000

439001

COMINCO EXPLORATION PTY. LTD.

EXPLORATION LICENCE 22/74,

Marionoak River Area

PROGRESS REPORT ON EXPLORATION

to July, 1976.

by

I.B. Freytag, B.Sc.(Hons)
Geologist.

Adelaide,
South Australia.

June, 1976.

CONTENTS

LIST OF MAPS

Figure 1 (in text)	Marionoak E.L 22/74, Location Plan	1:100,000
Figure 2	Marionoak E.L. 22/74, Stream Sediment Values - Cu, Pb, Zn (ppm)	1:10,000
Figure 3	Marionoak E.L. 22/74, Stream Sediment Values - Cu, Pb, Zn (ppm)	1:10,000
Figure 4	Marionoak E.L. 22/74, Stream Sediment Values - Cu, Pb, Zn (ppm)	1:10,000
Figure 5	Marionoak E.L. 22/74, Reconnaissance Geology	1:10,000
Figure 6	Marionoak E.L. 22/74, Reconnaissance Geology	1:10,000
Figure 7	Marionoak E.L. 22/74, Reconnaissance Geology	1:10,000

SUMMARY

A detailed stream sediment survey with geologic reconnaissance has commenced in Exploration Licence 22/74, in the Marionoak River - Silver Falls area. Approximately three quarters of the licence has been covered.

Several lead, zinc and copper drainage anomalies were located. The most significant is a first order Pb-Zn-Cu anomaly near Lynch Creek. Similar anomalies but of a lower order, occur near Higgins Creek and in drainages further south.

In the Silver Falls area, a linear zone of anomalies in lead only, relate to an altered acid tuff unit which is host rock to the Silver Falls prospect.

Most of the licence is underlain by a sedimentary sequence of turbidites, fine clastics and conglomerates. Acid volcanics are restricted to the Silver Falls area and the Rosebery Dam-site.

It is recommended that the licence be renewed and that the drainage survey be extended. Follow-up to the Lynch Creek and Higgins Creek anomalies is justified.

004

439005

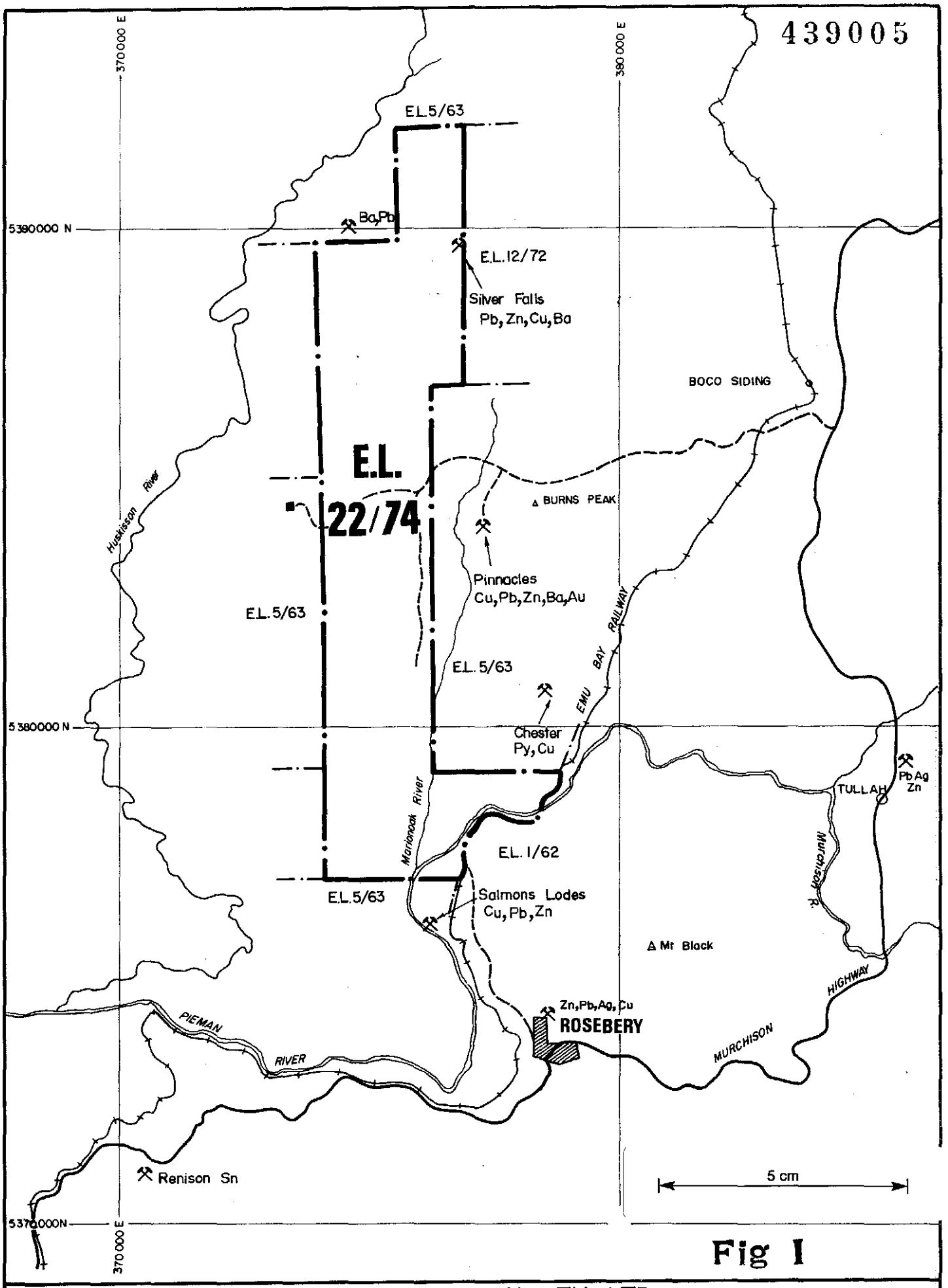


Fig 1

COMINCO EXPLORATION PTY LTD

Drawn: R.K.Y	NORTH WEST TASMANIA	Location code: K55/5+6
Traced:	MARIONOAK RIVER E.L.22/74	Scale: 1:100,00
Checked:	LOCATION PLAN	Date: December 1974
Revised: ——— Date: ———		Plate Nº MOC 1

1. INTRODUCTION

1.1 History

The Marionoak Licence area is portion of a former extensive tenement (E.L. 5/63) explored by Comstaff Pty. Ltd. Conzinc Riotinto of Australia had also covered the ground in regional surveys during the late 1950's.

In 1973, Asarco (Australia) Pty. Ltd. took tenure (E.L. 5/73) over ground which included the current Marionoak licence. Evidently very little exploration was carried out.

Apart from geological aspects published by Campana and King (1963), virtually no results of the foregoing exploration programmes are accessible.

Cominco's interest in acquiring and exploring the vacant Marionoak area arose from both direct and conceptual considerations.

Of the former, the geological disposition of mineralization on Salmon's Claim (Reid, 1918) was considered to be particularly significant. The Salmon lodes, as described by Reid, have some characteristics of the classical stratiform base metal deposit - one lode composed of banded, massive zinc-lead-silver ore, the other a parallel, subjacent lode containing disseminated pyrite and chalcopyrite.

These lodes were reported to be associated with carbonated (altered) "argillaceous schists" and "porphyroid", enclosed within dark slatey sediments. They strike north-north-west towards the southern part of the Marionoak licence (see Figure 5).

The locations of the Silver Falls prospect and the Lynch Creek prospect were known vaguely to be in the licence area. Lead-silver-barite mineralization reported by Reid at these localities justified search and evaluation.

In a more conceptual approach, it was considered that regional meridional fault structures ("Owen Rift" of Campana) passing through the Pinnacles-Silver Falls area might have produced favourable structural or palaeo-volcanic situations for mineralization in the Marionoak area.

These were the several premises for taking the licence.

1.2 Tenure

Exploration Licence 22/74 was granted to Cominco Exploration Pty. Ltd. on February 26, 1975, for an initial period of six months.

The licence has been extended twice, and presently it becomes due for renewal before August 26, 1976.

1.3 Location

The centre of E.L. 22/74 is approximately 11 km north-north-west of Rosebery (see Figure 1). The boundary of the licence is irregular and encloses an area of 37 square kilometres in a north-south strip from the vicinity of the Marionoak-Pieman River confluence to that of the Que-Huskisson confluence about 15 km to the north.

The Emu Bay Railway defines some 3 km of licence boundary on the south-east side where it parallels the Pieman River Gorge.

The Rosebery Dam, part of the Pieman River Hydro-Electric Scheme scheduled for construction during the next decade, will eventually fill the upper Pieman Gorge and submerge about 40 hectares of E.L. 22/74, as shown in Figure 2.

1.4 Topography

The topography and drainage in much of the licence area is dominated by a north-south spine (480 metres ASL) of resistant Cambrian conglomerates situated marginally inside the eastern boundary. Steeply incised dendritic drainages drop away over numerous waterfalls from the main ridge, before flattening towards the Huskisson River basin (c. 150 metres ASL).

The upper levels of the main ridge are covered with thick horizontal scrub, which gives way at lower elevation to open forest.

Two relatively flat undissected open areas occur within the licence. They are covered by button-grass, bauera and other low vegetation. Each is underlain by Quaternary boulder beds which may be largely re-worked

fluvio-glacial debris. North-west of Pinnacles Mine, a button-grass plain (440 metres ASL) defines the extent of a perched Quaternary valley remnant, while the extensive flats around the mouth of the Marionoak River north-west of the Pieman River gorge probably developed with the re-distribution of piedmont outwash.

1.5 Access

Vehicle access on the property is limited to a few graded tracks leading off the main Pinnacles-Chester road from Boco Siding (Fig. 1) and to the road along the old Tullah-Farrell Siding railway.

A vehicle may be driven from Rosebery to the south-east corner of the licence at the tailings dam, beyond which it is necessary to cross the Pieman River on foot, either at the railway bridge, or by flying-fox at the planned dam-site.

Good access to the southern end of the property will be available in 1977, with the establishment of an H.E.C. road through Farrell Siding to the Huskisson River (see Fig. 2). This will be the forerunner of the sealed highway from Tullah to the Lower Pieman Power Station via Mt. Lindsay. At the present time, the surveyed cut line for this road is a convenient walking access.

2. OBJECTIVES

Current objectives in this programme are:

(a) to carry out a blanket stream sediment survey of the licence, complementary to an airborne EM search for unknown or concealed base metal mineralization of the stratabound type reported at Salmon's Claim.

(b) to locate and evaluate recorded mineralization at Silver Falls and Lynch Creek.

(c) to develop an understanding and interpretation of the geology of the area.

3. EXPLORATION

3.1 Geochemical Work

3.1.1 Stream Sediment Survey

Sampling Programme

A blanket detailed survey of the licence area was planned. Drainage sampling was undertaken by P.J. Ashton Exploration, on contract. Thirty sampling days in the period February 14 to April 8 returned a total of 433 samples. The locations were tagged and taped in the field.

The drainage survey was based on a confluence design, to include all tributary junctions. Individual stream segments were sampled at spacings of about 250 metres.

To the present time, about 80 per cent of the licence has been covered (see Figs. 2, 3 and 4). This proportion includes the boulder covered flats around the Pieman Gorge (Fig. 5) and the Quaternary valley remnant north-west of Pinnacles (Fig. 7), neither of which are dissected by drainage.

Analytical Procedure

The minus 80 sieved fraction of each sediment sample was analyzed for total Cu, Pb and Zn in the Cominco laboratory. This is an AAS determination following perchloric acid leach. The geochemical metal values are shown on Figs. 2, 3 and 4 of this report.

Evaluation of Results

Selection of threshold values for the definition of Cu, Pb and Zn anomalies has been somewhat arbitrary, because of the complex data sets.

Inspection of the maps shows a distinctly lower background in metal values over the upper conglomerate sequence (see Figs. 6 and 7) and this is borne out by frequency distribution plots which indicate polymodal distributions particularly for Zn and Cu. However, further statistical analysis is considered unnecessary at this stage.

The following thresholds have been chosen:

	Threshold	Possibly Anomalous Values	Anomalous Values
Cu	55 ppm	55 - 70 ppm	>70 ppm
Pb	80 ppm	80 - 100 ppm	>100 ppm
Zn	200 ppm	200 - 300 ppm	>300 ppm

thus defining these anomalies:

	Number of Anomalies	Number of Possible Anomalies
Cu	5	5
Pb	25	8
Zn	22	19

Discussion of Geochemical Anomalies

The stream sediment anomalies will be discussed in five groups.

(a) Silver Falls area (see Figs. 4, 7)

A narrow linear source of Pb mineralization is inferred from stream anomalies extending along a line for 2 kilometres south from the Silver Falls prospect in Ross Creek. These anomalies are relateable to a line of outcrops of altered rhyolitic crystal tuff which is the host rock to weak mineralization at Silver Falls.

Anomalous Pb values also occur in the main channel of Ross Creek for nearly one kilometre downstream from Silver Falls. Several small side tributaries here are not anomalous.

Most of the anomalous Pb values do not exceed twice threshold for Pb. Three values exceed twice threshold and one, at Silver Falls, exceeds three times the threshold.

Copper is notably deficient in the stream values, and only a few of the corresponding Zn values approach the arbitrary threshold of 200 ppm. Analyses of three samples of tuff (87549, 87553, 87559 in Table 1) confirm that the metal associated other than Pb with the Silver Falls host rock is negligible.

GROUP		SAMPLE IDENTIFICATION							
		87536	87549	87553	87559		87533	87580	186444
ES 1	Be (1)	<1	1	1	1		10	3	3
	Co (5)	10	<5	<5	10		<5	<5	<5
	Cr (20)	100	300	300	100		100	300	300
	Ir (2)	<2	<2	<2	<2		<2	<2	<2
	Mn (5)	5	100	100	300		3000	3000	3000
	Mo (3)	10	<3	<3	<3		<3	<3	<3
	Nb (20)	<20	<20	20	<20		<20	<20	<20
	Ni (3)	50	30	10	10		50	30	30
	Os (10)	<10	<10	<10	<10		<10	<10	<10
	Pd (10)	<10	<10	<10	<10		<10	<10	<10
	Pt (10)	<10	<10	<10	<10		<10	<10	<10
	Re (10)	<10	<10	<10	<10		<10	<10	<10
	V (10)	100	30	30	10		500	500	300
	W (50)	300	<50	<50	<50		<50	<50	<50
	Ta (100)	<100	<100	<100	<100		<100	<100	<100
	Th (100)	<100	<100	<100	<100		<100	<100	<100
ES 2	Ag (0.1)	3	1	0.5	1		<0.1	<0.1	0.5
	As (50)	50	<50	<50	<50		<50	<50	<50
	Au (3)	<3	<3	<3	<3		<3	<3	<3
	Bi (1)	100	30	30	10		50	50	100
	Cd (3)	<3	<3	<3	<3		<3	<3	<3
	Cu (0.5)	100	50	10	10		30	30	100
	Ge (1)	10	<1	<1	<1		<1	<1	<1
	In (5)	30	<5	<5	<5		<5	<5	<5
	Pb (1)	200	300	100	10000		20	5	1000
	Sb (30)	30	<30	<30	<30		<30	<30	<30
	Sn (1)	50	50	10	10		3	3	50
	Ti (1)	<1	<1	<1	<1		<1	<1	<1
	Zn (20)	100	200	50	20		100	50	300
ES 3	Ba (30)	300	500	500	500		>10000	1000	1000
	Ca (20)	5000	5000	>10000	>10000		3000	3000	3000
	Ce (300)	<300	<300	<300	<300		<300	<300	<300
	La (100)	<100	<100	<100	<100		<100	<100	<100
	Sc (50)	<50	<50	<50	<50		<50	<50	<50
	Sr (30)	50	30	30	<30		300	30	30
	Ti (100)	1000	1000	3000	1000		5000	10000	10000
	Y (10)	<10	<10	<10	<10		<10	10	10
	Zr (100)	1000	300	300	300		<100	<100	<100
ES 4	Hg (30)	<30	<30	<30	<30		<30	<30	<30
	P (100)	3000	100	100	100		2000	1000	1000
	Te (20)	<20	<20	<20	<20		<20	<20	<20
ES 5	K (5)	5000	5000	3000	10000				
	Li (1)	50	30	1000	100				
	Na (50)	3000	>10000	>10000	10000				
	Cs (30)	<30	<30	<30	<30				
	Rb (10)	10	10	10	100				
ES 6	B (10)	30	10	10	10		50	30	30

TABLE 1

Semi-Quantitative Spectroscopic Scan of Rock Samples.
(see Figs. 5, 6 and 7 for locations)

(b) Lynch Creek area (see Fig. 4)

A small catchment draining into Lynch Creek from the northwest has the most intense and significant stream sediment anomaly defined in the survey.

First order values of 130 ppm Cu, 1,100 ppm Pb and 1,000 ppm Zn occur in one tributary, and second order Pb and Zn anomalies further south suggest mineralization occurs over about one kilometre. Adjacent drainages north and south have not been sampled.

The geological reconnaissance has not extended to the Lynch Creek anomalies. However, it was in this vicinity that Reid (1918) discovered a siliceous gossan (the "Lynch Creek Prospect") containing abundant oxidized pyrite, barite, galena and silver (on assay). A spectroscopic scan of the peak anomaly sediment sample (186444, Table 1) suggests also enrichment in bismuth and possibly tin.

(c) Higgins Creek area (see Fig. 3)

Six tributary streams draining north-west from the Comstaff Track ridge into Higgins Creek are anomalous in Zn, three of them also in Pb.

These are second order anomalies which indicate a north-east—south-west mineralized zone about one kilometre in length, striking obliquely across the regional strike of the underlying sediments.

The geology of the Higgins Creek anomalies has not been investigated. Outcrops of grey shale with pyrite nodules were found in the westernmost tributary where it crosses the licence boundary (sample 87536, Fig. 6). Spectroscopic scan of this sample indicates that Bi, Ag, W and In (Table 1) may be in anomalous quantities, together with Cu, Pb and Zn in syngenetic pyrite.

(d) Southern-Central anomalies

A circular drainage basin about one kilometre in diameter is situated centrally in the licence, approximately 3.5 km south of Higgins Creek.

Most of the tributaries in this basin are anomalous in Zn, three of them are anomalous in Pb, and two in Cu. Zn and Cu stream anomalies also occur 0.5 km north-west across a dividing ridge, suggesting that mineralization trends northwest-southeast for about one kilometre through this area.

Geological reconnaissance has produced no explanation for these anomalies. A prominant pointed hill near the northern rim of the drainage is underlain by highly weathered and leached igneous rock which was determined in thin section as a biotite microgabbro (sample 87580, Fig 3; also Appendix B). This evidently intrudes fine clastic sediments including greywacke.

A scan of the microgabbro (87580, Table 1) shows no associated mineralization.

Midway between the southern anomaly and Higgins Creek anomaly, a north-west flowing stream shows a significant Pb-Zn anomaly.

(e) Rosebery Damsite area (see Fig. 2)

It is significant that stream values in the Rosebery Damsite are very low (Fig. 2) despite the surrounding altered, often pyritic acid volcanic rocks (Fig. 5).

The reason probably is that valleys in this area are swampy and filled with Quaternary debris, and that samples taken are not representative of active bedrock material.

3.1.2 Experimental Barium Determinations

Fifty four sediment samples from the Silver Falls area between Ross Creek and Lynch Creek were analysed for Ba by emission spectroscopy. The aim was to investigate the use of Ba as a

pathfinder in a region where both volcanogenic and hydrothermal lode deposits are known to have barite in gangue.

Previous orientation on the Mt. Charter barite deposit suggested that dispersion may produce stream sediment values of about 5,000 ppm Ba up to several hundred metres from in situ material.

The results are inconclusive. Two distinct background levels are apparent. Values of 100-300 ppm Ba occur on the line or to the east of the Pb-anomalous tuff south of Silver Falls.

Nearly all Ba values west of this line, from sedimentary terrain, range between 1,000 and 2,000 ppm. This aspect of the programme has been discontinued.

3.1.3 Rock Sample Analysis

Several rocks which were scanned spectroscopically (see Table 1) have been referred to in section 3.1.1.
Also, a number of miscellaneous rock samples were analysed for Cu, Pb and Zn by AAS, with these results:-

Sample No.	Cu (ppm)	Pb (ppm)	Zn (ppm)
87531A	63	45	43
87531B	53	20	160
87532	80	100	31
87533	6	40	310
87538	3	30	90
87539	60	30	120
87541	11	75	100
87542	<2	20	125
87543	4	280	260
87548A	88	30	200
87548B	65	125	240
87560	6	11	80
87561	14	13	10
87562	185	145	180
87563	20	25	250

3.2 Geology

3.2.1 Previous Data

The Burnie 1:250,000 Sheet (1973) shows rocks underlying the Marionoak licence to be "unfossiliferous greywacke turbidite sequences of probable Cambrian age", and volcanics in the Rosebery

dam-site area. This sheet has drawn on maps by Groves (1971) and Taylor (1955), as well as stratigraphic data published by Campana and King (1963), and Loftus-Hills *et al* (1967).

Campana & King described a detailed section of sediments in Higgins Creek. Loftus-Hills reported on the sequence in the Pieman Gorge, along the south-east boundary of E.L. 22/74.

3.2.2. Present Survey

Field traverses were made in conjunction with the stream sediment survey.

i) Central and southern licence area.

A substantial thickness of sediments is confirmed. They strike east of north and commonly were seen to dip 50^{o} to 70^{o} east, except to the west of microdiorite and microgabbro outcrops (see Fig. 6), where there is a dip reversal.

The lower part of the sequence is composed of olive to brown, compact massive sandy and silty mudstones, subordinate reddish shales and fine-grained argillaceous micaceous greywackes. The proportion of greywacke increases upward where it includes some dark pyritic shale and siltstone units.

The upper part of the sediment sequence consists of tough, siliceous, polymict pebble and cobble conglomerates with quartzite, chert, tuff and lava clasts, interbedded with light grey, brittle, laminated siltstones, fine sandstones and minor shales.

ii) Silver Falls area.

Outcrops of iron-stained, massive quartz-feldspar crystal tuff found in creeks south of Silver Falls appear to form a narrow unit of acid pyroclastic rock enclosed on either side by sediments. The lithology is described (Appendix A) as a sodic rhyolite fragmental with ignimbritic features. Quartz sericite-chlorite-carbonate alteration occurs with sparse pyrite and galena mineralization.

The Silver Falls prospect has not been assessed geologically - reconnaissance samples were collected by the geochem. crew.

iii) Rosebery Dam-site area.

Massive greenish-grey, buff and pinkish coloured tuffs are exposed in the Rosebery Dam-site/Pieman Bridge area. They are generally sheared and variably sericitized, chloritized and pyritic. These volcanics are on strike from volcanics enclosing the Chester pyrite deposit (2 kilometres north) and they appear also to be a northward continuation of the Primrose Pyroclastics west of Rosebery.

The structural relationship between the east-dipping greywacke-conglomerate sequence west of Marionoak River, and volcanics at Rosebery Dam-site, Pinnacles and Silver Falls has not been determined. It is unlikely the volcanics are younger than the conglomerate sequence and therefore a fault break between them is inferred.

3.3 Geophysics

An airborne geophysical survey with a McPhar H-400 electro-magnetic system and Geometrics 804 proton precession magnetometer was flown over E.L. 22/74 in April, 1975. The survey was an extension of a similar programme conducted on the Mackintosh, Hatfield and Mayday licences (Webster, 1975). Technical details are included in that report.

No airborne anomalies warranting ground follow-up were defined in E.L. 22/74.

4. EXPENDITURE

The following amounts were expended on Exploration Licence 22/74 during the six months to July 6, 1976.

Geology	$4,090
Tenure	40
Geochemistry	4,772
General	123
	$9,025

5. CONCLUSIONS

i) A stream sediment geochemical survey has defined five areas with significant Pb, Zn and Cu anomalies.

ii) In the Silver Falls area, stream anomalies only in Pb, are related to an altered acid crystal tuff unit.

The geochemical response in this area is different to the western anomalies. It is indicative of lead (? + silver) mineralization which may be of a type not attractive for intensive investigation.

The source of Pb-Zn (± Cu) anomalies in the Lynch Creek-Higgins Creek area and further south is not yet known. Trends inferred from the anomalous streams suggest that locally, mineralization is present both parallel to and cross-cutting the underlying sediments. The regional trend of drainage anomalies is parallel to stratigraphy and there is a possibility that mineralization is related to pyritic units in a turbidite sequence.

Some of these anomalies warrant follow-up.

iii) The trial use of Ba in stream sediments has produced inconclusive results and more data is necessary to evaluate this approach.

In view of the high sensitivity of Cu, Pb and Zn geochemistry in the Marionoak survey, Ba has assumed less potential as a pathfinder.

iv) Geological reconnaissance has located acid volcanics in two parts of the licence. An altered crystal tuff unit is the host rock at the Silver Falls prospect.

Massive altered dacitic-rhyolitic tuffs underlying the Rosebery Dam-site may be host formation to the Chester deposit. No stream anomalies were defined. The area will be submerged eventually.

v) The licence area is generally underlain by a turbidite sequence of greywacke, mudstone, siltstone and shale including subordinate pyritic beds, stratigraphically beneath a sequence of polymict conglomerates interbedded with fine clastics.

These sediments may be part of the upper Dundas Group. The regional structure is east-dipping except for a reversal near the western lease boundary. Minor mafic rocks were probably intruded along faults.

6. RECOMMENDATIONS

Exploration results to date justify the following:

i) Application for extension of Exploration Licence 22/74 beyond August 26, 1976.

ii) Continuation of the geochemical stream sediment survey, primarily in the area between Ross Creek and Higgins Creek.

iii) Ground follow-up to two or three defined drainage anomalies, excluding Silver Falls. Lynch Creek and Higgins Creek anomalies should take order of priority.

Reconnaissance gridding is recommended in each area for soil geochemistry, geological mapping, ground magnetics, with provision for reconnaissance IP surveys where encouraging follow-up results are achieved.

iv) Geological assessment and prospecting in the Silver Falls area.

7. REFERENCES

Campana, B. and King, D.	(1963)	Palaeozoic Tectonism, Sedimentation and Mineralization in West Tasmania. J. Geol. Soc. Aust. 21 (2).
Reid, A. McIntosh	(1918)	The North Pieman and Huskisson and Sterling Valley Mining Fields. Geol. Surv. Bull 28, Tas. Mines Department.
Webster, S.S.	(1975)	Airborne geophysical Survey of an area within E.L. 2/70, (Mackintosh), E.L. 15/73 (Hatfield) and E.L. 5/74 (Mayday). Company Report CEPL.

Submitted by: _____

I.B. Freytag
Geologist.

Endorsed by: _____

L.V. Gentle
Chief Geologist.

IBF:KMW
7.7.76.

APPENDIX A

Petrological Report on Five Rocks from the Silver Falls Area

by

D. Cowan, B.Sc.,

Central Mineralogical Services Pty. Ltd.

SUMMARY

All rocks are stressed, devitrified, sodic rhyolitic fragmentals and thus extrusive.

Devitrification and (? contemporaneous) alteration has destroyed much of the finer textural detail but a few rocks are clearly ignimbritic with typical flow- or autobreccia fabrics. The main variation lies in the proportion of crystals and crystal fragments present.

The alteration assemblage comprises quartz-sericite, carbonate (calcite-dolomite) and (minor) chlorite. Pyrite occurs sporadically and galena and sphalerite in places. Alteration/mineralisation is pre-stress.

(Refer to Figure 7 for sample locations)

REPORT CMS 76/3/5

PETROLOGICAL DESCRIPTIONS

87549 Grey rhyolitic ? fragmental, K stain negative.
TS 18501 This is a devitrified, weakly altered, and stressed sodic rhyolite and considered as a flow- or autobrecciated ignimbrite.

Variably silicified-carbonated felsitic (devitrified) quartz and albite-porphyritic angular lava clasts (300μ - 5mm) are common. These features are enclosed in micro-anhedral quartz and albite (mean 10 - 15μ) with disseminated partly corroded quartz and albite crystal fragments. The matrix is fragmental with vague clasts (to 1.5mm) outlined by a disrupted flow microbanding in places and elsewhere by discontinuous eutaxitic microfabrics. Similarly one or two of the coarser fragments contain recognisable devitrified shards (to 50μ).

Sericite is an accessory alteration phase. Discontinuous quartz-healed microfractures are disseminated throughout the section and intersect discontinuous sericite films. Fine-grained (mean 30μ) euhedral pyrite comprise perhaps 1% of the rock with a little virtually opaque cloudy ?sphalerite. Stress is reflected in the coarser grained and crystal quartz and appears to be post-sulphide.

87544 Pinkish grey rhyolitic ? crystal tuff, K stain weakly positive.
TS 18502 A devitrified weakly altered and stressed sodic rhyolite probably a lithic-vitric-crystal tuff although much of the finer textural detail is now obliterated.

Coarse (to 4mm) stressed and partly recrystallised crystals and crystal fragments of albite and quartz are common with these features enclosed in fine anhedral-interlocking quartz and albite. The matrix shows patchy variations in mean grainsize, suggestive of devitrified lithic fragments which are locally outlined by faint relict flow banding (similar to 87549). Vague shard-like features are seen sporadically particularly interstitially to the coarser crystals.

Stress is particularly marked in this rock and as in 87549 is related to quartz healed microfractures in this case with accessory K-feldspar where they intersect feldspar crystals. These features "grade" into chlorite veinlets and sporadic interstitial patches of leucoxene-stained chlorite, which. atleast in part, develops from biotite. Rare limonite patches (to 1mm) after clustered pyrite anhedra are present.

This rock conceivably represents a crystal-rich variety of 87549. Unfortunately, close comparison is negated by the stress/partial recrystallisation and obliteration of the finer textural details.

87551 Pale brown aphanitic ? rhyolite, K stain negative.
TS 18503 A devitrified, weakly altered and somewhat weathered rhyolite with the appearance of a flow-brecciated ignimbritic vitric-crystal tuff.

Slightly corroded crystals/crystal fragments (mean 400μ) of albite and quartz are sparsely disseminated throughout a matrix of very fine anhedral-interlocking quartz and albite (mean 10 - 15μ). The matrix is fragmental with vague shardy textures in places, patchy irregular flow banding and angular-subangular fragments up to 5mm in diameter. Overall textural features are similar to 87549 (and by inference 87544), although the fragments appear to have developed wholly from late flow-brecciation.

The rock is more or less pervasively stained with kaolinitic material, dusty limonite and locally with degraded biotite. Occasional quartz veinlets are seen and oxidised pyrite anhedra (max. 100μ) occur sporadically.

87553 Pinkish rhyolitic ? crystal tuff, K stain negative.
TS 18504 A stressed, devitrified but not strongly altered vitric- crystal tuff or ignimbrite. This rock is rather similar to 87544, but devoid of lithic fragmental features.

Frequent strongly stressed, partly fragmented and partly recrystallised crystals/crystal fragments of albite and quartz are present. These features are incipiently resorbed in places and locally form clusters up to 5mm diameter. They are contained in a typical fine-grained anhedral-interlocking matrix of quartz and albite with patchy relict eutaxitic textures.

The rock is weakly stained with sericite which is partly degraded to kaolin. Semi-continuous quartz veinlets with accessory carbonate occur sporadically.

87559 Grey fragmental rhyolite, K stain negative.
TS 18505 This is an altered and stressed devitrified fragmental rhyolite considered as a flow-brecciated ignimbrite, if only by analogy with the associated rocks. There are no identifiable shards and distinction from a flow-brecciated lava is thus tenuous.

Stressed crystal fragments of quartz and albite are present but are not common. The matrix, as usual, consists of microcrystalline quartz and albite typically with a very fine relict flow banding of irregular orientation and outlining angular-subangular "clasts" up to about 5mm in diameter. This could be a disrupted very fine eutaxitic fabric but there is no positive evidence.

Some fragments are extensively sericitised and crude stressed vein-like masses of sericite carbonate and quartz are common throughout the rock. These features and sericitic portions of the host rock carry fairly frequent particles of galena (max. 400μ, typically < 50μ) with minor traces of sphalerite and pyrite.

D. Cowan, B. Sc.

APPENDIX B

Petrological Report on Rock Sample 87580

Location near middle of licence, 3.5 km south of the Comstaff track.
(refer to Fig.6)

by

D. Cowan, B.Sc.,

Central Mineralogical Services Pty. Ltd.

Hand Specimen:

Thoroughly weathered, leached felsic igneous rock.

Microscopic:

This is a thoroughly weathered biotite microgabbro.

The relict fabric is gabbroic and the rock was medium rather than coarse grained (hence micro-). It consisted largely of lath-like grains of plagioclase with disseminated weakly ophitic grains of pyroxene, occasional olivine crystals and an indeterminate plagioclase-interstitial mesostasis (probably alkali feldspar, there is no relict quartz). Feldspar is now represented by fine random kaolin-illite, pyroxene by "boxworks" of limonite, limonite-stained chlorite and opal and olivine by variably Fe-stained semi-pseudomorphs of "serpentine" and montmorillonite.

Sporadic patches of vermiculite pseudomorph biotite flakes which appear to have developed at a late-magmatic stage along with disseminated poikilitic opaques (?magnetite).

439023 **Fig 2**

84-2115

REPRESENTATION OF ANOMALIES

Anomalous	Possibly anomalous	
>70ppm	55-70ppm	COPPER
>100ppm	80-100ppm	LEAD
>300ppm	200-300ppm	ZINC

NOTE: Geochemical values were determined by AAS on the -80 fraction of sediment. See plan MOC 2 for sample numbers

LEGEND

35 — Cu
50 — Pb
76 — Zn

Licence area not yet sampled May, 1976

	371/380	
	371/375	379/375

Index to adjoining sheets

COMINCO EXPLORATION PTY. LTD.

Drawn by

Traced by E.D

Checked by

NORTH WEST TASMANIA
DUNDAS TROUGH
MARIONOAK E.L. 22/74 001
STREAM SEDIMENT VALUES Cu, Pb, Zn (ppm)

Location code K 55/5

Scale 1:10,000 | Date May 1976 | Plate MOC 3/375

371000 E 2000 E 3000 E 4000 E 5000 E 6000 E 7000 E 8000 E 379000 E

5385000 N 4000 N 3000 N 2000 N 1000 N 5380000 N

Comstaff Camp

Hagan Creek

Thomas Tunnel

Burns Peck

Pinnacles Mine

Marionoak River

Chester Mine

E.L. 22/74

5 cm

LEGEND

Licence area not yet sampled May 1976

Index to adjoining sheets

371/385 | 371/380 | 371/375

439024

See Plate MOC 3/375 for references

Fig 3

84-2115

COMINCO EXPLORATION PTY. LTD.			
Drawn by	Traced by E.D.	NORTH WEST TASMANIA DUNDAS TROUGH MARIONOAK E.L. 22/74	002
Checked by		STREAM SEDIMENT VALUES Cu, Pb, Zn (ppm)	
Location code K55/5		Scale 1:10,000 / Date May 1976 / Plate MOC 3/380	

371000 E
2000 E
3000 E
4000 E
5000 E
6000 E
7000 E
8000 E
379000 E

5390000 N
9000 N
8000 N
7000 N
6000 N
5385000 N

Ross Creek

Silver Falls Prospect (Pb, Zn, Ag, Ba)

Old costean

Lynch Prospect (Pb, Ag, Ba) reported in this vicinity

EL 22/74

Elk Lynch Creek

Huskisson River

439625

Fig 4

See Plate MOC 3/375 for references

84-2115

LEGEND

Licence area not yet sampled May, 1976

Index to adjoining sheets

371/390
371/385
371/380

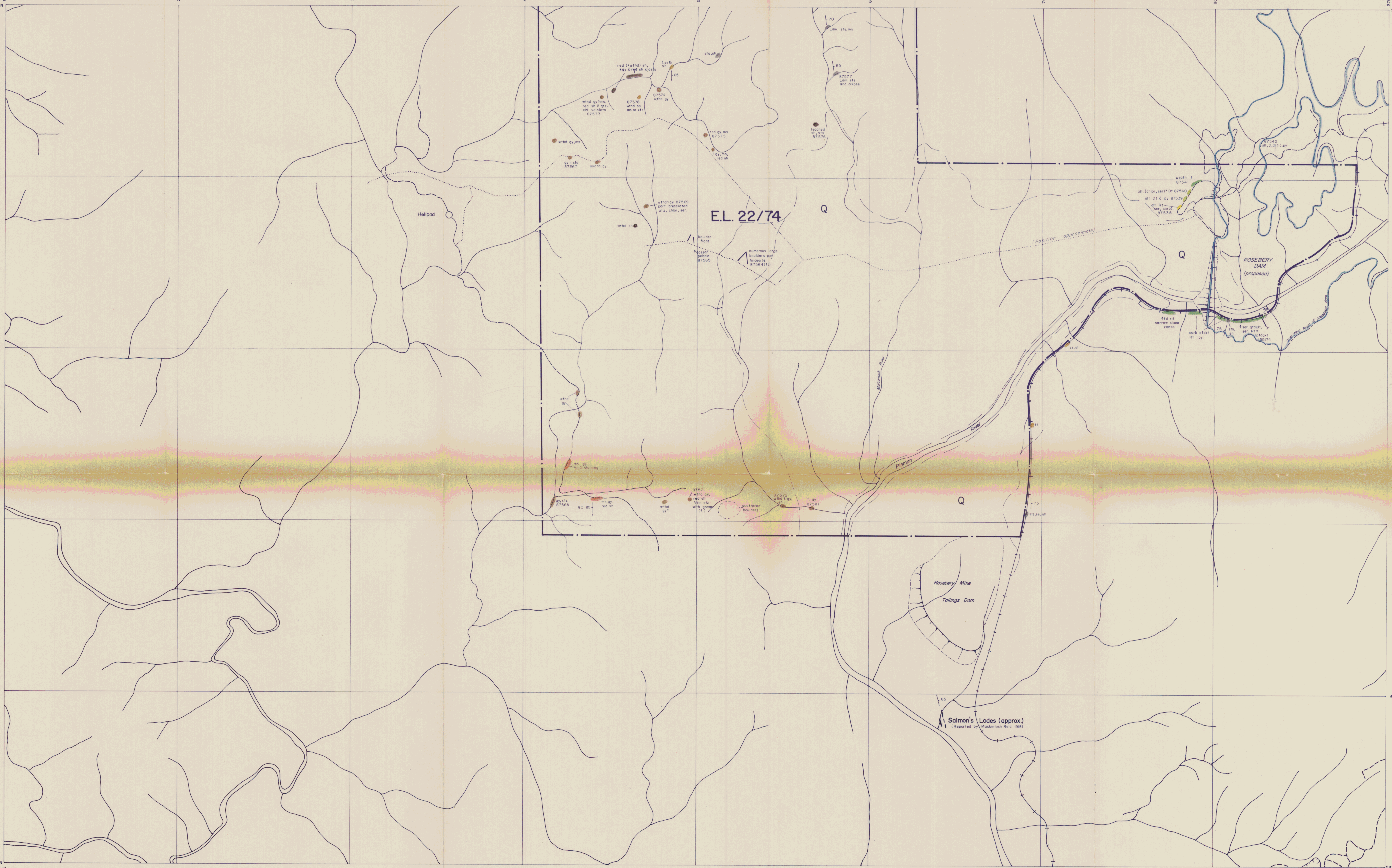
COMINCO EXPLORATION PTY. LTD.

Drawn by | Traced by E.D.
Checked by

NORTH WEST TASMANIA
DUNDAS TROUGH
MARIONOAK E.L. 22/74
003

STREAM SEDIMENT VALUES Cu, Pb, Zn, (ppm)

Location code K55/5 | Scale 1:10,000 | Date May 1976 | Plate MOC 3/385



LEGEND

Q	Quaternary piedmont valley and plain deposits (approximate extent)	co	Conglomerate	ms	Mudstone	q	Quartz
R	Rhyolite (-ic)	ss	Sandstone		Black Shale	fd	Feldspar
D	Dacite (-ic)	gy	Greywacke	t	Tuff	x	Crystal
		sts	Siltstone	p	Pumice	l	Lithic
						carb	Carbonated
						ser	Sericitic

py	Pyrite (-ic)
chlor	Chloritic
wthd	Weathered
alt	Altered
brecc	Brecciated
87561	Rock sample collected
(fl)	Float
— — —	Vehicle track
	Walking track

5 cm

371/380
371/375 379/375
Index to adjoining sheets

439026
Fig 5
84-2115

COMINCO EXPLORATION PTY. LTD.

Drawn by I. B. F.
Traced by P. F.
Checked by

NORTH WEST TASMANIA
DUNDAS TROUGH
MARIONOAK E.L. 22/74
Reconnaissance Geology

0 004

Location code K55/5
Scale 1:10,000
Date June 1976
Plate Moc 5a

371000 E 2000 E 3000 E 4000 E 5000 E 6000 E 7000 E 8000 E 379000 E

5385000N

4000 N

3000 N

2000 N

1000 N

5380000N

Comstaff Camp

Burns Peak

Marionoak River

hematitic chert (fl) 87561

sh C py nodules 87536

hematitic chert (fl) 87560

E.L. 22/74

Mn stained brecc sh 87563 (fl)

87580 wthd biotite microporphyro

87583 wthd sh

87582 gy

87579 gy

wthd fss

sts, sh

87584 sts, gy

v wthd ? sts ? (brecc)

439027 Fig 6

84-2115

371/385 | 371/380 | 371/375

Index to adjoining sheets

5 cm

COMINCO EXPLORATION PTY. LTD.

Drawn by I.B.F. | Traced by P. F.

Checked by

NORTH WEST TASMANIA
DUNDAS TROUGH C 005
MARIONOAK E.L. 22/74
Reconnaissance Geology

Location code K55/5 | Scale 1:10,000 | Date June 1976 | Plate Moc 5b

439028

Fig 7

84-2115

COMINCO EXPLORATION PTY. LTD.

Drawn by I.B.F.
Traced by P.F.
Checked by

NORTH WEST TASMANIA
DUNDAS TROUGH
MARIONOAK E.L. 22/74
Reconnaissance Geology

006

Location code K55/5
Scale 1:10,000
Date June 1976
Plate Moc 5c