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LEAD ZINC POTENTIAL IN THE MATHINNA BEDS
OF NORTH EAST TASMANIA

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1. RECOMMENDATIONS

It is recommended that the following work be completed in order of priority as follows:

1. a field inspection of the North Scamander Lead-Zinc Prospect, currently held by BHP, be conducted to assess the potential for discordant Cobar style ore shoots at the prospect.
2. the aeromagnetic and electromagnetic data flown over the Scamander-Mathinna-Mangana region by EZ Industries be assessed for the presence of Elura thumbprint style anomalies or anomalous trends indicative of pyrrhotite-magnetite of formational nature in the Mathinna Beds
3. a detailed stream sediment and soil sampling programme be implemented along the western lutite belt of the Mathinna Beds.
4. an aeromagnetic survey be conducted across areas of Mathinna Beds not previously covered in an attempt to identify pyrrhotite or magnetite bearing zones in the arenaceous association.

2. CONCLUSIONS

- 2.1 The Lower Palaeozoic Mathinna Beds of north east Tasmania are of turbiditic sandstone and siltstone which accumulated in a trough fed by sediment derived largely from a provenance in central Tasmania. The earliest sediments are of Ordovician age muds, with silts and sands, which are interpreted to be a facies

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equivalent of Ordovician age Gordon limestone now found in the Beaconsfield area to the west of a major structural break along the position of the Tamar River Valley (Figure 1).

2. The early muds, now forming a "lutite" association in the western part of the Mathinna Trough contain pyritic black shale and minor phosphate along breccia zones. Although lead-zinc occurrences are not known, this lithology, together with proximity to a structural disturbance centred along the Tamar River Valley, suggests that an environment suitable for the accumulation of stratabound shale hosted lead-zinc is present and warrants grass roots investigation.
3. Lead-zinc has been investigated in detail only in the eastern part of the Mathinna Trough at Scamander. The results of exploration, including a diamond drill hole, suggest that the occurrence is of shear controlled siliceous hydrothermal mineralization related to zoning around a granite margin. Resources appear to be less than 0.5 Mt of 6% Pb/Zn. However, the presence of magnetite with copper, lead and zinc sulphide is unusual for the Mathinna Beds and further work is warranted before a magnetite-pyrrhotite association of the Cobar type can be completely discounted; concealed targets may be present. An analysis of previously flown aeromagnetic and electromagnetic data is needed.
4. The regional potential for lead-zinc in the predominantly arenaceous turbidite sequence is not rated highly. Stratigraphic correlation with Victorian Ordovician to Devonian sequences is tenuous, but a link between the Melbourne and Mathinna Troughs is given in the published literature. It is proposed here however, that the Mathinna Trough correlates with the Wagga Trough and

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that there may be a relationship between the Silurian and Lower Devonian mineralization in eastern Victoria and that at Scamander. However, volcanics have not been identified in the Siluro-Devonian of eastern Tasmania and erosion levels in eastern Tasmania may be sufficiently deep to preclude preservation of volcanics comparable to those of eastern Victoria.

3. INTRODUCTION

North east Tasmania (including Flinders Island) is generally regarded as a tin-tungsten province rather than a lead-zinc province. There are few lead-zinc occurrences and no lead-zinc mines of any consequence have been worked. However, some features of the principal sedimentary basement sequence of Ordovician-Devonian rocks, known as the Mathinna Beds, suggest that the potential for economic lead-zinc should not be discounted without some study of evidence. The Mathinna Beds are similar in age and lithology to rocks which host the Cobar and Elura deposits in NSW and in a few features are similar to rocks which host stratabound and stratiform lead-zinc deposits in shales in western Canada.

This review of the Mathinna Beds was undertaken on instructions from Rowley Brunker and Peter Paizes with the objective of specifying the accumulation environment of the sediments, establishing style of known lead-zinc mineralization, estimating the potential for stratabound lead-zinc and designating Pb-Zn exploration targets. Published data of the Geological Survey of Tasmania and open file exploration licence results for lead-zinc exploration in north east

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Tasmania have been reviewed and collated herein. Field examinations will be the subject of a subsequent report.

4. REGIONAL GEOLOGY

The regional geology of north east Tasmania is relatively simple with a basement of Ordovician to Devonian Mathinna Beds sediments intruded by various Devonian granitoids some of which are tin-tungsten bearing (Figures 1 and 3). Flat-lying faulted Permo-Triassic sediments unconformably overlie the basement rocks. Redistribution of eroded highlands rock occurred in Tertiary time to give important eluvial and alluvial tin deposits. Minor gold and tin-tungsten are the only commodities of significance won from the basement rocks. The regional geology is described in numerous publications; the Devonian granites have received detailed research attention. Only the Mathinna Beds are reviewed in detail below.

4.1 Mathinna Beds

The Mathinna Beds consist entirely of clastic sedimentary rocks. Limestone is not known to occur and although tuff has been reported from the Lisle Goldfield, subsequent work has not confirmed the occurrence. Division into an argillaceous "lutite" sequence and a possibly younger arenaceous sequence is possible in the western part of the basin, and two belts of "lutite" are mapped (Figure 1). The upper boundary of the "lutite" with the arenaceous sequence is placed below the first major development of laminated siltstone in the Pipers River area (Marshall, 1970).

The "lutite" association contains shales and slates with sericite, quartz, clastic mica and minor chlorite with accessory tourmaline, zircon, rutile and opaques. Graphite is reported as a gangue mineral in the gold-quartz veins of the Bangor District (Marshall, 1970). At the Lefroy Goldfield quartz lodes were mined from the "lutite" association in black pyritic shale. Slates have been mined at Bangor.

The arenaceous association, which extends across most of north eastern Tasmania is of interbedded turbidite greywacke sandstone and siltstone, generally thin bedded with sandstone up to 3 m thick. The sequence is regarded as being monotonously uniform and to date there has been no attempt to subdivide the "arenaceous sequence" of Mathinna Beds. The sequence of quartz-wacke, siltstone and mudstone is poorly fossiliferous and age control is limited to two localities. The oldest beds occur near the east bank of the Tamar River where slates yield graptolites of Early Ordovician age (Banks and Smith, 1968). Near Scamander on the east coast Early Devonian graptolites occur in thin mudstone layers whereas the turbidite quartz-wacke layers contain transported fragments of marine fossils. Folds involving the Early Devonian sequences are discordantly intruded by granitic bodies of minimum age ranging from about 373 to 350 My.

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Folds trend NW and have horizontal or gently SE plunge fold axes. The folds are typically asymmetrical, long limbed with narrow flattened hinge zones. Axial surfaces generally dip south west. There is evidence for large folds with a half wave length of about 20 km. Folding indicates a tectonic transport from the south west. This direction of movement is opposite to that which resulted in folds of the similar aged Deloraine/Railton NW trend immediately west of the Tertiary Tamar Trough.

In western and central north Tasmania the narrow Cambrian troughs were filled by late Cambrian to Early Ordovician time with the deposition of shallow-marine and terrestrial Owen Conglomerate. The succeeding conformable beds are of the Gordon Limestone and the Eldon Group. The limestone, of Early to Late Ordovician age, was deposited in warm and shallow inundating seas. The Eldon Group consists of shallow-marine quartz sandstone and siltstone of Silurian to Early Devonian age.

There is no exposed transition between the shelf sediments of the Gordon Limestone and the Eldon Group of central north Tasmania, and the deeper water Mathinna Beds of a similar age range occurring east of the Tamar River. This abrupt change in sedimentary rock-type and structural characteristics between western and north-eastern Tasmania indicates that the Tamar River is the site of a major fracture along which lateral movements brought the contrasting regions into juxtaposition (Williams 1979). The degree of displacement along this fault has not been determined but Williams (1979) suggests that a flattening of late Devonian granitoids and crenulation cleavage indicates a sinistral movement of pre-Permian age.

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Unlike the situation evident for similar age rocks in Victoria, the original basin of sedimentation in Tasmania east of the Tyennan Block in the Lower to Upper Ordovician is likely to have been one of shallow shelf carbonate-limestone with a deeper water "lutite" facies, now exposed east of the Tamar Graben (Figure 2). The eastern margin of the Mathinna Beds basin presumably lies east of the current exposures of Mathinna Beds. Sedimentation of the Mathinna Beds appears to have been continuous from the Lower Ordovician to the Lower Devonian and like the Melbourne Trough, was uninterrupted by the orogeny evident at Benambra in the Eastern Victoria Trough. Like the Melbourne Trough active sedimentation appears to have ended at the onset of the Tabberabberan Orogeny and intrusion of granite in the Late Devonian (370 My). The Silurian Benambran unconformity in the Wagga Trough of Victoria is not recorded in the Mathinna Beds of north east Tasmania. In this report the Benambran event is taken to be of local nature and of insufficient significance to preclude correlation between the Wagga Trough and north east Tasmania.

Palaeocurrent data from the Pipers River Quadrangle indicate turbidity currents from the NW quadrant. This may be the result of sediment shedding from the sides of a narrow NW-trend trough and movement of clastics along the axis of the trough. However, current directions in north east Tasmania are highly variable and at Scamander they were from the SW and at Fingal from the NW.

4.2 Devonian Granitoid

Devonian granites are not described in detail herein. All granitoids show sharp contact with the Mathinna Beds and commonly have a narrow metamorphic aureole. Several major batholiths are present including the Scottsdale and Blue Tier Batholiths, each having a complex history of multiple intrusion. These batholiths reflect a deep structural erosion position for most of north east Tasmania.

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4.3 Comparison with the Cobar Trough, NSW

The Cobar lead-zinc-copper mining field has a host rock geology which bears many similarities with the geological environment in NE Tasmania. The rocks of Cobar are predominantly of turbidite facies poorly fossiliferous Siluro-Devonian sedimentary rocks overlying an older pre-Upper Ordovician basement. The Cobar Group contains several formations including a graded feldspathic greywacke siltstone, sandstone and conglomerate formation, a quartz-sericite or quartz-sericite-chlorite slate formation and a slate-siltstone formation which shows water depth facies variations. Folds are broad except in the mudstones where isoclinal folds are present. Regional cleavage is strongly developed. Although tuffaceous volcanics have been suggested for the Chesney Greywacke, a volcanic component has not been proven. A contrasting characteristic between the Cobar field and NE Tasmania is the absence of major granite intrusions near to Cobar and the presence of major granites intruding the Mathinna Beds. The Cobar Trough and the Mathinna Trough were of comparable size with a width of perhaps 100 to 200 km and an even less certain length of perhaps 500 - 1000 km. Tectonic activity outside of the immediate environs of the troughs of sedimentation and ore development commonly has an influence on the nature of mineralization in the trough. Local facies variations in the Cobar region and western NSW show some comparison with central and north east Tasmania, but on a State-wide scale show many contrasts.

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In western NSW, in the Early Ordovician, a shallow marine transgression extended over the area west of Cobar. This was flanked to the east by deep water facies of chert, greywacke, quartzite slate and minor basic volcanics in the Wagga Marginal Basin. Unlike Tasmania (judged by the preserved record) by the Middle Ordovician an andesitic volcanic arc, the Molong Volcanic Rise, was well established along the eastern margin of the Wagga Marginal Basin; both volcanics and limestone developed. Sedimentation patterns changed at the beginning of the Silurian and after intrusion of high-kinematic granites a thick litho-feldspathic greywacke shale facies was deposited in the newly formed Cobar and Cowra troughs. Thin shallow-water deposits of limestone, siltstone and sandstone developed on the Molong Rise. A feature contrasting with north east Tasmania developed in the Middle-Late Silurian with acid volcanism along rifts and arches and associated vein and disseminated iron-copper-zinc-lead sulphide and stratiform ex-halative styles of mineralization in the Mineral Hill region east of Cobar. Deep water sedimentation continued throughout the Middle and Late Silurian with thick turbidite accumulations.

The tectonic history of western NSW is complex and the above simplified notes are given to highlight the fact that in western NSW, unlike the tectonic patterns of Tasmania, volcanism was active in areas flanking the Cobar Trough and its associated turbidite accumulations. Details of Gondwanaland geology east of Tasmania require a fit of the pre-breakup geology. This is not attempted herein because it is considered that definitive data is not available.

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The Cobar mineralization is not clearly related to a granite margin but has a hydrothermal association in what appears to be a specific lithological zone; stratabound models can be constructed but evidence for syngenetic sulphide is not definitive.

It is concluded that

<u>Tectonic Feature</u>	<u>Cobar</u>	<u>NE Tasmania</u>
Extensive outcrop of granite	No	Yes
Volcanic facies present regionally	Yes	No
Periods of instability	Major	Minor
Rock exposure	Poor	Moderate

5. GEOPHYSICAL SURVEYS

The results of the few regional geophysical surveys have not been assessed. The EZ aeromagnetic and electromagnetic data of the Scamander Mathinna area which are available on open file warrant review. Figure 11 illustrates the major survey coverage in north east Tasmania. The detailed surface geophysical work in the St. Helens-Scamander district has not been reviewed.

6. LEAD-ZINC OCCURRENCES

The only "significant" reported lead-zinc occurrences are restricted to the Scamander-St. Helens Mineral District; incidental lead-zinc sulphide is reported in gold lode, tin and other minor deposits.

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6.1 Scamander Mineral District

Two publications have been produced on the Scamander-St. Helens area -

Twelvetrees, W.H. 1911 The Scamander Mineral District
Bull. Geol. Surv. Tas. 9

Groves, D.E. 1972 The Zoned Mineral Deposits of
the Scamander St. Helens District
Bull. Geol. Surv. Tas. 53

Groves (1972) concluded that a series of small discontinuous lodes cross cut the Mathinna Beds and granitic rocks and show a regional mineral zoning similar to hydrothermal deposits elsewhere (Figure 4). Wolfram and cassiterite occur in the west zone, copper deposits in the centre zone and silver-lead-zinc in the east (coastal) zone. The quartz-gold-silver veins occurring on the western extremity of the district are probably not part of the zoning. The wolfram and copper lodes are genetically related to the biotite (muscovite) granite located to the west of the mineralized area. The contact between this intrusion and the Mathinna Beds possibly extends east below the mineralization. Groves (1972) found less evidence to support a genetic relationship between the silver-lead-zinc and the granite but did suggest that the silver-lead-zinc formed an outer zone even though a spatial relationship to a granodiorite porphyry dyke which could be structurally controlled is evident. Groves maintains that the zonal arrangement is unique in NE Tasmania.

The Mathinna Beds are of turbiditic sandstone and siltstone with minor interbedded shale, dated as Lower Devonian, and belong to the arenaceous sequence. Unmetamorphosed sandstone/siltstone layers are 10 cm - 1 m thick. Less common graded, laminated mudstone beds are up to 4 m thick. Massive ungraded sandstone

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or coarse siltstone beds are up to 5 m thick. The sand grade rocks are poorly sorted with a high proportion of argillaceous or siliceous matrix. Numerous sedimentary structures of turbidity origin indicate a sediment source to the south west of Scamander.

Copper deposits occur mainly on a NW trend fault zone and include the Orieco Mine which produced about 85 tons of metallic copper (Figure 4 and 5). Gossan and supergene sulphide overlie the primary zone. The fault zone is up to 6 m wide and contained two economic ore shoots with copper grading 1.8-5.4%. Hypogene sulphides in order of abundance are pyrite, arsenopyrite, sphalerite, chalcopyrite, galena, marcasite, pyrrhotite, cubanite, bornite and tetrahedrite. Sphalerite occurs as granular interlocking aggregates in large almost monomineralic veins up to 0.15 m wide or in small patches up to 5 mm diameter in massive quartz veins and appears to replace arsenopyrite and pyrite. Galena is rare and intergrown with sphalerite. Further exploration has met with little success.

The North Scamander Prospect, located SE of the Great Pyramid Tin Mine, appears to be mineralized along partly replaced shale horizons, and partly as fracture fillings (Figure 4, 5 and 6). EZ prospected the NW trend with geophysics and geochemistry. A diamond drill hole PP 102 cut exposed mineralization 30 m down dip from surface showings (Figure 8). This mineralization contained pyrite, pyrrhotite and magnetite with galena, sphalerite and chalcopyrite and between 36.73 and 38.56 m (1.83 m) assayed 1.5% Pb, 4.4% Zn, 0.1% Cu, 34 g Ag/t 35.4% Fe. Sporadic pyrrhotite veins also occur. The

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occurrence of magnetite is unique to the area and seems to form the matrix for base metal sulphide; sphalerite is unusually free of exsolution chalcopryrite. Mortimore (1974) considered that the massive quartzites in the Mathinna Beds at the North Scamander Prospect were the result of silicification (Figure 6).

Texins further investigated this prospect and followed up EZ's work in 1973. The area was grid soil sampled (60 x 30 m) and 826 samples analysed for Pb, Zn, Cu and Ag (Figure 7). The results were not regarded by Geophoto/Texins as being indicative of significant mineralization and work was discontinued. The principal anomaly has lead values in soil of 300 - 960 ppm, zinc values of 70 - 710 ppm and copper values of 100 - 170 ppm and coincides with the magnetic anomaly and known "lode" mineralization at the North Scamander Prospect. Scattered one point anomalies of lower or comparable magnitude occur elsewhere on the 2000 m long grid. Broad "formational" trends are evident with a + 50 ppm Cu, + 25 ppm Zn and + 200 ppm Pb zone roughly reflecting a magnetite bearing "quartzite" horizon interbedded with the host sandstone-siltstone sequence. Soils are largely skeletal and the values appear to reflect in-situ bedrock metal contents. Gossans returned encouraging values or scattered locations in the anomalous zone.

NS	100	0.76% Pb	0.57% Zn
NS	94	0.29% Pb	0.24% Zn

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The assumption made by EZ and Texins, and to some extent proven by drilling, is the entirely discordant nature of the target mineralization. However, the coincidence along "strike" of geochemistry, magnetic anomaly and IP effects suggests a source bed. The possibility of a formational magnetite sulphide zone, locally modified to discordant concentrations of quartz-sulphide veins, needs review by field checking.

Silver-lead-zinc deposits in the eastern (coastal) zone occur in quartz veins in fracture zones in granodiorite porphyry dyke and to a lesser extent in the sedimentary horizons. They are typified by the presence of silver chloride (cerargyrite) and native silver in the oxidizing ore. Further assessment requires a field visit.

The Scamander River Mine workings have been inaccessible since 1893. Narrow (0.3 m) quartz galena chalcopryrite lodes and disseminated sulphide in granite assayed about 6% Pb and 69-9630 g Ag/t. Production was at least 51 t averaging 1130 g Ag/t. The quartz sulphide veins are commonly banded, particularly in arsenopyrite-pyrite rich specimens.

The Scamander Bell prospect contains two NNE lodes in a granodiorite porphyry dyke and has mineralogy similar to the Scamander River Mine.

The Beulah Mine was worked from a series of shallow shafts on two NNE lodes less than 0.3 m wide; silver was present as cerargyrite filling cavities.

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The Yarmouth Prospect in hornfels Mathinna Beds is of three narrow lodes of quartz with arsenopyrite partly replaced by pyrite, sphalerite and minor galena.

Conclusion: Several characteristics of the lead-zinc and copper occurrence at the Scamander North Prospect and the general district compare with those at Cobar. Mineralization of Cu-Pb-Zn is associated with discordant siliceous zones in an interbedded greywacke siltstone, sandstone sequence with slates. Although the area does not appear to have been rated highly as an exploration target, both EZ and Geophoto/Texins have conducted intensive surface work and EZ drilled a diamond drill hole. The results were disappointing and these companies abandoned the area which is currently held by Broken Hill Proprietary Co. Limited under EL 12/78 and EL 10/80. A field visit is needed to further assess this area but the potential for economic mineralization at the Scamander North Prospect based on data analysed to date is low.

6.2 Minor Occurrences of Lead-Zinc

SPL 107 was located about 3 km WSW of Mt. Victoria between Dan Rivulet and the Ringarooma Road: it encompassed the Una Mine in the north, Hinemoa Mine in the centre and the Strickland Mine in the south. Assays of 5% Sn, 4.8% Pb and 15 dwt Au had been reported. Geopeko established that the source was a sulphide quartz vein, 2 m x 0.5 m in Mathinna Beds arenite and pelite. Ten chip samples returned values of up to 31 dwt Au, 2.8% Pb, 2.0% Zn and only 100 ppm Sn. Arsenopyrite, marcasite, pyrite, sphalerite, chalcopyrite, covellite, galena, cuprite and pyrrhotite are present. The SPL was completely enclosed by Geophoto/Texins EL 6/68. Geopeko abandoned their interest.

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In the Avoca district galena occurs in association with sphalerite at the Rex Hill Tin Mine, in greisen at Flaherty Prospect and in similar mineralization to the south of Ben Lomond; these occurrences are of only incidental lead-zinc.

In the Mathinna Goldfield mullock heaps at the New Golden Gate mine contain quartz veins with pyrite, galena, sphalerite and chalcopyrite. In areas known to be mineralized, quartz veined and brecciated slate contains iron and manganese oxide at surface. Twelvetrees (1907) described the Scott and Pickett Mine in the Mathinna Goldfield as quartz reefs (max 0.6 m wide) containing an average of 1.5% sulphide with pyrite, arsenopyrite, chalcopyrite, galena and sphalerite. These narrow reefs, like other reefs at Mangana, Mathinna, Dans Rivulet, Alberton and Warrentinna follow a 90 km long shear zone containing en echelon faults.

None of these occurrences appears to have been explored systematically as lead-zinc targets and although the occurrences are meagre, the association with gold in the Mathinna Goldfield, as is the case at Cobar, warrants further work. Ground magnetic/aero-magnetic survey of this grass roots lead-zinc area is needed to further determine potential for Cobar style lead-zinc in the Mathinna area.

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7. PHOSPHATE OCCURRENCE

Banks (1962) conducted a systematic reconnaissance of phosphate in Tasmania and analysed 600 specimens of Palaeozoic rocks. About 12 gave a positive test.

Marakooa Caves, Mole Creek	Upper Ordovician limestone
Flowery Gully	Middle Ordovician limestone
Railton	Middle Ordovician limestone
Turquoise Bluff, Back Creek	Ordovician Mathinna Beds

Only the Mathinna Beds results are discussed here:

7.1 Mathinna Beds

Phosphate minerals are recorded from the Mathinna Beds as follows:

- . Petterd 1910 (see Banks 1962)
 - Barrendite Lyndhurst
 - Variscite (?turquoise) Back Creek and Lefroy
 - Vivianite Waterhouse (No. 1 North Pioneer Reef);
Supply Creek
 - Wavellite Australasian Slate Quarry, Back Creek,
Den, Lefroy Golconda; Scamander in quartz
reef and cleavages
- . Twelvetrees 1902 (see Banks 1962)
 - Wavellite Den Range
- . Sutherland 1964 (see Banks 1962)
 - Turquoise Australasian Slate Quarry, Back Creek
 - Wavellite

The deposits at Back Creek and Den Range occur in the siltstone "lutite" association but the provenance of the phosphate minerals from Lyndhurst, Supply Creek, Golconda Waterhouse and Scamander is uncertain.

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Back Creek - The Glen - Bangor Turquoise, variscite and wavellite occur in the quarry near the Turquoise Mine and from the Turquoise Mine as secondary deposits on joints and cleavage.

Road cuts, mine dumps and float along the SW and SE spurs of the Den Ranges just north of The Glen carry wavellite and/or turquoise in joint planes or cementing breccia; the siltstone matrix is not phosphatic. The breccia appears to occur in a zone trending NNW through black shales in the upper part of the lutite-association and lies in the central part of an interpreted dome extending from Pipers River Road to The Glen and highlighted by ridges of more resistant rock. The bedded (40 mm) fine grained siltstone is associated with thinly bedded carbonaceous pyritic void siltstone (0.1 mm). Banks considered that the "lutite" facies was deposited in the Ordovician on the continental slope or outer edge of the continental shelf as a deeper water facies of the Gordon Limestone. The phosphate occurrences may be similar to those at Mansfield, Victoria (see Legge 10066) on the western margin of the Wagga Trough. The phosphate appears to be non-bedded but it remains uncertain whether the deposits reflect the original sedimentation environment rather than subsequent Permian or Tertiary downward ground water seepage or fault zone water migration. The phosphate has no reported association with base metals.

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8. EXPLORATION FOR LEAD-ZINC

Little lead-zinc exploration has been undertaken in north east Tasmania except in the Scamander-St. Helens mineral district where surface showings are well documented. Reconnaissance stream sediment samples have been analysed in some cases for lead-zinc but only as an adjunct to tin, tungsten, molybdenum and gold survey. The most extensive survey to include lead-zinc search was that of Geophoto Resources Consultants on behalf of Texins. This work was both regional and detailed. Local base metal surveys were conducted by EZ Industries at the North Scamander lead-zinc prospect (see Section 6.1). The Mathinna Beds in the western part of the Mathinna Trough have been systematically surveyed for lead-zinc only over the Lisle Goldfield by Comalco.

8.1 Texins EL 6/68 (Mortimore 1974)

Texins Development Pty. Ltd. explored 1700 km² over the Blue Tier Batholith and adjacent regions in NE Tasmania through an associate group, Geophoto Resources Consultants. Australian Paper Manufacturers Ltd. entered a joint venture in 1970. Target metals included Sn, W, Mo, Bi, Cu, Pb, Zn, Au and radioactive elements. Exploration spanned a period of 5½ years and incorporated "grass roots" and detailed investigations. Texins appear to have left few stones unturned during their comprehensive work (Figure 11).

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Texins conducted five major surveys:

1. Regional
2. Scamander Mineral District
3. Blue Tier Batholith
4. Alluvial tin areas
5. Mathinna Goldfield

Mortimore (1974) gives a detailed review of prospect survey procedure and indexes prospect reports. The Regional and Scamander Mineral District surveys are summarized as follows:

Table 1

Summary of Geochemical Results from EL 6/68

Sample type - wet active stream sediment and some dry.
Analysed for Pb,Zn,Cu,Ag (-80 mesh), Mo and Bi (-20 mesh)

Average Values

Rock type	No. of Samples	Cu	Pb	Zn	Ag	Mo	Bi	ppm
Mathinna Beds	25	15	20	40	-	-	-	
Adamellite	25	15	20	40	-	<5	-	
Acid granite	25	25	20	40	-	<5	-	
Permian seds.	5	30	15	40	1	-	-	
Basalt	5	45	20	80	1	1	-	
Tertiary seds.	5	5	15	30	0	5	10	

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Best Values

<u>Sample No.</u>	<u>Cu</u>	<u>Pb</u>	<u>Zn</u>	<u>Ag ppm</u>	
SH 42	300*	25	30		Bills Marsh (Power Rivulet)
AB 158	280*	20	45	4	Upper Scamander copper anomaly
US 134	15	100*	15	tr	? Upper Scamander
US 135	10	150*	15	tr	"
US 90	30	150*	115	tr	"
US 5	90	220*	600*	tr	"
US 6	80	170*	500*	tr	"
AB 58	170	100*	45	3	n.a.
US 223	30	40	300*	tr	? Upper Scamander
US 97	120	70	240*	tr	"
R 6	tr	5	210*	tr	n.a.

Note: Geochemical data are presented by Geophoto on digitized plans and do not provide a detailed discussion of regional lead-zinc results.

9.1.1 Regional

- (a) Literature research and regional geology
- (b) Gamma ray spectrometry which differentiated the mineralizing tin granites of the Blue Tier Batholith and rock units not associated with mineralization
- (c) Collection of 1613 stream sediment (active wet) samples with analysis for Cu, Pb, Zn, Ag, Mo, Bi (Table 1). A few virgin anomalies were detected. Four such features were followed by detailed work:

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- (i) Upper Scamander
 - (ii) Bill's Marsh
 - (iii) Power Rivulet
 - (iv) Queen of Earth
- (d) Digital fracture analysis was used in an attempt to detect structurally anomalous areas. This work was not successful. (Figures 4 and 10).

8.1.2 Scamander Mineral District

- (a) Bill's Marsh - follow-up of SH 42 and associated samples provided no basis for further work.
- (b) Constables Creek - W,Mo,Bi,Sn veins in the contact of a denuded cupola of muscovite biotite granite
 - 5 holes 1701 ft
 - assays Cu,As,Cd,Sb,Au,Mo,Bi,W,Sn,Li
 - surface mineralization did not persist at depth
- (c) Copper Show Creek - similar to Upper Scamander copper anomaly 1 km to NW.
 - soil and rock geochemistry for Cu,Pb,Zn,Ag
 - fissure vein style
- (d) Great Pyramid Prospect - directly south of the Great Pyramid Tin Mine on which Paringa Mining Company was conducting an intensive rotary percussion and diamond drilling programme indicative of low grade large tonnage reserves. Rock geochemistry by Texins and costeans (261 samples) were assayed for Cu,Zn,Ag and also for tin with discouraging results.
- (e) Lutwyche Prospect - reconnaissance of the general Wolfram Creek area located wolframite and molybdenite in joint controlled veins in the old workings of the Lutwyche Prospect; a comparison with Storey's Creek was made.
 - detailed work including 4 holes for 2780 ft with 486 ft assayed for Cu,Mo,Bi,W,Sn; grade and width are reported sub-economic by Texins
 - (this is not the Lutwyche tin zone of Aberfoyle at Rossarden).

024

- (f) North Scamander lead-zinc prospect - this anomalous Pb-Zn area had been the subject of a comprehensive exploration programme in the early 1960's by EZ.
 - Texins detailed mapped soil and VLF surveyed
 - results are given in section 6.1
- (g) Pinnacles Tin prospect - soil geochemistry was run (90 samples) and analysed for Cu, Pb, Zn, Ag, Mo, Bi, W Sn
 - the survey encroached on Scamander Mining Co. and follow-up was not pursued.
- (h) Silver Echo prospect - Texins investigated this prospect because of its unusual po-py-cp association. Soil (20) and rock (20) samples for Cu \pm Pb, Zn, Sn were discouraging
- (i) Upper Scamander Copper anomaly - follow-up detailed stream sediment and soil geochem plus IP indicated weak anomalies but after drilling one hole to target the prospect was abandoned.

8.2 Austminex EL 16/65

Austimex collected stream sediment samples from the Blue Tier Batholith between the Avenue and Scamander Rivers in the south and the Tasman Highway to St. Helens in the north. The area was resurveyed by Geophoto-Texins.

A plan of cold extractable zinc gives the best value of 12 ppm against a background of about 3 ppm in a drainage sample from the south bank of the Avenue River.

025

8.3 Comalco EL 25/76

Comalco explored EL 25/76 (544700 mN - 5431400 mN, 521000 mE - 529350 mE) in the Lisle Goldfield and conducted a panning and stream sediment sampling programme (Figure 2). Only very fine grained gold was found in the panned concentrate. Some stream sediment samples contained + 10 ppm As. Tuff beds, reported by Reid (1926) were not located. Comalco found minor gold in a range of rock types, rather than an auriferous formation and terminated the search for stratabound gold. Twenty five stream sediment and 16 rock samples returned the following base metal assays:

	<u>Cu</u>	<u>Pb</u>	<u>Zn</u>	<u>As</u> (ppm)
Stream seds	7 - 22	11 - 24	26 - 79	1 - 44
Rock samples	8 - 150	5 - 55	5 - 95	2 - 75

A thin section of a hornfels containing cordierite and biotite with rare chalcopyrite (250 μ), apatite zircon and opaque oxides was collected at the north margin Lisle granite contact hornfels aureole.

P. J. LEGGE

026

REFERENCES

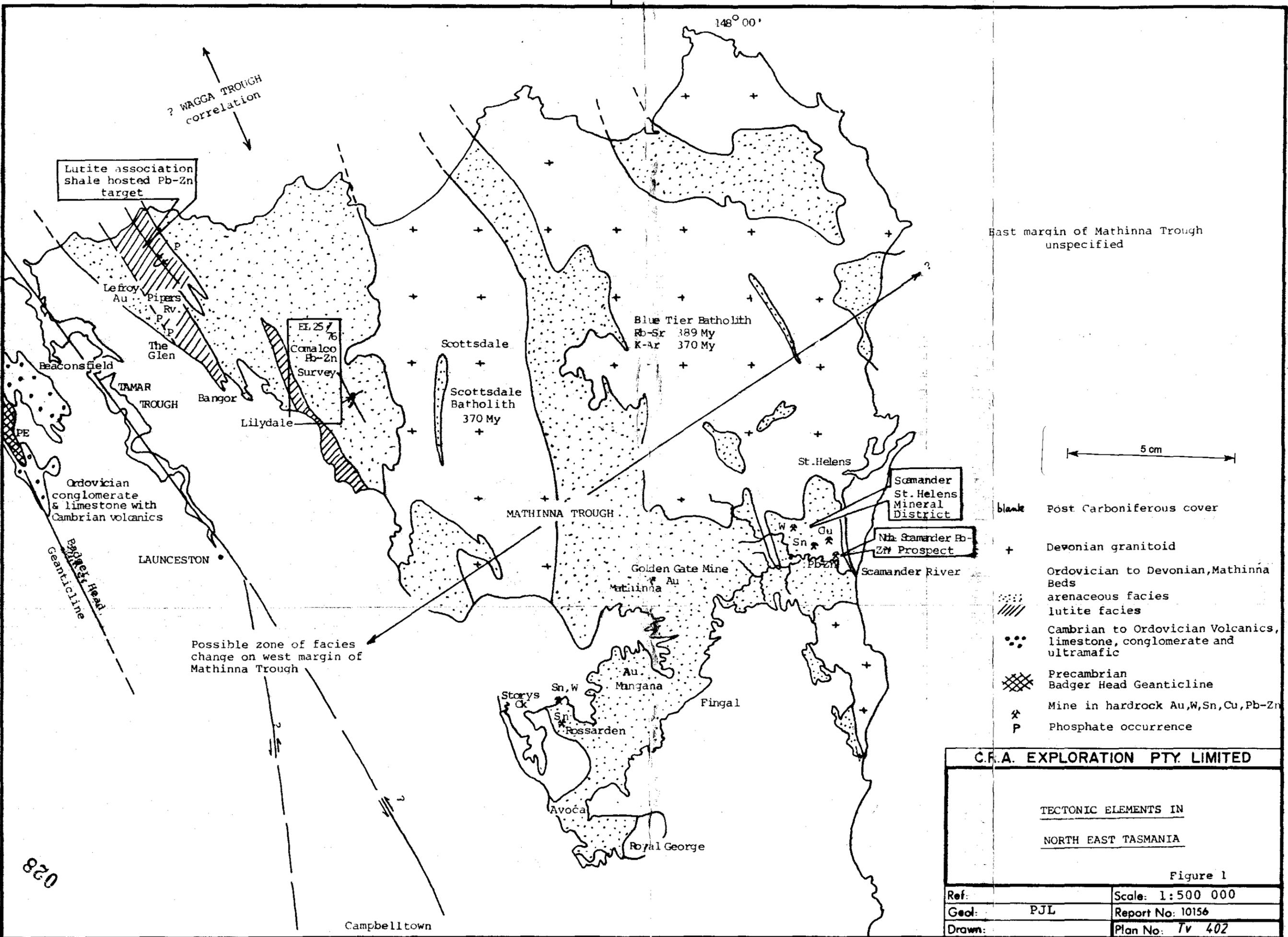
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(Revised)

027

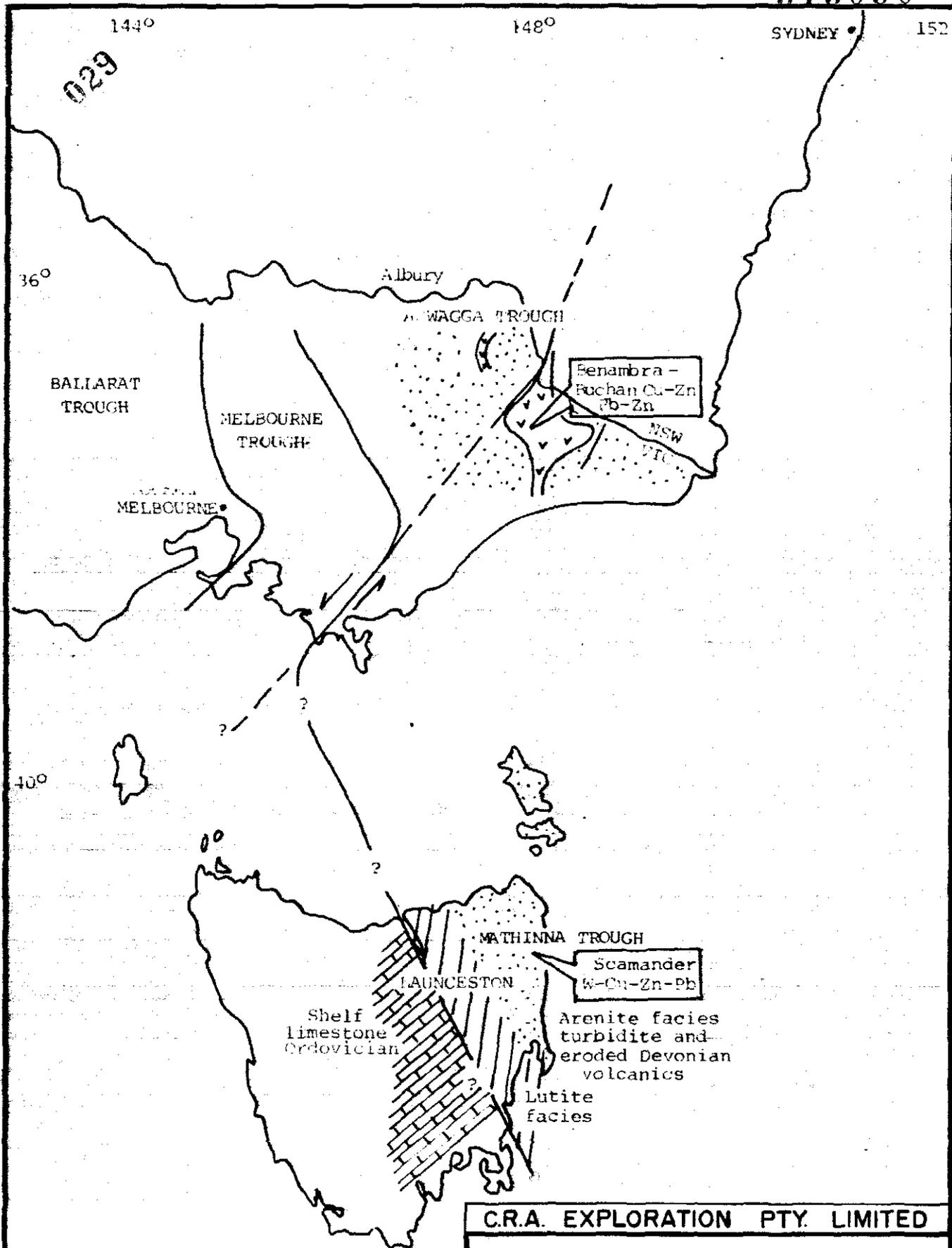
LIST OF PLANS

<u>PLAN NO</u>	<u>FIGURE NO</u>	<u>TITLE</u>
Tv 402	Figure 1	Tectonic elements in N.E. Tasmania
Tv 403	2	Sedimentation environment & correlation in the lower Palaeozoic for eastern Tasmania and eastern Victoria.
Tv	3	Geology of N.E. Tasmania Launceston 1:250 000 Geological Atlas SK 55-4
Tv 405	4	Regional geological setting North of Scamander Area
Tv 406	5	Geochemical surveys of the North Scamander Area (Texins)
Tv 407	6	Geology of the North Scamander Prospect
Tv 408	7	Geophysical anomaly and grid relationship of the North Scamander Prospect
Tv 409	8	EZ Drill Hole PP 102, North Scamander Prospect
Tv 404	9	Geophysics in N.E. Tasmania, major surveys
Tv 410	10	Geological sketch map, Upper Scamander and St. Helens area (Groves, 1972)
Tv 411	11	EL 6/68 Texins locality plan

KEYWORDS



028



C.R.A. EXPLORATION PTY. LIMITED

SEDIMENTATION ENVIRONMENT AND
CORRELATION IN THE LOWER
PALAEOZOIC FOR EASTERN TASMANIA
AND EASTERN VICTORIA

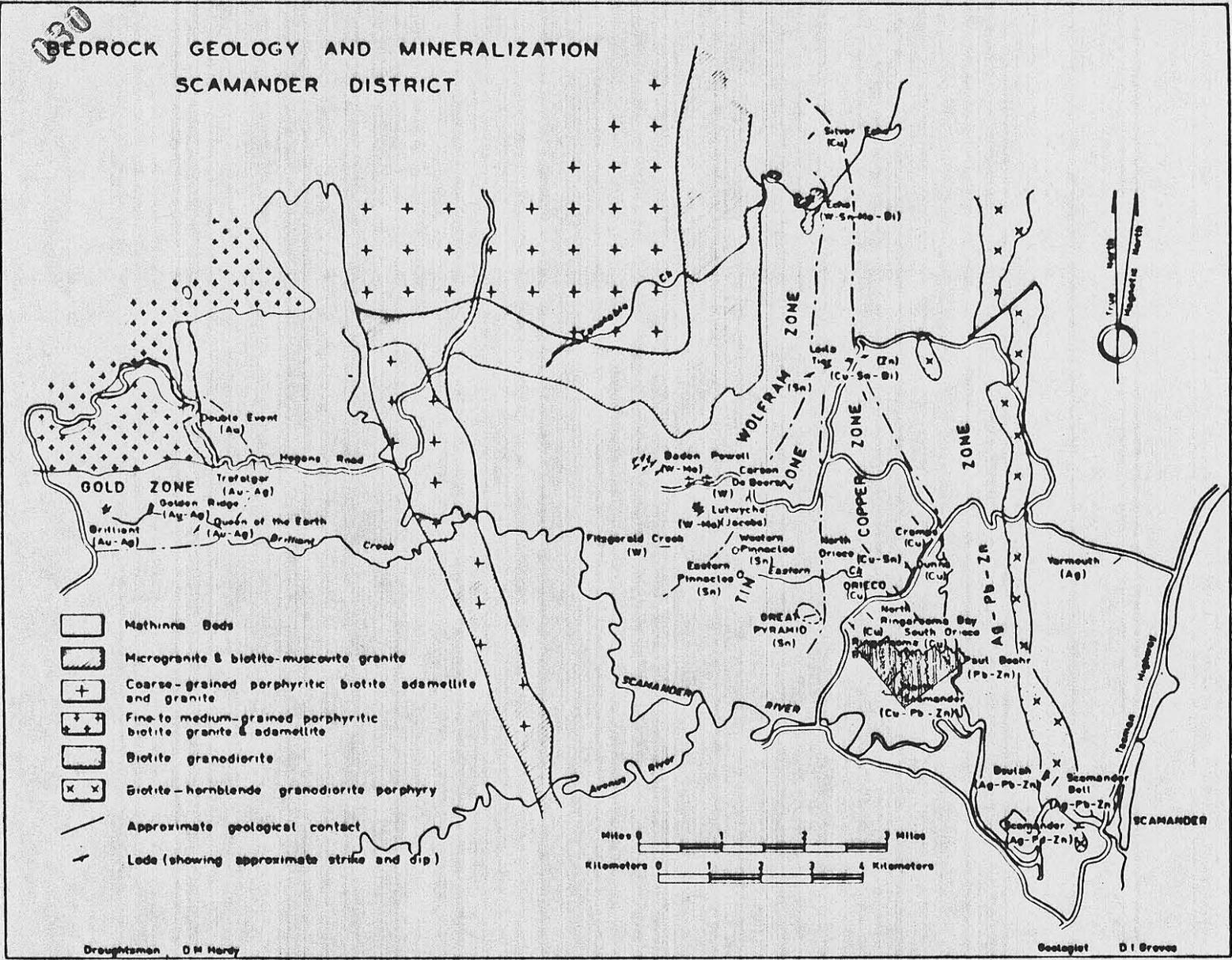
Figure 2

Geol: P.J.L.	Scale: 1:5 000 000
Drawn:	Report No: 10156
Ref:	Plan No: Tv 403

575031

030

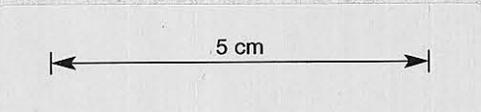
BEDROCK GEOLOGY AND MINERALIZATION SCAMANDER DISTRICT



Draughtsman D.H. Hardy

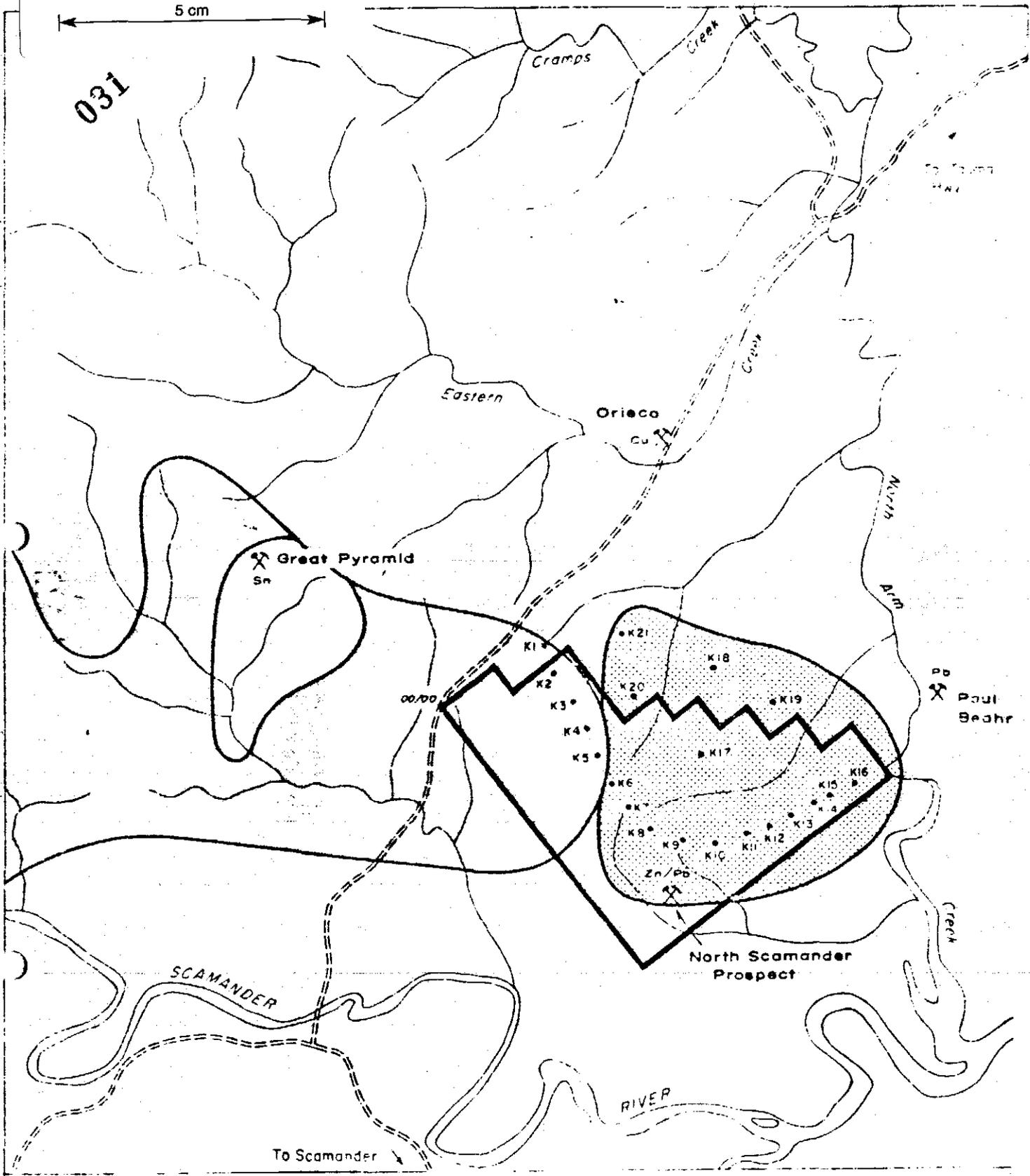
Geologist D. Groves

Regional geological setting of North Scamanda Area Plan N° Tv 405 Figure 4



5 cm

031



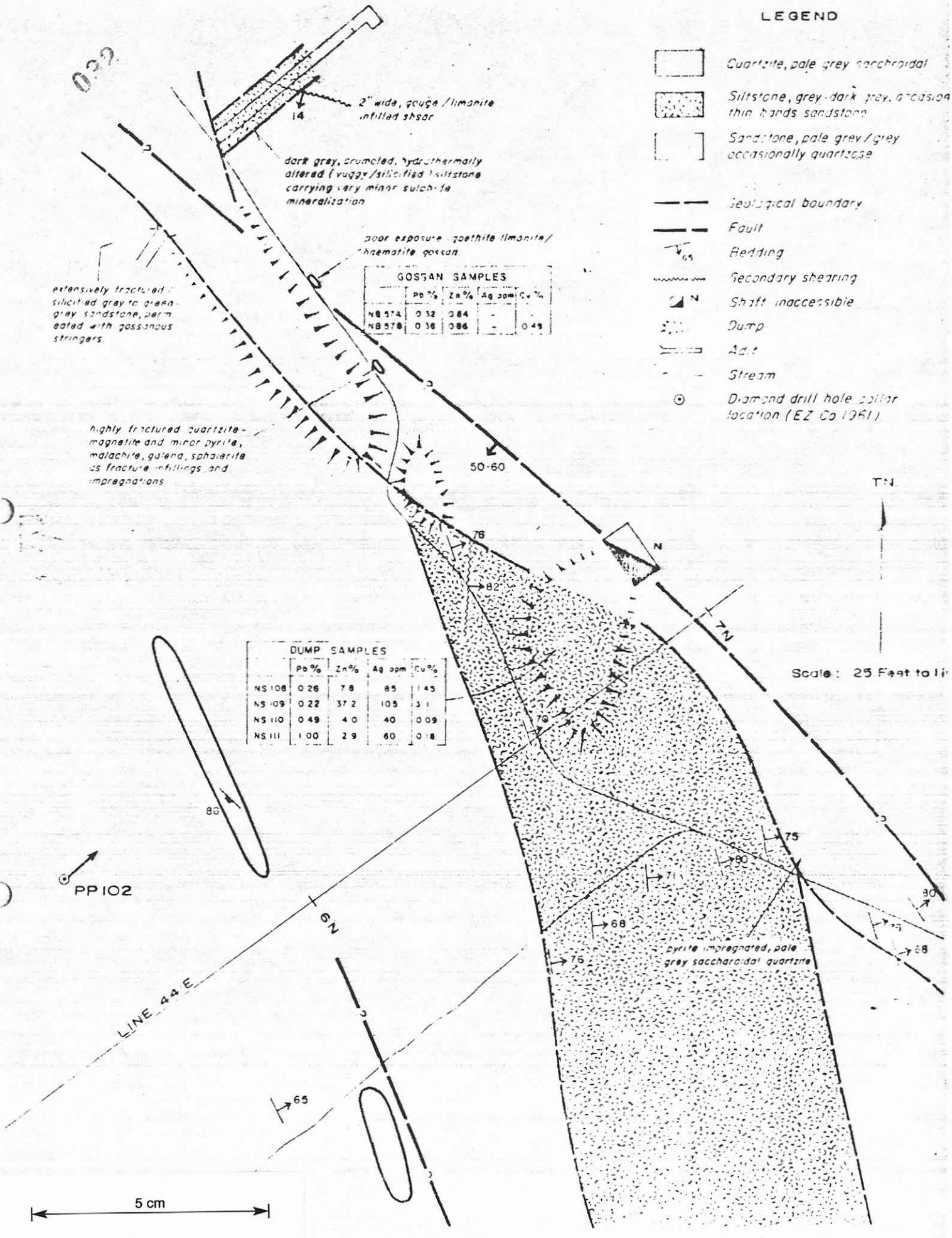
- All Preliminary ridge and spur soil and rock geochemistry
- Drainage anomaly
- ◐ Rock and soil anomaly
- ▭ North Scamander grid area

TN
Scale 1:25,000

Geochemical Surveys of the North Scamander Area

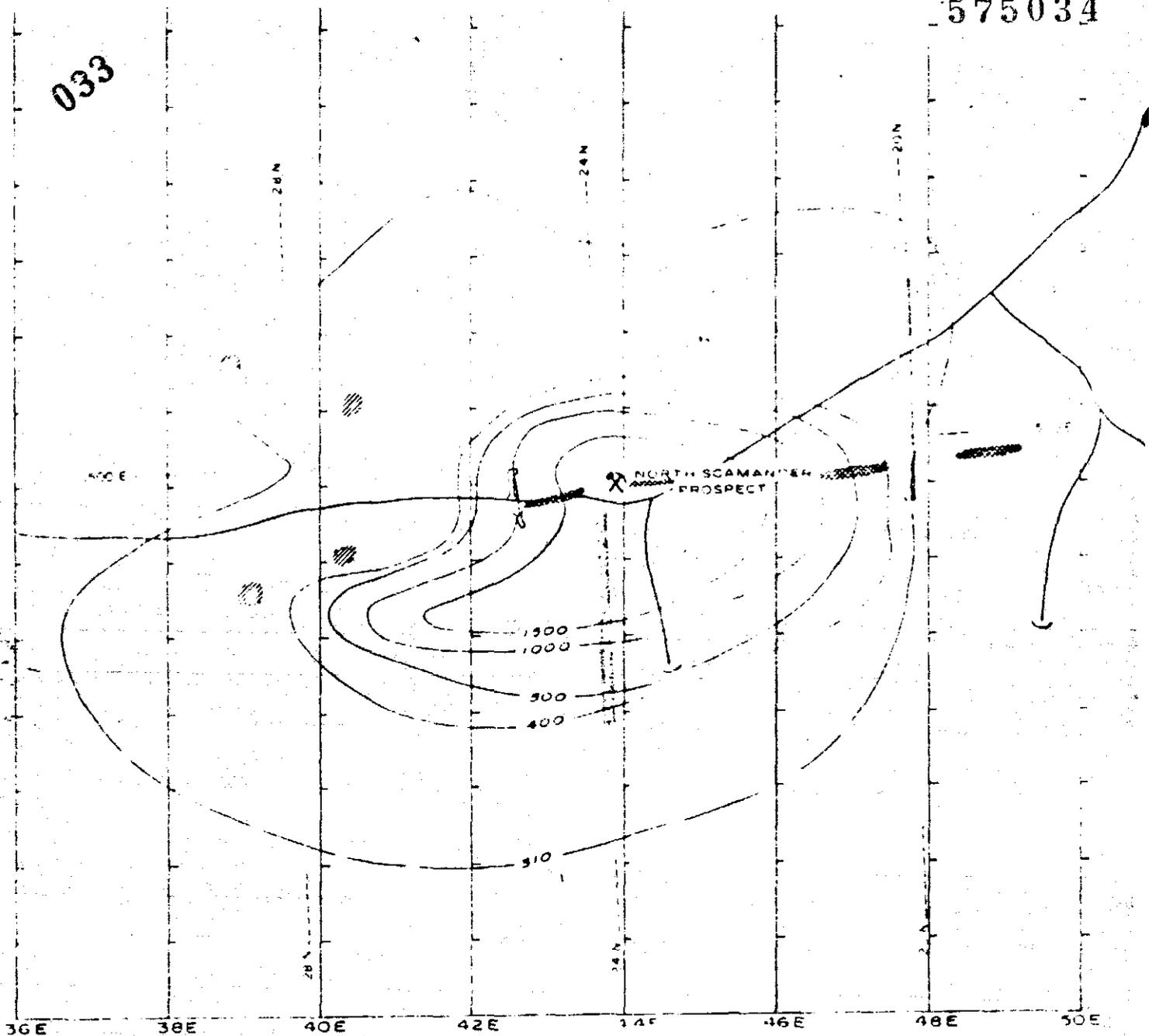
LEGEND

-  Quartzite, pale grey saccharoidal
-  Siltstone, grey-dark grey, occasional thin bands sandstone
-  Sandstone, pale grey/grey occasionally quartzose
-  Geological boundary
-  Fault
-  Bedding
-  Secondary shearing
-  Shaft inaccessible
-  Dump
-  Adit
-  Stream
-  Diamond drill hole collar location (EZ Co 1961)



Geology of North Scamander Prospect

033



E.Z. Co. Geophysical Survey 1960-61

400 Magnetic contours (gamma)

Definite conducting body

probable conducting body

I.P. anomaly

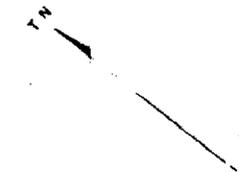
EZ Co. grid line

Geochron grid line

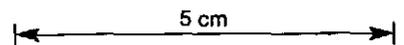
Adit

Creek

Interpretation from
e.m. traverse



Scale: 200 Feet to 1 inch



**Geophysical Anomalies and Grid Relationships
of North Scamander Area**

SOUTH WEST

NORTH EAST

034

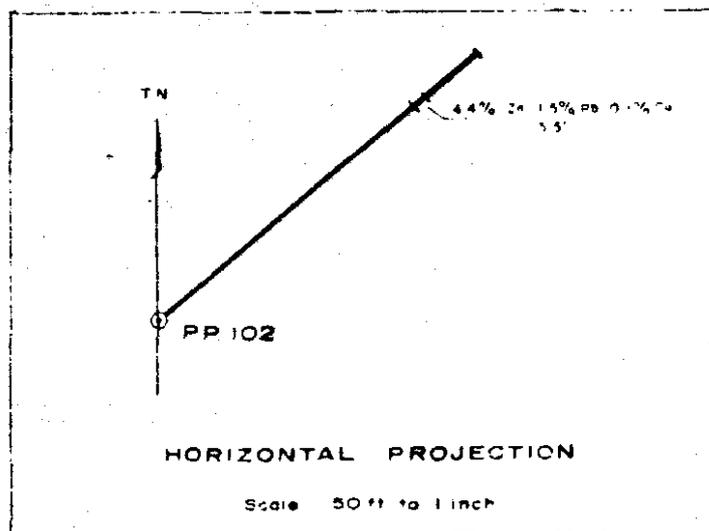
PP 102

North Scamander Prospect shaft

Sketch section of Diamond Drill Hole PP 102 compiled from E Z Co drill log

Scale: 25 ft to 1 inch

5 cm

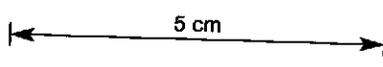


LEGEND

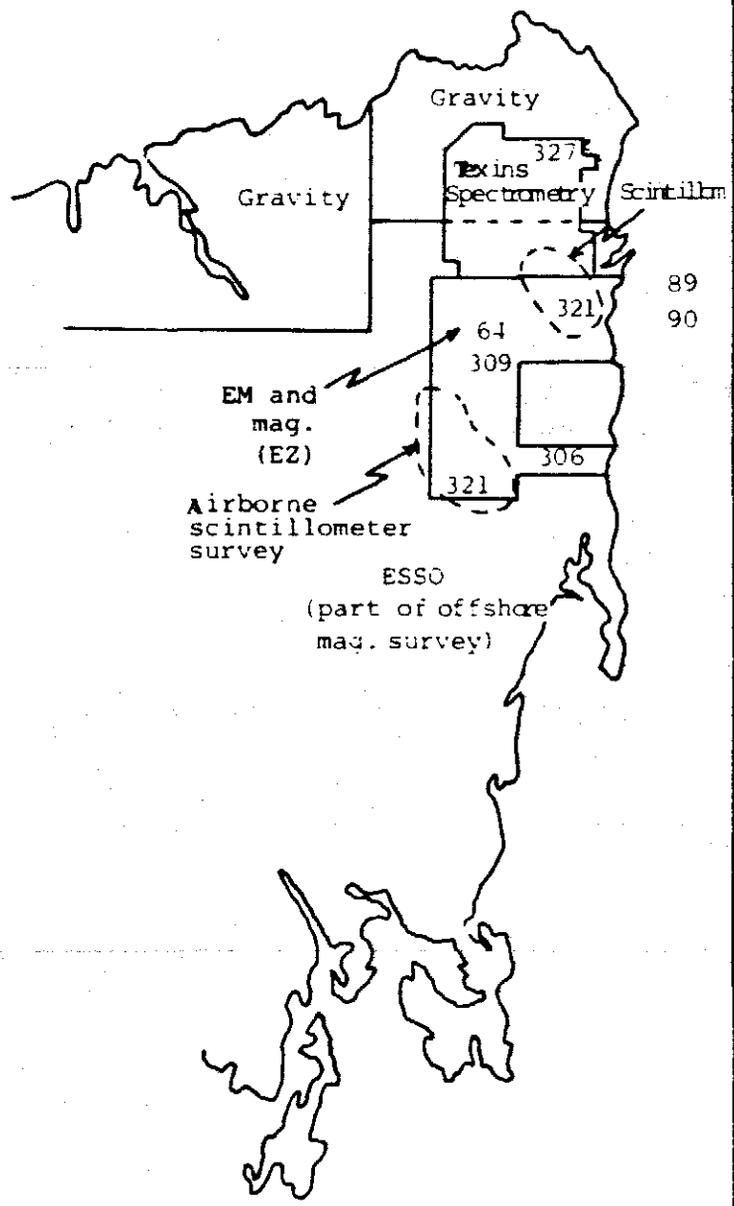
-  Dominantly sandstone
-  Dominantly siltstone
-  Interbedded siltstone/sandstone
-  Veined sulphide mineralization dominated by pyrrhotite
-  Massive magnetite mineralization carrying significant sulphide mineralization

Plan No. Tv 409

035



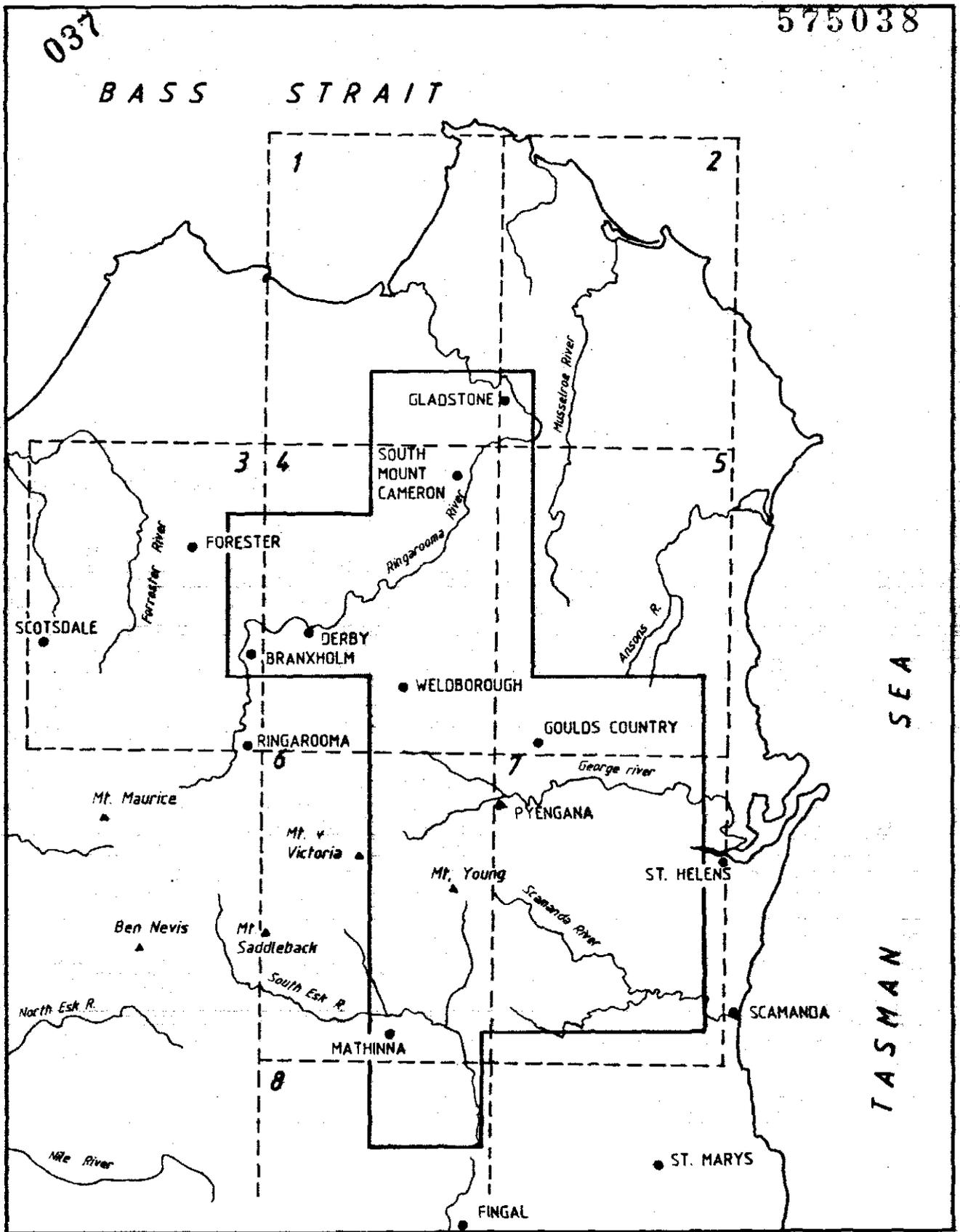
0 20 40 60 80 100 km



C.R.A. EXPLORATION PTY. LIMITED	
GEOPHYSICS IN N.E. TASMANIA MAJOR SURVEYS	
Figure 9 (After Leaman, Dept. Mines, Tas.)	
Geol. P.C.L.	Scale Shown
Drawn	Report No 10156
Ref	Plan No. 404.

037

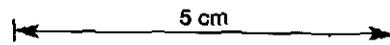
575038



LOCATION MAP AND 1: 50 000 SHEET INDEX OF EL. 6.69 N.E. TASMANIA.

SCALE 1: 500 000 — E.L. BOUNDARY - - - SHEET BOUNDARY

- Sheet 1 Tomahawk
- Sheet 2 Musselroe
- Sheet 3 Scotsdale
- Sheet 4 Derby
- Sheet 5 Fraser
- Sheet 6 Mathinna
- Sheet 7 St. Helens
- Sheet 8 Fingal



Report No. 10156

Plan No. Tv 411