NORTHERN TERRITORY GOLD MINES N.L.

ANNUAL REPORT YEAR 1
16.07.93 - 15.07.94
EL 8170

VOLUME 1: TEXT, APPENDICES

NORTHERN TERRITORY GOLD MINES N.L.

EXPLORATION LICENCE 8170

McKINLAY RIVER EAST

FIRST ANNUAL REPORT - FOR YEAR ENDING 15/7/94

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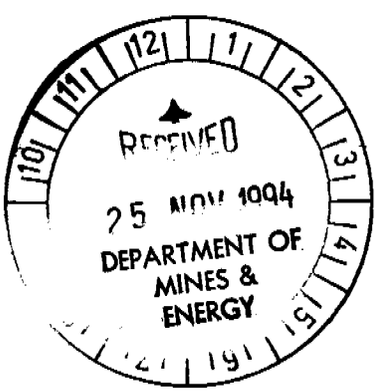

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Darwin

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SUMMARY

The licence was granted to Northern Territory Gold Mines N.L. on 16/7/93 for a period of six (6) years.

The licence area contains low-grade metasediments and metavolcanics of Palaeoproterozoic age which have been folded strongly and intruded extensively by pro-orogenic dolerite. The area has potential for gold mineralisation, particularly of the large tonnage, low grade type in quartz stockworks or complex vein systems. While no specific gold occurrences or old workings are known, small tin, manganese (-iron) and lead (-zinc) vein-type deposits do occur and appear to be fault-controlled.

Research and data compilation comprised the main exploration activities in the first year of tenure. All data were processed digitally per a Geographic Information System. Open-file records of Commonwealth and Territory government agencies were the main sources of data. A considerable amount of historical geological and exploration data was processed.

The activities in the first year have demonstrated that subsequent exploration for gold should be focussed upon structural targets with particular emphasis given to soil-covered areas in the south and anticlines plus faults in the north where outcrop is good.

INTRODUCTION

Exploration Licence (EL) 8170 of 42 one minute by one minute graticular blocks was granted to Northern Territory Gold Mines N.L. (NTGM) by the Northern Territory Department of Mines and Energy (NTDME) on 16/7/93 for a period of 6 years. The first licence year expired on 15/7/94.

The licence area is one of 11 comprising the McKinlay River project area of NTGM. The main administrative details of the licences are provided in Table 1 below.

Table 1

Details of McKinlay River ELs

EL no,	No. of blocks	Date of grant	Term (years)	Expenditure commitment	Title year
7155	4	05/12/90	6	$ 8000	4
7674	17	31/03/92	6	$ 5000	3
8055	9	27/07/93	6	$20000	1
8056	14	15/09/93	6	$30000	1
8069	36	27/04/93	6	$35000	1
8161	1	20/09/93	6	$ 5000	1
8170	42	16/07/93	6	$35000	1
8184	62	10/12/93	6	$30000	1
8228	24	31/12/93	6	$23000	1
8424	34	24/12/93	6	$20000	1
8425	3	24/12/93	3	$10000	1

Transfers of the title for ELs 7155 and 7674 from the original holder, Robert Biddlecombe were approved by NTDME on 29/10/93. Statutory areal reductions also have occurred as follows:

EL 7155 - 15 blocks originally ; first reduction 5/12/92 with 8 blocks retained ; second reduction 17/1/94 with 4 blocks retained

EL 7674 - 34 blocks originally ; first reduction 15/7/94 with 17 blocks retained

The total number of blocks in the project area is 246 of which EL 8170 comprises approximately 17 per cent.

The initial expectation of the company was that a very substantial field program in the project area would have been completed in the 1994 dry season, including a substantial component for EL 8170. However, unforseen problems with the public float of NTGM's parent company, Australian Gold Mines No Liability (AGM) on the Australian Stock Exchange caused major delays and difficulties in funding the proposed exploration program. Consequently, only research, administration and data management activities have occurred in Year 1. Considerable time, effort and expenditure has been devoted to digitising relevant technical data and establishing a Geographic Information System (GIS) for ongoing storage, processing, interpretation and presentation of such data per Ekos Research (NT) Pty Limited of Darwin. Details of the GIS are contained in the First Annual Report for EL 8069.

The main exploration target of the company is large-tonnage, low-grade, open-pittable gold mineralisation similar to that which occurs at major deposits at Union Reefs and Mount Todd. The potential for high grade gold deposits amenable to underground mining, and for base-metals deposits also will be assessed routinely during exploration. Small tin, manganese (-iron) and lead (-zinc) deposits occur in the area.

This report contains details of the geology of the licence area, the results of previous exploration plus the research and data management activities which have occurred in Year 1 and part of Year 2 (to 30/9/94).

Two small areas within the EL are excluded from tenure. These areas cover the old Rosemary Tin Mine and an unnamed lead-silver prospect to the near north of this mine. Details of the tenements which are held by other parties are as follow:

Rosemary Tin Mine

a) Mining Lease North (MLN) 37

Holder:	Michael McNally
Area:	16.19 ha
Date of Grant:	13/06/67
Date of Renewal:	30/12/87
Date of Expiry:	30/12/97

b) MLN 50

Holder:	Jimmy Ah Toy and Edward Ah Toy
Area:	9 ha
Date of Grant:	08/09/71
Date of Renewal:	Pending (application lodged 20/12/90)

Unnamed Lead-Silver Prospect

MLN 43 - 46

Holder:	As for MLN 50
Area:	9 ha each
Date of Grant:	21/06/71
Date of Renewal:	Pending (application lodged 20/12/90)

No sacred/significant sites are registered or recorded with the Aboriginal Areas Protection Authority.

LOCATION AND ACCESS

The location of EL 8170 is shown in Figure 1. The area occupied by the other ELs which with EL 8170 comprise the company's McKinlay River project area also is shown. The licence area, which has an inverted "L" shape, occurs in the central part of the total area which is held.

The approximate centrepoint of the licence area, the Rosemary Tin Mine locality, is situated approximately 50 km northnorthwest of the township of Pine Creek. Vehicle access to the area is gained most conveniently from the south via the Stuart Highway, thence via the good, unsealed road adjacent to the old

railway line and thence via the good, unsealed Burrundie Siding - Mount Wells - Mount Harris road. Part of this road traverses the central portion of the licence area. The old Mount Wells Mining Centre lies approximately two kilometres to the west of the most southern portion of the area. Access can be gained also from the west via an approximately east-west track between Ban Ban Springs homestead and the McKinlay Gold Mine (within the contiguous EL 8069) and thence south to the licence area. However, access from the west is complicated by the fact that, for much of its route, this track passes over a black-soil plain which is difficult, if not impossible, to traverse by vehicle in the wet season (particularly over the central portion of the licence area between Compass Creek in the northwest and McKinlay River in the east).

The central-northern part of the licence area can be reached by a track which leads north from Jessops Tin Mine.

SURFACE TENURE

The licence area lies wholly within Ban Ban Springs Perpetual Pastoral Lease 1111 (NT Portions 695 and 1344). This property supports beef raising.

PHYSIOGRAPHY

The principal physiographic and cultural features of the licence area are shown in Figure 2. An aerial photograph of the area constitutes Figure 3.
The licence area occurs in the catchments of the McKinlay and Mary rivers as shown by McGowan (1989). Tributaries of these rivers mark the southern-central and northern parts respectively. In the southern part of the area, drainage is to the north via the McKinlay River and one of its major tributaries, Watts Creek. In the central part of the area, drainage is to the west via tributaries of the McKinlay River. In the northern part of the area, drainage is to the north via Douglas Creek and "Douglas Creek East" and to the east via tributaries of the Mary River in the vicinity of the old Mount Harris Battery.

A major physiographic study of the region bordered by the Alligator and East Alligator rivers was undertaken by CSIRO in the period 1965 - 1969 This study

covered the licence area. Several authors, notably Williams (1969), Story (1969) and Williams and others (1969), contributed papers to a major publication which is the principal source of physiographic data in this report. Additional data have been obtained from the Vegetation Map of the NT published by the Conservation Commission of the NT ((Wilson and others, (1991)). The distributions of soil and vegetation types are shown in Figures 4 and 5.

Two major land units are recognised by Williams and others (1969). These are the dissected foothills and alluvial floodplains. The former unit occurs mainly in the northern part of the licence area and is characterised by, low hills and rubble-covered rises formed by metasedimentary rocks with intervening alluvial flats. Strike ridges also are present. Woodland and/or stunted woodland (Box and Bloodwood) occur on the hills and rises with a grassland under-story, with grassland on the flats. Soils vary from leached, skeletal types to yellow, loamy types on the elevated areas to alkaline types on the flats. The latter unit occurs in the southern-central part of the licence area and is marked by floodplains, deeply incised channels, levees and billabongs. Sands and silts occur on floodplains and in channels while areas of loamy to sandy alkaline and/or acid soils also are present. Paperbark (Melaleuca) woodland and open savannah grassland are distinctive features of this land unit.

The licence area has a monsoonal climate with an average annual rainfall in the order of 1500 mm, with most rain falling in the summer months. No waterbores are known to exist within the licence area.

REGIONAL GEOLOGY

The licence area lies within the Pine Creek Inlier (or Geosyncline). This major tectono-sedimentary unit contains pelitic and psammitic sediments with minor volcanics of Palaeoproterozoic age which developed in a basinal setting on granitic basement of Late Archaean age. The sedimentary pile subsequently was deformed and metamorphosed (mostly to greenschist facies) by the Top End Orogeny which lasted for approximately 180 Ma (1870 - 1690 Ma). Pre-orogenic sills of mafic intrusives and syn- to post - orogenic granitoids intrude the metasedimentary and metavolvanic rocks. Most granitoids were emplaced in the waning stages of the tectonism.

A voluminous literature has developed for the Inlier over more than 50 years commencing with studies by the Aerial, Geological and Geophysical Survey of Northern Australia (AGGSNA) of mine areas and their surrounds. A considerable boost to the geological studies and to exploration followed the discovery of uranium at Rum Jungle in 1948. However, it is beyond the scope of this report to review this literature and only key publications have been referenced, notably those of Walpole (1968), Ferguson (1980), Stuart-Smith and others (1986), Needham and others (1988), Stuart-Smith and others (1993) and Nicholson and others (1994) which are particularly relevant to the licence area and its near surrounds. Geological maps at 1:63,360, 1:100 000 and 1:250 000 scales with accompanying reports produced by Commonwealth and NT government agencies are major components of this extensive database. A vast amount of data has accumulated from base-metal, gold and uranium exploration programs. Studies dealing with specific features of sedimentation, tectonism, magmatism and metallogenesis also have been features of the developing literature.

Key references dealing with the mineralisation and metallogenesis of the Inlier are those of Crohn (1968), Needham (1981), Nicholson and Eupene (1984), Nicholson & Eupene (1990), Needham and de Ross (1990), Ahmad and others (1994), Ormsby and others (1994) and Bajwah (1994).

In this report, the regional geology and stratigraphic framework proposed by Nicholson and others (1994) are adopted (see Figures 6 and 7). These authors have advocated a three-fold lithostratigraphic subdivision rather than the four-fold subdivision advocated by earlier BMR authors and applied widely in recent years. The significance of rim faults around major granitic bodies also is highlighted by Nicholson and others (1994). Such faults also were postulated by authors reporting on airborne geophysical surveys of the McKinlay River area in the 1960s eg. Goodeve (1966).

The region contains mainly metasediments and metavolcanics of the Frances Creek Group namely Mundogie Sandstone, Koolpin Formation, Gerowie Tuff and Mount Bonnie Formation is ascending stratigraphic order. Pelitic and psammitic units of the overlying Finniss River Group are confined to a very small area near the Rosemary Tin Mine which is immediately adjacent to the western boundary of the licence area. BMR authors place the Mundogie Sandstone with the overlying Wildman Siltstone in the Mount Partridge Group

stratigraphically below the South Alligator Group, The latter group contains the Koolpin Formation, Gerowie Tuff and Mount Bonnie Formation in the earlier interpretation.

The Frances Creek Group is dominated by carbonaceous and commonly sulphidic shale with interbedded turbidites and varying amounts of chert, iron formation, tuff, carbonate rocks and non-carbonaceous shale of apparent pelagic origin, according to Ormsby and others (1994). Stratigraphic boundaries between the units of the group are determined by the relative abundances of the very distinctive chemical and volcanogenic sediments. Both crystal and vitric tuffs are known. The overlying Finniss River Group is a flysch sequence of greywacke, siltstone and shale. The units have undergone low-grade metamorphism (greenschist facies). Hornfelsing due to contact metamorphism associated with the components of the Cullen Bathylith, notably the Minglo Granite and the Frances Creek Leucogranite, is a prominent feature of the regional geology up to several kilometres from the margins of intrusive granitoids.

The metasediments and metavolcanics have undergone at least two phases of folding. The first phase produced tight to isoclinal, upright folds about NNW - SSE axes while a second, gentler phase produced broad, open folds about east-west axes.

Both strike-slip and cross faulting have affected units of the Frances Creek Group to significant degrees.

LOCAL GEOLOGY

The geology of the licence area is shown in Figure 8.

The area contains the full complement of units comprising the Frances Creek Group (predominantly the units of the South Alligator and Mount Partridge groups in the earlier interpretation of BMR). The units (Mundogie Sandstone, Koolpin Formation, Gerowie Tuff and Mount Bonnie Formation) are intruded extensively by the pre-tectonic sills of the Zamu Dolerite. However, for the most part, the sills are contained either within the Koolpin Formation or occur at the contact between the Koolpin Formation and the overlying Gerowie Tuff.

The main lithologies present are pelite and psammitic rock types, chert, banded iron formation, vitric and lithic tuffaceous rock types. Carbonaceous and sulphidic pelites are common throughout the sequence but occur notably in the Mundogie Sandstone (Wildman Siltstone level of BMR) and in the Koolpin Formation.

All units have undergone tight to isoclinal folding about NNW-SSE axes which are subhorizontal and plunge mainly to the north. Drag folds on the limbs near fold noses are common. The units also have undergone low-grade metamorphism and now display greenschist facies effects.

Both strike-slip and cross-faulting have affected the units considerably. Extensive hornfelsing within the contact metamorphic aureole of the Cullen Bathylith also has occurred.

The units are intruded extensively by quartz and brecciated, quartz-haematite (ex-sulphide) veins. In the latter category, both tectonic and collapse types are evident, with collapse brecciation due to the oxidation of sulphides (mainly pyrite and arsenopyrite) and consequent volume changes.

To the immediate north and west of the northwest corner of the EL lies a prominent, fault-bounded outlier of near-horizontal arenites and rudites of Mesoproterozoic age (Kombolgie Formation of Katherine River Group) which overlie unconformably the Palaeoproterozoic metasediments and metavolcanics.

Outcrop of Gerowie Tuff at grid reference 027263 was sampled by the BMR for the purpose of radiometric dating (sample number 79125004). However, a more suitable sample of a similar lithology collected elsewhere was used for the purpose ultimately and gave the date which allows a precise fix upon the crystallisation age of the volcanics which comprise the Gerowie Tuff, namely 1884 ± 3 Ma, according to Needham and others (1988).

KNOWN MINERALISATION

The former Mount Wells Policy Reserve occupied part of the licence area. This reserve, which was created in 1964 to encourage small-scale mining, was

revoked in May, 1988. The workings of the Mount Wells Mining Centre lie to the near west of the southern portion of the licence area.

The Mount Wells Tin Mine was discovered in 1879 and worked intermittently until 1929, with recorded production being approximately 100,000t grading 1% Sn. A few tonnes of hand-picked ore grading 37% Cu also were produced in 1917. The Mount Wells Battery was established in 1961 as an aid to prospecting and small-scale mining in the Pine creek district. Subsequently, the battery was upgraded and then sold eventually in 1981 to Jingellic Minerals N.L., a company which acquired title to the Mount Wells Tin Mine in 1970. Ownership of the mine and facilities then passed in 1983 to Territory Resources N.L. and a further upgrading of the plant occurred in 1985, followed by further production from three of the six lodes (approximately 5,000t of ore with grades in the range 0.3 - 0.8% Sn). Underground ore reserves in 1985 in probable and possible categories stood at some 360,000t and 375,000t of 1.5% Sn and 1.3% Sn respectively while an open-cut reserve of 400,000t of 0.4% Sn was indicated.

The nature and genesis of tin deposits in the Mount Wells region are discussed at length by Ahmad (1993).

The Rosemary Tin Mine occurs in the central part of the licence area and has been drill-tested. Six core holes were drilled by the Northern Territory Geological Survey which downgraded the potential, according to Newton and Shields (1977) and Newton (1979).

The Northern Territory geological Survey also drilled one core hole at the Lewis Manganese Mine to the near south of the Rosemary Tin Mine, again without significant encouragement according to Newton (1977).

A large claim block (68 titles) lies to the near southeast of the southern part of the licence area. The area covered by this block has been tested extensively in the recent past by costeaning and reverse circulation drilling by Kable Resources Pty. Ltd and Dominion Mining Limited.

Gold production has occurred recently from Mineral Claims covering the Touhys North and Touhys South prospects to the near northeast and east respectively of the Rosemary Tin Mine.

Sketchy information only exists for the unnamed lead prospect to the near north of the Rosemary Tin Mine. The deposit is small and of vein type (as are most of the known mineral occurrences within and/or near the licence area which invariably are localised within fault or shear zones).

No information is available on the lead-zinc prospect shown at grid reference 071311 in Figure 8. The prospect may be of considerable significance in light of the information available for the George Creek and Mary River (Gubberah Gossan) lead-zinc prospects to the near east of the Mary River which are contained within altered basalt and sulphidic-carbonaceous pelites respectively. The significant zinc contents of these prospects distinguish them from the more common quartz-galena veins in the general region (of which the PJ prospect to the immediate north of the northeast portion of the licence area is one example).

Recent drilling at the Jessops Tin Mine intersected low-grade gold mineralisation (approximately 0.5g/t) beneath tin-bearing gossans and quartz-haematite breccias ((Ahmad (1993), Orridge (1994)). The association of tin and gold, albeit an erratic one, had been shown earlier by sampling carried out by Northern Territory Geological Survey in the Mount Harris Tinfield, notably at the Big Julie Mine ((Newton, (1977)).

Mine Data Sheets for the mineral deposits within and close to the licence area are provided in Appendices 1 and 2 respectively.

PREVIOUS GEOLOGICAL STUDIES AND EXPLORATION ACTIVITIES

The central part of the Pine Creek Inlier has been the focus of many geological studies by Commonwealth and Territory government agencies and of substantial mineral exploration in recent years. The latter activities have occurred mainly in the 1980s and early 1990s and have been concentrated upon geochemical sampling (stream sediment and soil principally), being directed towards the search for one or more of gold, base-metals and uranium. Gold exploration has been the most recent. Small-scale production of tin has occurred from small mines near the licence area in past years, notably from Mount Wells.

Significant aspects of the past government work are:

- work by the Aerial, Geological and Geophysical Survey of the Northern Australia (ASSSNA) at the McKinlay Gold Mine : Hossfeld (1940)

- core drilling by by the Northern Territory Geological Survey at the McKinlay Gold Mine, Rosemary Tin Mine and Lewis Manganese Mine: Newton (1974); Newton and Shields (1977), Newton (1977) and Newton (1979)

- 1:63 360 scale geological and geophysical mapping by the BMR in the 1950s and 1960s: eg Goodeve (1966)

- detailed geophysical mapping as an aid to tin exploration and mining in the Mount Masson - Mount Harris region to the immediate south of the northern, east-west half of the present licence area: Tipper and Finney (1966)

- detailed assessment of the Mary River (Gubberah Gosan) lead-zinc deposit approximately 9 km east of the Mount Harris Tinfield: Darby (1985)

- 1:100 000 scale geological mapping by the BMR in the 1980s: Stuart-Smith and others (1986)

- detailed geological and metallogenic studies by the BMR of the Cullen Mineral Field: Stuart Smith and others (1993)

- metallogenic mapping by the NTGS of the Pine Creek 1:250 000 mapsheet area: Ahmad and others (1994)

Geological and geophysical plans provided in this report are based on BMR publications as listed above eg Figures 8 and 9.

Detailed mineral exploration has been undertaken by many title holders, both of Exploration Licences and of Mineral Claims and Mining Leases. Only exploration on past Exploration Licences has been summarised as available technical data for past claims and leases are very incomplete. Included in the past exploration activities have been large airborne magnetic-radiometric surveys, principally designed as aids to uranium exploration but with much relevance to base metal and gold exploration as well. However, the bulk of the

airborne geophysical data relates to ground to the immediate north and west of the licence area where black-soil plains are extensive.

The highlights of previous exploration activities are summarised below. In this work, the results of 1:100 000 - scale geological mapping by the BMR have been used as the starting point by most previous explorers for large amounts of stream-sediment, soil and rock geochemistry, followed by limited drilling in some cases. While low-order geochemical anomalies have been quite commonplace in the past, none has led to intensive drill testing.

The multi-client, high resolution, airborne geophysical survey flown by Aerodata in 1988 (with additions in 1991 and 1992) unfortunately covers only the southern portion of the licence area.

ATP 2226 "Mary River Joint Venture" - Australian Geophysical Pty. Limited, Kenneth McMahon and Partners Pty. Limited (1969)

- extensive radiometric surveying plus followup stream-sediment and soil geochemistry
- widespread, low-order Pb soil anomaly on MD grid
- narrow anomalous Pb zones associated with Adam Creek Fault

EL 351 - Central Pacific Minerals N.L., Pietsch (1973)

- soil and rock geochemistry for Sn mostly to the south of Jessops Tin Mine

EL 947 - Comalco Limited Chak (1975)

- stream-sediment sampling of McKinlay River and tributaries for Au (pan concentrates)
- no anomalous samples in streams draining present licence area

EL 1296, 1592 - Occidental Minerals Corporation of Australia, Swingler (1979)

- high-resolution airborne magnetic and radiomagnetic survey for uranium at contact between Palaeoproterozoic and Mesoproterozoic rocks in Mount Douglas area
- followup stream-sediment geochemistry produced Pb and As anomalies associated with the Koolpin Formation, none of which was deemed significant
- most exploration to near north and west of present licence area

EL 3121 - Aquitaine Minerals Pty. Ltd. and International Nickel Australasia Limited, D'Auvergne (1982)

- unsuccessful follow-up of stream-sediment geochemistry of Occidental Minerals Corporation of Australia over same areas

EL 4759 - Kable Resources Pty. Ltd. and Dominion Mining Limited, Burn (1988)

- extensive costreaming to northnorthwest and southsoutheast of old Watts Creek alluvial diggings by Kable plus followup mapping, sampling and reverse circulation drilling by Dominion of low-grade, stockwork - type Au mineralisation
- Southern Stockwork Zone (SSZ), Watts Creek North and Watts Creek South prospects
- current tenure as large claim block (68 claims)

EL 4944 - BP Australia Gold Pty Ltd, Walker (1989)

- followup to earlier BLEG sampling by Kennecott Explorations (Australia) Ltd
- BLEG values to 18.7 ppb
- four prospects, Hill 5, Hill 156, Central Anomaly and L82185 Anomaly delineated
- Hill 5 prospect received detailed mapping plus gridding, costeaning and induced polarisation survey followed by reverse circulation drilling (5 holes with best intercept being 6m of 0.6 ppm Au
- elevated As values associated with Hill 5 and Hill 156 prospects
- surface samples of quartz or quartz-haematite veins with values to 0.4 ppm Au

EL 5139 (Douglas Creek East) Dominion Mining Limited, Curnow and Tyson (1990)

- BLEG, silt and pan-concentrate stream-sediment plus rock geochemistry
- no significantly anomalous values
- initially part of Golden Dyke Joint Venture with Peko Wallsend Operations Limited
- most emphasis on Middle Koolpin Formation

EL 5140 (Douglas Creek West) - Dominion Mining Limited, Burn (1989)

- as for EL 5139
- BLEG stream-sediment values to 6.5 ppb Au

EL 5512 - Geopeko, Sowerby (1990)
- BLEG stream-sediment anomaly associated with faulted anticline of Koolpin Formation
- followup to earlier work by Electroytic Zinc Company of Australasia Ltd and Norgold Ltd
- BLEG values to 22.0 ppb, soil values to 106 ppb, rock values to 0.33 ppm

EL 5534 - Union Reefs Gold N.L., Mulroney (1991)
- mapping and rock sampling for Au
- several weakly anomalous samples

EL 5548 - Eastern Gold NL, Vakil (1989)
- anomalous As and Zn but no anomalous Au rock geochemistry
- two quartz-vein systems evaluated

EL 6095 (Mount Douglas) - Geopeko, Sowerby (1990)
- BLEG stream-sediment geochemistry with background levels only

EL 6143 - Trescabe Pty. Ltd; Geopeko, Jettner (1993)
- extensive soil sampling to south and east of Rosemary Tin Mine
- exploration led to the mining of the small Touhys North and South Au deposits in ironstones developed above fine-grained, sulphidic metasediments

EL 6184 - Wyrala Pty Ltd, Mining Management Services Pty Ltd (1990)
- rock sampling in Mount Harris Tinfield
- moderate As anomalies associated with gossanous, quartz-veined siltstone

EL 6185 (Watts), 6186 (Masson) - Riomin Australia Gold Limited, Penney (1990)
- earlier work by BP Australia Gold Pty Limited also relates
- BLEG and silt stream-sediment geochemistry plus follow-up rock-geochemistry
- several values greater than 3 ppb Au plus one rock value of 1.6 ppm (latter from fine-grained metasediment containing pyrite and arsenopyrite) in EL 6185
- BLEG values less than 2 ppb Au in EL 6186; also one rock value of 0.12 ppm Au

EL 6444 (Frances Creek) - Billiton Australia, Mackay (1991)
- BLEG stream-sediment geochemistry with values less than 5 ppb Au
- one rock sample with 0.17% Zn

EL 6473 - Auridiam N.L. Romanoff (1990)
- research only re Au potential

EL 7155 - self, Orridge (1993)
- summary of previous exploration by Dominion Mining Limited (EL 5139, 1987 - 89) and BP Australia Gold Limited (EL 4944, 1986 - 89)

The principal findings of past mineral exploration programs within and/or close to the present licence area are:

- a close association of tin and gold has been demonstrated in quartz and quartz-haematite (ex-sulphide) veins which invariably are related to faulting or shearing

- the Koolpin Formation and to a lesser extent, the Zamu Dolerite, have received much exploration for syngenetic, stratiform-stratabound and epigenetic, discordant (structurally controlled) types of Au mineralisation respectively, mostly for bulk-tonnage, low-grade deposits

- numerous past explorers can claim technical success in that one or more of BLEG, silt and pan-concentrate types of stream-sediment and/or soil samples has/have detected subeconomic Au mineralisation (and economic success in the case of Touhys South)

- past experience suggests that the levels of 5 ppb Au for stream-sediment samples and 50 ppb Au for soil samples are appropriate thresholds; higher than average background levels of Au in stream-sediment, soil and rock samples were encountered frequently by past explorers

- tin mineralisation invariably is fine grained eg Mount Harris Tinfield (gold often was present in tin concentrates during earlier mining). Jessops Tin Mine, Rosemary Tin Mine

- tourmaline is a common accessory in the tin-gold mineralisation

- higher gold values in the ferruginous cappings of quartz-sulphide veins and sulphidic metasediments point to a considerable degree of surficial enrichment during oxidation and weathering

- lead and arsenic have been established as pathfinders (arsenopyrite occurs commonly with pyrite in the sulphidic metasediments)

- sulphidic-carbonaceous units are common throughout the Frances Creek group, with the greatest concentrations being in the Mundogie Sandstone and Koolpin Formation

EXPLORATION CRITERIA

The criteria being observed by NTGM in its exploration of the area are:

- particular attention to subareas of non-outcrop given that past exploration activities had a strong geochemical focus (stream-sediment, soil and rock sampling) upon subareas of good outcrop, with largely discouraging results

- re-evaluation of all known mineral deposits and occurrences, with a particular emphasis on zinc in some localities (as well as on gold)

- delineation of structurally complex subareas using available detailed aeromagnetic data, satellite imagery and aerial photography, with particular emphasis on faults, shears and anticlinal axial zones

- evaluation of the mineral prospectivity generally of the contact metamorphic aureole of the Cullen Bathylith (evidence possibly favours metal dispersion rather than concentration of metals?)

- detailed sampling of the ferruginous cappings of sulphidic and carbonaceous rock units in the Koolpin Formation specifically and in the Frances Creek Group generally

- detailed sampling of tourmalinised rocks of present

- specific assessment of the potential of the Zamu Dolerite to host quartz-stockwork gold mineralisation

The principal aim of the Year 2 program will be to locate drilling targets in appropriate structural settings via a combination of the interpretation of airborne geophysical data, detailed soil and rock sampling, detailed geological mapping and ground magnetometry.

WORK COMPLETED IN YEAR 1 OF TENURE

The following activities were undertaken in Year 1:

- acquisition and digitising of colour aerial photography for the McKinlay River project area, which includes the licence area

- research of available geological and exploration-related data, mostly available in the open-file records of NTDME, in connection with compilation of the prospectus for Australian Gold Mines NL (AGM), the parent company of NTGM ; this work was carried out by Dr. G.R. Orridge of Geonorth Pty. Ltd., Darwin and submitted as the Independent Geologist's Report for the prospectus ((Orridge (1994)). The prospectus, which was issued in April 1994, subsequently was withdrawn in June 1994

- title management by principals and agents of NTGM based in Perth, Melbourne and Darwin

- establishment of a Geographic Information System (GIS) with subsidiary databases to manage all data generated by NTGM for its NT titles; this work was carried out by Mr. R. Fernandez of Ekos Research (NT) Pty. Limited

- assessment of options to obtain existing geophysical data (principally the aeromagnetic type) and satellite imagery in digital format to allow image processing

This work has extended into the early months of the second year of title and included an extension of the research activities with work by AJ Hosking of AJ Hosking and Associates Pty. Ltd.

As a consequence of the failure of the public float of AGM, alternative sources of funding for NTGM's exploration program in the NT have been sought.

EXPENDITURE STATEMENT FOR YEAR 1

	$
Darwin Office - Consultants	8545
Tenement Costs	1003
Aerial Photography	2242
Data Acquisition and Compilation	446
Geological Consultants	10735
GIS Management	2562
Travel and Accommodation	2449
Administration Overheads	2895
	$30,877

The expenditure incurred in Year 1 was less than the covenant. Accordingly an application for a Variation of Condition has been made.

Three geological consultants were utilised for varying periods in connection with preparation of the Prospectus for AGM, title administration and advice re programs and budgets for the title.

PROPOSED EXPLORATION PROGRAM AND BUDGET FOR YEAR 2

Given the generally disappointing nature of the results of past exploration activities within and/or immediately adjacent to the licence area, the exploration philosophy and program for Year 2 will be based upon the following key aspects:

- completion of a structural interpretation of the area using colour aerial photographs plus images prepared from digital Thematic Mapper and aeromagnetic data

- rock-chip, soil and ground magnetic traverses across prospects delineated by the structural interpretation with auger and/or RAB drilling as necessary to sample beneath black soil

- detailed geological mapping of the prospects (subject to outcrop limitations)

Most emphasis will be placed upon:

- assessment of the prospectivity of soil-covered subareas in the southern and central parts of the licence area

- delineation of faults, shear zones and folds (particularly the surface traces of anticlinal hingelines)

- delineation of magnetic units within the Koolpin Formation and of any major discontinuities or aberrations associated with them

- assessments of sulphidic-carbonaceous and tourmalinised rocks as potential hosts to mineralisation

Expenditure is envisaged as follows:

	$
Geology - detailed mapping, supervision, data interpretation	4000
Geophysics - computer imaging of TM and aeromagnetic data, ground magnetic traversing	7000
Geochemistry - soft and rock-chip sampling (traverses), assaying	5000
Gridding	2000
Information Management (per GIS)	3000
Title Management	2000
	23000
Overheads (10%) - Darwin and Perth offices	2300
Say	$25,500

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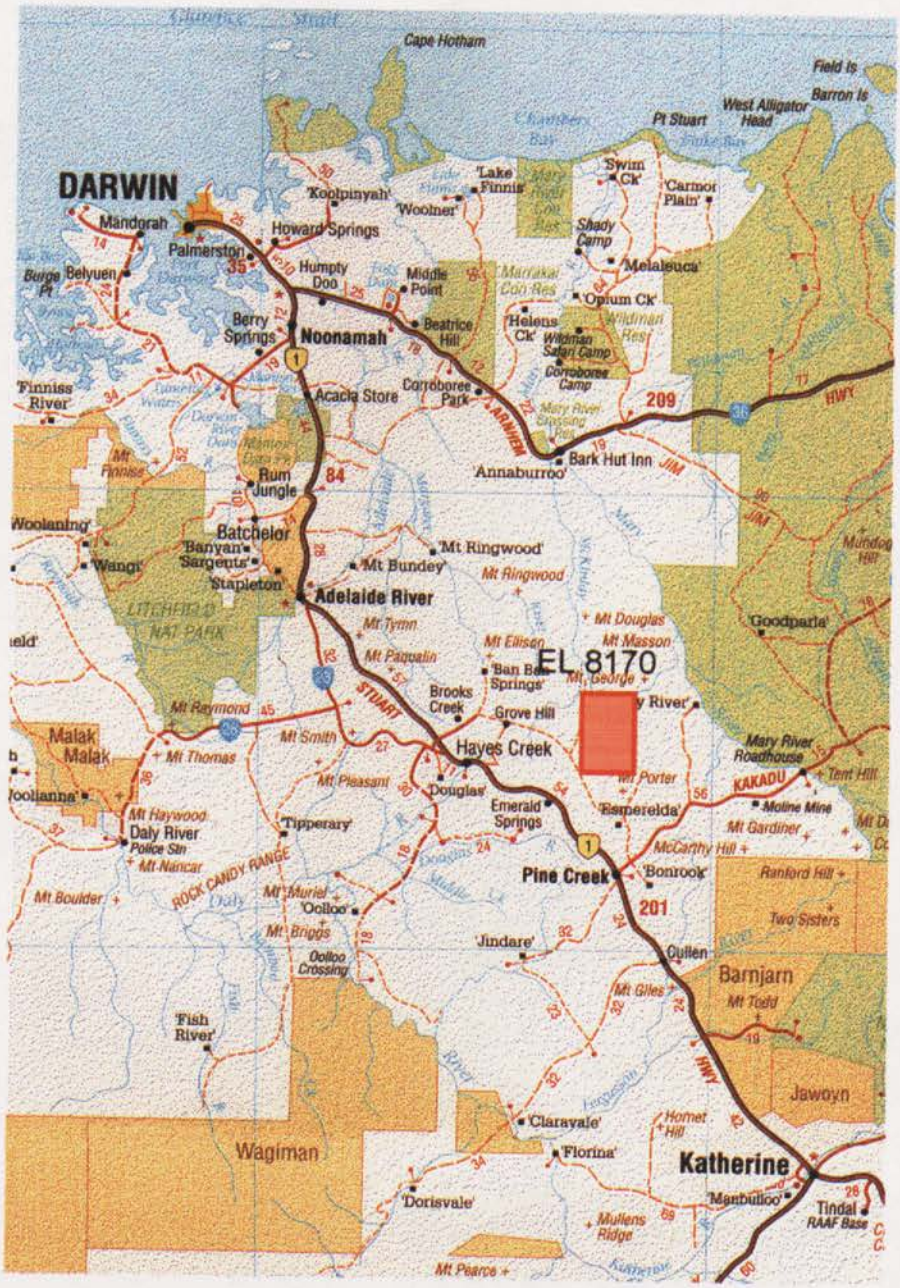
EL 8170



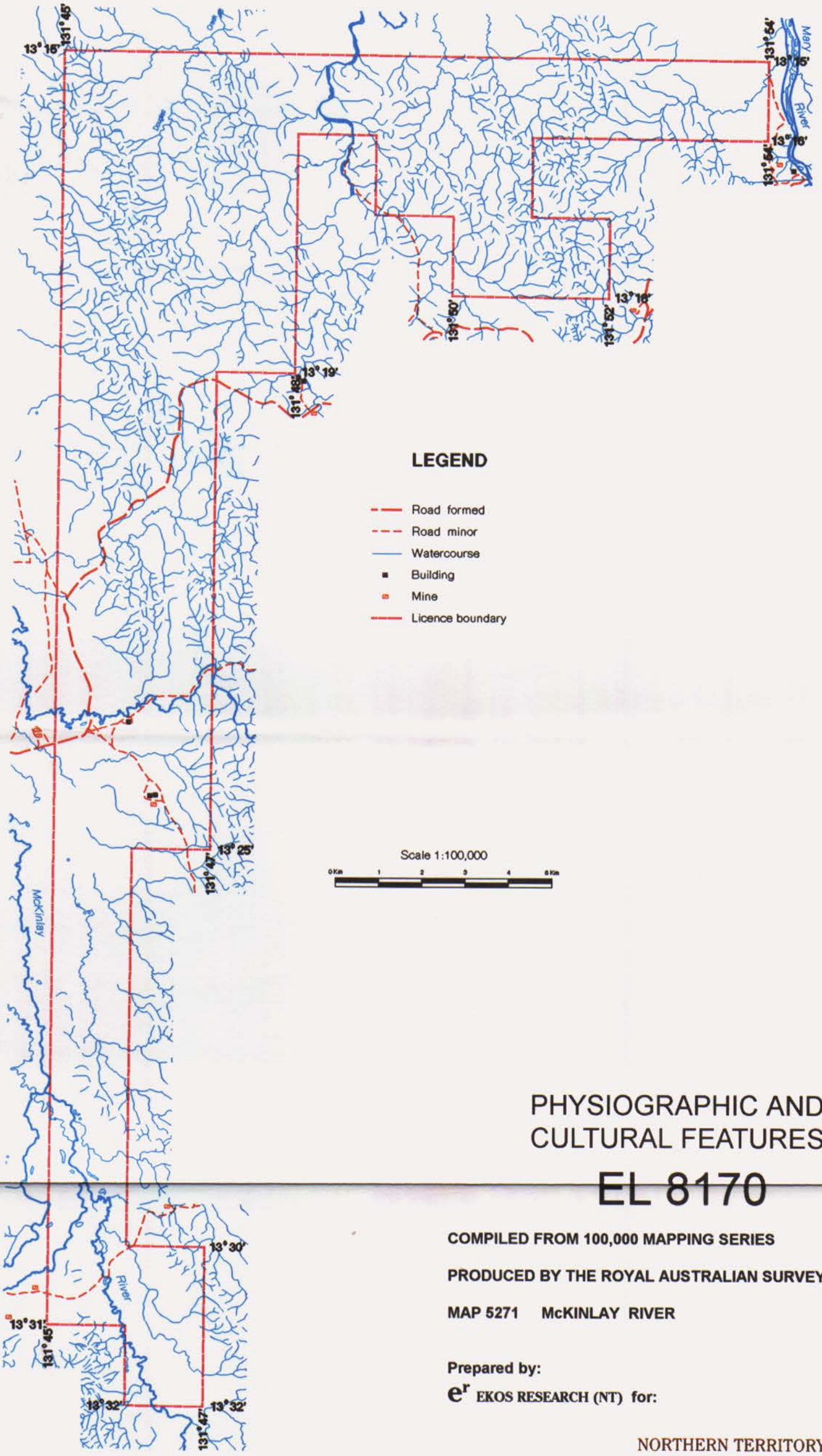
Prepared by:

er EKOS RESEARCH (NT) for:

NORTHERN TERRITORY
GOLD MINES NL

ACN 057 123 930

FIGURE 1
LOCATION



PHYSIOGRAPHIC AND CULTURAL FEATURES

EL 8170

COMPILED FROM 100,000 MAPPING SERIES

PRODUCED BY THE ROYAL AUSTRALIAN SURVEY CORPS

MAP 5271 McKINLAY RIVER

Prepared by:

er EKOS RESEARCH (NT) for:

NORTHERN TERRITORY
GOLD MINES NL

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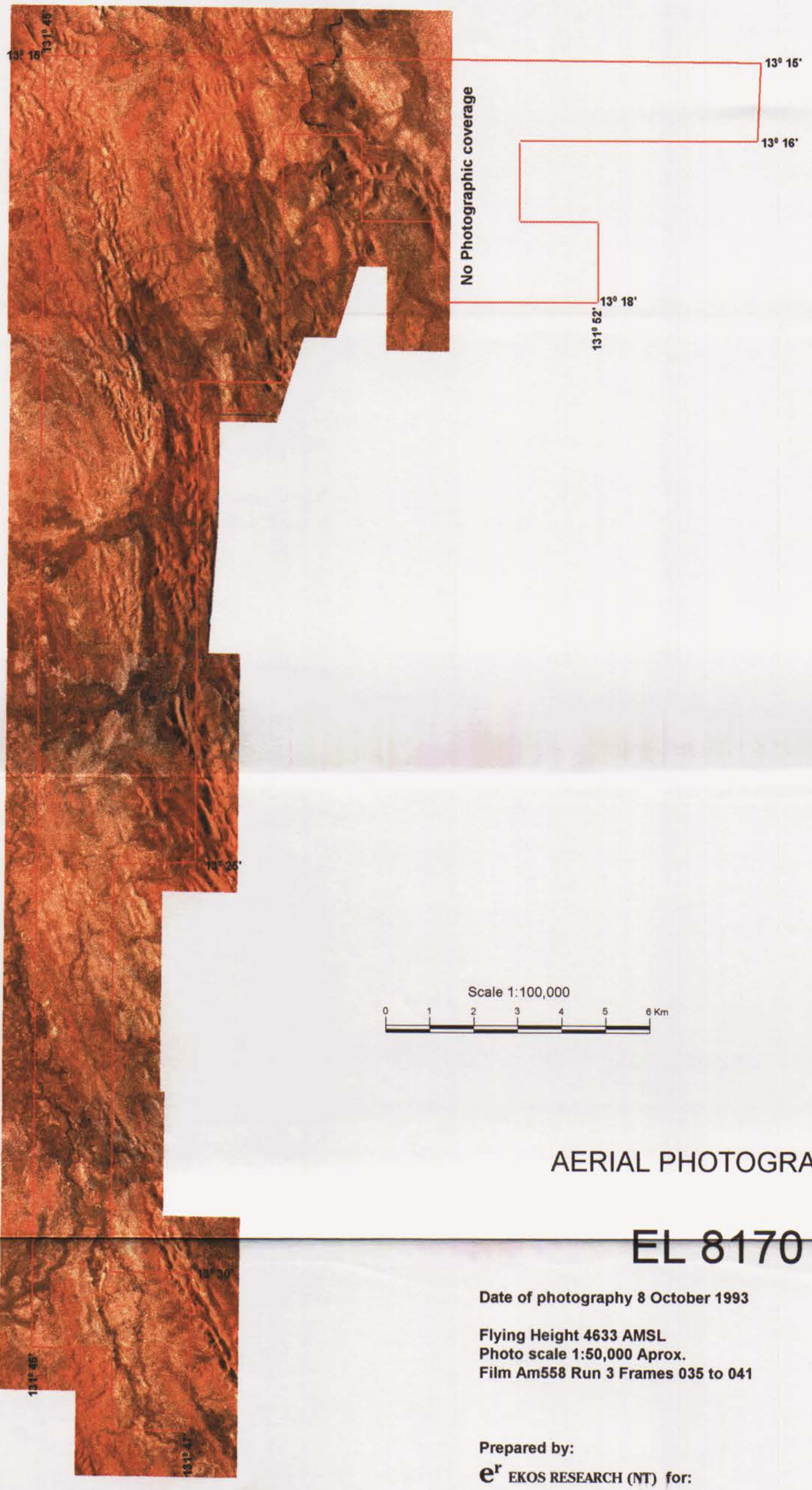
FIGURE 2
PHYSIOGRAPHIC AND CULTURAL FEATURES



Scale 1:100,000

0 1 2 3 4 5 6 Km

AERIAL PHOTOGRAPHY

EL 8170

Date of photography 8 October 1993

Flying Height 4633 AMSL
Photo scale 1:50,000 Aprox.
Film Am558 Run 3 Frames 035 to 041

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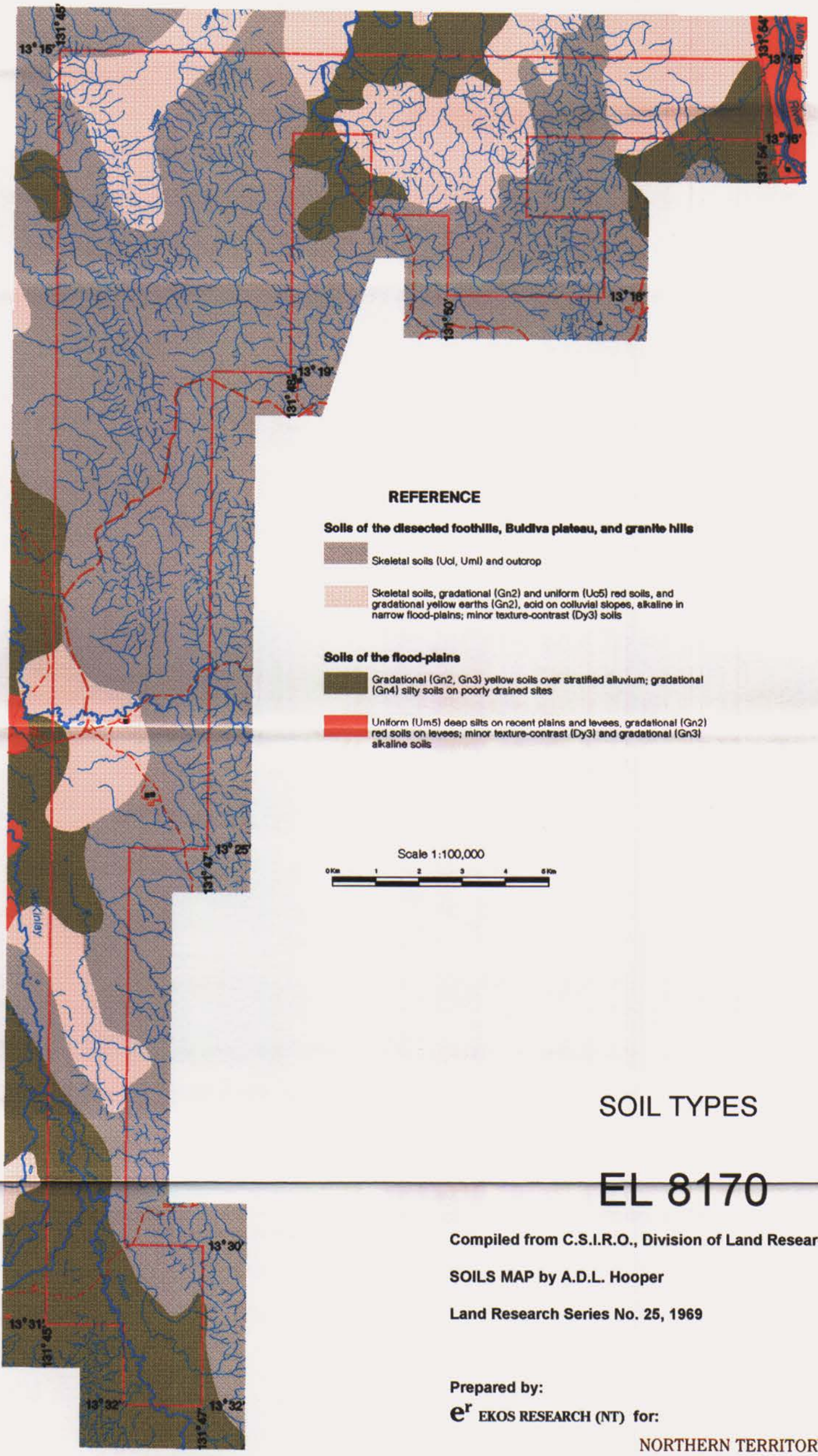
FIGURE 3
AERIAL PHOTOGRAPHY



REFERENCE

Soils of the dissected foothills, Buldiva plateau, and granite hills

Skeletal soils (Ucl, Uml) and outcrop

Skeletal soils, gradational (Gn2) and uniform (Uc5) red soils, and gradational yellow earths (Gn2), acid on colluvial slopes, alkaline in narrow flood-plains; minor texture-contrast (Dy3) soils

Soils of the flood-plains

Gradational (Gn2, Gn3) yellow soils over stratified alluvium; gradational (Gn4) silty soils on poorly drained sites

Uniform (Um5) deep silts on recent plains and levees, gradational (Gn2) red soils on levees; minor texture-contrast (Dy3) and gradational (Gn3) alkaline soils

Scale 1:100,000

0 Km 1 2 3 4 5 Km

SOIL TYPES

EL 8170

Compiled from C.S.I.R.O., Division of Land Research

SOILS MAP by A.D.L. Hooper

Land Research Series No. 25, 1969

Prepared by:

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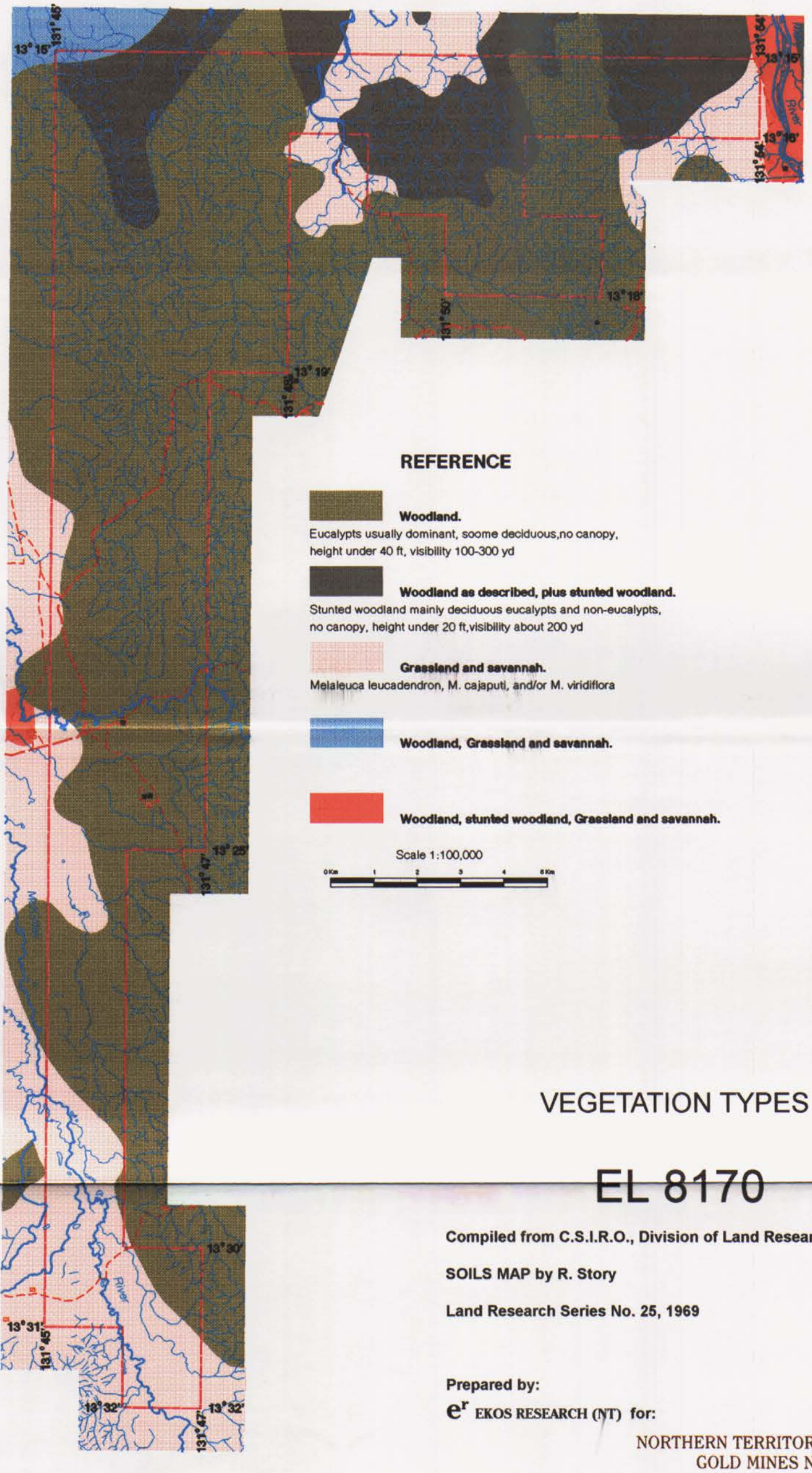
FIGURE 4
SOIL TYPES



REFERENCE

Woodland.
Eucalypts usually dominant, soome deciduous,no canopy,
height under 40 ft, visibility 100-300 yd

Woodland as described, plus stunted woodland.
Stunted woodland mainly deciduous eucalypts and non-eucalypts,
no canopy, height under 20 ft,visibility about 200 yd

Grassland and savannah.
Melaleuca leucadendron, M. cajaputi, and/or M. viridiflora

Woodland, Grassland and savannah.

Woodland, stunted woodland, Grassland and savannah.

Scale 1:100,000

0Km 1 2 3 4 5Km

VEGETATION TYPES

EL 8170

Compiled from C.S.I.R.O., Division of Land Research

SOILS MAP by R. Story

Land Research Series No. 25, 1969

Prepared by:

e^r EKOS RESEARCH (NT) for:

NORTHERN TERRITORY
GOLD MINES NL

ACN 057 123 930

FIGURE 5
VEGETATION TYPES

Generalised geology of the central Pine Creek Geosyncline
by P.M. Nicholson and others.

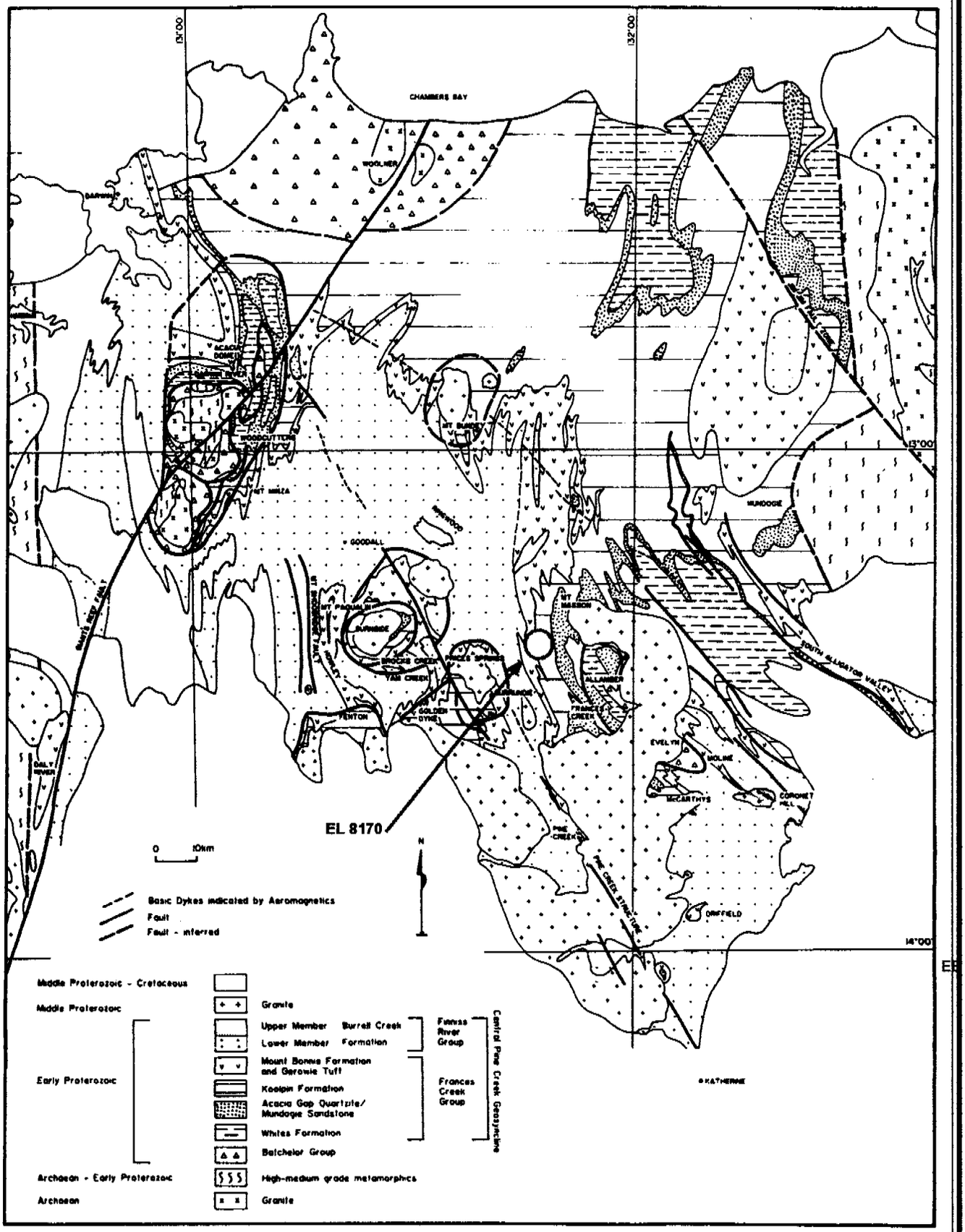


FIGURE 6
GENERAL GEOLOGY

Central Pine Creek Geosyncline stratigraphy.
by P.M. Nicholson and others

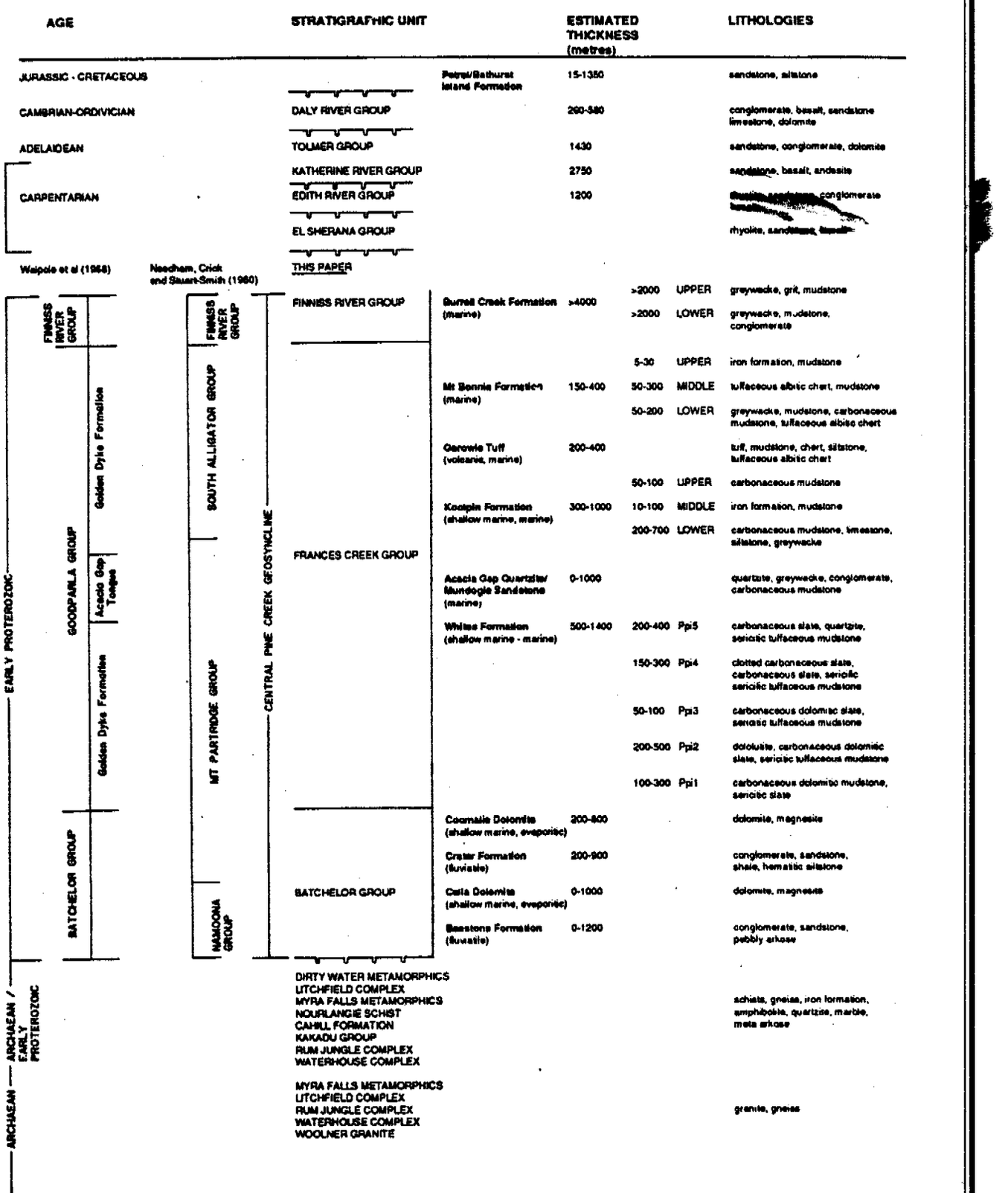
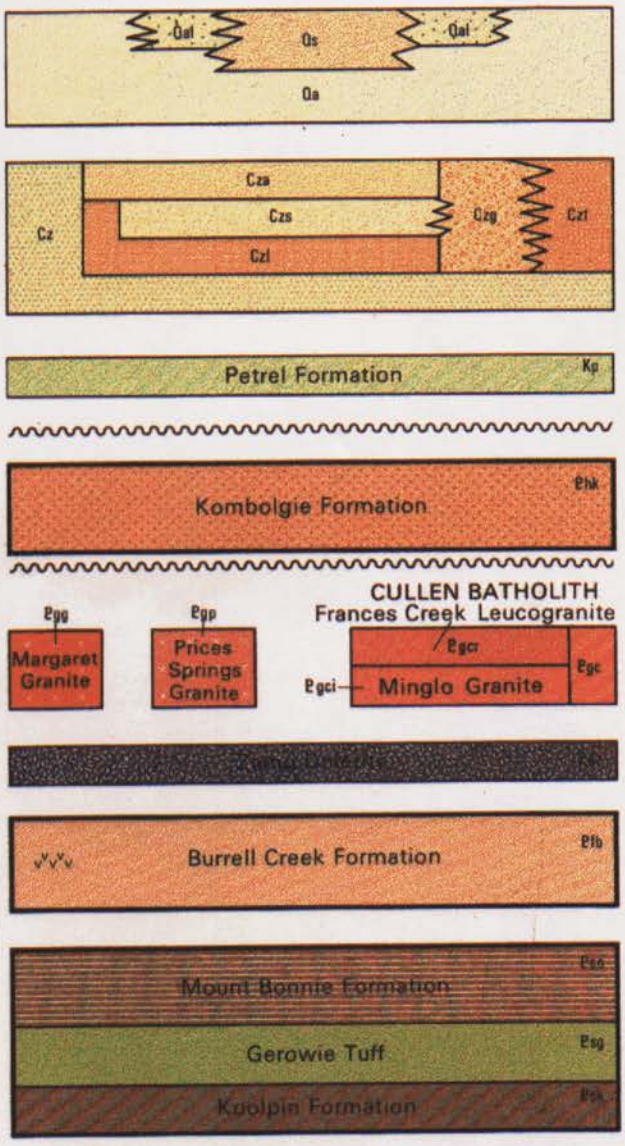


FIGURE 7
STRATIGRAPHY

REFERENCE



Qa	*Silt, sand, clay and gravel: alluvium and flood plain deposits*
Qal	*Silt, clayey silt: levee deposits*
Qs	*Quartz sand: outwash and channel deposits*
Cz	*Lithosols, gradational red soils and yellow earth type soils shown ::::: where these soils occur over known rock units*
Cza	*Winnowed sand, silt, clay, partially derived from Czs*
Czs	*Quartz sand, ferruginous and clayey sand: fan deposits*
Czl	*Detrital pisolitic and concretionary ironstone*
Czg	*Higher level gravels and gravelly lithosols*
Czt	*Sandstone, and metasediment fragments, sand: talus and scree deposits*
Kp	*Dark brown limonitic coarse to pebbly quartz sandstone, and massive friable white quartz sandstone and conglomerate*
Phk	*Ripple-marked and cross-bedded, very coarse to pebbly quartz ' sandstone. Purple clayey coarse topebbly quartz sandstone, quartz pebble conglomerate, boulder conglomerate, medium purple quartz sandstone, lithic greywacke and marlstone at base*
Pgg	*Coarse porphyritic granite*
Pgp	*Coarse even-grained to porphyritic granite*
Pgc	*Undivided granite*
Pgcr	*Fine even-grained grey leucocratic granite*
Pgci	*Coarse porphyritic pink and green granite*
Pdz	*Massive quartz dolerite, amphibolite*
Pfb	*Brown, grey and red sandy siltstone, siltstone, phyllite, slate and quartz - andalusite -muscovite-biotite-cordierite hornfels. Fine to coarse greywacke, minor volcanolithic pebble ~conglomerate. ᵛᵛᵛ Denotes rare highly altered felsic volcanics*
Pso	*Siltstone and slate with minor laminated black chert bands, lenses and nodules, massive medium to coarse feldspathic greywacke; minor banded iron formation, argillite, crystal tuff and tuffaceous chert*
Psg	*Grey and brown siltstone and phyllite, andalusite - garnet - biotite-muscovite - quartz hornfels;pink, green, grey and brown argillite; glassy black spotted vitric tuff, crystal tuff and tuffaceous chert*
Psk	*Brown ferruginous siltstone, shale and phyllite commonly carbonaceous and containing chert bands,lenses and nodules, massive ironstone; carbonaceous claystone; grey graphitic chiastolite -muscovite-quartz hornfels; minor lenses of laminated, massive or brecciated silicified dolomite,impure dolomite, dolomitic marble and tremolite hornfels. Rare sandy siltstone andlimonitic quartz sandstone at base*

FIGURE 8a
REFERENCE

REGIONAL GEOLOGY

EL 8170

Compiled from B.M.R. 100,000 Series

by P.G. Stuart-Smith and others

Map 5271, McKinlay River

Prepared by:

er EKOS RESEARCH (NT) for:

NORTHERN TERRITORY
GOLD MINES NL

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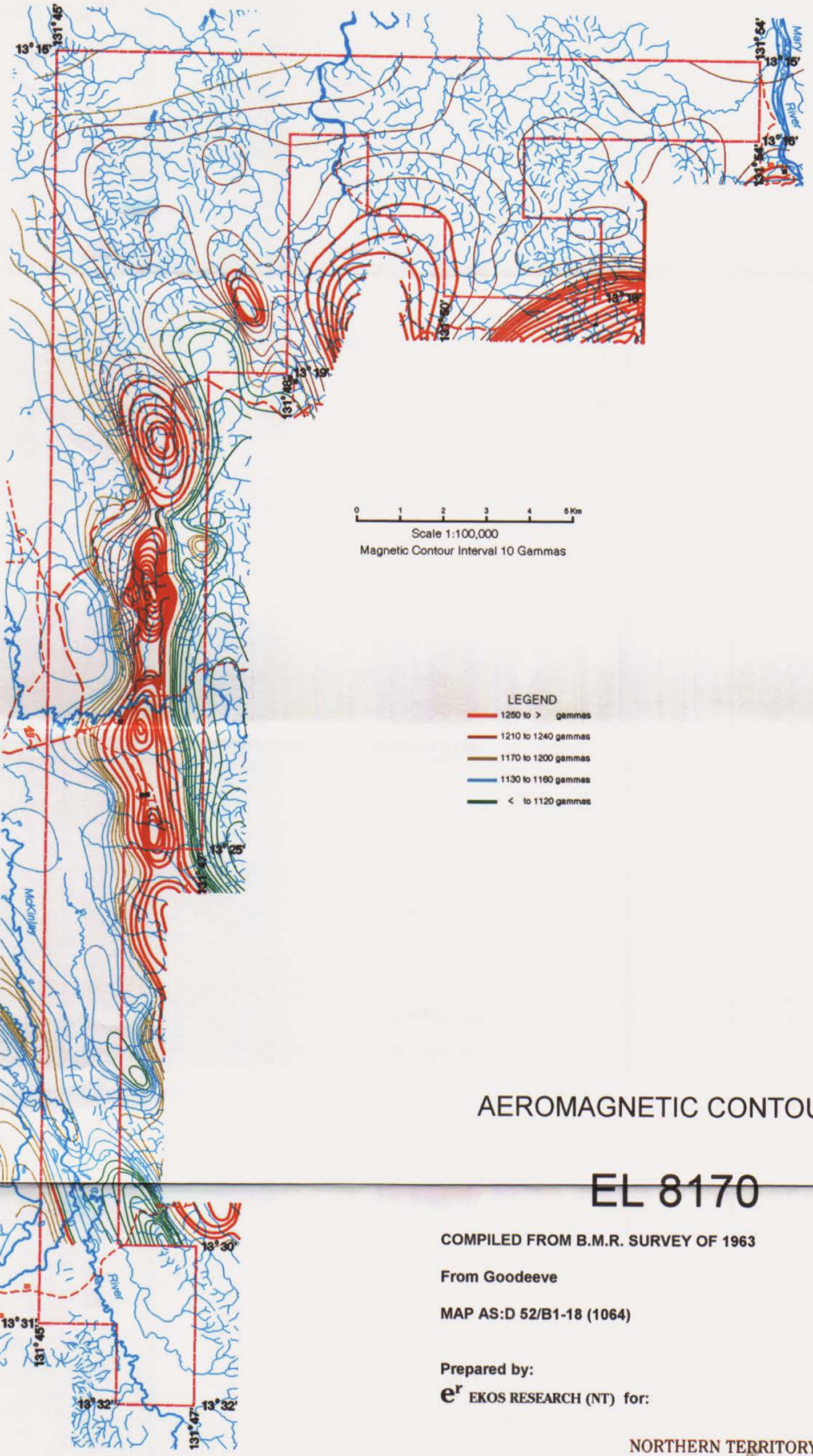
FIGURE 8
REGIONAL GEOLOGY



AEROMAGNETIC CONTOURS

EL 8170

COMPILED FROM B.M.R. SURVEY OF 1963

From Goodeeve

MAP AS:D 52/B1-18 (1064)

Prepared by:

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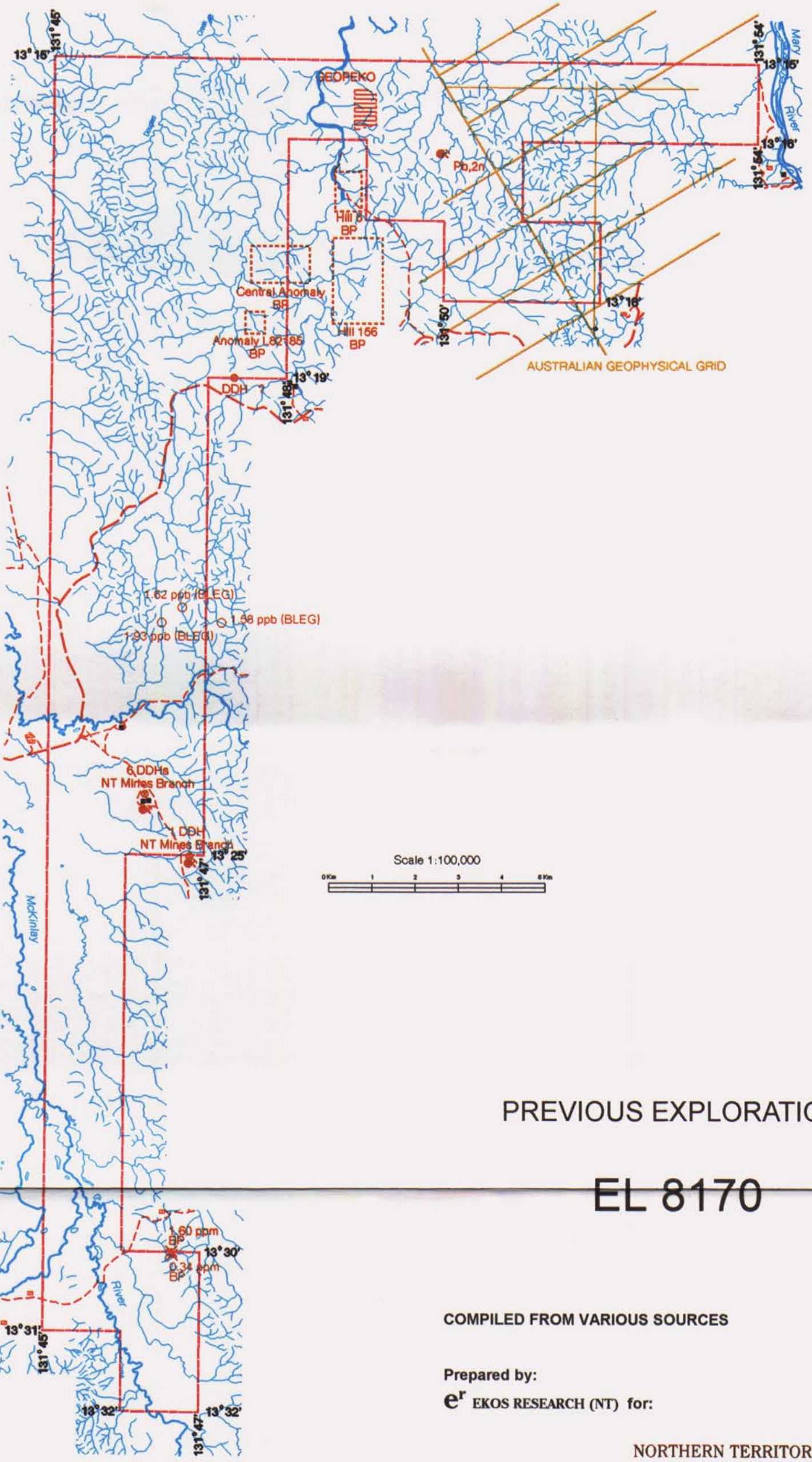
GOLD MINES NL

ACN 057 123 930

FIGURE 9
AEROMAGNETIC CONTOURS



PREVIOUS EXPLORATION

EL 8170

COMPILED FROM VARIOUS SOURCES

Prepared by:

e^r EKOS RESEARCH (NT) for:

NORTHERN TERRITORY
GOLD MINES NL

ACN 057 123 930

FIGURE 10
PREVIOUS EXPLORATION

APPENDIX 1

NTGS MINE DATA SHEETS

Localities within EL 8170

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Unnamed
Commodities - Major/Minor: Pb Zn
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 071 311
Latitude: Longitude:
Length (m): Width(m): Depth(m):
Strike bearing: Dip: Plunge:

Deposit number: 055
Compiled by: P.F.
Date entered: 22/08/89

Status: Mineral occurrence
Shape:
Size: Occurrence only
Mode of origin: Unknown

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Mount Partridge Group
Formation: Wildman Siltstone
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock:
Subsidary host rock:
Wall rock:
Subsiduary wall rock:
age of metamorphism: 1800 Ma Type: Regional Facies: Greenschist

STRUCTURE

Type: Bedding Strike: 340 Dip: 60NE Plunge: Age relative to mineralisation: Pre
Type: Strike: Dip: Plunge: Age relative to mineralisation:

MINERALISATION

Principal primary ore mineral: Grain size:
Other primary ore mineral(s):
Principal secondary ore mineral:
Other secondary ore mineral(s):
Principal gangue mineral: Age of Mineralisation:
Other gangue mineral(s):
Macroscopic ore textures:
Weathering affect(s):
Depth of weathering(m):

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
:		
:		
:		

EXPLORATION AND MINING

Exploration methods:
Mining methods:
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: Stuart-Smith et al., 1986 (Map)

REMARKS

Occurrence was not inspected.

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Unnamed
Commodities - Major/Minor: Pb Ag
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference GL 995 181
Latitude: Longitude:
Length (m): 200 Width(m): 0.8 Depth(m): 2
Strike bearing: 015 Dip: 90 Plunge:

Deposit number: 086
Compiled by: P.F.
Date entered: 22/08/89

Status: Mineral occurrence
Shape: Vein
Size: Occurrence only
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: South Alligator Group
Formation: Mount Bonnie Formation
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Gossanous vein quartz breccia
Subsidary host rock:
Wall rock: Pyritic volcanoclastic lutite
Subsiduary wall rock:
age of metamorphism: 1800 Ma Type: Regional Facies: Greenschist

STRUCTURE

Type: Shear Strike: 015 Dip: 90 Plunge: Age relative to mineralisation: Syn
Type: Bedding Strike: 020 Dip: 80 W Plunge: Age relative to mineralisation: Pre

MINERALISATION

Principal primary ore mineral: Galena
Other primary ore mineral(s): Pyrite
Principal secondary ore mineral: Cerussite
Other secondary ore mineral(s): Pyromorphite
Principal gangue mineral: Quartz
Other gangue mineral(s): Limonite
Macroscopic ore textures: Brecciation
Weathering affect(s): Oxidation
Depth of weathering(m): 30

Grain size: Medium

Age of Mineralisation: E. Prot.

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
: Silicification	In ore	Syn
:		
:		

EXPLORATION AND MINING

Exploration methods:
Mining methods: Opencut
Open-cut workings - Depth(m): 2 Length: 30 Width1

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: Ferenczi, 1990b (GS90/15)

REMARKS

It appears that about 130t of ore and mullock has been extracted from the high grade parts of this deposit. Ore samples assayed 14.4% Pb, 1350g/t Ag and 1.25g/t Au (NTGS 9798).

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Rosemary
Commodities - Major/Minor: Sn
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 002 162
Latitude: Longitude:
Length (m): 400 Width(m): 0.5 Depth(m):
Strike bearing: 320 Dip: 75E Plunge:

Deposit number: 105
Compiled by: M.A
Date entered: 27/8/90

Status: Abandoned mine
Shape: Vein
Size: Small
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: South Alligator Group
Formation: Gerowie Tuff
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Quartz vein
Subsidary host rock:
Wall rock: Siltstone
Subsiduary wall rock: Greywacke
age of metamorphism: 1800 Ma Type: Regional/Contact Facies: Gnsch./Alb.Ep.

STRUCTURE

Type: Shear zone Strike: 320 Dip: 75E Plunge: Age relative to mineralisation: Pre
Type: Strike: Dip: Plunge: Age relative to mineralisation:

MINERALISATION

Principal primary ore mineral: Cassiterite Grain size: Fine
Other primary ore mineral(s): Pyrite
Principal secondary ore mineral: Hematite
Other secondary ore mineral(s): Goethite,limonite
Principal gangue mineral: Quartz Age of Mineralisation: E. Prot.
Other gangue mineral(s): Hematite
Macroscopic ore textures: Vein fill & dissiminations
Weathering affect(s): Oxidation
Depth of weathering(m): 50

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
: Sericitic	Proximal	Syn
: Chloritic	Proximal	Syn
:		

EXPLORATION AND MINING

Exploration methods: Geol. mapping,Costeaning,Drilling
Mining methods: Underground
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
: 1967-76	4478	0.6% Sn	26.8	15.03t
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
: Inferred resource	80 000	0.68% Sn	
:			
:			
:			

REFERENCES

: Taylor,1967(CR 67/38)
: Newton & Shields,1977(GS 77/7)
: Newton,1979(GS 79/19)
: Roarty,1975(GS 75/16)

REMARKS

Reserves may be an overestimate.

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Lewis
Commodities - Major/Minor: Mn Fe
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 012 150
Latitude: Longitude:
Length (m): 100 Width(m): 10 Depth(m): 25
Strike bearing: 325 Dip: 85NE Plunge:

Deposit number: 106
Compiled by: P.F.
Date entered: 07/09/89

Status: Mineral occurrence
Shape: Stratiform
Size: Occurrence only
Mode of origin: Superficial enrichment

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: South Alligator Group
Formation: Koolpin Formation
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Gossan
Subsidary host rock:
Wall rock: Carbonaceous shale
Subsidiuary wall rock: Banded ironstone
age of metamorphism: 1800 Ma Type: Regional Facies: Greenschist

STRUCTURE

Type: Bedding Strike: 325 Dip: 85NE Plunge: Age relative to mineralisation: Pre
Type: Strike: Dip: Plunge: Age relative to mineralisation:

MINERALISATION

Principal primary ore mineral: Grain size:
Other primary ore mineral(s):
Principal secondary ore mineral: Pyrolusite
Other secondary ore mineral(s): Hematite
Principal gangue mineral: Shale Age of Mineralisation:
Other gangue mineral(s): Chlorite
Macroscopic ore textures: Boxworks, Botryoidal
Weathering affect(s): Supergene
Depth of weathering(m): 25

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
:		
:		
:		

EXPLORATION AND MINING

Exploration methods: Geol. mapping, Geochem., Drilling.
Mining methods:
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: Newton, 1977c (GS77/8)

REMARKS

APPENDIX 2.

NTGS MINE DATA SHEETS

Localities in close proximity to EL 8170

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: P.J.
Commodities - Major/Minor: Pb Ag
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 124 338
Latitude: Longitude:
Length (m): 200 Width(m): 2 Depth(m): 50
Strike bearing: 330 Dip:75SW Plunge:

Deposit number: 056
Compiled by: P.F.
Date entered: 29/03/89

Status: Mineral occurrence
Shape: Vein
Size: Occurrence only
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Mount Partridge Group
Formation: Mundogie Sandstone
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Gossanous vein quartz breccia
Subsidary host rock: Fractured arenite
Wall rock: Quartz litharenite
Subsiduary wall rock:
age of metamorphism: 1800 Ma Type: Regional Facies: Greenschist

STRUCTURE

Type: Shear	Strike: 330	Dip:75SW	Plunge:	Age relative to mineralisation: Syn
Type: Bedding	Strike: 335	Dip:60SW	Plunge:	Age relative to mineralisation: Pre

MINERALISATION

Principal primary ore mineral: Galena Grain size:Medium
Other primary ore mineral(s):
Principal secondary ore mineral: Pyromorphite
Other secondary ore mineral(s): Cerussite
Principal gangue mineral: Quartz Age of Mineralisation:E. Prot.
Other gangue mineral(s):
Macroscopic ore textures: Fracture filling, Brecciation
Weathering affect(s): Oxidation
Depth of weathering(m): 40

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
: Carbonatisation	In ore	Syn
: Sericitic	Footwall & Hangingwall	Syn
:		

EXPLORATION AND MINING

Exploration methods: Geol. mapping, Geochem., Geophy., Drilling.
Mining methods:
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: Wills, 1978a (CR78/62)
: Swensson et al., 1979 (CR79/54)

REMARKS

Drilling intersected 1m grading 1500ppm Pb, 1000ppm Zn and 2ppm Ag. A chip sample from a gossan assayed 17.9% Pb, 217ppm Ag and 1.35g/t Au.

Produced by Northern Territory Geological Survey, Dept Mines and Energy

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: George Creek
Commodities - Major/Minor: Zn Pb,Ag
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 223 326
Latitude: Longitude:
Length (m): 2 Width(m): 17 Depth(m): 80
Strike bearing: 340 Dip: 85 Plunge:

Deposit number: 057
Compiled by: P.F.
Date entered: 29/03/89

Status: Prospect
Shape: Stratabound
Size: Small
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Namoona Group
Formation: Masson Formation
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Quartz/carbonate veins
Subsidary host rock: Altered Basalt
Wall rock: Altered Basalt
Subsiduary wall rock: Shale (graphitic & pyritic)
age of metamorphism: 1800 Ma Type: Regional Facies: Greenschist

STRUCTURE

Type: Fracture Strike: 340 Dip: 85 Plunge: Age relative to mineralisation: Syn
Type: Bedding Strike: 340 Dip: 45 NE Plunge: Age relative to mineralisation: Pre

MINERALISATION

Principal primary ore mineral: Galena Grain size: Fine to medium
Other primary ore mineral(s): Sphalerite, Pyrite, Chalcopyrite, Arsenopyrite
Principal secondary ore mineral: Cerussite
Other secondary ore mineral(s): Anglesite
Principal gangue mineral: Quartz Age of Mineralisation: E. Prot.
Other gangue mineral(s): Carbonate
Macroscopic ore textures: Massive, Veinlets, Disseminations
Weathering affect(s): Oxidation
Depth of weathering(m): 40

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
: Carbonatisation	In ore	Syn
: Sericitic	Footwall & Hangingwall	Syn
: Chloritic	Footwall & Hangingwall	Syn

EXPLORATION AND MINING

Exploration methods: Geol. mapping, Geochem., Geophy., Drilling.
Mining methods:
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
: Inferred resource	50 000	2% Pb, 4% Zn 130g/t Ag	
:			
:			
:			

REFERENCES

: Wills, 1978a (CR78/62)
: Swensson et al., 1979 (CR79/54)
: Ikstrums, 1980 (CR80/113)
: Cook, 1981 (CR81/127)

REMARKS

Drilling intersections include; 5.48m grading 4.5% Pb, 4.2% Zn, 98g/t Ag with 0.6m of 2.7% Pb, 12.2% Zn, 455g/t Ag, 3.8g/t Au (DD80GC4), 0.9m grading 3.1% Pb 9% Zn, 770g/t Ag & 2.7g/t Au(78GCD1), 1m at 4% Pb, 7.6% Zn & 288g/t Ag(78GCD3)

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Tolmer South
Commodities - Major/Minor: Cu
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: Reynolds River 5071
Universal Grid Reference FL 922 215
Latitude: Longitude:
Length (m): Width(m): Depth(m):
Strike bearing: Dip: Plunge:

Deposit number: 058
Compiled by: P.F.
Date entered: 20/05/89

Status: Mineral occurrence
Shape: Vein
Size: Occurrence only
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Finniss River Group
Formation: Burrell Creek Formation
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Vein quartz
Subsidary host rock:
Wall rock: Phyllite
Subsiduary wall rock:
age of metamorphism: 1800 Ma Type: Regional Facies: Greenschist

STRUCTURE

Type: Bedding Strike: 340 Dip: 50 E Plunge: Age relative to mineralisation: Pre
Type: Strike: Dip: Plunge: Age relative to mineralisation:

MINERALISATION

Principal primary ore mineral: Chalcopyrite Grain size:
Other primary ore mineral(s):
Principal secondary ore mineral: Malachite
Other secondary ore mineral(s):
Principal gangue mineral: Quartz Age of Mineralisation: E. Prot.
Other gangue mineral(s):
Macroscopic ore textures: Disseminated
Weathering affect(s): Oxidation
Depth of weathering(m): 30

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
:		
:		
:		

EXPLORATION AND MINING

Exploration methods:
Mining methods:
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: Pietsch, 1989. (Map)

REMARKS

Not located during field survey.

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Touhys
Commodities - Major/Minor: U
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: Batchelor 5171
Universal Grid Reference GL 308 256
Latitude: Longitude:
Length (m): 250 Width(m): 1 Depth(m): 5
Strike bearing: 345 Dip: 65W Plunge:

Deposit number: 059
Compiled by: P.F.
Date entered: 29/03/89

Status: Abandoned mine
Shape: Vein
Size: Occurrence only
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Finniss River Group
Formation: Burrell Creek Formation
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Slate
Subsidary host rock:
Wall rock: Greywacke
Subsiduary wall rock:
age of metamorphism: 1800 Ma Type: Regional Facies: Greenschist

STRUCTURE

Type: Bedding Strike: 345 Dip: 65 W Plunge: Age relative to mineralisation: Pre
Type: Vein Strike: 110 Dip: 35NE Plunge: Age relative to mineralisation: Syn

MINERALISATION

Principal primary ore mineral: Grain size:
Other primary ore mineral(s):
Principal secondary ore mineral: Torbernite
Other secondary ore mineral(s): Autunite
Principal gangue mineral: Slate Age of Mineralisation: E. Prot.
Other gangue mineral(s):
Macroscopic ore textures: Coating joint planes
Weathering affect(s): Supergene
Depth of weathering(m): 15

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
: Silicification	Proximal	Syn
:		
:		

EXPLORATION AND MINING

Exploration methods: Geochem., Geophys., Costeaning.
Mining methods: Shaft(6-10m) and shallow pits.
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:	5			
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: Shields & Pietsch,1971(CR71/09)
: Fander,1981(CR81/160)
: Robertson,1956(BMR Rec.1956/87)
: Ferenczi,1990e (GS90/18)

REMARKS

Production figure is a visual estimate of ore and mullock material which lies beside the exploration shaft. Chip sample assayed 360ppm U (Shields & Pietsch, 1971).

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: George Creek
Commodities - Major/Minor: U
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: Batchelor 5171
Universal Grid Reference GL 313 246
Latitude: Longitude:
Length (m): 20 Width(m): 1.5 Depth(m): 40
Strike bearing: 345 Dip:75E Plunge:

Deposit number: 060
Compiled by: P.F.
Date entered: 29/03/89

Status: Abandoned mine
Shape: Vein
Size: Occurrence only
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Finniss River Group
Formation: Burrell Creek Formation
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Fractured greywacke
Subsidary host rock: Vein quartz
Wall rock: Siliceous shale
Subsiduary wall rock: Greywacke
age of metamorphism: 1800 Ma Type: Regional Facies: Greenschist

STRUCTURE

Type: Shear zone Strike: 345 Dip:75 E Plunge: Age relative to mineralisation: Syn
Type: Bedding Strike: 345 Dip:32 W Plunge: Age relative to mineralisation: Pre

MINERALISATION

Principal primary ore mineral: Pitchblende Grain size:Fine
Other primary ore mineral(s): Pyrite, Chalcopyrite
Principal secondary ore mineral: Torbernite
Other secondary ore mineral(s): Autunite
Principal gangue mineral: Quartz Age of Mineralisation:E. Prot.
Other gangue mineral(s):
Macroscopic ore textures: Stringers, Pods
Weathering affect(s): Supergene
Depth of weathering(m): 15

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
: Silicification	Proximal	Syn
:		
:		

EXPLORATION AND MINING

Exploration methods: Geol. mapping, Geophys., Drilling
Mining methods: Shaft(38.4m) with drives to the north & south.
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
: 1958-59	120	0.26% U3O8		300 kg U
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
: Inferred resource	250	0.26% U3O8	
:			
:			
:			

REFERENCES

: Rade & Clarke,1954(BMR Rec.1955/3)
: Roberts,1955(ibid.1955/17)
: Rade,1955(ibid.1955/38)
: Firman & Clarke(ibid.1955/83)
: Roberston,1956(ibid.1956/87)
:
:
: Rade,1956 (Econ. Geol.)
: Arkin & Walpole,1960(BMR Rec.1960/10)
: Shields & Pietsch,1971(CR71/09)
: Fander,1981(CR81/160)
:
:
:

REMARKS

The uranium mineralisation is localised within a series of weak en echelon shears in greywacke bands. At depth the mineralisation is highly irregular, and pinches out just below the 25m level (Arkin & Walpole, 1960).

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Unnamed
Commodities - Major/Minor: Pb
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 025 255
Latitude: Longitude:
Length (m): 40 Width(m): 1 Depth(m): 3
Strike bearing: 315 Dip:90 Plunge:

Deposit number: 071
Compiled by: P.F.
Date entered: 29/03/89

Status: Mineral occurrence
Shape: Vein
Size: Occurrence only
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: South Alligator Group
Formation: Gerowie Tuff
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Gossanous tuff-breccia
Subsidary host rock: Chert
Wall rock: Chert
Subsidiary wall rock: Cordierite hornfels
age of metamorphism: 1800 Ma Type: Regional/Contact Facies: Gnsch./Hb.Hfs

STRUCTURE

Type: Shear zone Strike: 315 Dip:90 Plunge: Age relative to mineralisation: Syn
Type: Bedding Strike: 340 Dip:55 E Plunge: Age relative to mineralisation: Pre

MINERALISATION

Principal primary ore mineral: Galena Grain size:Medium
Other primary ore mineral(s): Pyrite
Principal secondary ore mineral: Cerussite
Other secondary ore mineral(s):
Principal gangue mineral: Quartz Age of Mineralisation:E. Prot.
Other gangue mineral(s): Hematite
Macroscopic ore textures: Disseminated
Weathering affect(s): Oxidation
Depth of weathering(m): 20

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
: Silicification	Footwall & Hangingwall	Syn
:		
:		

EXPLORATION AND MINING

Exploration methods: Costeaning
Mining methods: Small pits.
Open-cut workings - Depth(m): 1.5 Length: 10 Width:2

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:	15	High grade	Silver-lead ore	12.9 t Pb
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: J. Crago pers comm. 1988
: Ferenczi, 1990b (GS90/15)

REMARKS

Contained metal calculation assumes 86% Pb

Produced by Northern Territory Geological Survey, Dept Mines and Energy

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Jessops
Commodities - Major/Minor: Sn
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 052 260
Latitude: Longitude:
Length (m): 360 Width(m): 0.6 Depth(m):
Strike bearing: 350 Dip: 60W Plunge:

Deposit number: 072
Compiled by: M.A
Date entered: 27/8/90

Status: Abandoned mine
Shape: Vein
Size: Small
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Mount Partridge Group
Formation: Wildman Siltstone
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Hematite quartz breccia
Subsidary host rock:
Wall rock: Siltstone
Subsiduary wall rock:
age of metamorphism: 1800 Ma Type: Regional/Contact Facies: Gnsch./Alb.Ep.

STRUCTURE

Type: Shear Strike: 350 Dip: 60W Plunge: Age relative to mineralisation: Pre
Type: Strike: Dip: Plunge: Age relative to mineralisation:

MINERALISATION

Principal primary ore mineral: Cassiterite Grain size: Fine
Other primary ore mineral(s): Pyrite,Arsenopyrite
Principal secondary ore mineral: Hematite
Other secondary ore mineral(s): Limonite,Goethite
Principal gangue mineral: Hematite,Limonite Age of Mineralisation: E. Prot.
Other gangue mineral(s): Quartz
Macroscopic ore textures: Vein fill&dissiminations in sulphides
Weathering affect(s): Oxidation
Depth of weathering(m): 50

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
: Sericitic	Proximal	Syn
: Hematitisation	In ore	Post
:		

EXPLORATION AND MINING

Exploration methods: GeoL mapping,Costeaning, Drilling
Mining methods: Open cut & Underground
Open-cut workings - Depth(m): 15 Length: 200 Width: 4

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
: 1957-72		1.0% Sn	193	106.5 t Sn
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
: Indicated resource	10 000	1.0% Sn	
:			
:			
:			

REFERENCES

: United Uranium NL,1963(CR 63/11)
: Vanderplank,1964(GS 64/5)
: Hays,1960(BMR Rec.1960/2)
: Hays,1958(BMR Rec 1958/2)
: Blaskett& Dunkin(1951)
: Baker(1960)

REMARKS

Mineralised zone represent oxidised part of massive sulphide vein.Minor gold (about 1 ppm) is present in the ore. Cassiterite is very fine and is dissiminate in the sulphides.

Produced by Northen Territory Geological Survey, Dept Mines and Energy

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Billycan
Commodities - Major/Minor: Sn
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 055 255
Latitude: Longitude:
Length (m): Width(m): Depth(m):
Strike bearing: 350 Dip:60W Plunge:

Deposit number: 073
Compiled by: M.A
Date entered: 27/8/90

Status: Abandoned mine
Shape: Vein
Size: Occurrence only
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Mount Partridge Group
Formation: Wildman Siltstone
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Hematite quartz breccia
Subsidary host rock:
Wall rock: Siltstone
Subsiduary wall rock:
age of metamorphism: 1800 Ma Type: Regional/Contact Facies: Gnsch./Alb.Ep.

STRUCTURE

Type: Shear Strike: 350 Dip: 60W Plunge: Age relative to mineralisation: Pre
Type: Strike: Dip: Plunge: Age relative to mineralisation:

MINERALISATION

Principal primary ore mineral: Cassiterite Grain size:Fine
Other primary ore mineral(s): Pyrite,Arsenopyrite
Principal secondary ore mineral: Hematite
Other secondary ore mineral(s): Limonite,Goethite
Principal gangue mineral: Hematite,Limonite Age of Mineralisation:E. Prot.
Other gangue mineral(s): Quartz
Macroscopic ore textures: Vein fill&dissiminations in sulphides
Weathering affect(s): Oxidation
Depth of weathering(m): 50

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
: Sericitic	Proximal	Syn
: Hematitisation	In ore	Post
:		

EXPLORATION AND MINING

Exploration methods: Geol. mapping,Costeaning, Drilling
Mining methods:
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: United Uranium NL,1963(CR 63/11)
: Hays,1960 (BMR Rec.1960/2)
: Hays.1958 (BMR Rec.1958/2)

REMARKS

Mineralised zone represent oxidised part of massive sulphide vein.Minor gold (about 1 ppm) is present in the ore. Cassiterite is very fine and is dissiminate in the sulphides.

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Mount Masson
Commodities - Major/Minor: Sn
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 055 245
Latitude: Longitude:
Length (m): 120 Width(m): 0.5 Depth(m):
Strike bearing: 340 Dip: 90 Plunge:

Deposit number: 074
Compiled by: M.A
Date entered: 27/8/90

Status: Abandoned mine
Shape: Vein
Size: Small
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Mount Partridge Group
Formation: Wildman Siltstone
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Hematite quartz breccia
Subsidary host rock:
Wall rock: Siltstone
Subsiduary wall rock:
age of metamorphism: 1800 Ma Type: Regional/Contact Facies: Gnsch./Alb.Ep.

STRUCTURE

Type: Shear Strike: 350 Dip: 60W Plunge: Age relative to mineralisation: Pre
Type: Strike: Dip: Plunge: Age relative to mineralisation:

MINERALISATION

Principal primary ore mineral: Cassiterite Grain size: Fine
Other primary ore mineral(s): Pyrite,Arsenopyrite
Principal secondary ore mineral: Hematite
Other secondary ore mineral(s): Limonite,Goethite
Principal gangue mineral: Hematite,Limonite Age of Mineralisation: E. Prot.
Other gangue mineral(s): Quartz
Macroscopic ore textures: Vein fill&dissiminations in sulphides
Weathering affect(s): Oxidation
Depth of weathering(m): 50

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
: Sericitic	Proximal	Syn
: Hematitisation	In ore	Post
:		

EXPLORATION AND MINING

Exploration methods: Geol. mapping,Costeaning, Drilling
Mining methods: Underground
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
: 1942-68	2916	1.1% Sn		32.08 t Sn
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
: Inferred resource	5400	1.1% Sn	
:			
:			
:			

REFERENCES

: Hays,1960(BMR Rec. 1960/2)

REMARKS

Mineralised zone represent oxidised part of massive sulphide vein.Minor gold (about 1 ppm) is present in the ore. Cassiterite is very fine and is dissiminate in the sulphides.

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Big Drum
Commodities - Major/Minor: Sn
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 057 239
Latitude: Longitude:
Length (m): Width(m): Depth(m):
Strike bearing: 340 Dip:90 Plunge:

Deposit number: 075
Compiled by: M.A
Date entered: 27/8/90

Status: Abandoned mine
Shape: Vein
Size: Occurrence only
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline Sub-unit:
Group: Mount Partridge Group Age: Palaeoproterozoic
Formation: Wildman Siltstone Age: Palaeoproterozoic
Member: Age:

LITHOLOGY AND METAMORPHISM

Host rock: Hematite quartz breccia
Subsidary host rock:
Wall rock: Siltstone
Subsiduary wall rock:
age of metamorphism: - 1800 Ma Type: Regional/Contact Facies: Gnsch./Alb.Ep.

STRUCTURE

Type: Shear Strike: 350 Dip: 60W Plunge: Age relative to mineralisation: Pre
Type: Strike: Dip: Plunge: Age relative to mineralisation:

MINERALISATION

Principal primary ore mineral: Cassiterite Grain size:Fine
Other primary ore mineral(s): Pyrite,Arsenopyrite
Principal secondary ore mineral: Hematite
Other secondary ore mineral(s): Limonite,Goethite
Principal gangue mineral: Hematite,Limonite Age of Mineralisation:E. Prot.
Other gangue mineral(s): Quartz
Macroscopic ore textures: Vein fill&dissiminations in sulphides
Weathering affect(s): Oxidation
Depth of weathering(m): 50

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
: Sericitic	Proximal	Syn
: Hematitisation	In ore	Post
:		

EXPLORATION AND MINING

Exploration methods: GeoLmapping,costeaning
Mining methods: Underground
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
: 1962	220			220kg
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: Hays,1960(BMR Rec.1960/2)
:
:
:
:
:
:

REMARKS

Mineralised zone represent oxidised part of massive sulphide vein.Minor gold (about 1 ppm) is present in the ore. Cassiterite is very fine and is dissiminate in the sulphides.

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Big Julie
Commodities - Major/Minor: Sn
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 057 238
Latitude: Longitude:
Length (m): 65 Width(m): 0.5 Depth(m):
Strike bearing: 340 Dip: Plunge:

Deposit number: 076
Compiled by: M.A
Date entered: 27/8/90

Status: Abandoned mine
Shape: Vein
Size: Occurrence only
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Mount Partridge Group
Formation: Mundogie Sandstone
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Hematite quartz breccia
Subsidary host rock:
Wall rock: Siltstone
Subsiduary wall rock: -
age of metamorphism: 1800 Ma Type: Regional/Contact Facies: Gnsch./Alb.Ep.

STRUCTURE

Type: Shear Strike: 350 Dip: 60W Plunge: Age relative to mineralisation: Pre
Type: Strike: Dip: Plunge: Age relative to mineralisation:

MINERALISATION

Principal primary ore mineral: Cassiterite Grain size:Fine
Other primary ore mineral(s): Pyrite,Arsenopyrite
Principal secondary ore mineral: Hematite
Other secondary ore mineral(s): Limonite,Goethite
Principal gangue mineral: Hematite,Limonite Age of Mineralisation:E. Prot.
Other gangue mineral(s): Quartz
Macroscopic ore textures: Vein fill&dissiminations in sulphides
Weathering affect(s): Oxidation
Depth of weathering(m): 50

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
: Sericitic	Proximal	Syn
: Hematitisation	In ore	Post
:		

EXPLORATION AND MINING

Exploration methods: Geol. mapping,costeaning, drilling
Mining methods: Open cut
Open-cut workings - Depth(m): 3 Length: 30 Width: 4

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
: 1970-80	493		4.17	
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: : Newton,1977b (GS 77/5)
:
:
:
:
:
:

REMARKS

Mineralised zone represent oxidised part of massive sulphide vein.Minor gold (about 1 ppm) is present in the ore. Cassiterite is very fine and is dissiminate in the sulphides.

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Nelson 1
Commodities - Major/Minor: Sn
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 120 278
Latitude: Longitude:
Length (m): Width(m): Depth(m):
Strike bearing: 045 Dip: Plunge:

Deposit number: 077
Compiled by: M.A
Date entered: 27/8/90

Status: Abandoned mine
Shape: Vein
Size: Occurrence only
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Mount Partridge Group
Formation: Mundogie Sandstone
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Hematite quartz breccia
Subsidary host rock:
Wall rock: Siltstone
Subsiduary wall rock:
age of metamorphism: 1800 Ma Type: Regional/Contact Facies: Gnsch./Alb.Ep.

STRUCTURE

Type: Strike: Dip: Plunge: Age relative to mineralisation:
Type: Strike: Dip: Plunge: Age relative to mineralisation:

MINERALISATION

Principal primary ore mineral: Cassiterite Grain size:Fine
Other primary ore mineral(s): Pyrite,Arsenopyrite
Principal secondary ore mineral: Hematite
Other secondary ore mineral(s): Limonite,Goethite
Principal gangue mineral: Hematite,Limonite Age of Mineralisation:E. Prot.
Other gangue mineral(s): Quartz
Macroscopic ore textures: Vein fill
Weathering affect(s): Oxidation
Depth of weathering(m): 50

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
:		
:		
:		

EXPLORATION AND MINING

Exploration methods: Geol. mapping, Costeaning
Mining methods: Small pits
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: Hays,1960(BMR Rec.1960/2)
: Crohn,1968(BMR Bull.82)

REMARKS

Few grab samples assayed upto 1.53% Sn.Traces of gold are also present.

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Margaret
Commodities - Major/Minor: Sn
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 120 273
Latitude: Longitude:
Length (m): 19 Width(m): 1.8 Depth(m):
Strike bearing: 145 Dip: 60NE Plunge:

Deposit number: 078
Compiled by: M.A
Date entered. 27/8/90

Status: Abandoned mine
Shape: Vein
Size: Small
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Mount Partridge Group
Formation: Mundogie Sandstone
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Hematite quartz breccia
Subsidary host rock:
Wall rock: Siltstone
Subsiduary wall rock:
age of metamorphism: 1800 Ma Type: Progr. reg/cont Facies: Gnsch./Hb.Hfs

STRUCTURE

Type: Shear	Strike: 145	Dip: 60NE	Plunge:	Age relative to mineralisation: Pre?
Type: Vein	Strike: 90	Dip: 90	Plunge:	Age relative to mineralisation: Pre

MINERALISATION

Principal primary ore mineral: Cassiterite Grain size:Fine
Other primary ore mineral(s): Pyrite,Arsenopyrite
Principal secondary ore mineral: Hematite
Other secondary ore mineral(s): Limonite,Goethite
Principal gangue mineral: Hematite,Limonite Age of Mineralisation:E. Prot.
Other gangue mineral(s): Quartz
Macroscopic ore textures: Vein fill
Weathering affect(s): Oxidation
Depth of weathering(m): 50

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
: Sericitic	proximal	syn
: Hematitisation	in ore	post
:		

EXPLORATION AND MINING

Exploration methods: Geol. mapping, costeaning,drilling
Mining methods: Underground,Open cut
Open-cut workings - Depth(m): 5 Length: 50 Width: 1

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
: 1957-76			62	
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: McQueen,1956(BMR Rec.1956/133)
: Hays,1960(BMR Rec. 1960/2)
: Crohn,1968(BMR Bull. 82)

REMARKS

Includes Buffalo,Charlie and Bessie leases.The Buffalo lease has produced some 4 tones of hand sorted ore.Mineralisation style is probably similar to the Jessops lode i.e. dissiminated in massive sulphides.Traces of gold are present.

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Nelson 2
Commodities - Major/Minor: Sn
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 114 264
Latitude: Longitude:
Length (m): 1500 Width(m): 0.5 Depth(m):
Strike bearing: 045 Dip: Plunge:

Deposit number: 079
Compiled by: M.A
Date entered: 27/8/90

Status: Abandoned mine
Shape: Vein
Size: Occurrence only
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Mount Partridge Group
Formation: Mundogie Sandstone
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Hematite quartz breccia
Subsidary host rock:
Wall rock: Siltstone
Subsiduary wall rock:
age of metamorphism: 1800 Ma Type: Regional/Contact Facies: Gnsch./Alb.Ep.

STRUCTURE

Type: Strike: Dip: Plunge: Age relative to mineralisation:
Type: Strike: Dip: Plunge: Age relative to mineralisation:

MINERALISATION

Principal primary ore mineral: Cassiterite Grain size:Fine
Other primary ore mineral(s): Pyrite,Arsenopyrite
Principal secondary ore mineral: Hematite
Other secondary ore mineral(s): Limonite,Goethite
Principal gangue mineral: Hematite,Limonite Age of Mineralisation:E. Prot.
Other gangue mineral(s): Quartz
Macroscopic ore textures: Vein fill
Weathering affect(s): Oxidation
Depth of weathering(m): 50

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
: Sericitic	Proximal	Pyn
: Hematitisation	In ore	Post
:		

EXPLORATION AND MINING

Exploration methods: Prospecting pits
Mining methods: Small pits
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: Hays,1960(BMR Rec.1960/2)
: Crohn,1968(BMR Bull, 82)

REMARKS

Lodes are discontineous ove a total strike length of 1500m. Traces of gold are also present.

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Unnamed
Commodities - Major/Minor: Sn
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 125 268
Latitude: Longitude:
Length (m): Width(m): Depth(m):
Strike bearing: 045 Dip: Plunge:

Deposit number: 080
Compiled by: M.A
Date entered: 27/8/90

Status: Mineral occurrence
Shape: Vein
Size: Occurrence only
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Mount Partridge Group
Formation: Mundogie Sandstone
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Hematite quartz breccia
Subsidary host rock:
Wall rock: Siltstone
Subsiduary wall rock:
age of metamorphism: 1800 Ma Type: Regional/Contact Facies: Gnsch./Alb.Ep.

STRUCTURE

Type: Strike: Dip: Plunge: Age relative to mineralisation:
Type: Strike: Dip: Plunge: Age relative to mineralisation:

MINERALISATION

Principal primary ore mineral: Cassiterite Grain size:Fine
Other primary ore mineral(s): Pyrite,Arsenopyrite
Principal secondary ore mineral: Hematite
Other secondary ore mineral(s): Limonite,Goethite
Principal gangue mineral: Hematite,Limonite Age of Mineralisation:E. Prot.
Other gangue mineral(s): Quartz
Macroscopic ore textures: Vein fill
Weathering affect(s): Oxidation
Depth of weathering(m): 50

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
: Sericitic	Proximal	Pyn
: Hematitisation	In ore	Post
:		

EXPLORATION AND MINING

Exploration methods: Prospecting pits
Mining methods:
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: Hays,1960 (BMR Rec. 1960/2)

REMARKS

Small veins,erratic assays.

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Mary River Gossan
Commodities - Major/Minor: Zn Pb,Cu
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 198 262
Latitude: Longitude:
Length (m): 200 Width(m): 4 Depth(m): 60
Strike bearing: 040 Dip: 75NW Plunge:

Deposit number: 081
Compiled by: P.F.
Date entered: 29/03/89

Status: Prospect
Shape: Vein
Size: Medium
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Mount Partridge Group
Formation: Mundogie Sandstone
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Quartz vein breccia
Subsidary host rock: Pyritic shale
Wall rock: Quartzwacke
Subsidiary wall rock: Shale
age of metamorphism: 1800 Ma Type: Regional Facies: Greenschist

STRUCTURE

Type: Shear zone Strike: 040 Dip: 75NW Plunge: Age relative to mineralisation: Syn
Type: Bedding Strike: 310 Dip: 65SW Plunge: Age relative to mineralisation: Pre

MINERALISATION

Principal primary ore mineral: Sphalerite Grain size: Coarse
Other primary ore mineral(s): Galena, Pyrite, Stannite.
Principal secondary ore mineral: Cerussite
Other secondary ore mineral(s):
Principal gangue mineral: Quartz Age of Mineralisation: E. Prot.
Other gangue mineral(s): Sericite, Carbonate.
Macroscopic ore textures: Brecciation, Fracture filling.
Weathering affect(s): Oxidation
Depth of weathering(m): 30-40

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
: Silicification	Footwall & Hangingwall	Syn
: Sericitic	In ore	Syn
: Chloritic	Footwall & Hangingwall	Syn

EXPLORATION AND MINING

Exploration methods: GeoL mapping, Geochem., Geophys., Drilling.
Mining methods:
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
: Inferred resource	900 900	9.4% Zn 0.5% Pb	
:			
:			
:			

REFERENCES

: Darby,1985(GS85/10)
: Watts,1969a(GS69/12)
: Daly,1971(GS70/05)
: Daly,1975(GS75/01)
: Shields & Willis,1978(GS Rec.78/01)

REMARKS

Additional references ; Shields & Taube,1967(BMR Rec.1967/129), Sheilds- 1969(ibid. 1969/90), Duckworth,1969(ibid.), Williams,1971(ibid. 1971/134), Bullock,1972(ibid. 1972/52), Michail,1974(ibid. 1974/166),Hone & Major,1978.

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Mary River South
Commodities - Major/Minor: Zn Pb
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 201 251
Latitude: Longitude:
Length (m): 150 Width(m): 1 Depth(m): 110
Strike bearing: 315 Dip: 70SW Plunge:

Deposit number: 082
Compiled by: P.F.
Date entered: 29/03/89

Status: Prospect
Shape: Vein
Size: Occurrence only
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Mount Partridge Group
Formation: Mundogie Sandstone
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Quartz vein breccia
Subsidary host rock:
Wall rock: Quartzwacke
Subsiduary wall rock: Shale
age of metamorphism: 1800 Ma Type: Regional Facies: Greenschist

STRUCTURE

Type: Shear zone Strike: 315 Dip: 70SW Plunge: Age relative to mineralisation: Syn
Type: Bedding Strike: 150 Dip: 70SW Plunge: Age relative to mineralisation: Pre

MINERALISATION

Principal primary ore mineral: Sphalerite Grain size: Coarse
Other primary ore mineral(s): Galena, Pyrite
Principal secondary ore mineral:
Other secondary ore mineral(s):
Principal gangue mineral: Quartz Age of Mineralisation: E. Prot.
Other gangue mineral(s): Hematite
Macroscopic ore textures: Brecciation, Fracture filling
Weathering affect(s): Oxidation
Depth of weathering(m): 30-40

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
: Silicification	Footwall & Hangingwall	Syn
:		
:		

EXPLORATION AND MINING

Exploration methods: Geol. mapping, Geochem., Geophys., Drilling.
Mining methods:
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: Duckworth,1969(BMR Rec.1969/90)
: Watts,1969a(GS69/12)
: Daly,1971(GS70/5)
: Williams,1971(BMR Rec.1971/134)
: Bullock,1972(BMR Rec.1972/52)
: Daly,1975(GS75/01)
: Hone & Major,1978(BMR Rpt 206)
: Darby,1985(GS85/10)

REMARKS

Best drilling intersection was 3.57% Zn between 141-142.5m in DDH1. This prospect has good potential; further drilling may prove tonnages and grades similar to the Mary River Gossan.

Produced by Northern Territory Geological Survey, Dept Mines and Energy

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Minglo No2
Commodities - Major/Minor: Pb Zn
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 213 238
Latitude: Longitude:
Length (m): Width(m): Depth(m):
Strike bearing: 310 Dip: 80SW Plunge:

Deposit number: 083
Compiled by: P.F.
Date entered: 29/03/89

Status: Mineral occurrence
Shape: Stratiform
Size: Occurrence only
Mode of origin: Superficial enrichment

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Mount Partridge Group
Formation: Wildman Siltstone
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Carbonaceous shale
Subsidary host rock:
Wall rock: Carbonaceous shale
Subsiduary wall rock: Cordierite hornfels
age of metamorphism: 1800 Ma Type: Regional/Contact Facies: Greenschist

STRUCTURE

Type: Bedding	Strike: 310	Dip: 80SW	Plunge:	Age relative to mineralisation: Pre
Type:	Strike:	Dip:	Plunge:	Age relative to mineralisation:

MINERALISATION

Principal primary ore mineral: Pyrrhotite Grain size: Fine
Other primary ore mineral(s):
Principal secondary ore mineral:
Other secondary ore mineral(s):
Principal gangue mineral: Host Age of Mineralisation:
Other gangue mineral(s):
Macroscopic ore textures:
Weathering affect(s): Oxidation
Depth of weathering(m): 20

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
:		
:		
:		

EXPLORATION AND MINING

Exploration methods: Geophy., Drilling.
Mining methods:
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: Michail,1974(BMR Rec.1974/166)
: Daly,1975(GS75/01)
: Hone & Major,1978(BMR Rpt 206)

REMARKS

Purely a geophysical target caused by local concentrations of pyrrhotite in carbonaceous shales of the Wildman Siltstone. No economic minerals were observed in the drill core.

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Mount George
Commodities - Major/Minor: Sn
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 081 202
Latitude: Longitude:
Length (m): 60 Width(m): Depth(m):
Strike bearing: NW Dip: Plunge:

Deposit number: 084
Compiled by: M.A
Date entered: 27/8/90

Status: Abandoned mine
Shape: Vein
Size: Occurrence only
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Mount Partridge Group
Formation: Mundogie Sandstone
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Hematite quartz breccia
Subsidary host rock:
Wall rock: Siltstone
Subsiduary wall rock:
age of metamorphism: 1800 Ma Type: Regional/Contact Facies: Gnsch./Alb.Ep.

STRUCTURE

Type: Strike: Dip: Plunge: Age relative to mineralisation:
Type: Strike: Dip: Plunge: Age relative to mineralisation:

MINERALISATION

Principal primary ore mineral: Cassiterite Grain size:Fine
Other primary ore mineral(s): Pyrite,Arsenopyrite
Principal secondary ore mineral: Hematite
Other secondary ore mineral(s): Limonite,Goethite
Principal gangue mineral: Hematite,Limonite Age of Mineralisation:E. Prot.
Other gangue mineral(s): Quartz,Tourmaline
Macroscopic ore textures: Vein fill & stingers
Weathering affect(s): Oxidation
Depth of weathering(m): 50

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
: Sericitic	Proximal	Syn
: Hematitisation	In ore	Post
:		

EXPLORATION AND MINING

Exploration methods: Prospecting pits
Mining methods: Open cut,underground
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
: 1926-65	200		12	7.15 t Sn
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: Crohn,1968(BMR Bull. 82)
: Hays,1960(BMR Rec. 1960/2)

REMARKS

The lodes have no definite trend and the ore is in fine stringers.

Produced by Northern Territory Geological Survey, Dept Mines and Energy

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Boots
Commodities - Major/Minor: Fe Mn
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 007 182
Latitude: Longitude:
Length (m): 120 Width(m): 2 Depth(m): 10
Strike bearing: 335 Dip: 75E Plunge:

Deposit number: 085
Compiled by: P.F.
Date entered: 07/09/89

Status: Mineral occurrence
Shape: Stratiform
Size: Occurrence only
Mode of origin: Superficial enrichment

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: South Alligator Group
Formation: Koolpin Formation
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Hematite-shale beccia
Subsidary host rock: Massive hematite
Wall rock: Slate
Subsiduary wall rock: Shale
age of metamorphism: 1800 Ma Type: Regional Facies: Greenschist

STRUCTURE

Type: Bedding Strike: 340 Dip: 75E Plunge: Age relative to mineralisation: Pre
Type: Strike: Dip: Plunge: Age relative to mineralisation:

MINERALISATION

Principal primary ore mineral: Grain size:
Other primary ore mineral(s):
Principal secondary ore mineral: Hematite
Other secondary ore mineral(s): Limonite, Pyrolusite
Principal gangue mineral: Slate Age of Mineralisation:
Other gangue mineral(s):
Macroscopic ore textures: Boxwork, Brecciation.
Weathering affect(s): Supergene
Depth of weathering(m): 40

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
:		
:		
:		

EXPLORATION AND MINING

Exploration methods: Geochem.
Mining methods:
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: Shields, 1966 (GS66/4).

REMARKS

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: McKinley
Commodities - Major/Minor: Au
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference GL 963 168
Latitude: Longitude:
Length (m): 200 Width(m): 1 Depth(m):
Strike bearing: 155 Dip: 80 Plunge:

Deposit number: 087
Compiled by: A.W.
Date entered: 15/7/87

Status: Abandoned mine
Shape: Vein
Size: Occurrence only
Mode of origin: Hydrothermal

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: South Alligator Group
Formation: Mount Bonnie Formation
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Vein quartz
Subsidary host rock:
Wall rock: Ferruginous siltstone
Subsiduary wall rock: Greywacke
age of metamorphism: 1800 Ma Type: Regional/Contact Facies: Gnsch./Alb.Ep.

STRUCTURE

Type: Anticline Strike: 155 Dip: 80 Plunge: Age relative to mineralisation: Pre
Type: Shear zone Strike: 155 Dip: 90 Plunge: Age relative to mineralisation: Pre

MINERALISATION

Principal primary ore mineral: Gold
Other primary ore mineral(s): Pyrite,Arsenopyrite
Principal secondary ore mineral: Hematite
Other secondary ore mineral(s):
Principal gangue mineral: Quartz
Other gangue mineral(s): Hematite
Macroscopic ore textures: Dissemainated in quartz veins
Weathering affect(s): Oxidation
Depth of weathering(m): 30

Grain size:Microscopic

Age of Mineralisation:E. Prot.

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
: Chloritic	Proximal	Syn.
: Sericitic	Proximal	Syn./Post.
:		

EXPLORATION AND MINING

Exploration methods: Geolog. mapping, Costeaning, Drilling
Mining methods: Open cut
Open-cut workings - Depth(m): 3 Length: 50 Width: 4

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
: -1939	127	3.28g/t Au		0.4 kg Au
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: Hossfeld, 1940
: Newton, 1974a (GS 74/017)
:
:
:
:
:

: Hossfeld, 1940
:
:
:
:
:
:

REMARKS

Given production figure is almost certainly incomplete.

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Porcupine
Commodities - Major/Minor: Fe
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 040 149
Latitude: Longitude:
Length (m): 500 Width(m): 15 Depth(m): 10
Strike bearing: 330 Dip: 55W Plunge:

Deposit number: 107
Compiled by: P.F.
Date entered: 07/09/89

Status: Mineral occurrence
Shape: Stratiform
Size: Occurrence only
Mode of origin: Superficial enrichment

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Mount Partridge Group
Formation: Wildman Siltstone
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Ferruginous shale breccia
Subsidary host rock:
Wall rock: Shale
Subsiduary wall rock: Slate
age of metamorphism: 1800 Ma Type: Regional Facies: Greenschist

STRUCTURE

Type: Bedding Strike: 330 Dip: 55W Plunge: Age relative to mineralisation: Pre
Type: Strike: Dip: Plunge: Age relative to mineralisation:

MINERALISATION

Principal primary ore mineral: Grain size:
Other primary ore mineral(s):
Principal secondary ore mineral: Hematite
Other secondary ore mineral(s): Limonite
Principal gangue mineral: Shale Age of Mineralisation:
Other gangue mineral(s):
Macroscopic ore textures: Brecciation
Weathering affect(s): Supergene
Depth of weathering(m): 50

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
:		
:		
:		

EXPLORATION AND MINING

Exploration methods: Geochem.
Mining methods:
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: Shields, 1966 (GS66/4).

REMARKS

Five chip samples along the lode averaged 52.4% Fe and 0.4% P.

Produced by Northern Territory Geological Survey, Dept Mines and Energy

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: McFarrars
Commodities - Major/Minor: Fe Mn
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 015 144
Latitude: Longitude:
Length (m): 200 Width(m): 15 Depth(m): 15
Strike bearing: 330 Dip: 45E Plunge:

Deposit number: 108
Compiled by: P.F.
Date entered: 07/09/89

Status: Mineral occurrence
Shape: Stratiform
Size: Occurrence only
Mode of origin: Superficial enrichment

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: South Alligator Group
Formation: Koolpin Formation
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Massive limonite gossan
Subsidary host rock: Limonite-shale breccia
Wall rock: Carbonaceous shale
Subsiduary wall rock:
age of metamorphism: 1800 Ma Type: Regional Facies: Greenschist

STRUCTURE

Type: Bedding Strike: 330 Dip: 45E Plunge: Age relative to mineralisation: Pre
Type: Strike: Dip: Plunge: Age relative to mineralisation:

MINERALISATION

Principal primary ore mineral: Grain size:
Other primary ore mineral(s):
Principal secondary ore mineral: Limonite
Other secondary ore mineral(s): Pyrolusite
Principal gangue mineral: Shale Age of Mineralisation:
Other gangue mineral(s):
Macroscopic ore textures: Boxwork, Brecciation
Weathering affect(s): Supergene
Depth of weathering(m): 40

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
:		
:		
:		

EXPLORATION AND MINING

Exploration methods: Geochem.
Mining methods:
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: Shields, 1966 (GS66/4).

REMARKS

Three chip samples along the lode averaged 41% Fe and 11.8% Mn (Shields, 1966).

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Egg Cup
Commodities - Major/Minor: Fe
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 023 141
Latitude: Longitude:
Length (m): 30 Width(m): 2 Depth(m): 10
Strike bearing: 340 Dip: 60SW Plunge:

Deposit number: 109
Compiled by: P.F.
Date entered: 07/09/89

Status: Mineral occurrence
Shape: Stratiform
Size: Occurrence only
Mode of origin: Superficial enrichment

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline Sub-unit:
Group: South Alligator Group Age: Palaeoproterozoic
Formation: Koolpin Formation Age: Palaeoproterozoic
Member: Age:

LITHOLOGY AND METAMORPHISM

Host rock: Hematite-shale beccia
Subsidary host rock: Massive hematite
Wall rock: Slate
Subsiduary wall rock: Shale
age of metamorphism: 1800 Ma Type: Regional Facies: Greenschist

STRUCTURE

Type: Bedding Strike: 340 Dip: 60SW Plunge: Age relative to mineralisation: Pre
Type: Strike: Dip: Plunge: Age relative to mineralisation:

MINERALISATION

Principal primary ore mineral: Grain size:
Other primary ore mineral(s):
Principal secondary ore mineral: Hematite
Other secondary ore mineral(s): Limonite
Principal gangue mineral: Slate Age of Mineralisation:
Other gangue mineral(s):
Macroscopic ore textures: Boxwork, Brecciation
Weathering affect(s): Supergene
Depth of weathering(m): 40

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore

EXPLORATION AND MINING

Exploration methods:
Mining methods:
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade

REFERENCES

: Shields, 1966 (GS66/4).

REMARKS

Produced by Northern Territory Geological Survey, Dept Mines and Energy

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Bowerbird
Commodities - Major/Minor: Fe Mn
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 048 134
Latitude: Longitude:
Length (m): 480 Width(m): 5 Depth(m): 10
Strike bearing: 320 Dip: 60W Plunge:

Deposit number: 111
Compiled by: P.F.
Date entered: 07/09/89

Status: Mineral occurrence
Shape: Stratiform
Size: Occurrence only
Mode of origin: Superficial enrichment

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Mount Partridge Group
Formation: Wildman Siltstone
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Massive hematite
Subsidary host rock: Hematite-shale breccia
Wall rock: Shale
Subsiduary wall rock: Slate
age of metamorphism: 1800 Ma Type: Regional Facies: Greenschist

STRUCTURE

Type: Bedding Strike: 320 Dip: 60W Plunge: Age relative to mineralisation: Pre
Type: Cleavage Strike: 020 Dip: 80E Plunge: Age relative to mineralisation: Pre

MINERALISATION

Principal primary ore mineral: Grain size:
Other primary ore mineral(s):
Principal secondary ore mineral: Hematite
Other secondary ore mineral(s): Limonite, Pyrolusite
Principal gangue mineral: Shale Age of Mineralisation:
Other gangue mineral(s):
Macroscopic ore textures: Massive, Brecciation.
Weathering affect(s): Supergene
Depth of weathering(m): 50

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
:		
:		
:		

EXPLORATION AND MINING

Exploration methods: Geochem.
Mining methods:
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: Shields, 1966 (GS66/4).

REMARKS

The prospect contains two subparallel lodes which average 50% Fe (Shields, 1966).

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Big Hill
Commodities - Major/Minor: Fe
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 044 143
Latitude: Longitude:
Length (m): 800 Width(m): 6 Depth(m): 15
Strike bearing: 345 Dip: 60W Plunge:

Deposit number: 110
Compiled by: P.F.
Date entered: 07/09/89

Status: Prospect
Shape: Stratiform
Size: Small
Mode of origin: Superficial enrichment

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline Sub-unit:
Group: Mount Partridge Group Age: Palaeoproterozoic
Formation: Wildman Siltstone Age: Palaeoproterozoic
Member: Age:

LITHOLOGY AND METAMORPHISM

Host rock: Massive limonite
Subsidary host rock: Limonite-shale breccia
Wall rock: Shale
Subsiduary wall rock: Slate
age of metamorphism: 1800 Ma Type: Regional Facies: Greenschist

STRUCTURE

Type: Bedding Strike: 345 Dip: 60W Plunge: Age relative to mineralisation: Pre
Type: Bedding Strike: 345 Dip: 45W Plunge: Age relative to mineralisation: Pre

MINERALISATION

Principal primary ore mineral: Grain size:
Other primary ore mineral(s):
Principal secondary ore mineral: Limonite
Other secondary ore mineral(s): Hematite
Principal gangue mineral: Green-grey slate Age of Mineralisation:
Other gangue mineral(s):
Macroscopic ore textures: Massive, Brecciation
Weathering affect(s): Supergene
Depth of weathering(m): 50

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
:		
:		
:		

EXPLORATION AND MINING

Exploration methods: Drilling
Mining methods:
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
: Inferred resource	300 000	~50% Fe	
:			
:			
:			

REFERENCES

: Shields, 1966 (GS66/4).

REMARKS

Bands of slate within limonite are common.

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: Millers
Commodities - Major/Minor: Fe Mn
Locality - 1:250 000 sheet: PINE CREEK SD52-5
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 054 122
Latitude: Longitude:
Length (m): 250 Width(m): 15 Depth(m): 40
Strike bearing: 345 Dip: 60W Plunge:

Deposit number: 112
Compiled by: P.F.
Date entered: 07/09/89

Status: Prospect
Shape: Stratiform
Size: Small
Mode of origin: Superficial enrichment

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline
Group: Mount Partridge Group
Formation: Wildman Siltstone
Member:

Sub-unit:
Age: Palaeoproterozoic
Age: Palaeoproterozoic
Age:

LITHOLOGY AND METAMORPHISM

Host rock: Limonitic gossan
Subsidary host rock:
Wall rock: Metagreywacke (weathered)
Subsiduary wall rock: Silty shale
age of metamorphism: 1800 Ma Type: Regional Facies: Greenschist

STRUCTURE

Type: Bedding	Strike: 345	Dip: 60W	Plunge:	Age relative to mineralisation: Pre
Type: Syncline	Strike: 345	Dip: Tight	Plunge: N	Age relative to mineralisation: Pre

MINERALISATION

Principal primary ore mineral: Grain size:
Other primary ore mineral(s):
Principal secondary ore mineral: Limonite
Other secondary ore mineral(s): Hematite, Pyrolusite
Principal gangue mineral: Wallrock Age of Mineralisation:
Other gangue mineral(s):
Macroscopic ore textures: Massive, Brecciation
Weathering affect(s): Supergene
Depth of weathering(m): 50

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
:		
:		
:		

EXPLORATION AND MINING

Exploration methods: Geol. mapping, Geochem., Drilling.
Mining methods:
Open-cut workings - Depth(m): Length: Width:

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
: Indicated resource	380 000	52% Fe	
: Inferred resource	1 234 900	50% Fe, 7% Mn	
:			
:			

REFERENCES

: Shields, 1966a (GS66/4).
: Shields, 1966b (GS66/12).
: Friesen, 1972 (CR72/6).

REMARKS

The lode is in the form of a tight syncline.

MINERAL DEPOSIT DATA SHEET

METALLOGENIC MAP DATA

Deposit/Prospect name: McKeddies
Commodities - Major/Minor: Au
Locality - 1:250 000 sheet: PINE CREEK SD52-8
1:100 000 sheet: McKinlay River 5271
Universal Grid Reference HL 091 112
Latitude: Longitude:
Length (m): 3333 Width(m): Depth(m):
Strike bearing: Dip: Plunge:

Deposit number: 113
Compiled by: Z.B
Date entered: 5/12/90

Status: Abandoned mine
Shape: Placer
Size: Occurrence only
Mode of origin: Superficial enrichment

GEOLOGICAL SETTING

Major tectonic unit(s): Pine Creek Geosyncline Sub-unit:
Group: Age:
Formation: Czs Age: Cainozoic
Member: Age:

LITHOLOGY AND METAMORPHISM

Host rock: Gravel
Subsidary host rock: Sand, silt and alluvium
Wall rock:
Subsiduary wall rock:
age of metamorphism: - Type: Facies:

STRUCTURE

Type: Strike: Dip: Plunge: Age relative to mineralisation:
Type: Strike: Dip: Plunge: Age relative to mineralisation:

MINERALISATION

Principal primary ore mineral: Gold Grain size:
Other primary ore mineral(s):
Principal secondary ore mineral:
Other secondary ore mineral(s):
Principal gangue mineral: Magnetite Age of Mineralisation:Cainozoic
Other gangue mineral(s): Limonite, Hematite
Macroscopic ore textures:
Weathering affect(s):
Depth of weathering(m):

WALLROCK ALTERATION

Type	Location Relative to ore	Age relative to ore
:		
:		
:		

EXPLORATION AND MINING

Exploration methods: Geol. Mappinf, Costeaning
Mining methods: Open pit excavation
Open-cut workings - Depth(m): 1 Length: 200 Width: 100

PAST PRODUCTION

Period	Ore(t)	Grade(%)	Concentrate(t)	Contained metal (t)
:				
:				
:				
:				

ORE RESERVES

Status	Tonnes	Grade	Cut-off grade
:			
:			
:			
:			

REFERENCES

: Walpole and others, 1968(BMR Bull.82)

REMARKS