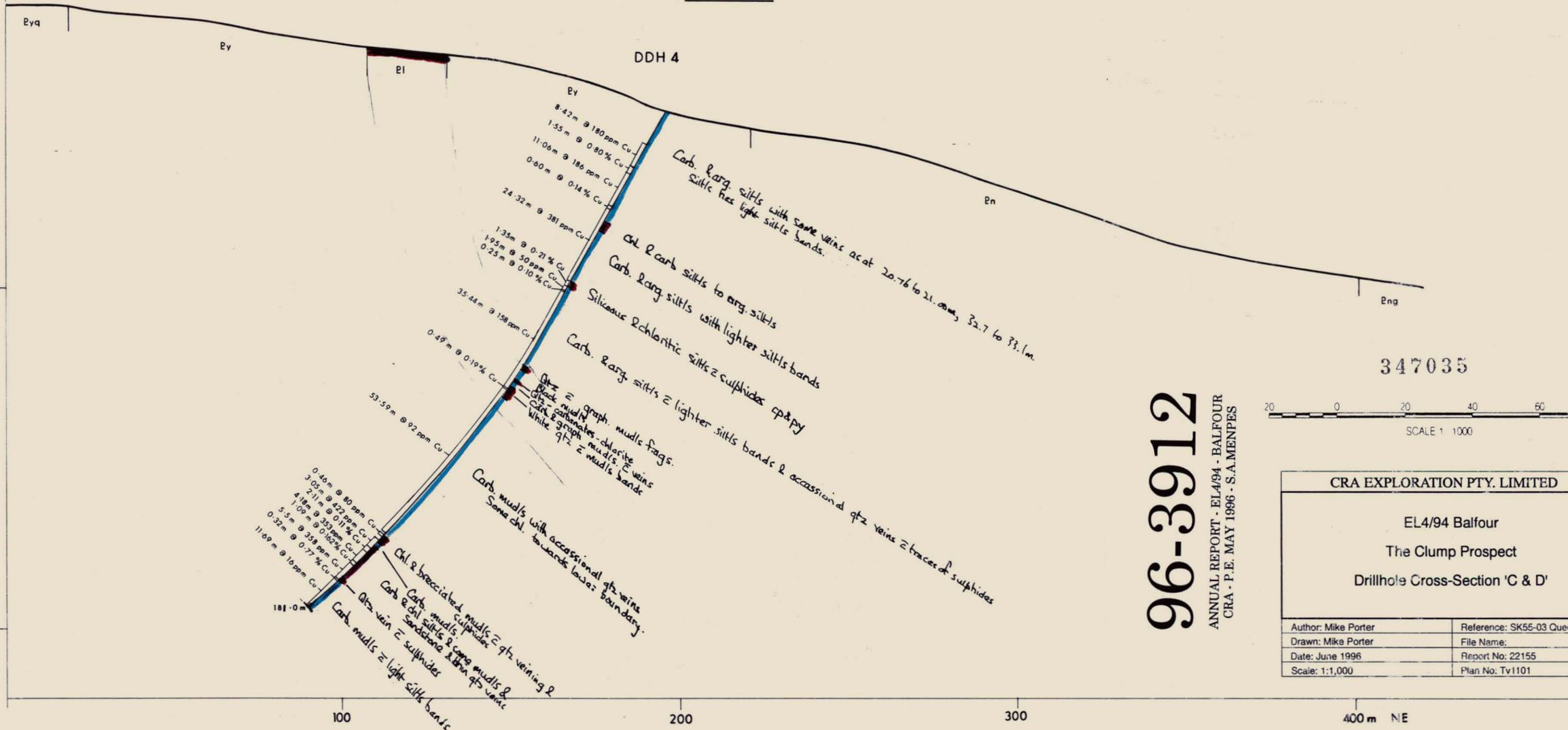
200m

LINE C



200m

LINE D



347035

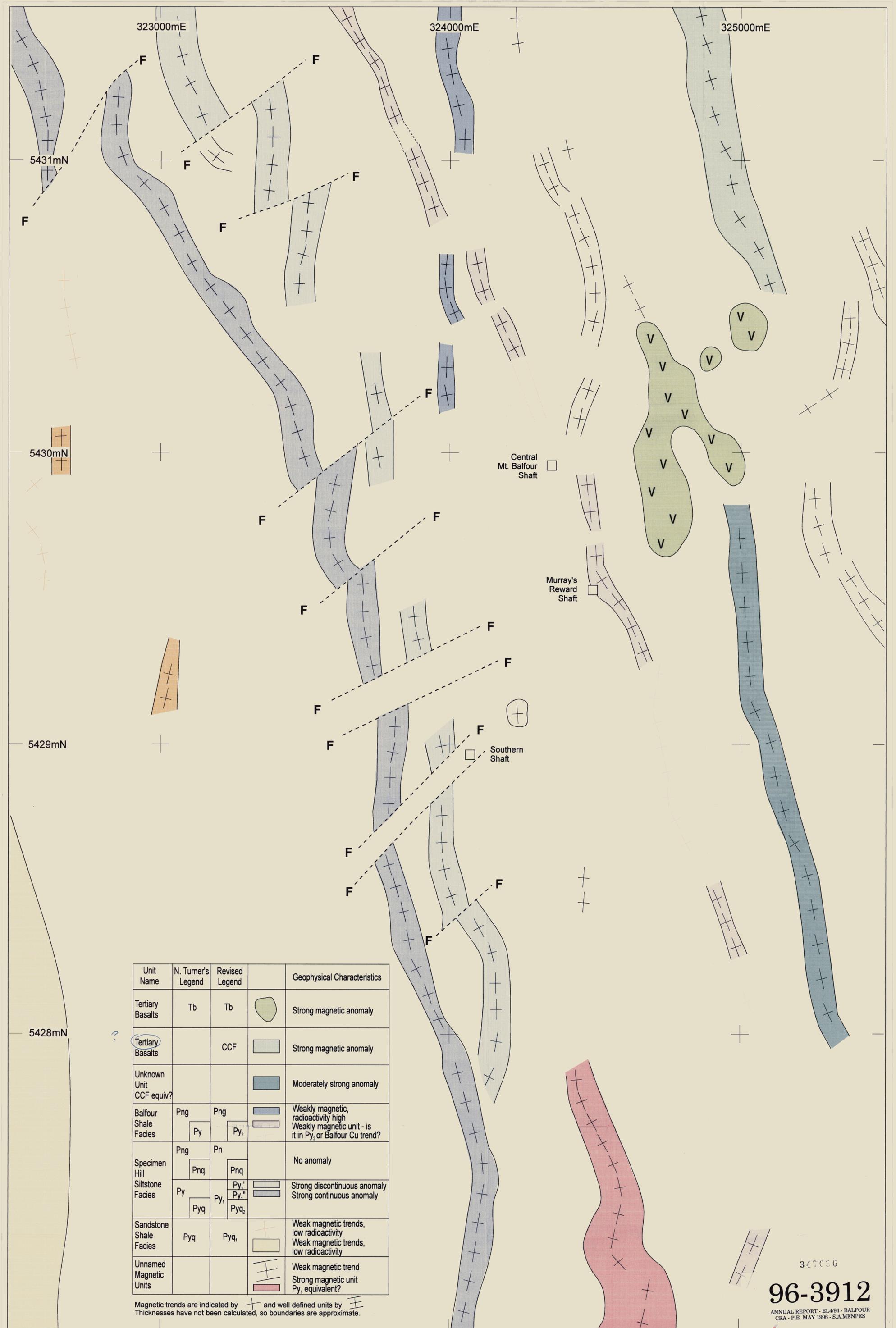


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ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES

CRA EXPLORATION PTY. LIMITED	
EL4/94 Balfour	
The Clump Prospect	
Drillhole Cross-Section 'C & D'	
Author: Mike Porter	Reference: SK55-03 Queenstown
Drawn: Mike Porter	File Name:
Date: June 1996	Report No: 22155
Scale: 1:1,000	Plan No. Tv1101

400 m NE



Unit Name	N. Turner's Legend	Revised Legend	Geophysical Characteristics
Tertiary Basalts	Tb	Tb	Strong magnetic anomaly
Tertiary Basalts		CCF	Strong magnetic anomaly
Unknown Unit CCF equiv?			Moderately strong anomaly
Balfour Shale Facies	Png Py	Png Py ₂	Weakly magnetic, radioactivity high Weakly magnetic unit - is it in Py ₂ or Balfour Cu trend?
Specimen Hill Siltstone Facies	Png Pnq Py Pyq	Pn Pnq Py ₁ Py ₂ Pyq ₁	No anomaly Strong discontinuous anomaly Strong continuous anomaly
Sandstone Shale Facies	Pyq	Pyq ₁	Weak magnetic trends, low radioactivity Weak magnetic trends, low radioactivity
Unnamed Magnetic Units			Weak magnetic trend Strong magnetic unit Py, equivalent?

Magnetic trends are indicated by + and well defined units by Thicknesses have not been calculated, so boundaries are approximate.

327000

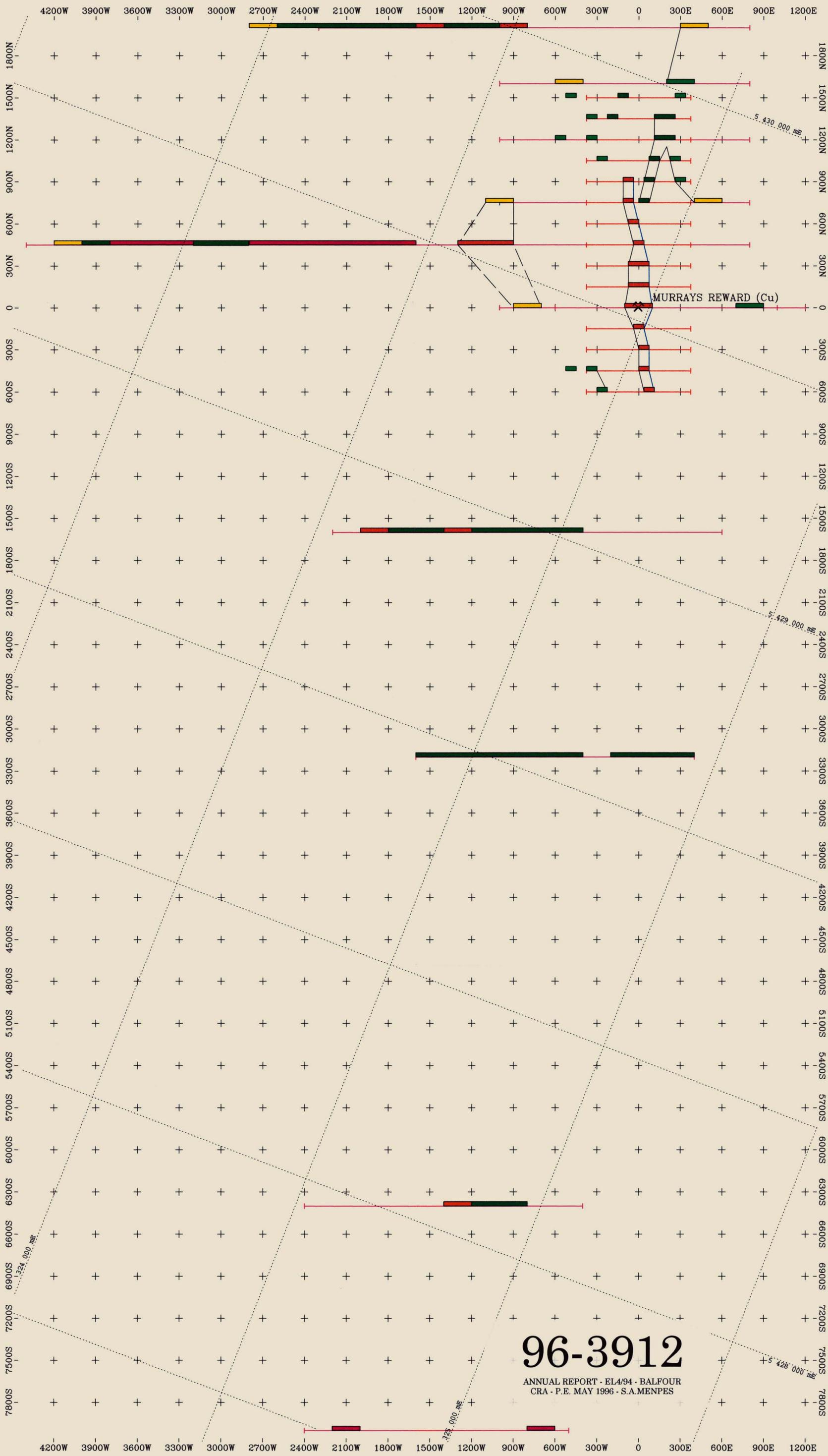
96-3912

ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES

DRAFT

RA EXPLORATION PTY. LIMITED
Murray's Reward
Lithomagnetic Interpretation
S.R. 1996

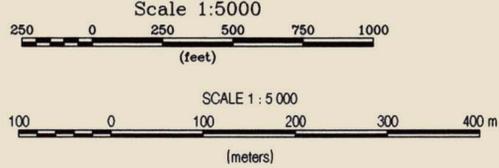
Author: S.Rajagopalan	Ref: SK55-3
Drawn: C. Hunt	Filename: Tbn2
Date: March 1996	Report No: 22155
Scale: 1:5 000	Plan No: Tbn2



96-3912

ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES

- LEGEND**
- a spacing = 75'
 - a spacing = 200'
 - Strong IP feature PFE>10%
 - Moderate IP feature PFE 5-10%
 - Moderate IP feature PFE 5-10% (only partially defined)
 - Weak IP feature PFE 2-5%
 - Weak IP feature PFE 2-5% (only partially defined)



Datum: local datum
Grid: local grid in feet.
AMG Zone 55 grid +/- 100m

CRA EXPLORATION PTY. LIMITED			
MT FRANKLAND EL 18/92 & BALFOUR EL4/94			
ACI IP INTERPRETATION PLAN (1967 & 1970 Freq. domain data)			
BURNIE SK55-03			
GEO:	TA	SCALE: 1:5000	REPORT: 22155
DRAWN: TA/TS	DATE: 1/2/96	PLAN: Tv 1103	

347038



96-3912

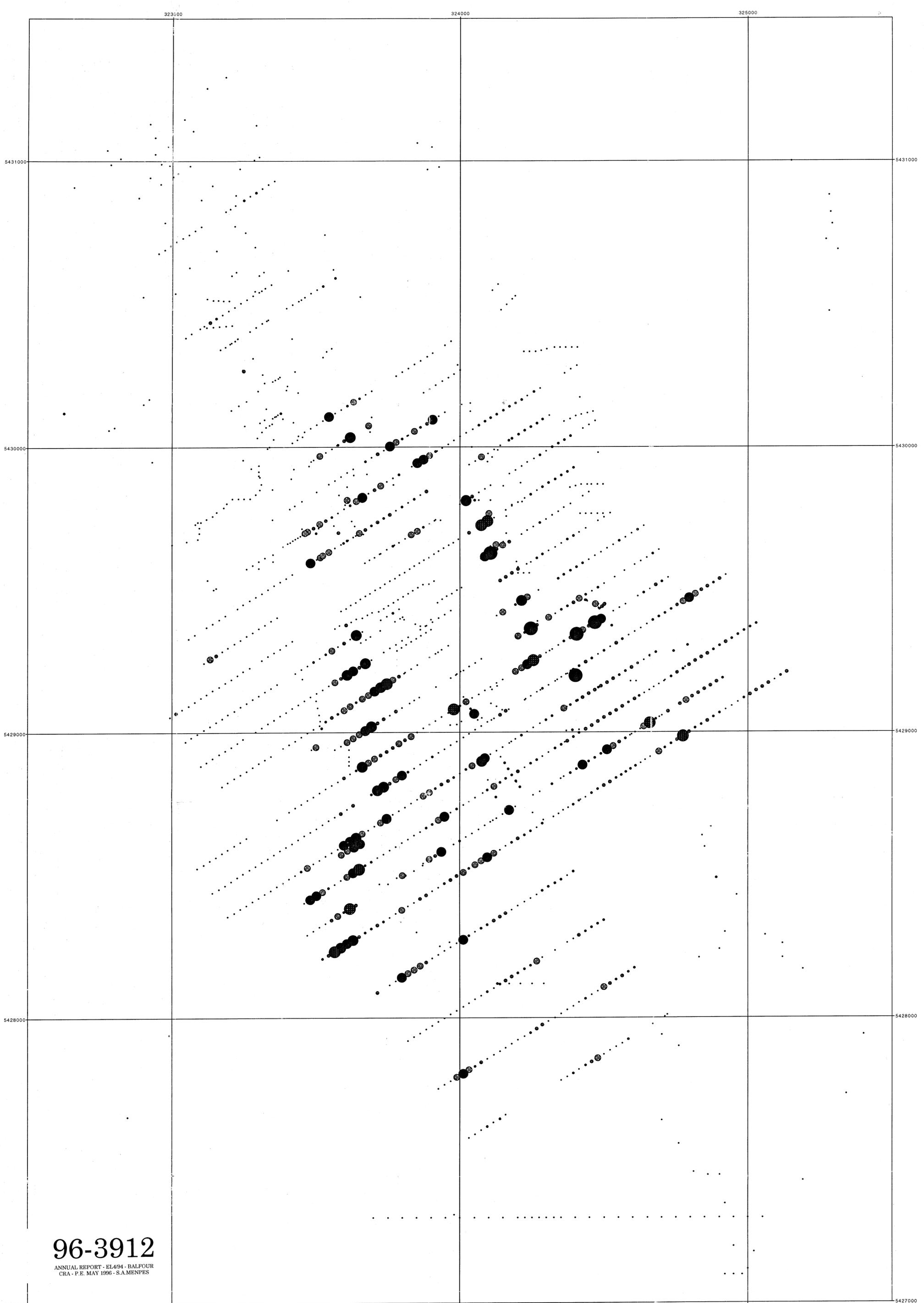
ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES

- TERTIARY RECENT**
- Buttongrass sedgeland obscures bedrock.
 - Basalt and derived soil.
 - Unconformity
- LATE PROTEROZOIC**
- Predominantly planar banded pale- and medium- green siltstone (Eng) ; thin banded green to olive siltstone with dark grey siltstone and minor mudstone (En), with common interbeds of medium grained quartz arenite (Ena). Banded dark grey siltstone with common thin lenticular, graded beds of fine grained sandstone (Py), with common to abundant interbeds of medium grained quartz arenite (Pya).
 - Fracture zone containing quartz veins, carbonate and silicate rocks, pyrite/chalcopyrite/common covellite mineralisation. This assemblage has been shattered, brecciated and sheared by late movement.
 - Tourmalinised and brecciated zone on Specimen Hill (after Heithersay and Langford, 1981).
 - Geological boundary - position approximate.
 - Geological boundary - inferred
 - Strike and dip of bedding - right way up, overturned, facing unknown.
 - Strike and dip of observed fault, vertical.
 - Fault - position approximate.
 - Fault - inferred.

NOTE : 347039
This is a compilation map based on mapping by N.J. Turner Geological Services and by Aust. Consolidated Industries (1973) ; reference has also been made to Heithersay and Langford (1981) and Veska (1993). Map prepared by N.J. Turner Geological Services. See also 83-1934R, Fig. TASH No. 1122.
Base map obtained by photocopying enlargement of portions of Tasmania 1:25 000 Series, numbers 3243 'Dempster' and 3242 'Balfour'.

CRA EXPLORATION PTY. LIMITED
MT FRANKLAND EL 18/92
BALFOUR EL 4/94
Geological Setting
of the
Murrays Reward
Copper Mineralisation

Ref.: Burnie SK55-3 Scale: 1 : 5000
Author: N.J. Turner Report No.: 22155
Feb. 1995 Drawn: S. Brook Plan No.: Tv 897



96-3912

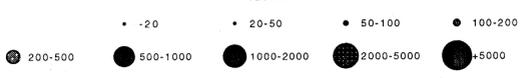
ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES

347040

CRA EXPLORATION PTY. LIMITED

EL4/94 Balfour
Murrays Reward - Specimen Hill Area
Zn (ppm) in Soils & Bedrock

Author: Sandy Menpes	Reference: SK55-03 Queensland
Drawn: Sandy Menpes	File Name:
Date: June 1996	Report No: 22155
Scale: 1:5,000	Plan No: Tv1104





Key

IP Features

- > 50 ms
- 30 - 50 ms
- > 40 ms (surficial?)

Resistivity Features

- < 10 Ω m
- 10 - 50 Ω m

—●— CRAE drillhole

ID	IP	Strength	Depth	COMMENTS	Explained
IP A	10300 10350 8600	weak	0		
IP B	9950 10000 8800	weak to moderate	0	DEB (10240E 9100N) intersected 'occasional' veinlets of quartz-py-ampy	Y
IP C	9475 9525 8900	moderate	N/A	Only partially defined. Associated with conductor and DIORISM feature.	
IP D	9800 9850 8900	moderate	0	Associated with moderately resistive unit.	
IP E	10345 10395 8900	weak	25	May be fault off set continuation of 951PA.	
IP F	10600 10650 9000	weak	N/A	Only partially defined.	
IP G	10350 10400 9100	weak	0	May be related to 951PA.	
IP H	9875 10000 9600	strong	0	Weird shape suggestive of near surface source with limited depth extent. Drill testing by Peko DEC1 (10075E 9630N - TD-116m) & DEC2 (10060E 9550N - TD-210.5 m) intersected 3-7% py & po, with some 10-30 cm intervals of 30% py. Similar amounts of sulphides were encountered by CRAE in DEC3 (10090E 9770N - TD-300m).	Y
IP I	10125 10200 9600	moderate	0	Weird shape suggestive of near surface source with limited depth extent. Similar to 951PA.	Y
IP J	9425 9475 9500	moderate	0	Feature associated with contact with very low IP units to the east.	
IP K	9425 9475 9500	moderate	0	Drill testing by DEE7 (10460E 9500N) intersected two 2 m intervals of py quartzite.	Y
IP L	10700 10750 9500	weak	N/A	Only partially defined.	
IP M	10550 10600 9500	weak	0	Only partially defined.	
IP N	9925 9975 9500	moderate	0	Although shape is better defined, this may be a continuation of 951PA.	
IP O	9900 9950 9600	moderate	0	Adjacent to DIORISM feature and thus suggesting black shale?	
IP P	9800 9850 10100	strong	0	Adjacent to DIORISM feature and thus suggesting black shale?	
IP Q	9850 9900 10300	moderate	N/A	Only partially defined.	
IP R	10150 10200 10100	moderate	10-25	Only partially defined with poor shape. Adjacent to DIORISM feature and thus suggesting black shale?	
IP S	9675 9725 10300	moderate	0	Only partially defined.	
IP T	9700 9750 10700	strong	0	Only partially defined.	
IP U	9700 9750 10800	strong	0	Adjacent to low resistivity zone.	
IP V	9625 9675 10600	moderate	0	Adjacent to low resistivity zone.	
IP W	9850 9900 10700	to strong	0	Associated with mag feature. Drill testing by DEB9 (10050E 10900N - TD-15.5m) intersected 1-2% py through out. BC7 also tested IP feature.	Y
IP X	10000 10050 10900	moderate	25	Associated with mag feature. Drill testing by DEB9 (10050E 10900N - TD-15.5m) intersected 1-2% py through out. BC7 also tested IP feature.	Y
IP Y	9800 9850 10800	moderate	0	May be related to 951PA.	
IP Z	9850 9900 10900	moderate	0	May be related to 951PA.	
IP AA	9650 9700 11000	weak	N/A	Only partially defined.	
IP AB	9900 9950 11000	moderate	25	Only partially defined.	
DESA	9775 9825 9900	low	0	May be extension of 958ESA. Drill testing by DEB10 (9770E 10100N - TD-3m) intersected graphitic black shale.	
DESA	9775 9825 10000	low	0	May be extension of 958ESA.	
DESA	9725 9775 10100	low	25	May be extension of 958ESA.	
DESA	9850 9900 10300	low	0	May be extension of 958ESA.	
DESC	9725 9775 10600	very low	0	Adjacent to 958ESC.	
DESD	9775 9825 10700	low	0	Adjacent to 958ESC.	
DESD	9800 9850 10700	low	0	Adjacent to 958ESC.	
DESD	9850 9900 10800	low	0	Adjacent to 958ESC.	
DESD	9800 9850 11000	very low	0	Adjacent to 958ESC.	

347041

96-3912

ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES

CRA EXPLORATION PTY. LIMITED

EL4/94 Balfour
CRAE/Peko IP Interpretation

Author: Theo Aravanis	Ref: SK95-03
Drawn: Tony Sargeant	File Name: Tv1038.dgn
Date: April 1996	Report No: 22155
Scale: 1:5,000	Plan No: Tv1038



Datum: local grid datum
Grid: AMG Zone 55 Grid projected with error +/- 100m

Appendix 1

Memorandum TM Porter to S Menpes entitled "Balfour"



Exploration Technology & Information

4 Research Avenue, Bundoora,
Private Bag 3, Bundoora MDC, Victoria 3083, Australia

Telephone: 9230 1278
Facsimile: 9230 1188
Prefix - STD : 03, IDD : 61 3

2nd February 1996

Memorandum to : S MENPES

**Copy to : T McConachy
R J Rebek
S Rajagopalan
T Aravanis**

From : T M Porter

BALFOUR

The following summarises the geological thoughts on the prospectivity of, and potential targets that might be found in the Balfour area, subsequent to the meeting of the Balfour Team in Tasmania on the 29th and 30th of January.

The prospectivity of the area is based primarily on:

- The presence of a large mineralised system represented by a 20 km 'trend' of copper workings and other mineralisation, including tin and zinc, which is found within a kilometre of that trend.
- The presence of past drill intersections within that trend that include 30 m of more than 1% Cu, embracing 6 m @ 3.5% Cu, ie. the large system is capable of generating ore grades.

Past exploration includes geological mapping, prospect descriptions, geochemical sampling and drilling.

The oldest drilling at Balfour was undertaken by BHP in the mid 1960's, some of which was over the Specimen Hill Sn-W mineralisation to the west of the Copper Trend, while others were directed at the lodes of the Copper Trend. No information on these holes is readily available, specifically those into the Copper Trend.

Drilling by ACI in the late 1960's and early 1970's comprised 37 diamond drill holes located mainly in the Murray's Reward area, but also including 7 at the Clump on the northern end of the Copper Trend. In addition there have been three holes on the Blocks, one at Development and another at the Gully prospect, all of which are within the intervening 7 km between the Clump and Murray's Reward. A further two holes were drilled at each of the Waratah and Pierpont Morgan prospects which are 2.5 and 5 km respectively to the SSE of Murray's Reward.

In the late 1970's to early 1980's CRAE and Geopeko in joint venture drilled a series of holes, directed mainly at the Sn-W potential of the area, largely ignoring the Copper Trend. These included 5 shallow, small diameter jacro holes, and 7 diamond drill holes.

The most significant intersections have been from the ACI drilling at Murray's Reward. The majority of the holes elsewhere along the Copper Trend have cut low grade Cu mineralisation associated with silica-dolomite and pyrite lode zones that are generally 10 to 15 m thick, varying down to 5 m locally, and up to more than 30 m in places. Intervals carrying grades of 0.1 to 75% Cu are common within these lodes over widths of 1 to 8 m, and sometimes up to 20 m, with a few intersections of more than 20 m of >1% Cu. All of these assay results, with the drill hole and surface geology, are illustrated on the series of drill sections

and plans that have been presented to you following the meeting, along with the drill logs. It must be emphasised that, due to the nature of the source data, locations may errors of up to 25 m.

Mineralisation is present in a number of forms, namely:

- Mixed massive sulphide (covellite-chalcopyrite-pyrite) and quartz lodes within the Copper Trend. The Copper Trend appears to represent a multiply-reactivated NNW-SSE trending fault zone. This style of mineralisation has produced most of the 'economic grades' encountered to date. The texture of the sulphides and quartz strongly indicates that the lodes have been tectonically remobilised, producing a fine grained mass of covellite-chalcopyrite and/or pyrite enclosing rounded and fish-hook quartz and sediment clasts, and coarse (up to 3 cm diameter) rounded pyrite crystals. This mineralisation has some similarities with the texture of the ore grade lodes at Dugald River.
- Brecciated quartz veins with intermixed coarse dolomite and masses of sulphide, mainly chalcopyrite and/or pyrite, but also including angular fragments and slivers of the country sediments. This style of mineralisation is generally intermixed with the first style and may also carry higher grades.
- Massive sulphide-quartz lodes containing pyrite-marcasite, pyrrhotite, chalcopyrite, sphalerite, arsenopyrite, cassiterite, etc., as in Tatlow's open cut to the west of the main Copper Trend.
- Disseminated pyrite, with associated weak sphalerite and chalcopyrite within carbonaceous siltstones and sandstones. Samples from this style have assayed up to 1% Zn, and are assumed to be the source of the Zn soil and rock anomalies in the area. Disseminated pyrite is widespread at Balfour, although based on the geochemical anomalism, only certain bands appear to have associated sphalerite. It is possible that the extreme surface leaching noted in the area may have removed much of the surface Cu, while associated Zn has been retained at surface by the humic material associated with the peat cover. If this is the case, the Zn anomalism may indicated zones of sulphide mineralisation, not necessarily those which are primarily Zn. Sphalerite is a common associate of Cu mineralisation in sediment hosted deposits, commonly only being of the order of 1 to 1.5% accompanying 2% Cu (eg, Dzhezkazgan in Kazakhstan).
- Quartz veining containing cassiterite and/or wolframite, mainly on Specimen Hill, but also on Peters Ridge between Specimen Hill and the Copper Trend. This mineralisation is found to the west of the main Cu occurrences and is commonly hosted by tourmaline rich (dravite) interbedded quartzites and siltstones.

The most significant examples of all of these styles are located in the Murray's Reward - Specimen Hill section of the Copper Trend, corresponding to the interval where the NW-SE trending Balfour Transform zone crosses the Balfour Copper Trend. The best Sn mineralisation by far is on Specimen Hill in the same interval, possibly representing the centre of the mineralised system.

In the old Murray's Reward workings the Copper Trend lode was 15 to 20 m wide, dipping at 80°W near the surface, but changing to 70°E at a depth of greater than 75 m. It was composed of a thinner eastern zone, averaging around 50 cm, and a thicker 5 to 12 m wide western band. These two zones contained higher grade sulphide and quartz-sulphide zones, separated by lower grade brecciated quartz and quartz-sediment mineralisation, still quoted as containing 'several percent' Cu.

The host sequence is grossly composed of a lower predominantly quartzite unit, occupying the area to the west of and below the zone of mineralisation. This is overlain by finely laminated and strongly contorted, slumped, cross bedded, interbedded fine sandstone and siltstone, with numerous sand-dykes and variable carbonaceous material. This section of the sequence hosts the majority of the Sn-W mineralisation. It is overlain in turn by chloritic shale to phyllite with increasing amounts of carbonaceous siltstone interbeds and laminae, grading fairly rapidly into an upper bed of well laminated, strongly carbonaceous, pyritic siltstone. These are bounded across the Copper Trend fault at Murray's Reward by more chloritic shale/phyllite.

The carbonaceous siltstones within the last three units contain disseminated sulphides, with the Zn rich bands apparently being near the upper contact of the interbedded shales and sandstones, near the contact with the overlying chloritic shales. The better grades with the Copper Trend lodes appear to be localised where the trend cuts the carbonaceous siltstones. Chloritic alteration appears to accompany the massive sulphide-quartz and silica-dolomite-sulphide lodes, although this is difficult to distinguish from the chloritic shales.

Moderate to strong IP anomalies correspond closely with sections of the main Copper Trend mineralisation, specifically the intervals of known strong sulphides. Other untested, comparable IP anomalies are found to the west, some corresponding with zones of known Zn anomalism, and observed outcrops of sandstone carrying pyrite, sphalerite and chalcopyrite.

On the basis of the detail summarised above the best target would appear to comprise broad, steeply plunging shoots with limited lateral extent, but extensive depth continuity. Such shoots would be localised within the more extensive, tabular zones of low grade material as represented by the main Copper Trend intersections. It is envisaged that such shoots might be distributed within the main Copper Trend fault zone, and developed as an en echelon cluster in the broad interval where the Balfour Transform crosses the Copper Trend zone, including the mineralised interval to the west. Along the Copper Trend the higher grade Cu intersections cut by the ACI drilling might represent the edge of one such shoots, while the IP anomalies to the west and the Cu-Zn-Sn lodes at Tatlow's could represent others.

Such shoots could be of the order of a few hundred metres in length, a few tens of metres in width and a kilometre or so in vertical extent. They would be expected to be elongated along the direction of movement on the Copper Trend Fault and temporally and spatially follow lower grade mineralisation that had been emplaced within the Copper Trend structure and/or within the adjacent sediments. Such early stage lower grade mineralisation may have been either stratabound, or transgressive. The elongation of ore shoots might also correspond to the intersection of the original mineralisation and the host structure or other remobilising agent.

Due to the limited surface dimensions of such a target it is suggested that any testing would start with the known higher grade mineralisation (specifically ACI drill hole 16) and the best geophysical-geochemical-geological indications, and work out gradually using down hole geophysics and drilling.

These notes are general and somewhat cursory. I am available for further comment or to expand upon them at any time.

Regards

A handwritten signature in black ink, appearing to read "Mike", written over a horizontal line.

Mike Porter

Appendix 2

Interpretation of Gravity and Aeromagnetic Data in the Balfour Area

**Exploration Technology & Information Group**

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MEMORANDUM

To: Sandy Menpes
From: Shanti Rajagopalan
Subject: Summary of work in the Mt. Frankland area, Tasmania
Date: 8th July, 1996

I Aims of the interpretation

1. To create an "inferred geology" map through interpreting the aeromagnetic map and combining the interpretation with Nick Turner's mapping.
2. To examine the aeroradiometric data for any unusual features which may have been linked to mineralisation.
3. To review available gravity data.

II Results and discussion

The results of the work carried out between December 1995 and March 1996, integrated with comments on the meeting held on the 29th and 30th of January, are summarised below.

1. Inferred geology map:

The Mt. Frankland area had been covered by a high-resolution aeromagnetic and aeroradiometric survey (100 m line spacing). Much of the terrain is covered by button-grass and trees grow mainly where there are Tertiary basalts exposed or the ground has been disturbed because of past mining activity. Very little mapping has been carried out. Nick Turner was employed to map the region around Murray's Reward and The Clump --- where most mining for copper was carried out. The Balfour copper trend passes through both these areas.

I interpreted the aeromagnetic data at a scale of 1:10,000 for these two regions and at a scale of 1:25,000 for the whole region. Only in the Murray's Reward area was it possible to match mapped geology with magnetic signatures. This is mainly because outcrop in the rest of the region is poor but also because from the magnetic map it would appear that there is more "structure" than previously thought. The map for Murray's Reward has been redrafted at 1:5,000 scale. Any follow-up in this region should have a rock susceptibility component added. [There was initially some doubt as to the accuracy of the location of the magnetic data, but after discussions with Kevron, the contractors who flew the survey, these doubts

have been laid to rest. The altimeter data have not been corrected for parallax and the digital terrain model therefore has positioning errors. However, the magnetic data have been corrected for parallax.]

In the Murray's Reward area, it was possible to follow a number of linear magnetic anomalies which were correlated with the "stratigraphy" as identified by Nick Turner. In the vicinity of the Balfour copper trend there is a weakly and variably magnetic linear anomaly. Further north, where the known copper grade is lower, the copper trend can be associated with a distinct magnetic anomaly. Several faults can be easily mapped.

Nick Turner's map of The Clump showed the copper trend but is otherwise sparse. The magnetic anomalies in The Clump were therefore a lot harder to classify. The copper trend now cuts through a magnetic unit. Major faults and "packages" of what appear to belong to the same magnetic unit were delineated.

The major structures and lithomagnetic packages in the Mt. Frankland area have been mapped on a scale of 1:25,000 and 1:50,000. Preliminary maps have been drawn but have not been drafted.

2. Radiometric anomalies:

In general, the sandier units are less radioactive than the more silty units. In both the Murray's Reward and The Clump areas, there appears to be a tenuous correlation with a radioactivity high (total count, potassium and thorium --- uranium data were too noisy and not used) and the copper trend. The highs are over areas draining away from the copper trend and at least one of the highs has not been accounted for by a known feature, such as a gravel pit. Note that sericitic alteration has been reported from the copper trend at Murray's Reward.

3. Review of gravity data:

The Murray's Reward region is covered by gravity data on a roughly 1 km spaced grid and in the vicinity of Murray's reward itself, by detailed gravity. Time constraints prevented the interpretation of the regional gravity data but a gravity high over Specimen Hill was noted. Maps of the detailed gravity survey over Murray's reward are attached: a gravity anomaly of 1mGal is evident about 100 m east of Murray's Reward. Is the anomaly significant? Or can it be explained away by incorrect surveying procedures, incorrect terrain correction, or varying overburden thickness?

The successful use of gravity in a mineral exploration survey is critically dependent on the corrections applied, most of which will be greater in amplitude than the hoped-for anomaly. The detailed gravity data were collected by Bob Richardson's team at the Tasmanian Mines Department. The data were apparently collected to fulfil some tenement spending obligations (Bob Richardson, pers. comm.). As a result, the positioning of stations was arbitrary. A digital barometer was used to establish elevations but no base station barometer was used. The crew apparently returned to trig. points regularly to constrain the computed elevations. In a good barometer survey, with excellent base station control, the optimist would hope for a 1/3 metre accuracy and the realist a one metre accuracy. In the Murray Reward's area, the elevations could be out by at least a metre which is equivalent to an error

of 0.2 mGals in the Bouguer gravity. David Leaman applied the corrections to the data and this included terrain corrections.

I have examined the digital data carefully and these are my conclusions:

- 1) Given the observed gravity and elevations, I have repeated the corrections and arrived at the same reduced gravity values as David Leaman.
- 2) The anomaly exists on line 4, is perhaps visible on line 3, and is absent on line 5. On line 4, the anomaly is to be found near the eastern end of the line. Quite clearly, line 4 is too short and data between lines 3 and 4, and 4 and 5 are required.
- 3) The 1 mGal anomaly looks odd because of its high frequency: with errors in elevation of 1 metre, the anomaly could come down to 0.5 mGals or less and we might even be left with a regional gradient. Nevertheless, the anomaly cannot be ignored.
- 4) Therefore if we intend to return to Balfour to follow-up the discussion in Smithton, then I would strongly recommend that a gravity survey be commissioned.

Final recommendations

A gravity survey carried out along the lines described below would adequately test the anomaly. The survey would consist of three long lines (1km long), and four short lines (500 metres long), all oriented EW and centred on 324575E, and also one base line. All coordinates given as AMG coordinates.

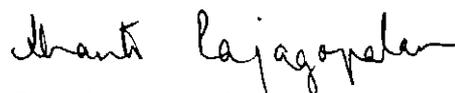
The coordinates of the lines are given below.

25 metre sample interval throughout for lines 1, 3, 5, 7 and the base line.

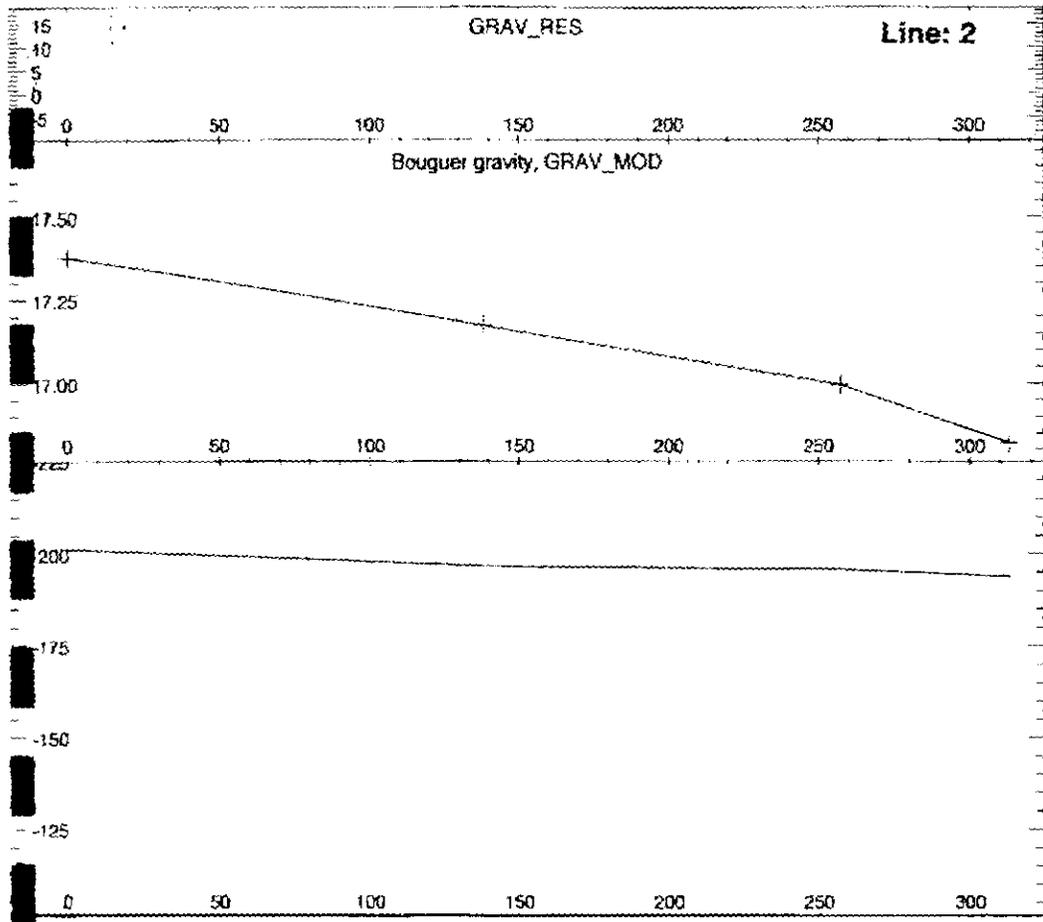
25 metre sample interval for lines 2, 4 and 6 for the 500 metres on either side of the base line, and then changing to 50 metres beyond that.

Line 1:	(324325E, 5429350N) to (324825E, 5429350N)
Line 2:	(324075E, 5429400N) to (325075E, 5429400N)
Line 3:	(324325E, 5429450N) to (324825E, 5429450N)
Line 4:	(324075E, 5429500N) to (325075E, 5429500N)
Line 5:	(324325E, 5429550N) to (324825E, 5429550N)
Line 6:	(324075E, 5429600N) to (325075E, 5429600N)
Line 7:	(324325E, 5429650N) to (324825E, 5429650N)
Base line:	(324575E, 5429300N) to (324575E, 5429700N).

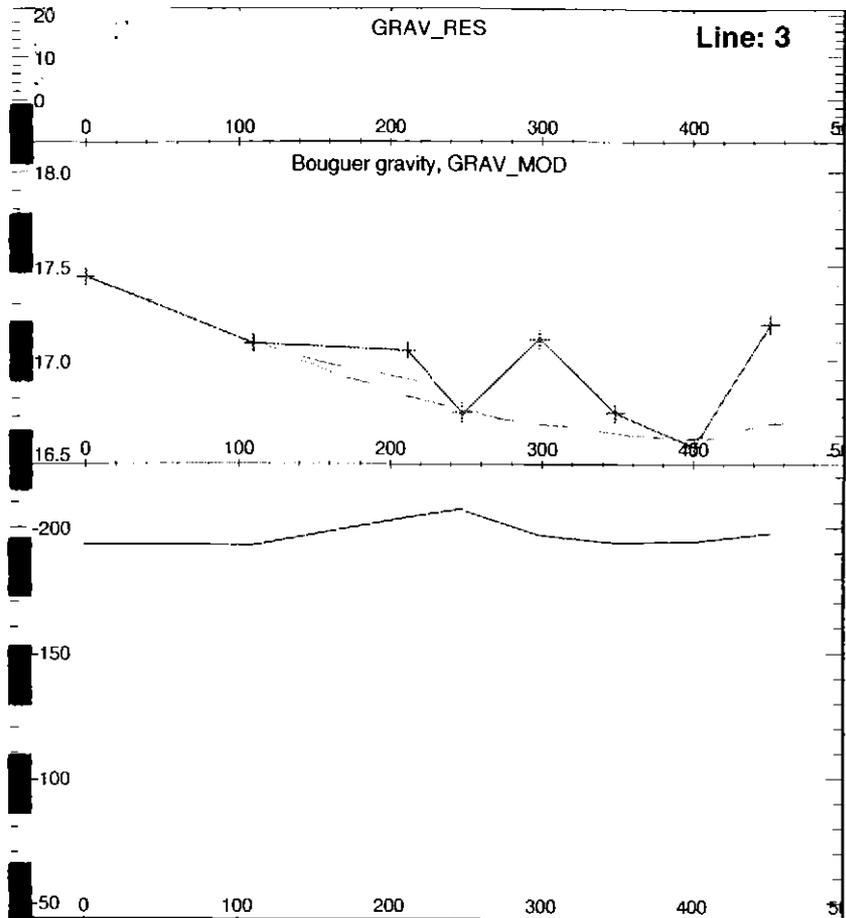
Since station positioning, especially altitude determination is critical, I'd recommend that we use the Haines Brothers because they have a reputation as good surveyors and can also take gravity measurements. I have handed the gravity data to Bob Harvey so he can maintain CRAE's gravity data base.

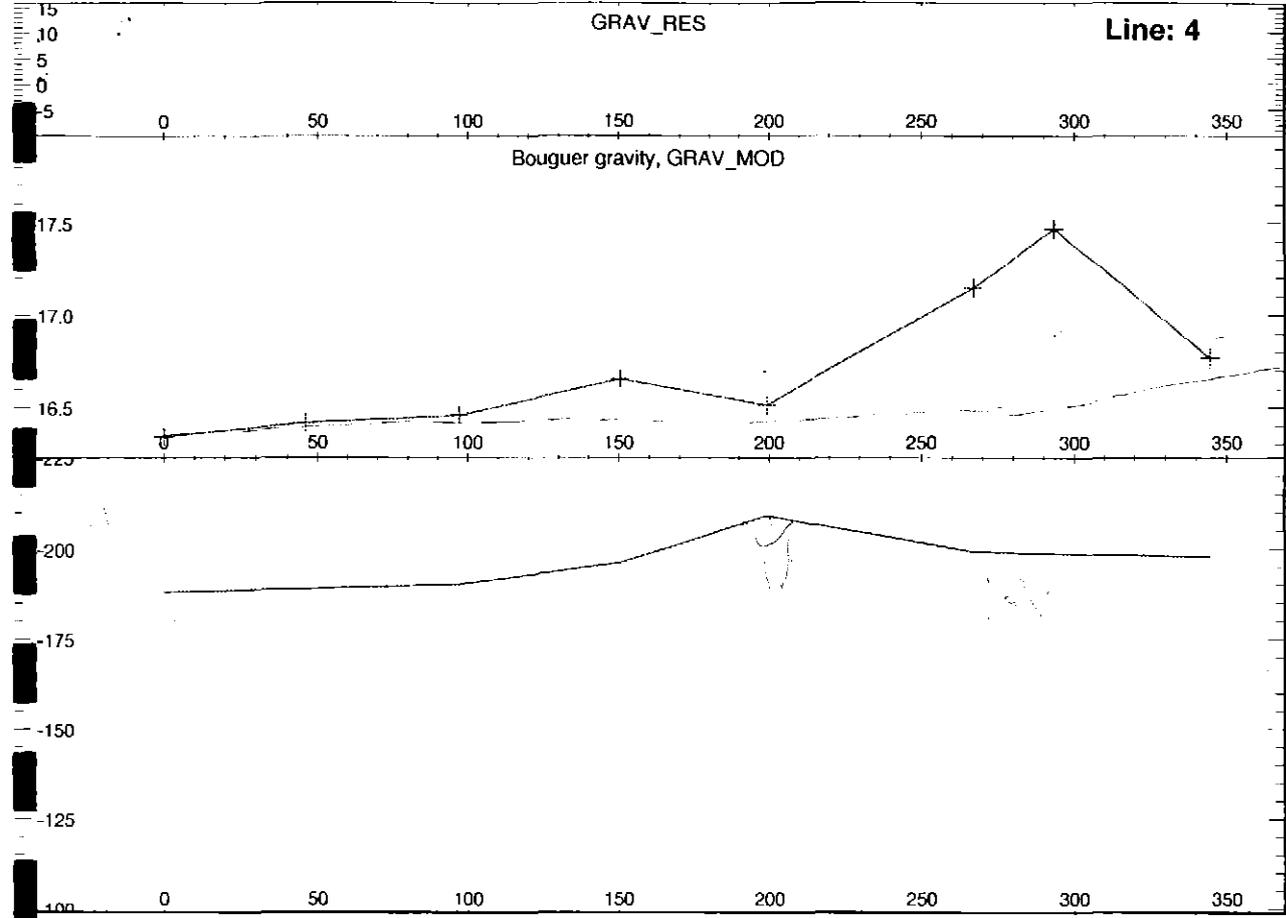


Shanti Rajagopalan

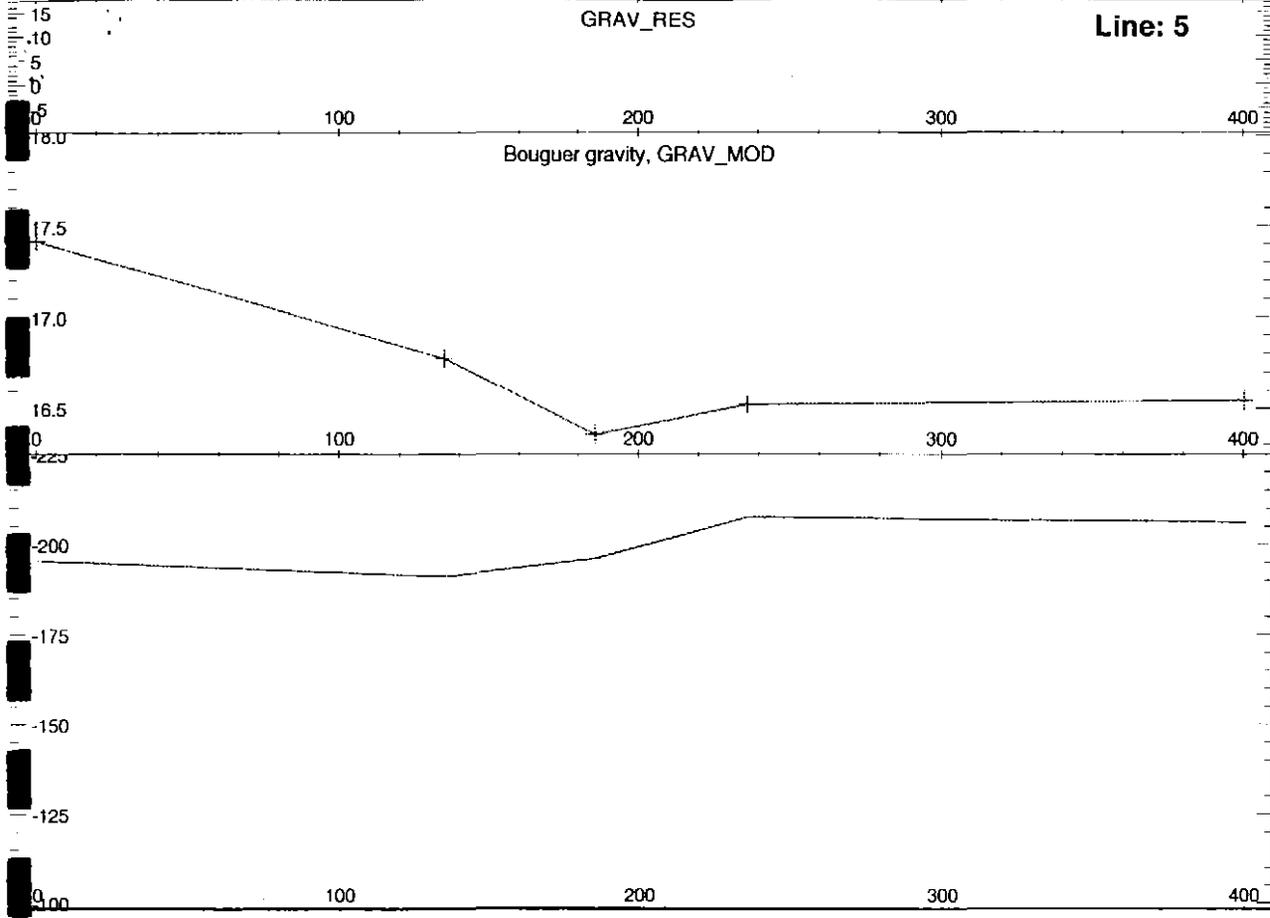


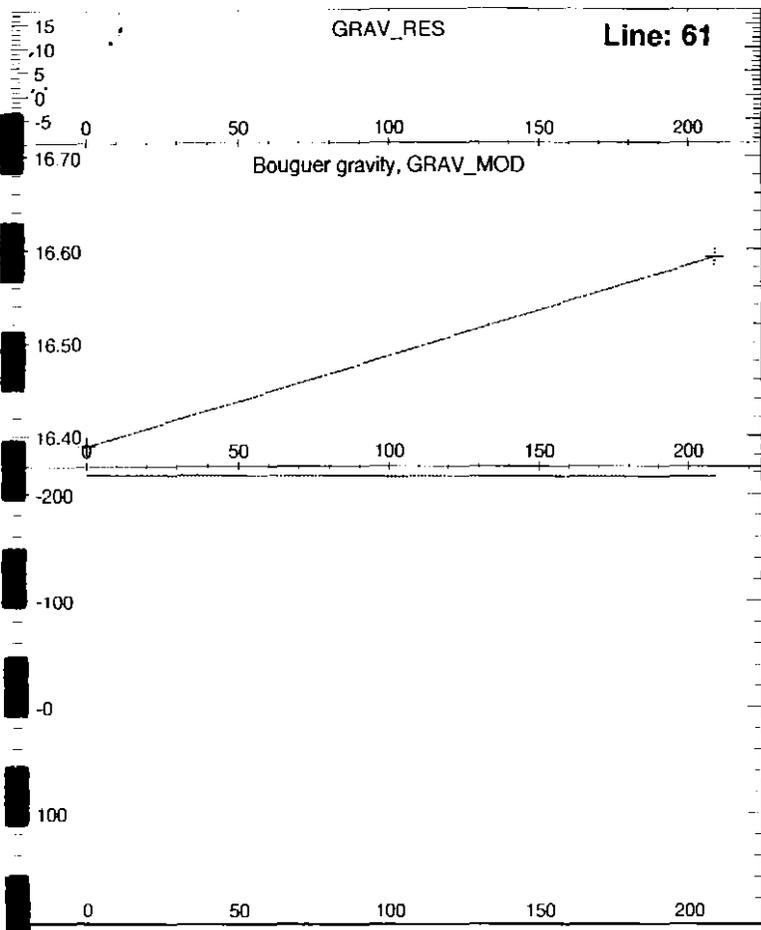
347050



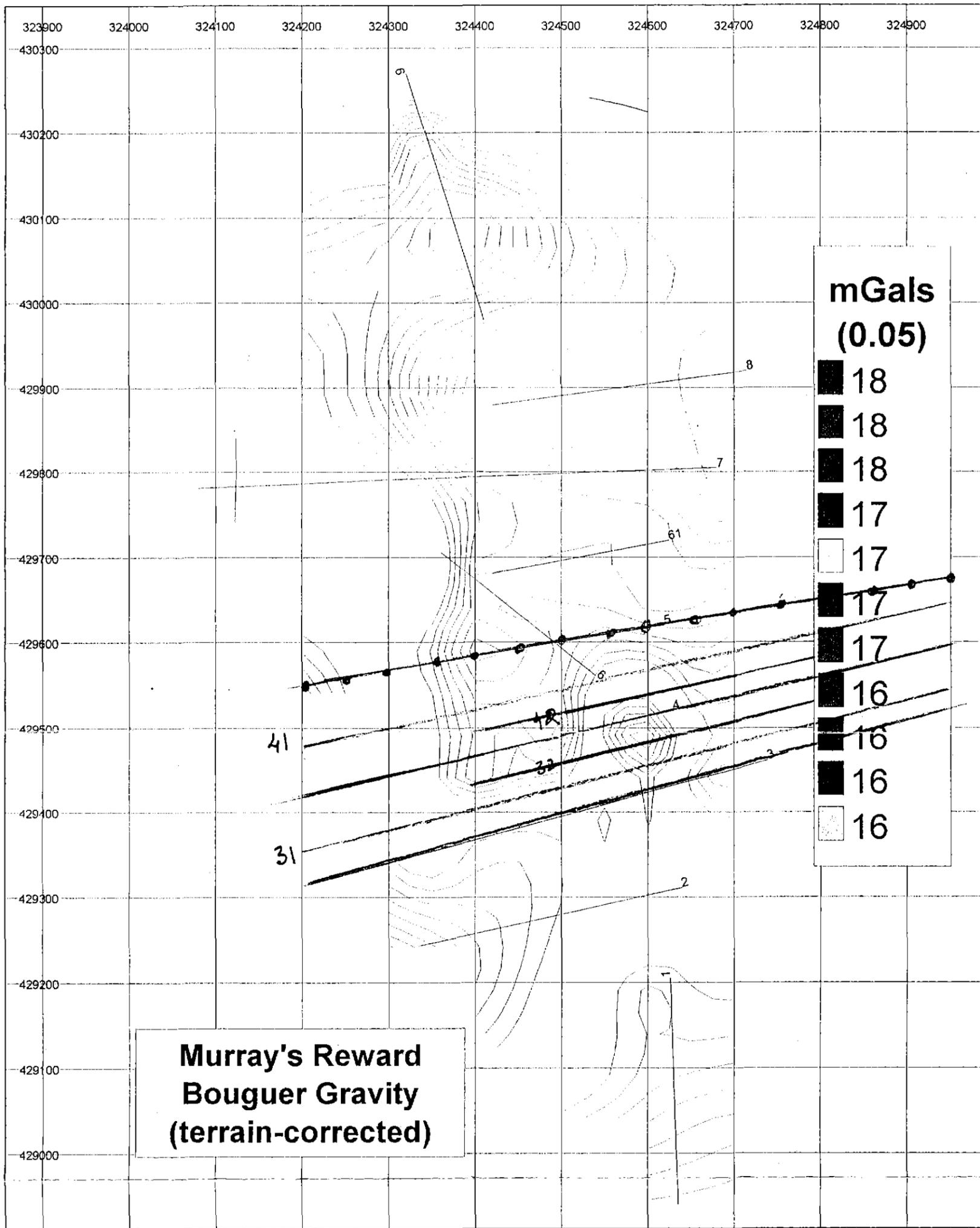


347053





347054



A. Extend lines 4, 3 and 5

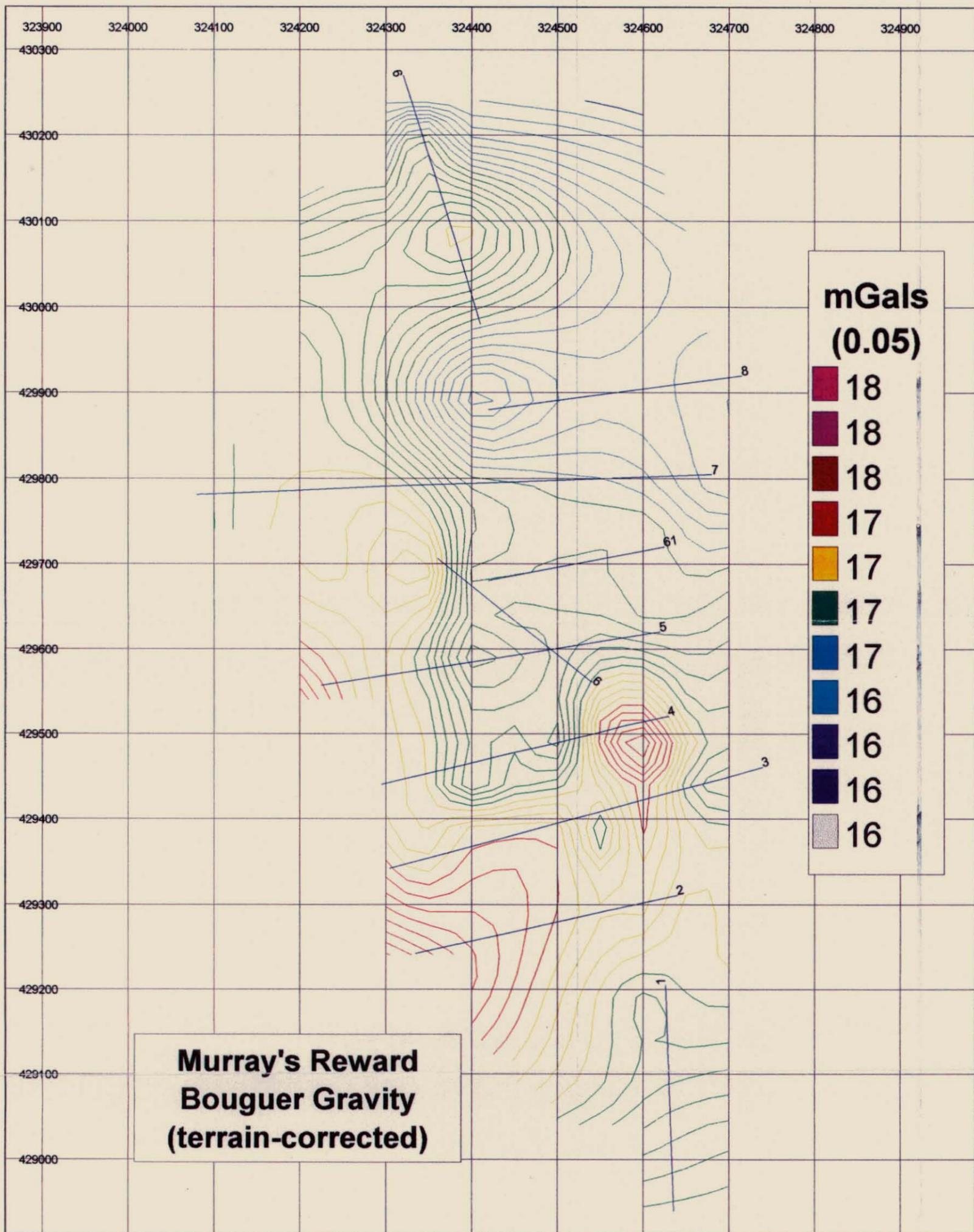
B. Add lines 31 + 41

C. Add 32 + 42 to define anomaly

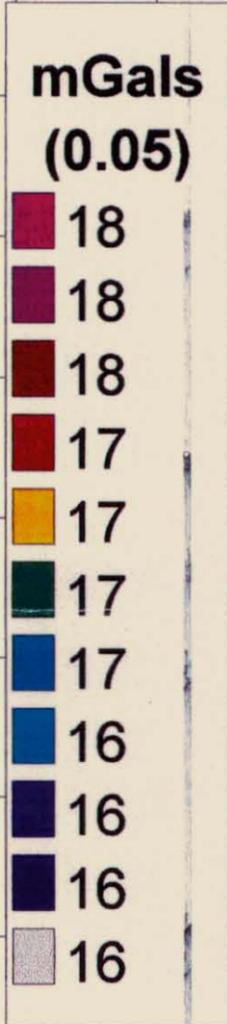
It may be that re-measurement of line 4, the anomaly is no longer there i.e. the previous observations were spurious?

So stages A, B + C would proceed on the basis that the previous stage recovered the anomaly. I'll be back on the 29th Feb. Please ask Theo for costs as I don't have them handy.

347053



**Murray's Reward
Bouguer Gravity
(terrain-corrected)**



Appendix 3

**Report by G W Patterson entitled
"A Review of Exploration at Specimen Hill, Balfour, Tasmania"**

CRA EXPLORATION PTY. LIMITED
ACN 000 057 125

A Review of Exploration at Specimen Hill,
Balfour, Tasmania

Author: GW Patterson

Date: January 1996

Submitted to: Chief Geologist, Vic/Tas

Copies to: CRAE - Vic/Tas District
Sandy Menpes
Mike Porter
CRAE - ETIG

Submitted by:

GW Patterson

Accepted by:

Mike Porter

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Contents

	Page No.
List of Plans	
1. Summary and Conclusions	1
2. Recommendations	1
3. Introduction	1
4. History	1
5. Tonnage Potential	2
6. Discussion of Exploration	2
6.1 BHP Costean Sampling	3
6.2 CRAE Bulk Rock-Chip/Channel Sampling	3
6.3 CRAE Drilling and Grade Estimates	3
6.4 Mapping	4
7. Prospects other than Specimen Hill	4
7.1 Robbies Workings (Tatlows Leases)	4
7.2 Peters Flat and Peters Ridge	4
7.3 Murray's Reward	4
8. References	5
9. Location	5
10. Keywords	6

Plans

Plan No.	Title	Scale	
✓ Tv 19	SPL 781 - Balfour, Specimen Hill Bulk Sampling	1:2,500	✓
✓ Tv 36	Specimen Hill Grid - Balfour Geochemical Plan - Sn Results Showing Jacro Weathered Bedrock Sampling	1:5,000	✓
✓ TASH 585	Balfour Tenements, Locality Plan	1:50,000	✓
✓ TASH 656	CRAE/Geopeko JV, Balfour Grid	1:2,500	✓
✓ TASH 822	Balfour, Summary of Geophysics	1:5,000	✓
✓ TASH 994	Geological Map of Part of Specimen Hill Balfour	1:1,000	✓
✓ TASH 1139	Diagrammatic Stratigraphic Column Specimen Hill Area	Not to scale	✓
✓ TASH 993	Geological Map, Peters Ridge Area, Balfour	1:1,000	✓
✓ TASH 959	Balfour Area, NW Tasmania BHP Drill Hole DDB5 Vein Density and Assay Data	1:750	✓
✓ TASH 960	Balfour Area, NW Tasmania BHP Drill Hole DDB6 Vein Density and Assay Data	1:750	✓
✓ TASH 961	Balfour Area, NW Tasmania BHP Drill Hole DD81BC2 Vein Density and Assay Data	1:750	✓
✓ TASH 962	Balfour Area, NW Tasmania BHP Drill Hole DD81BC1 Vein Density and Assay Data	1:750	✓
✓ TASH 963	Balfour Area, NW Tasmania BHP Drill Hole DD81BC6 Vein Density and Assay Data	1:750	✓
✓ TASH 964	Balfour Area, NW Tasmania BHP Drill Hole DD81BC4 Vein Density and Assay Data	1:750	✓

1. Summary and Conclusions

The Specimen Hill tin prospect and the surrounding area at Balfour has been well explored by several companies (including CRAE) between 1964 and 1983.

A small resource grading 0.8% copper was outlined by ACI drilling (1977) in a 50,000m² zone at Murray's Reward.

A breccia zone of 50,000m² at Specimen Hill was considered by CRAE as a bulk mining target. However a calculated quartz vein content of 0.66% at an estimated quartz grade of 0.81% tin and 1.02% tungsten, based on drill core assays, was considered to be uneconomic.

Some potential might exist for upgrading of the breccia zone by bulk sampling and/or RC drilling. Potential may exist for ore grade mineralisation in adjacent prospects.

2. Recommendations

Consideration should be given to the feasibility of bulk sampling by costeaning or possibly, large diameter drilling (eg. Caldwell bucket drill). RC drilling should also be considered as an alternative to or in conjunction with bulk sampling.

If further work is undertaken at Specimen Hill some consideration should be given to other drill targets such as Tatlows and Peter's Hill.

No further work should be commenced without an accurately surveyed grid based on AMG coordinates.

3. Introduction

At Tim McConachy's request I have examined the available data on Specimen Hill and the surrounding Balfour. The CRAE Reports examined were retrieved from Tasmanian Mines Department open file micro fiche and the maps were printed from originals in the drafting office. None of the archived Tasmania EL files produced any useful information, except for some geological plans of Murrays Reward and Central Mt Balfour (ACI). There are no copies of the BHP 1964 reports in CRAE Vic/Tas office.

4. History

Copper mining and alluvial tin mining were carried out prior to 1912. The first serious investigations into hard-rock tin were undertaken by BHP during 1963-64. BHP carried out geological mapping and used soil and gravel sampling to define areas of possible bedrock tin occurrence. An attempt at costeaning was evidently unsuccessful due to failure to penetrate deeply enough into bedrock. Six diamond drill holes totalling 825m were drilled, four to test quartz veining on Specimen Hill and two to test magnetic anomalies north and south of Specimen Hill.

BHP's drilling showed that concentrations of cassiterite from 1 to 10% occur in massive quartz veins, but most tin occurs in laminated shales with values ranging 100-1100 ppm. The magnetic anomalies were considered to be due to weakly disseminated pyrrhotite encountered in drilling.

ACI during 1968-69 carried out further exploration in the Balfour area under EL 16/68. They investigated copper occurrences at Murray's Reward Mine, Central Mt Balfour Mine and the Blocks and Clump prospects. They also investigated a small but high grade tin occurrence (overlooked by BHP) known as Jaeger's Prospect on the southern side of Specimen Hill. In 15 or more shallow drillholes the only significant copper mineralisation recorded by ACI was in the Murray's Reward-Central Mine area where a zone 250m x 200m grading 0.8% Cu was outlined by drilling. The mineralised body is quartz-dolomite-pyrite-chalcopyrite hosted by chloritic and carbonaceous shales. It was observed to be similar to ore in the lower workings of Murray's Reward.

In 1977 Tico mines began work on SPL 762 held by JD Ware, but do not appear to have done more than review past exploration. Their report suggests that one of BHP's magnetic anomalies may have been due to massive pyrrhotite.

During 1979-83 a CRAE-Geopeko joint venture carried out geological mapping on a 2.6 km by 0.65 km grid, including detailed 1:1,000 scale mapping of selected areas at Specimen Hill and Peter's Ridge. Rock chip sampling, Jacro auger sampling and selective vein sampling were undertaken. Geophysical surveys including aeromagnetics, ground magnetics, follow up IP and SP surveys and Dighen (Multicoil EMP) were also carried out.

Eight diamond drill holes totalling 1536m were drilled during 1981-92. Three of the holes were in the breccia zone on Specimen Hill, where detailed mapping had defined a south plunging anticline with a 50,000m² area of brecciation and tourmalinisation evidently related to the Specimen Hill Fault. The last of the three holes (DD82BC8) was sited to intersect an IP target modelled as a tabular dyke-like body with a near vertical westerly dip. It intersected 33 quartz veins and encountered the Specimen Hill Fault at 293m.

CRAE carried out an assessment of the Specimen Hill prospect based on quartz vein density and assay data from earlier BHP drilling and CRAE-Geopeko drilling. It was estimated that the average grade of quartz veins would be 0.8% Sn and 1.0% W in an average vein content of 0.66%.

The proportion of mineralised quartz was estimated at 42%. Ore sorting was considered, but it appeared likely that difficulty would be met with in separating abundant white quartzite from quartz. Also the uneven distribution of quartz throughout the sections would make ore grade sections discontinuous. The conclusion therefore was that open pit mining would not be feasible.

5. Tonnage Potential

In his 1982 report Langsford roughly estimated a potential tonnage of mineralised material in the Specimen Hill breccia zone, using an area figure of 50,000m², an S.G. of 2.5 and a depth extent of 200m. His estimate was 25 million tons.

From the 1:1,000 geological plan (plan no. Vv TASH 994) I took a surface area of 44,000m². At 2.2 S.G. this would give a tonnage of about 10 million tonnes of unknown grade to 100m depth (or 20 million tonnes to 200m).

Using the above figures, at current metal prices (Sn and W approximately equal to \$US6200-6300 per tonne) a grade of 0.6% Sn or combined Sn-W would be required for a 10 million tonne resource equal to a gold resource of 1 million oz (i.e. at 3 g/t Au) or a copper grade of 2% Cu (LT 1998). Realistically for a porphyry gold/copper CRAE target the resource would probably need to be around 30 million tonnes.

This would appear to be a difficult goal in terms of the 1983 conclusions from the vein density study. To achieve it would require a big improvement in tin-tungsten grade in whatever sampling method were to be employed.

6. Discussion of Exploration

Several aspects of exploration at Balfour are worth discussing briefly.

6.1 BHP Costean Sampling

I have not seen the BHP reports, but from what is recorded in CRAE reports it appears that costeaning was unsuccessful or at best only partially effective. This is assumed to be due to failure of earthmoving equipment to excavate cemented gravels and penetrate fresh bedrock. The value of any costean sampling is therefore in doubt.

6.2 CRAE Bulk Rock-Chip/Channel Sampling

These were 15 kg samples in 10m intervals and consisted of 2 parallel samples 1m apart. It seems that these samples were taken with reasonable care. However, considering the coarse nature of the cassiterite it is still questionable as to whether they were big enough. It might have been better to obtain a cassiterite-wolframite concentrate rather than splitting and assaying.

6.3 CRAE Drilling and Grade Estimates

As with the bulk surface samples, it is questionable if the NQ core recovered a truly representative sample considering the erratic distribution of quartz veins and the generally coarse cassiterite. (The BHP drilling possible used an even smaller core size). Larger diameter holes would be preferable, if practical. Some Caldwell bucket drill holes may be applicable, with concentrate recovery rather than assay.

In 1982 Langsford proposed testing the breccia zone by rotary-percussion holes, but remarked that this would be ineffective below the water table. This however would not apply today. RC drill rigs with adequate air are able to keep holes dry to considerable depth and provide a much bigger sample than diamond drilling.

6.4 Mapping

Although geological mapping appears to have been carried out carefully and in considerable detail, the accuracy of the grid is somewhat in doubt. The grid lines and probably the baseline appear to have been laid out by tape and compass. As a result none of the grid lines are parallel and spacing is irregular. It would be impossible to re establish the re establish the grid and should further work be done a properly surveyed grid based on AMG coordinates would be required. The 1:5,000 geochemical plan (Tv 36) in CRAE report 9991 has an AMG grid superimposed, but there is a discrepancy in the spacing of the east grid lines.

7. Prospects other than Specimen Hill

Several other prospects are known any may warrant further investigation.

7.1 Robbies Workings (Tatlow's Leases)

Langsford (1982) noted that small high grade tin lodes in Tatlow's Shaft and Robbies Workings were exposed as weakly mineralised quartz-pyrite-cassiterite veins and that many such veins are exposed on Tatlow's Leases. Langsford considered that DDB14 (sited west of Tatlow's shaft and drilled east to test beneath the workings, without intersecting mineralisation) should have been sited south of the shaft and drilled to the north.

7.2 Peters Flat and Peters Ridge

Veins are poorly exposed, but are believed to contain significant tin. Langsford suggested an area of potential veining around 400m x 100m.

7.3 Murray's Reward

Langsford (1982) noted that a composite chip sample of chalcopyrite-pyrite-quartz lode material from Murray's Reward dumps, with 4.5% Cu, had contained 350 ppm Sn. However samples of carbonate hosted copper mineralisation from ACI drill core showed no significant tin. Mike Porter's recommendation to reassy old ACI Murray's Reward Core thus appears to have been done, but is not recorded. This should be checked.

8. References

- | | | |
|----------------------|------|---|
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9. Location

Burnie	SK 55-3	1:250,000
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10. Keywords

Tin, tungsten, veins, drill diamond, geology, geophysics.

5 430 000 m N

5 430 000 m N

5 429 000 m E

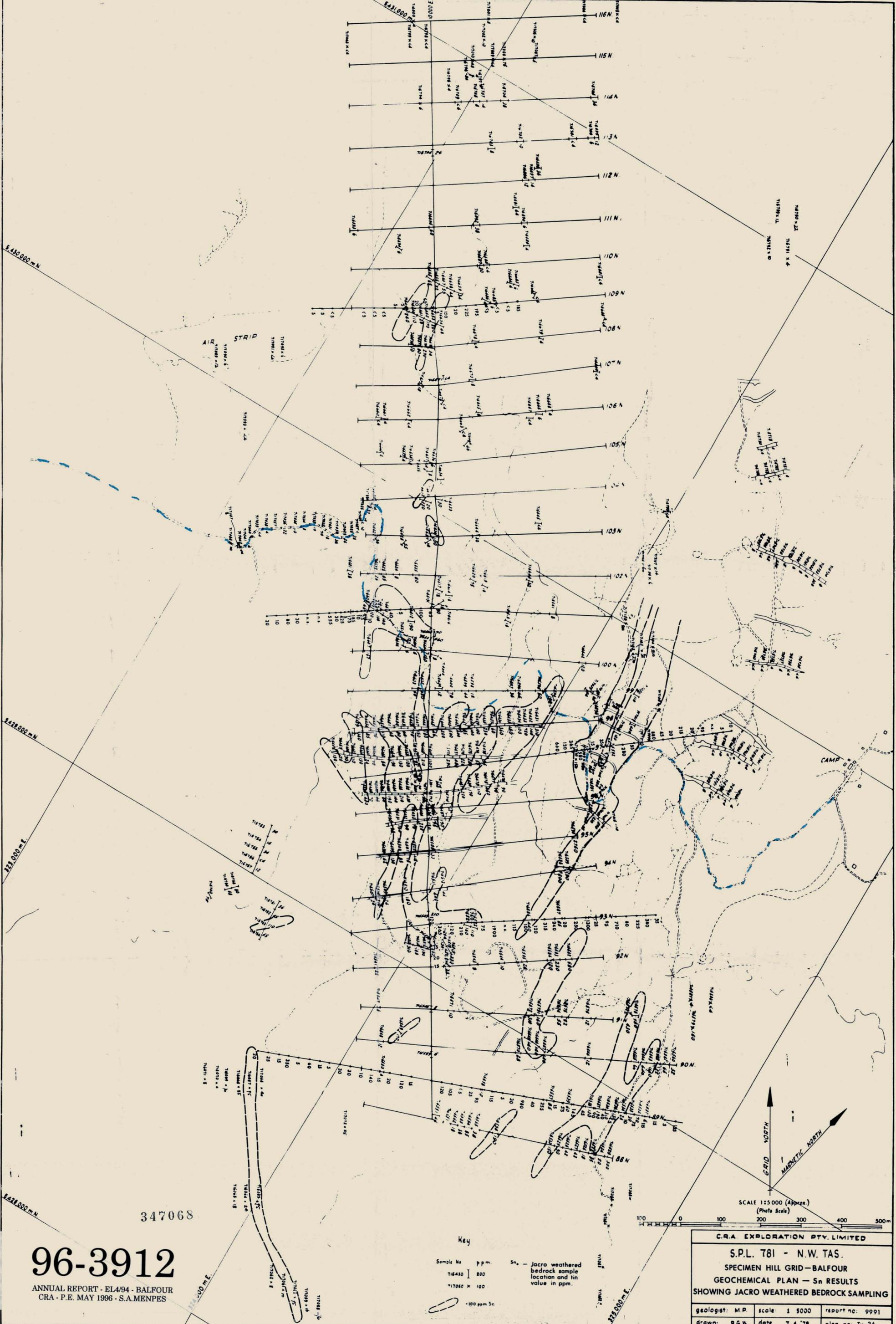
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ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES

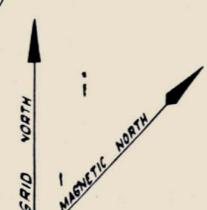
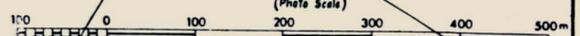


Key

Sample No ppm Sn_w - Jacro weathered
 716430 | 800 bedrock sample
 717060 x 100 location and tin
 value in ppm.

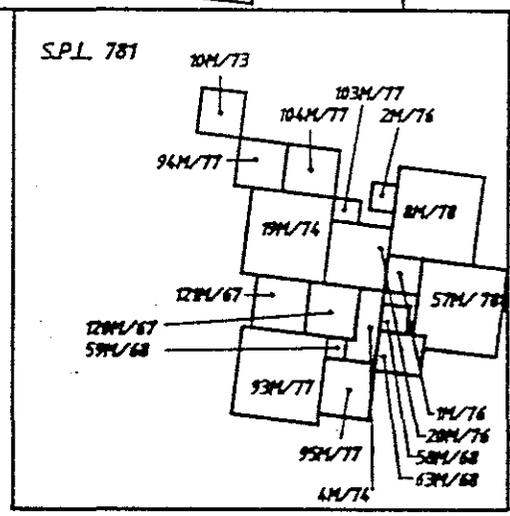
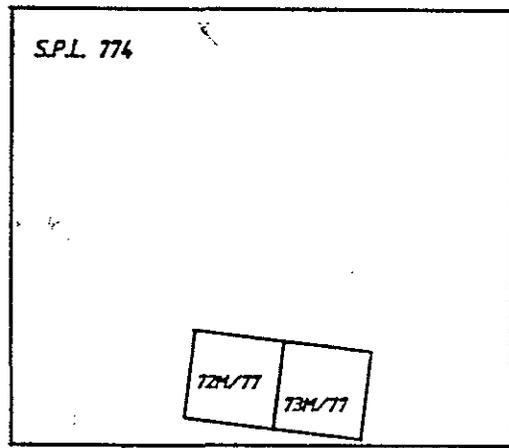
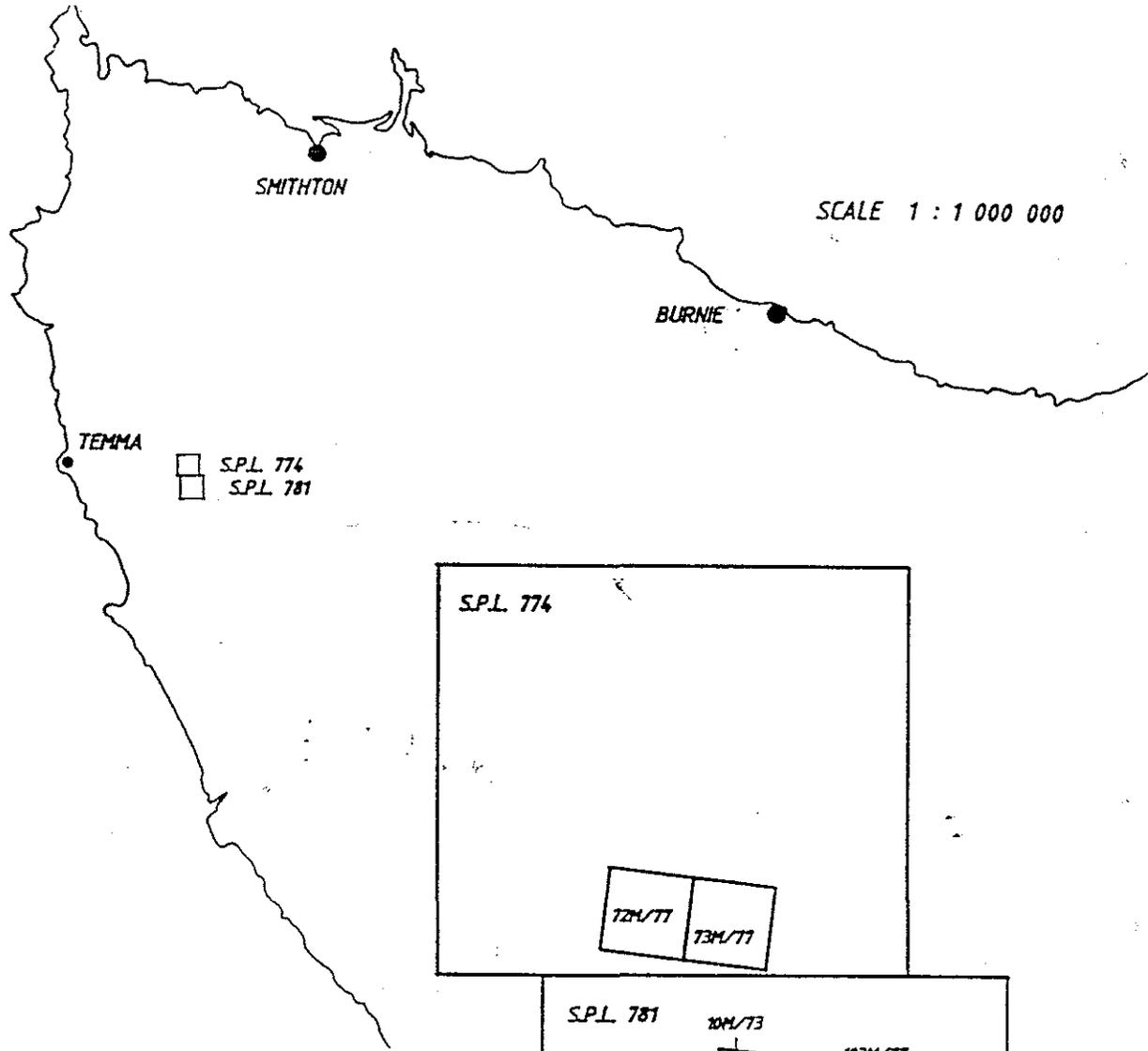
100 ppm Sn

SCALE 1:5000 (Approx.)
(Photo Scale)



C.R.A. EXPLORATION PTY. LIMITED
 S.P.L. 781 - N.W. TAS.
 SPECIMEN HILL GRID - BALFOUR
 GEOCHEMICAL PLAN - Sn RESULTS
 SHOWING JACRO WEATHERED BEDROCK SAMPLING

geologist: M.P.	scale: 1 5000	report no: 9991
drawn: R.G.W.	date: 7 4 '79	plan no: Tv 36



SCALE 1 : 50 000

347069

96-3912

ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES

CRA EXPLORATION PTY. LIMITED	
BALFOUR TENEMENTS	
LOCALITY PLAN	
Ref. s SKSS - 3	
Scale. AS SHOWN	Drawn. R. T.
Author. T. W. D.	Report N°. 11914, 11912, 11913
Date. 16th Feb. 1982	Plan N°. TASH 585

LEGEND

LINES SURVEYED WITH I.P.

I.P. ANOMALY - DEFINITE

- PROBABLE

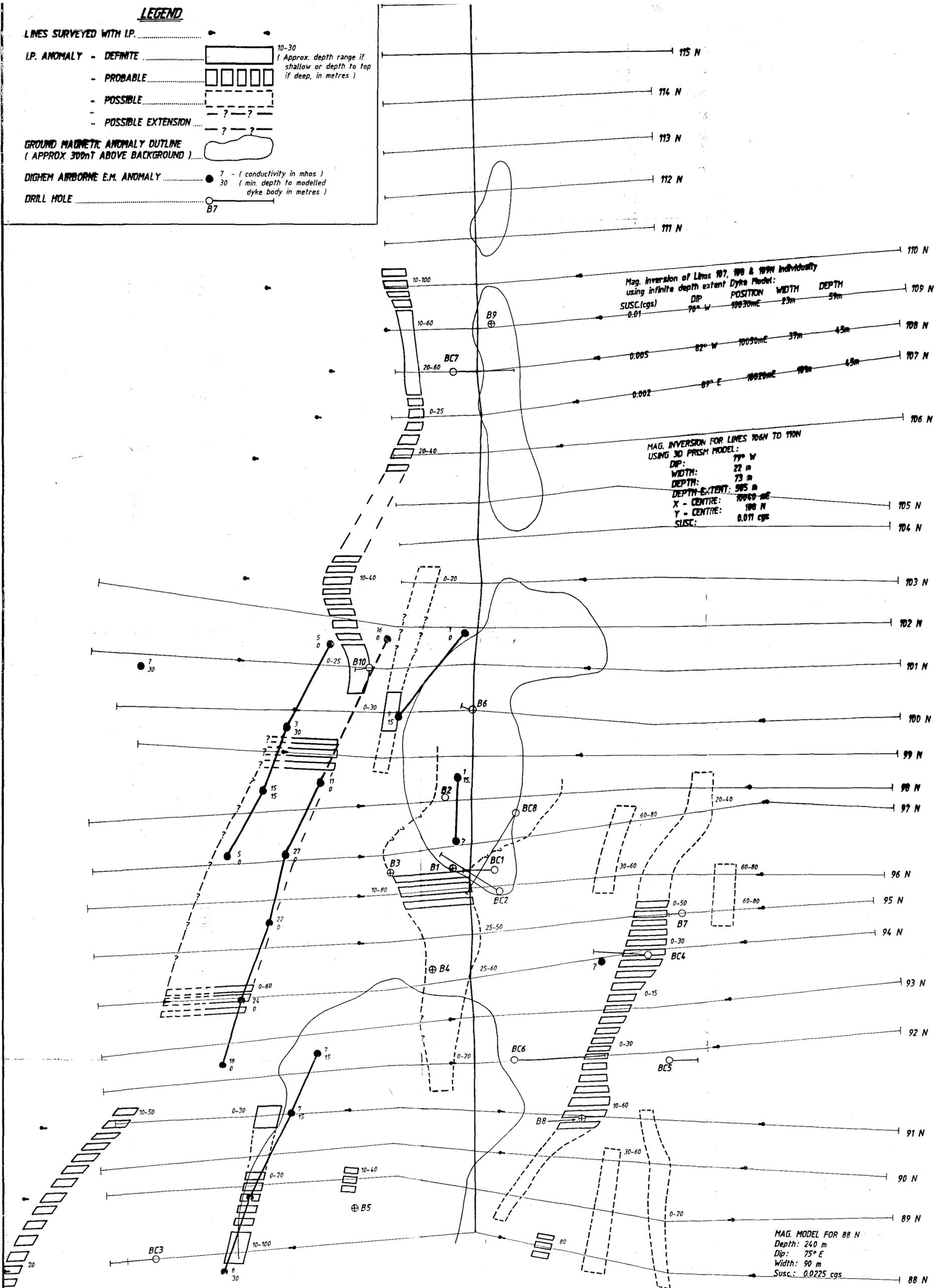
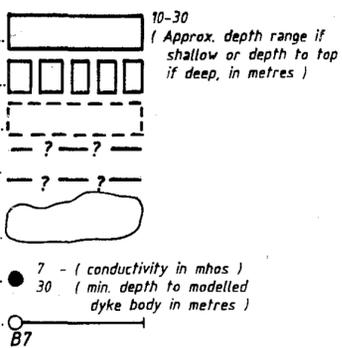
- POSSIBLE

- POSSIBLE EXTENSION

GROUND MAGNETIC ANOMALY OUTLINE
(APPROX 300nT ABOVE BACKGROUND)

DIGHEM AIRBORNE E.M. ANOMALY

DRILL HOLE



Mag. inversion of Lines 107, 108 & 109N individually using infinite depth extent Dyke Model:

SUSC.(cgs)	DIP	POSITION	WIDTH	DEPTH
0.01	79° W	10030mE	23m	59m
0.005	82° W	10050mE	37m	45m
0.002	87° E	10020mE	10m	45m

MAG. INVERSION FOR LINES 106N TO 110N USING 3D PRISM MODEL:

DIP:	79° W
WIDTH:	22 m
DEPTH:	73 m
DEPTH EXTENT:	505 m
X - CENTRE:	10060 mE
Y - CENTRE:	100 N
SUSC:	0.071 cgs

MAG. MODEL FOR 88 N

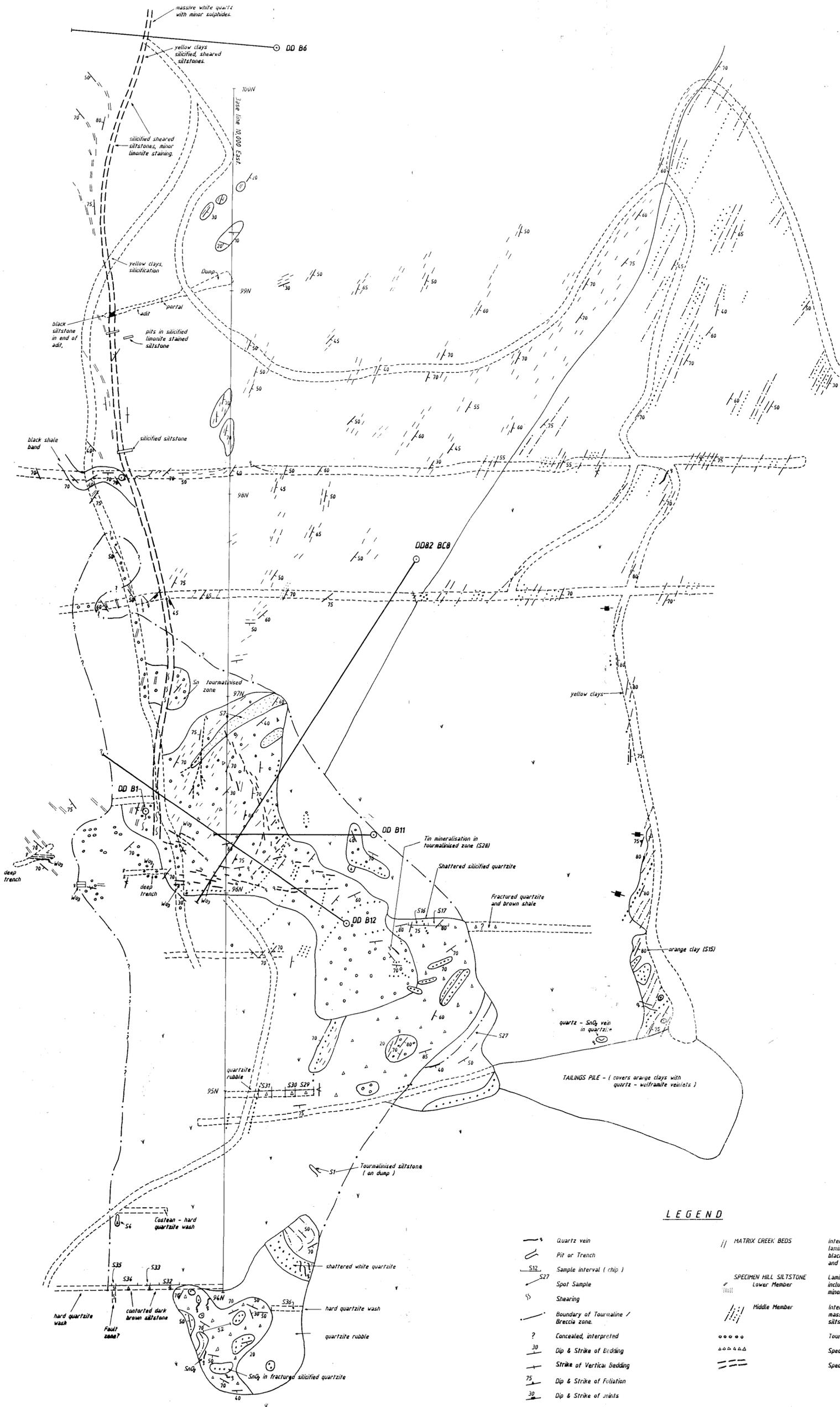
Depth:	240 m
Dip:	75° E
Width:	90 m
Susc:	0.0225 cgs

347071

96-3912

ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES

CRA EXPLORATION PTY. LIMITED	
BALFOUR	
SUMMARY OF GEOPHYSICS	
Ref:	SK55 - 3
Scale:	1 : 5000
Author:	M. F. F.
Date:	22 - 7 - 1982
Drawn:	R. T.
Report No.:	11914, 11912, 11913
Plan No.:	TASH 822



LEGEND

- Quartz vein
- - - Pit or Trench
- S12 Sample interval (chip)
- S27 Spot Sample
- SS Shearing
- Boundary of Tourmaline / Breccia zone
- ? Concealed, interpreted
- 30 Dip & Strike of Bedding
- 75 Strike of Vertical Bedding
- 30 Dip & Strike of Foliation
- 30 Dip & Strike of Joints
- Strike of Vertical Joints
- Cleavage
- /// MATRIX CREEK BEDS
interbedded massive to faintly laminated grey siltstones; black carbonaceous siltstones and grey to white quartzites.
- SPECIMEN HILL SILTSTONE
Lower Member
Middle Member
Laminated grey green siltstone, includes "pyjama" rocks, minor friable sandstones.
Interbedded quartzites and massive grey green to brown siltstones.
- Tourmalinisation
- ▲▲▲▲▲ Specimen Hill Breccia
- Specimen Hill Fault

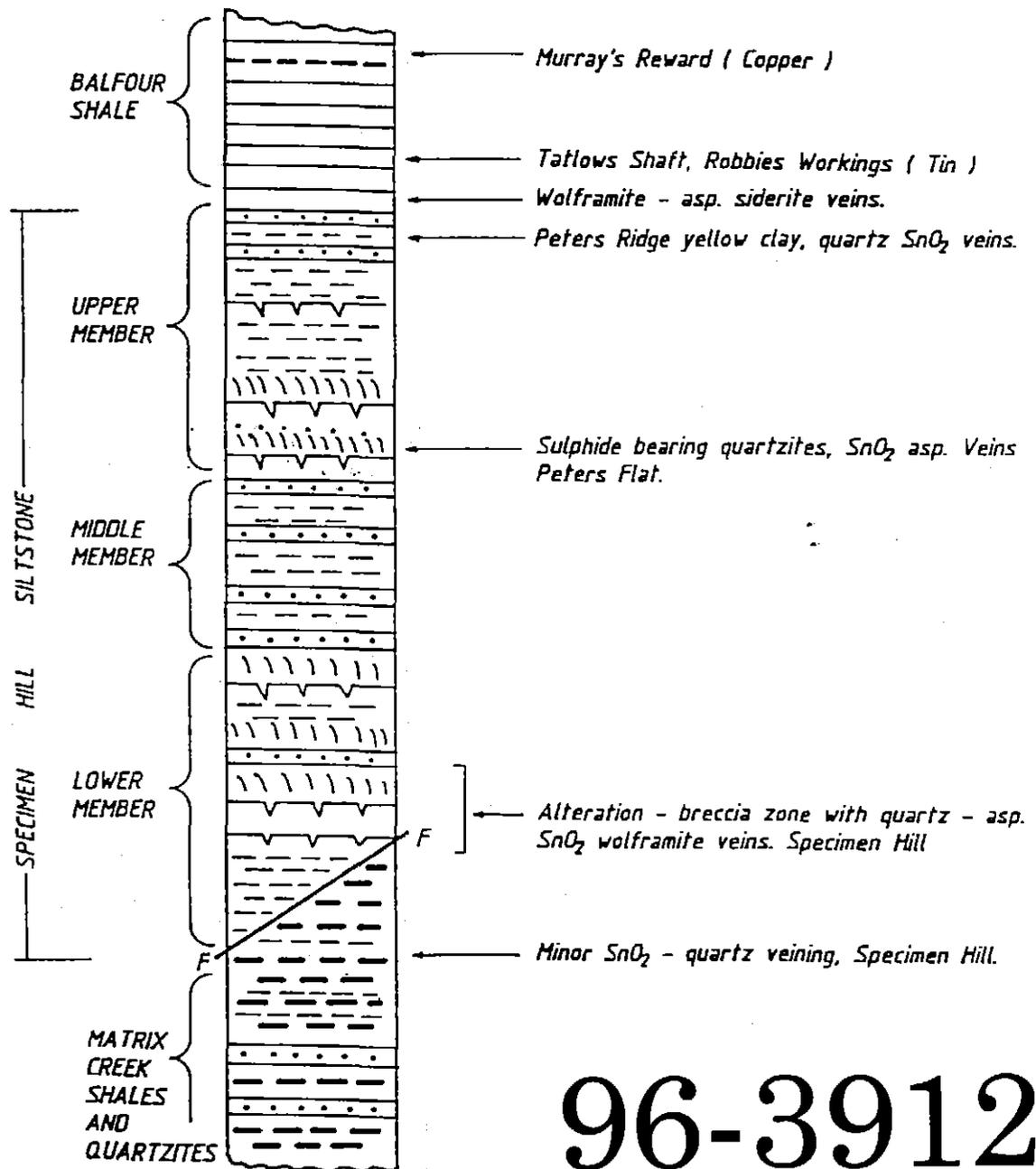
347072

96-3912

ANNUAL REPORT - ELA/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES

CRA EXPLORATION PTY. LIMITED			
GEOLOGICAL MAP of part of SPECIMEN HILL BALFOUR			
REF	SK55 - 3	PROJECT N°	11912, 11913
AUTHOR	N.R.L.	DRAWN	R. T.
SCALE	1 : 1000	FILED N°	YASH 994
DATE	20 - 12 - 1992		

MINERALISATION



96-3912

ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES

- Regularly lam. green siltstone.
- Massive to laminated siltstone
- "Pyjama" siltstone
- Quartzites sandstones
- Black shales, siltstones.

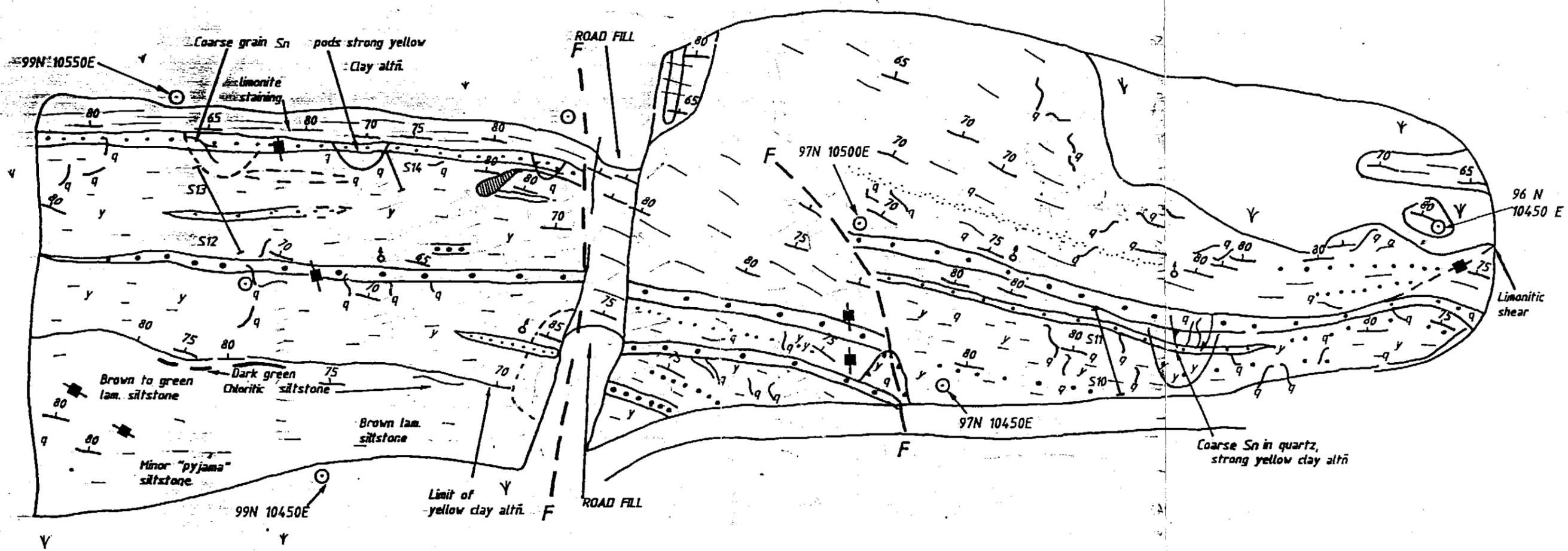
CRA EXPLORATION PTY. LIMITED

**DIAGRAMATIC
STRATIGRAPHIC COLUMN
SPECIMEN HILL AREA**

Ref: SK55 - 3	
Scale:	Drawn: R. T.
Author: N. R. L.	Report N°: 11912, 11913
Date: JAN 1983	Plan N°: TASH 1139

347074

GRID NORTH
317° MAGNETIC



LEGEND

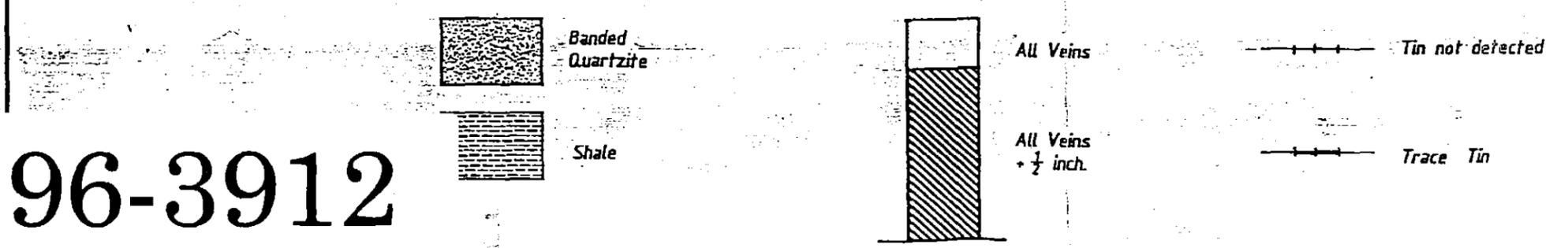
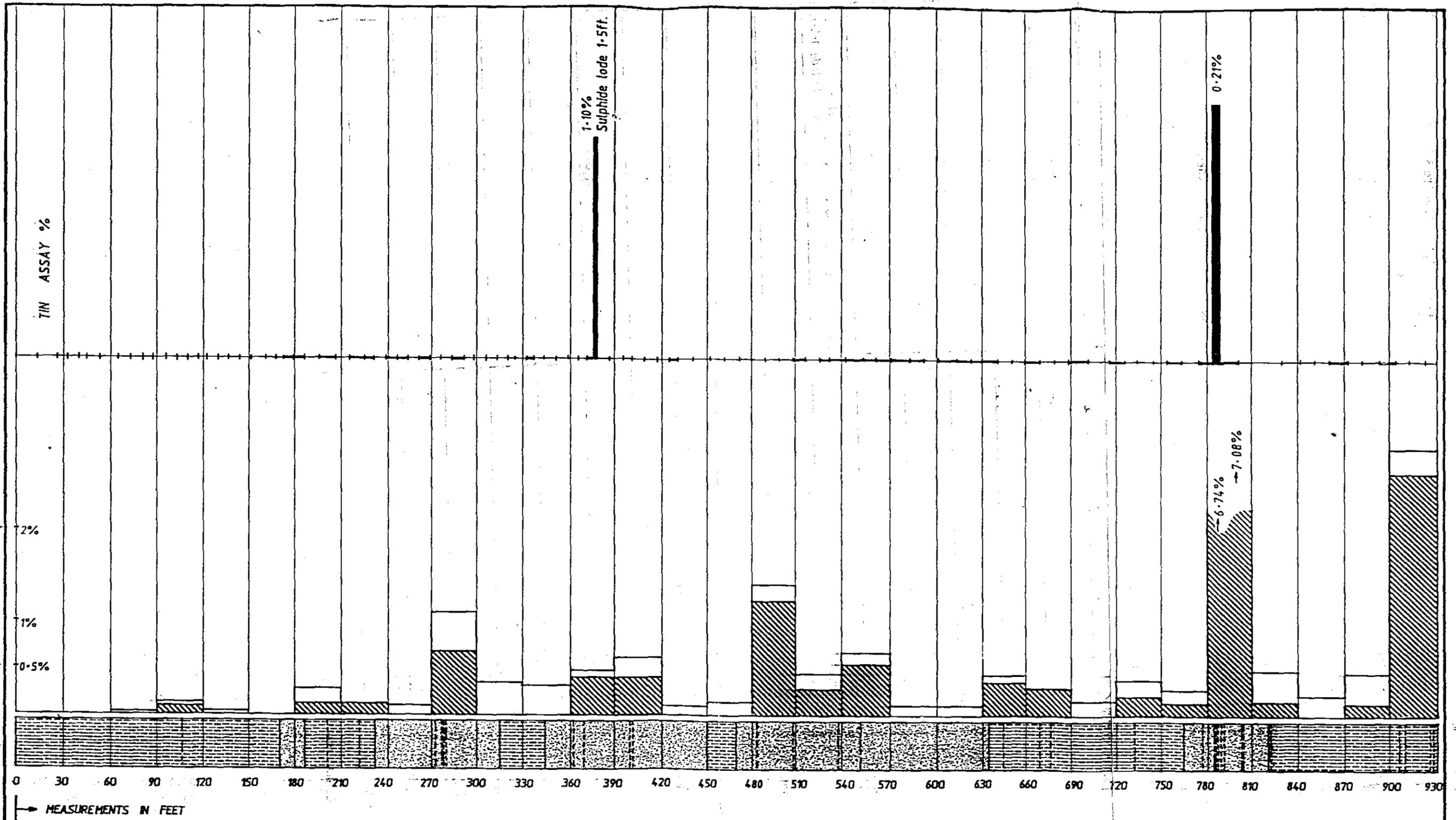
- Irregular Quartz vein with variable amounts of cassiterite
- Quartz "blow"
- Yellow clay alteration
- Pit excavated on qtz - SnO₂ Pads in fractured quartzite
- Fault: — Definite
- ? inferred
- Peat cover
- Sample traverse

- BALFOUR SHALE**
 - Thinly regularly laminated green to brown green to brown siltstone.
 - Minor black siltstones, interbedded quartzites.
 - Laminated friable fissile Mg sandstone
- SPECIMEN HILL SILTSTONE**
 - Massive to faintly laminated white quartzites silicified in part, interbedded green siltstones.
 - Laminated to massive grey-green to brown siltstones, interbedded "pyjama" siltstones.
 - Green chloritic siltstone

96-3912

ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES

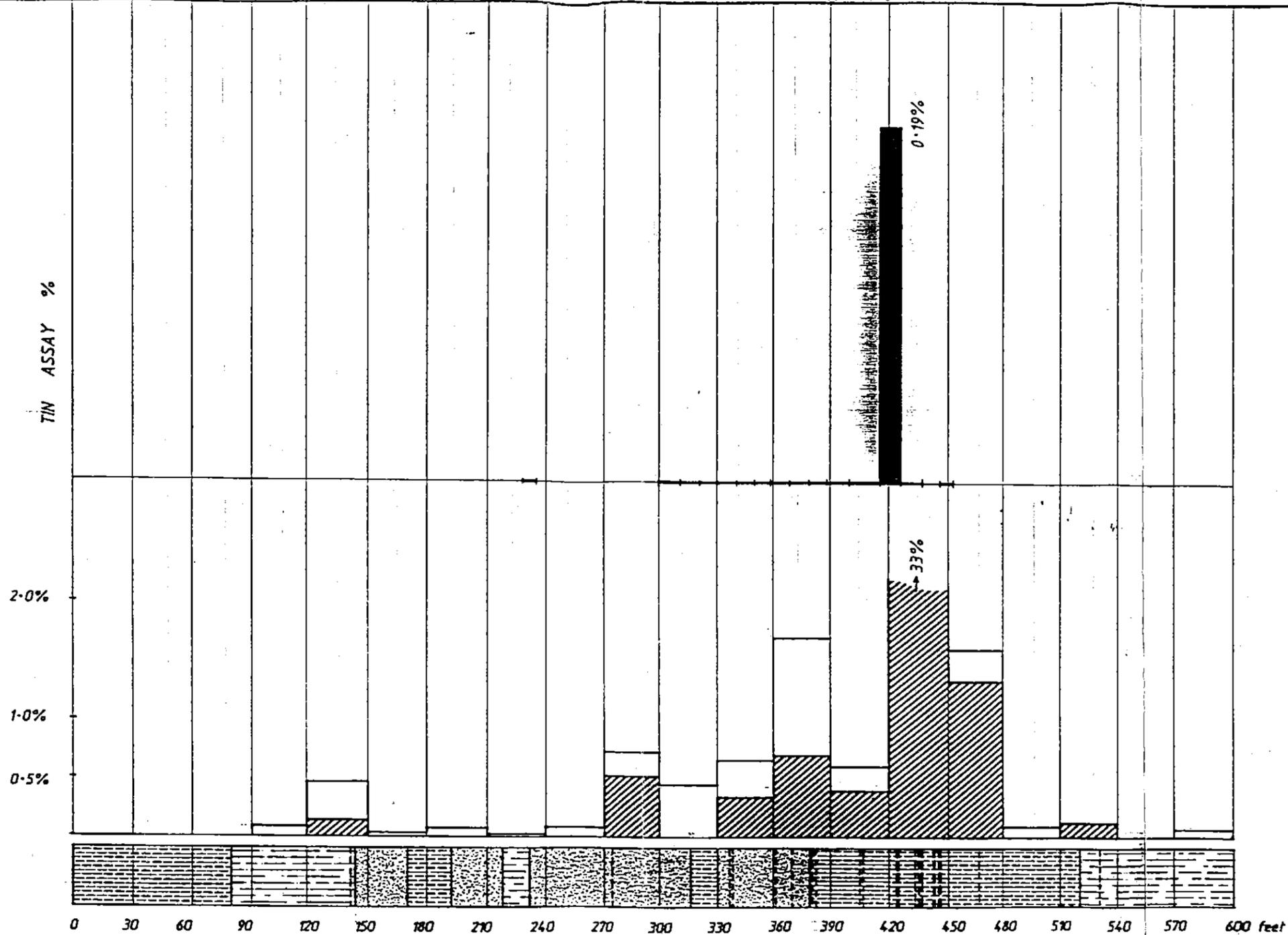
CRA EXPLORATION PTY. LIMITED	
GEOLOGICAL MAP PETERS RIDGE AREA BALFOUR (20M / 76 & 103M / 77)	
REF. SK55-3	
SCALE 1 : 1000	DRAWN R. B. G.
AUTHOR N. D. L.	REPORT N° 11914
DATE 15 - 12 - 1982	TASH N° 993



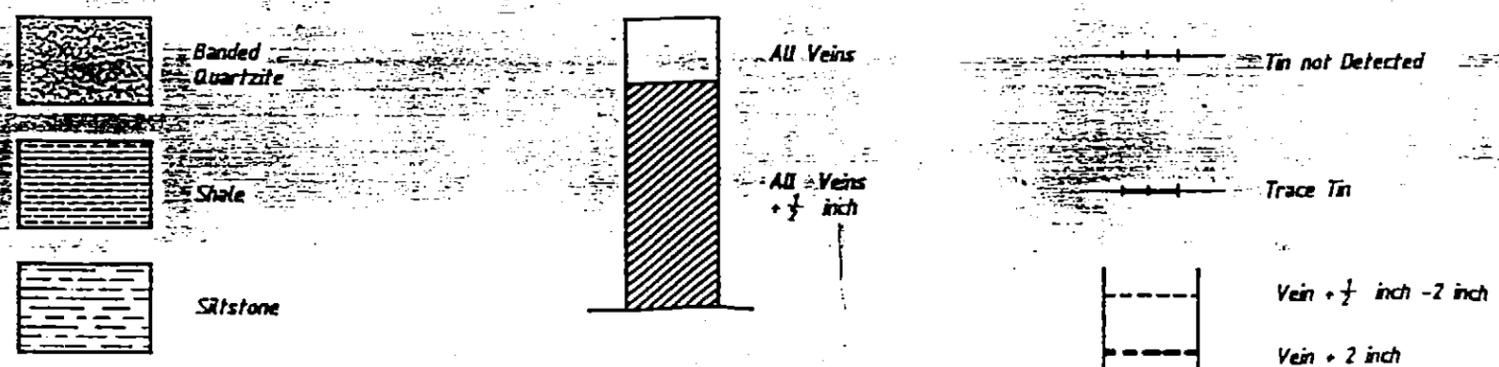
96-3912

ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES

CRA EXPLORATION PTY. LIMITED	
BALFOUR AREA NORTH WEST TASMANIA B.F.P. DRILL HOLE DD B 5 VEIN DENSITY & ASSAY DATA	
REF.	SK55 - 3
SCALE	1 : 750
DRAWN	R. T.
AUTHOR	T. W. D.
REPORT N°	11912, 11913
DATE	30 - 11 - 1982
TASH N°	959

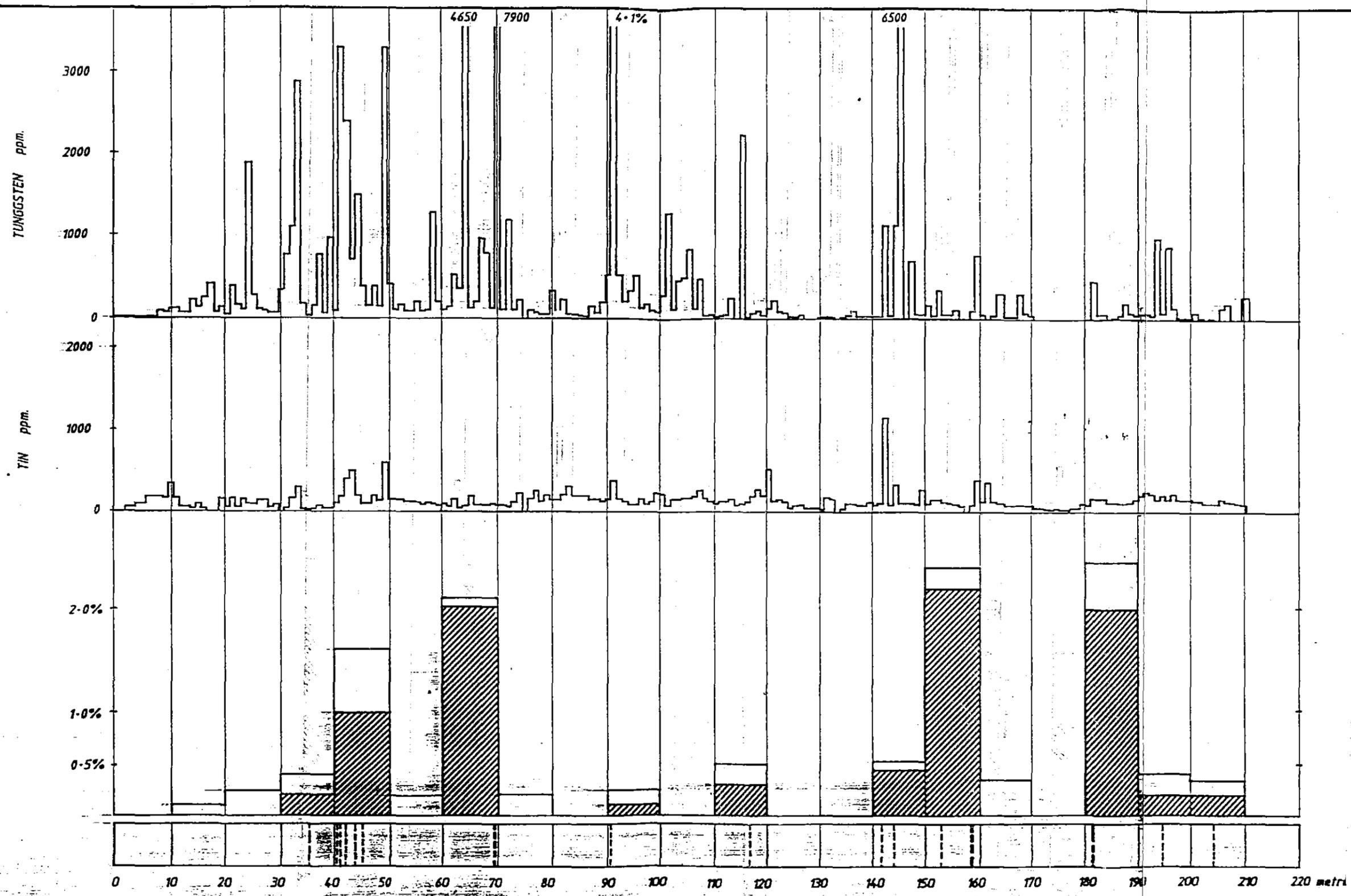


96-3912
 ANNUAL REPORT - EL4/94 - BALFOUR
 CRA - P. E. MAY 1996 - S.A.MENPES

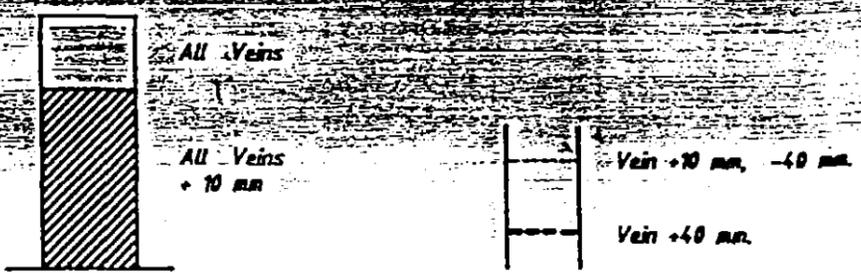


CRA EXPLORATION PTY. LIMITED	
BALFOUR AREA NORTH WEST TASMANIA B.H.P. DRILL HOLE DD B 6 VEIN DENSITY & ASSAY DATA	
REF. SK55 - 3	
SCALE 1 : 750	DRAWN R. T.
AUTHOR. T. W. D.	REPORT N ^o . 11912, 11913
DATE 30 - 11 - 1982	TASH N ^o . 960

347077

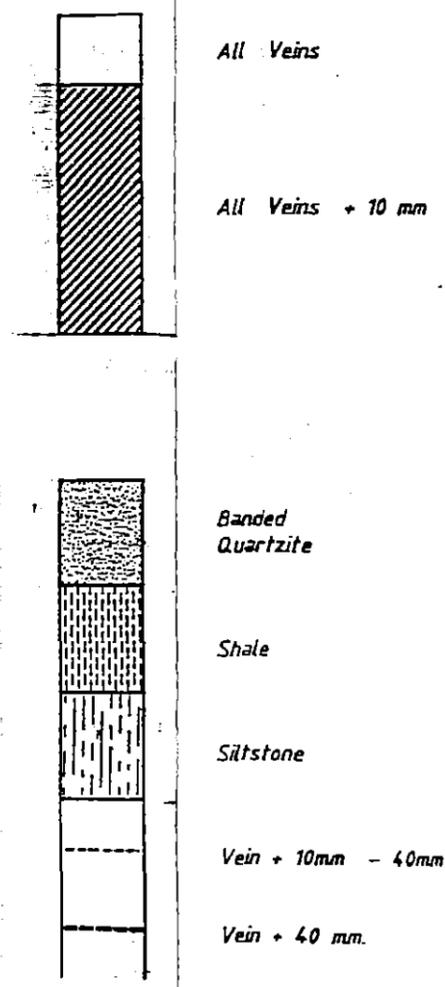
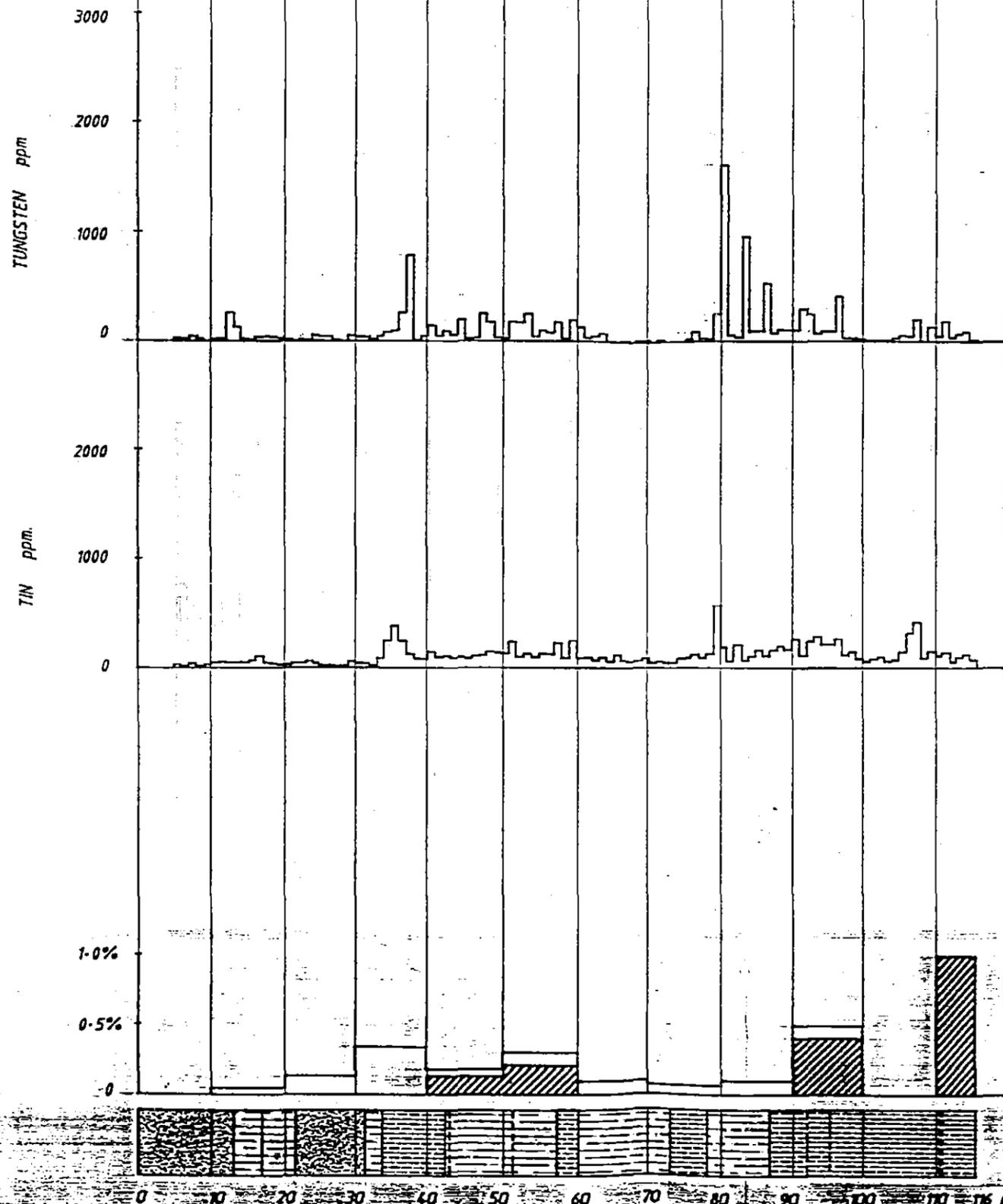


96-3912
 ANNUAL REPORT - EL4/94 - BALFOUR
 CRA - P.E. MAY 1996 - S.A.MENPES



CRA EXPLORATION PTY. LIMITED	
BALFOUR AREA NORTH WEST TASMANIA DD 81 BC 2 VEIN DENSITY & ASSAY DATA	
REF.	SK55 - 3
SCALE	1 : 750
AUTHOR.	T. W. D.
DATE	30 - 11 - 1982
DRAWN	R. T.
REPORT N°	11912, 11913
TASK N°	961

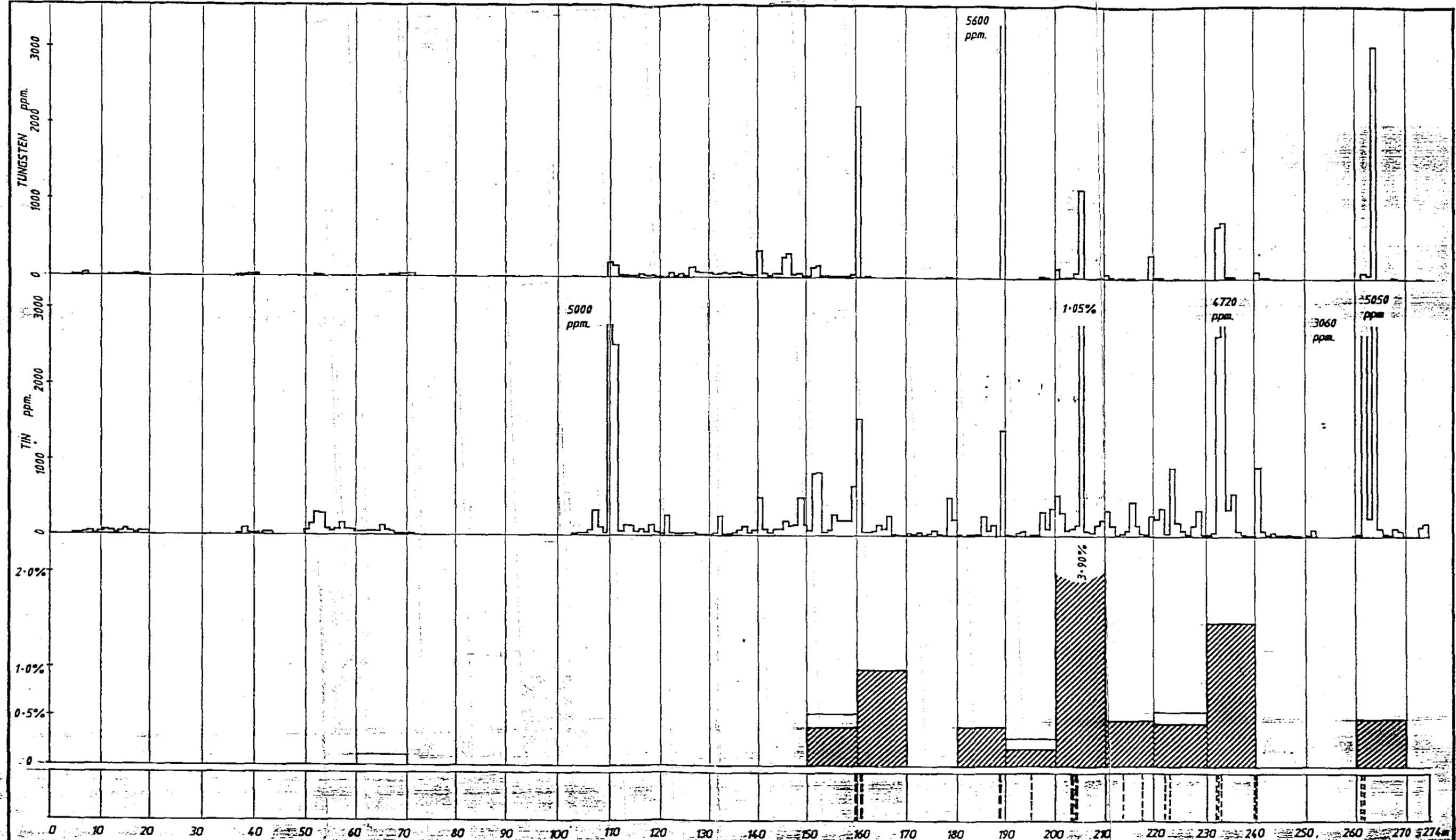
347078



ANNUAL REPORT - EIA/94 - BALFOUR
CRA - P. E. MAY 1996 - S. A. MENPES

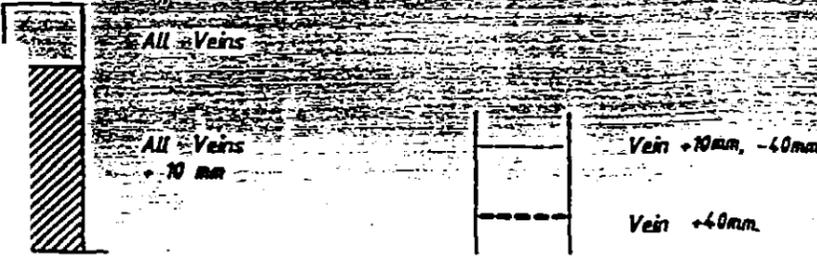
96-3912

CRA EXPLORATION PTY. LIMITED			
BALFOUR AREA NORTH WEST TASMANIA DD 81 BC 1 VEIN DENSITY & ASSAY DATA			
REF.	SK55 - 3		
SCALE.	1 : 750	DRAWN.	R. T.
AUTHOR.	T. W. D.	REPORT N°.	11912, 11913
DATE.	1 - 12 1982	TASH N°	962

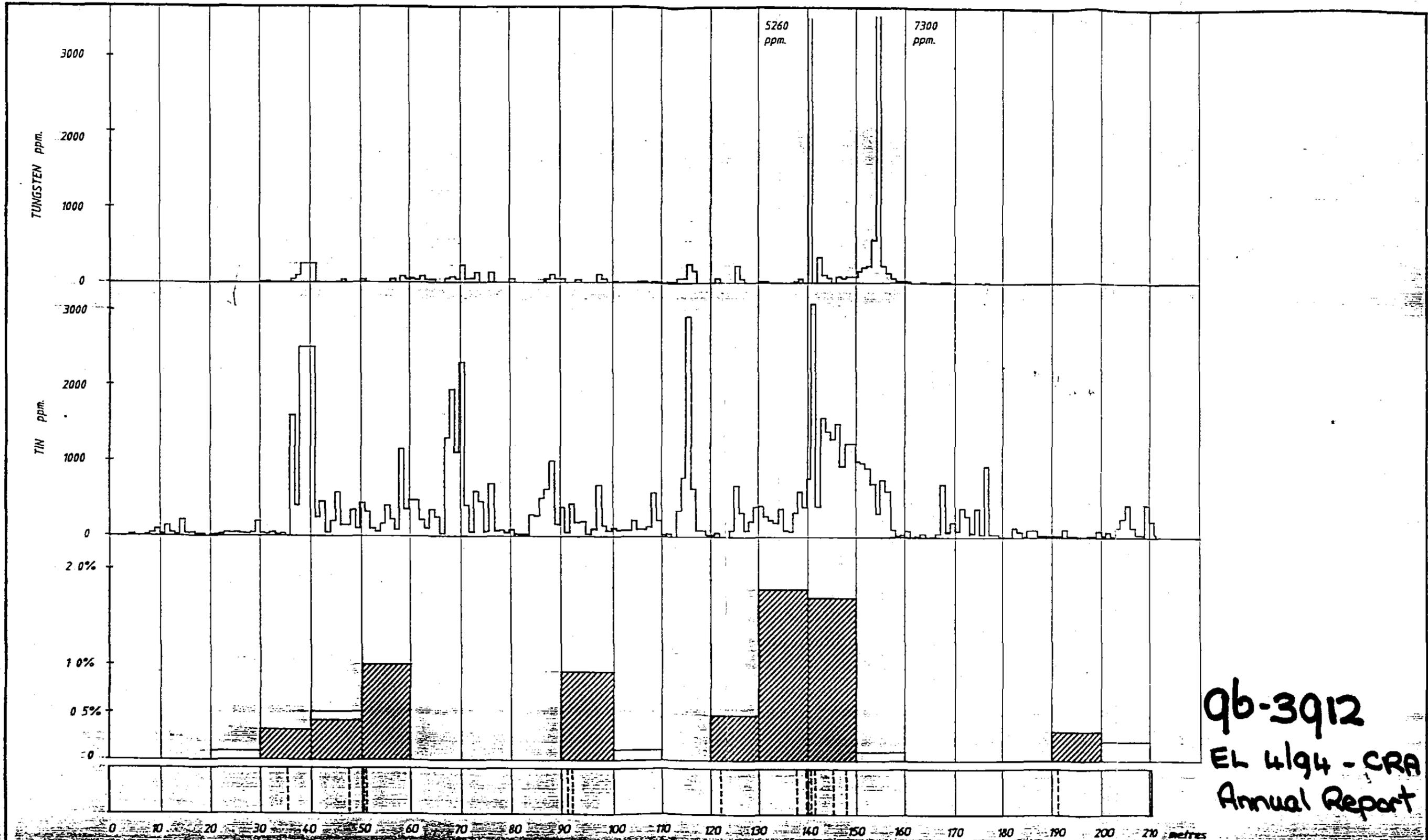


96-3912

ANNUAL REPORT - EL4/94 - BALFOUR
CRA - P.E. MAY 1996 - S.A.MENPES



CRA EXPLORATION PTY. LIMITED	
BALFOUR AREA NORTH WEST TASMANIA DD 81 BC 6 VEIN DENSITY & ASSAY DATA	
REF.	SK55 - 3
SCALE	1 : 750
AUTHOR	T. W. D.
DATE	1 - 12 - 1982
DRAWN	R. T.
REPORT NO.	11912, 11913
TASH NO.	963



qb-3912
 EL 4194 - CRA
 Annual Report



CRA EXPLORATION PTY. LIMITED	
BALFOUR AREA	
NORTH WEST TASMANIA	
DD 81 BC 4	
VEIN DENSITY & ASSAY DATA	
REF.	SK55 - 3
SCALE	1: 750
DRAWN	R. T.
AUTHOR	T. W. D.
REPORT N°	11912, 11913
DATE	1 - 12 - 1982
TASH N°	964

Appendix 4

Rockchip Sample Ledger and Geochemical Assays

ROCKCHIP AND DRILLING CODES

22/2/1994

BMLRTHRock code as per published geological map
For time designation use:-

Q	Quaternary	M	Permian	P	Proterozoic
T	Tertiary	C	Carboniferous	A	Archaean
		S	Silurian		
K	Cretaceous	D	Devonian		
R	Triassic	O	Ordovician		
J	Jurassic	E	Cambrian		

FIELD ID

Field term for rock type
Broad groupings are:-

S	Sedimentary	I	Intrusive	C	Surficial
M	Metamorphic	E	Extrusive	O	Others

SEDIMENTARY

Scg	Conglomerate	Sls	Limestone	Sw	Wacke
Sss	Sandstone	Sdl	Dolomite	Sag	Agglomerate/mixtite
Ssi	Siltstone				
Ssh	Shale	Sch	Chert	Sbx	Breccia
Sbs	Black shale	Sif	BIF		

METAMORPHIC

Msl	Slate	Mq	Quartzite	Mmg	Migmatite
Mph	Phyllite	Mm	Marble		
Msc	Schist	Ma	Amphibolite		
Mcs	Graphitic schist	Mcs	Calcsilicate	Msk	Skarn
Mgn	Gneiss	Mh	Hornfels		

INTRUSIVE IGNEOUS

If	Felsic undiff.	li	intermed undiff.	lu	Ultramafic
Itp	Felsic porphyry	lip	intermed porph	lus	Serpentinite
Iap	Aplite	Im	Mafic undiff.		
Igr	Granite	Ido	Dolerite	Ipg	Pegmatite
Igd	Granodiorite	Igb	Gabbro		

EXTRUSIVE IGNEOUS

Ery	Rhyolite	Ean	Andesite	Et	Tuff undiff
Edc	Dacite	Eb	Basalt	Eft	Felsic tuff
				Emt	Mafic tuff

SURFICIAL (COVER) MATERIAL

Ca	Alluvium	Cit	Laterite	Csg	Gossan
Cco	Colluvium	Csp	Pisolites		
Cs	Sand	Csf	Ironstone	Ccy	Clay
Cbs	Black soil	Csi	Siltcrete		
Cg	Gravel	Cd	Calcrete	Cv	Vegetation/peat

OTHERS

Ovq	Vein quartz	Omy	Mylonite	Oms	Massive sulphide
Ovc	Vein carbonate	Obx	Breccia	Oxc	Contamination
Ovs	Vein sulphide	Of	Fault gouge	Ox	Unknown

TEXTURAL CODES

WEATHERING/SURFICIAL FEATURES

We	Weathered	Fe	Ferruginous
Bl	Bleached	Fo	Fe ox in fract
Le	Leached		

MINERALISATION/ALTERATION FEATURES

Gs	Gossanous	Vs	Vein sulphide	Al	Altered
Vn	Veined	Ds	Dissem sulph	Sl	Silicified
Vc	Vein carbonate	Fs	Fracture sulph		
Vq	Vein quartz	Bs	Banded sulph	Di	Disseminated

GEOLOGICAL FEATURES

Bd	Bedded	Fr	Fractured	Po	Porphyritic
Bn	Banded	lb	Interbedded	Sc	Schistose
Bx	Brecciated	Lm	Laminated	Sh	Sheared
Fi	Fissile (slaty)	Ma	Massive	Vu	Vuggy

DIAGNOSTIC MINERALOGY

PRIMARY MINERALISATION

Ga	Galena	Py	Pyrite	Ni	Ni sulphides
Sp	Sphalerite	Po	Pyrrhotite		
Op	Chalcopyrite	Su	Unknown sulph		

SECONDARY MINERALISATION

Ls	Lead secondaries	Cs	Copper sec.	Ni	Ni secondaries
Zs	Zinc "	Us	Uranium "		

ALTERATION/DIAGNOSTIC MINERALS

Cy	Clay	He	Haematite	Gt	Garnet
Ep	Epidote	Mt	Magnetite	Ky	Kyanite
Cc	Carbonate	Js	Jarosite	To	Tourmaline
Sd	Siderite/Ankerite	Mn	Manganese mins	Cl	Chlorite
Di	Dolomite				

COLOUR CODES

L	Light	A	Banded	M	Mottled
D	Dark				
N	Black	P	Purple	V	Green
G	Grey	R	Red	K	Pink
B	Brown	O	Orange	E	Blue
W	White	Y	Yellow	S	Silver

Balfour EL4/94
Rockchip Sample Ledger

Sample No	AMGE	AMGN	EL	Prospect	Sample type	Rock type	Alt	Min	Comments
4142264	321475	5437060	EL4/94	The Clump	CLAY	Ccy			Sample of ferruginous orange sludge near collar of DDH 3
4142266	324500	5429500	EL4/94	Murray's Reward	RKCHAN	Sbs		Py	Pyrite tends to follow coarser siltstone bands. 5m W of ore zone
4142267	324500	5429500	EL4/94	Murray's Reward	RKCHIP	Sbs		PyCp	Greenish brown alteration. 5m W of ore zone
4142268	324350	5429220	EL4/94	Tatlow's Costean	RKFLOAT	OvqOvs		Py	Lode quartz with py-arsenopy-cassiterite etc
4142269	322740	5432300	EL4/94	Blocks Prospect	RKFLOAT	Ssi	Cl	Py	Finely laminated chloritic siltstone with coarse, dissem py
4142270	324070	5429650	EL4/94	Peter's Flat	RKFLOAT	Sss		PySp	Fine gr qtz sandstone with finely dissem ?sphalerite



ANALYTICAL DATA

SAMPLE PREFIX

REPORT No.

REPORT DATE

CLIENT ORDER No.

PAGE

104165.60.11264

05/10/95

77188

2 OF 2

	SAMPLE No.	Sn	W						
METHOD		GX401	GX401						
1	4142264	<3	<10						
2	4142265	5	<10						
3	4142266	14	<10						
4	4142267	5	<10						
5	4142268	2730	1800						
-	4142269	4	<10						
7	4142270	341	60						
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24	DETECTION	3	10						
25	UNITS	pdm	pdm						

Results in ppm unless otherwise specified
- element not determined

IS = insufficient sample
SNR = sample not received

AUTHORISED OFFICER

Phone (004) 316837

14 Thirkell St. DOBEE TAS 7320

Fax (004) 316890

ANALYTICAL REPORT No.

104165.60.11264

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

INVOICE TO:

CRA Exploration Pty Limited
P.O. Box 8093
NORTHLAND CENTRE VIC 3072

ORDER No.

77188

PROJECT

DATE RECEIVED

21/09/95

RESULTS REQUIRED

ASAP

No. OF PAGES
OF RESULTS

2

DATE
REPORTED

05/10/95

No.
OF COPIES

1

TOTAL No.
OF SAMPLES

7

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
4142264/2270	RD Prep : SP033	Cu,Pb,Zn,Ag,Fe,Mn/GA140 Au,Au(51/88309 Sn,W/GX401

RESULTS
TO

Ms S Menpes
CRA Exploration Pty Ltd
P O Box 8093
NORTHLAND CENTRE VIC 3072

RESULTS
TO

Mr C Hayward
CRA Exploration Pty Limited
P.O. Box 8093
NORTHLAND CENTRE VIC 3072

RESULTS
TO

Exploration Technology & Information
Group
Information Resources
Private Bag 3 Bundora RDC
Victoria 3083

REMARKS


AUTHORISED OFFICER

ANALYTICAL DATA

SAMPLE PREFIX

REPORT No

REPORT DATE

CLIENT ORDER No.

PAGE

SAMPLE PREFIX		104165.60.11264		05/10/95		77188		1 OF 2		
METHOD	SAMPLE No		Cu	Pb	Zn	Ag	Fe	Mn	Au	Au(S)
		GA	GA104	GA140	GA140	GA140	GA140	GA140	GG309	GG309
1	4142264	4	-	<3	61	<1	>5.00	207	0.012	-
2	4142265	13	-	7	11	<1	1.42	377	<0.008	-
3	4142266	966	-	7	33	1	2.36	202	0.011	-
4	4142267	7	-	4	42	<1	3.13	180	0.013	-
5	4142268	-	1.07	748	3776	>50	>5.00	1400	0.028	-
	4142269	1531	-	<3	161	1	>5.00	650	0.025	-
7	4142270	20	-	19	43	<1	0.89	190	<0.008	-
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24	ION	2	0.01	3	2	1	0.01	3	0.008	0.008
25	ITS	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm

Results as specified

 IS = insufficient sample
 SNR = sample not received

 AUTHORISED
 OFFICER

ANALYTICAL DATA

SAMPLE PREFIX

REPORT No

REPORT DATE

CLIENT ORDER No

PAGE

104165.60.11264

05/10/95

77188

2 OF 2

METHOD	SAMPLE No	Sn	W						
		GX401	GX401						
1	4142264	<3	<10						
2	4142265	5	<10						
3	4142266	14	<10						
4	4142267	5	<10						
5	4142268	2730	1800						
-	4142269	4	<10						
7	4142270	341	60						
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24	DETECTION	3	10						
	UNITS	ppm	ppm						

ppm in ppm unless otherwise specified
 not determined

IS - Insufficient sample
 SNR - sample not received

AUTHORISED OFFICER