DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

REPT.BK.NO. 88/41
REVIEW OF LEAD-ZINC MINERALISATION IN SOUTH AUSTRALIA - ADELAIDE GEOSYNCLINE AND INLIERS, STUART SHELF

GEOLOGICAL SURVEY

by

R.S. ROBERTSON
MINERAL RESOURCES

CONTRIBUTORS: R.S. Robertson
I.J. Townsend
B.J. Morris
A.W. Newton
W.M. Cowley
B.G. Forbes

JUNE, 1988 DME.180/86

CONTENTS

Fig. 23	CURNAMONA AG 111	S19968
Fig. 24	PORT AUGUSTA AG 112	S19969

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

REPT. BK. NO. 88/41
D.M.E. NO. 180/86
DISK NO. 17

REVIEW OF LEAD-ZINC MINERALISATION IN SOUTH AUSTRALIA - ADELAIDE GEOSYNCLINE & INLIERS, STUART SHELF

ABSTRACT

Information on lead, zinc & silver mineralisation in the Adelaide Geosyncline, basement inliers, Stuart Shelf and Spencer Shelf has been reviewed. Mineralisation is widespread both geographically and stratigraphically but many areas are underexplored. Past exploration generally focussed on copper. Further investigation is recommended in the following units and areas:-

Cambrian
- Hawker Group.
- Normanville Group.
- Lake Frome Group.

Adelaidean
- Tapley Hill Formation and Woocalla Dolomite particularly on the Stuart Shelf.
- McDonald Shear Zone.
- Ulooloo Prospect.
- Boucaut Volcanics.
- Anomalous zones in several other Adelaidean units.

Basement Inliers - Peake and Denison Ranges, Mount Babbage and Mount Painter Inliers.

Ordovician Granitoids (& surrounding rocks).

INTRODUCTION

This report is one of a series prepared to assist in the search for lead, zinc, silver orebodies in South Australia to provide feedstock for the Port Pirie smelting and refining facilities of Broken Hill Associated Smelters. Summarised are all lead, zinc and silver prospects in Adelaidean and Cambrian rocks of the Stuart Shelf Spencer Shelf and Adelaide Geosyncline (but excluding the Cambrian of the Kanmantoo Trough) and older Proterozoic inliers within the Geosyncline.

Open file references summarised were obtained from the SADME bibliographic retrieval system SAMREF (1981-1987) and SADMEB (1953-1983) using the keywords lead and/or zinc. References with no or very minor lead/zinc mineralisation or anomalies have been excluded from this report.

SUMMARY

Exploration in the Adelaide Geosyncline and Stuart Shelf has located widespread lead and zinc mineralisation. However many areas are underexplored. Many lead and zinc anomalies have not been followed up and relatively little drilling has been done. Past exploration often focussed on copper alone.

Deposits currently in production are the Puttapa (Beltana) Mine where the Electrolytic Zinc Co. mines the secondary zinc silicate willemite and a small operation at Baratta - Eukaby Hill producing lead, silver and gold.

Adelaidean geology of the Adelaide Geosyncline and Stuart Shelf is described in Preiss (1987). Cambrian units are described in Daily (1976), Dalgarno (1964) and Wopfner (1969).

Cambrian Hawker Group and Normanville Group

Mineralisation and anomalous areas are summarised in Table 1. Wilkawillina Limestone and equivalents are particularly favourable host units. Two styles of mineralisation are present:

(a) stratiform and stratabound mineralisation near the base of the Wilkawillina Limestone or Ajax Limestone.

(b) Mississippi Valley Type cavity fill deposits in massive fossiliferous limestone. Exploration for this style of orebody in the Flinders Ranges was pioneered by B.H.P. Minerals Ltd. and the concept was also used by SADME in exploration on the western edge of the Flinders Ranges National Park. Settings found to be particularly favourable include biohermal reef complexes, major unconformities with related karsting and fault related breccias.

Particularly promising prospects and areas in the Hawker Group include the Mt. Chambers Mine - Moorowie Mine area, Donkey Bore area, Wirrealpa Mine area, Wilkawillina Gorge area, Red Range, Arrowie Gorge - Moro Gorge area, Black Range Spring, Third Plain area and Radford Creek. The Ediacara Mineral Field was worked from 1869 to 1913 to produce 24 000 tonnes of ore containing 30% Pb. Extensive drilling has found subeconomic mineralisation. The Aroona and Third Plain deposits are secondary willemite mineralisation similar to Puttapa. Muller (1972) considered that the willemite at Puttapa was derived by oxidation of a primary sulphide ore body in brecciated Cambrian Archaeocyatha limestone. One deep diamond drillhole encountered sparse galena, sphalerite, pyrite and marcasite 150 metres below the willemite orebody.

On the Spencer Shelf, Hawker Group rocks near Curramulka (Yorke Peninsula) and Bute contain lead-zinc mineralisation in a similar environment to that in the Flinders Ranges. This area also has potential for MVT orebodies.

On Fleurieu Peninsula, Normanville Group rocks contain anomalous lead and zinc in a series of prospects between Carrickalinga Head and Sellicks Hill. At Wangkonda South Prospect one drillhole located 10 m of 3.2% Pb in a fracture zone. Further exploration is warranted in this area.

Sampling of stratigraphic holes in the Lake Frome area found up to 1.9% Zn, 0.39% Pb in Cambrian Lake Frome Group sediment (AG 111).

TABLE 1

Pb, Zn Prospects in Cambrian Units

Locality/Prospect	Stratigraphic Unit	Reference No. AG... in this report
HAWKER GP. - Yorke Peninsula		
Curramulka	Kulpara Lst., Ramsay Lst.	11, 14
Clinton & Dowlingville	Kulpara Lst.	12
Bute	Kulpara Lst.	13
HAWKER GP. - Flinders Ranges		
Ediacara	Ajax Lst., Parachilna Fm.	28
Puttapa (Beltana) Mine	Ajax Lst., Parachilna Fm.	29
Aroona Prospect	Ajax Lst., Parachilna Fm.	29
Sliding Rock Mine	Wilkawillina Lst., Parachilna Fm.	31,34
Northeast of Puttapa Springs	Wilkawillina Lst., Parachilna Fm.	31,34
Northwest of Mt Hack	Wilkawillina Lst., Parachilna Fm.	31,34
North of Black Range Spring	Wilkawillina Lst.	32,34
Sliding Rock Creek (headwaters)	Wilkawillina Lst.	33
Wilkawillina Gorge Area (including Linda Prospect)	Wilkawillina Lst.	36,62,63
Wirrapowie Creek	Wilkawillina Lst., Parara Lst.	36
North of Mt Serle	Nepabunna Siltstone, Parara Lst.	37,44
West of Angepena H.S.	Wilkawillina Lst.	38
McKinlay Creek - Italowie Gorge	Wilkawillina Lst.	43,44
Mt Chambers & Moorowie Mine Areas	Wilkawillina Lst.	45,56
Red Range	Ajax Lst.	46
Arrowie & Moro Gorge Areas	Wilkawillina Lst., Parachilna Fm.	47,48
West flank of Heysen Range (Flinders Ranges National Park)	Wilkawillina Lst.	51,52,53,54
Chace & Druid Syncline, Vanessa	Wilkawillina Lst., Parara Lst.	55
Donkey Bore, Wirrealpa Mine Area	Wilkawillina Lst.	57
Reaphook Hill Zn Prospect	Wilkawillina Lst.	58
Third Plain Zn Prospect	Wilkawillina Lst.	60,61,62
Reaphook Reef Prospect	Wilkawillina Lst.	62
Ragless Range	Wilkawillina Lst., Parachilna Fm.	68,71
Radford Creek	Wilkawillina Lst., Parachilna Fm.	70,74
Mt. Arden - Comstock Mine Area	Wilkawillina Lst., Parachilna Fm.	72,73
Kanyaka Mine Area	Wilkawillina Lst., Parachilna Fm.	70,75,76
NORMANVILLE GP. - Fleurieu Peninsula		
Sellick Hill	Wangkonda Fm.	91,92
Pipeline Prospect	Wangkonda Fm., Forktree Lst., Mt Terrible Fm.	92,95,96
Fork Tree Prospect	Wangkonda Fm., Fortree Lst.	93,94,95
Wangkonda Prospect	Wangkonda Fm., Sellick Hill Lst.	96,97
Peninsula Prospect	Andamooka Lst.	5

Adelaidean

Known mineralisation and anomalous areas are summarised in Table 2.

The Tapley Hill Formation and partly equivalent Woocalla Dolomite on the Stuart Shelf contain widespread stratiform mineralisation and are of particular interest. In the Winnie Pinnie - Trevenna area black shale of the Woocalla Dolomite contains persistent, although uneconomic, Pb & Zn sulphides. At Pond Well up to 7.15% Zn over 4 m was intersected in the base of the Tapley Hill Formation. Mineralisation has also been located south of Island Lagoon and along Myall Creek. Further exploration of these units is warranted particularly where favourable environments can be identified e.g. adjacent to major lineaments.

Bunyeroo Formation shale hosts stratiform Zn mineralisation at Puttapa Gap and Patawarta and possibly elsewhere. Balcanoona Formation, Wilyerpa Formation, Skillogalee Dolomite and Wortupa Quartzite, at the localities shown in Table 2, have Pb and Zn anomalies extending along strike indicating stratiform or stratabound mineralisation.

At Winklers Prospect, Pb-Zn mineralisation occurs for at least 500 m in sediments assigned to the Appila Tillite near the major McDonald Shear Zone. Appila Tillite hosts Pb-Zn mineralisation at Ulooloo Prospect where drill intersections of up to 1.35% Zn and 0.5% Pb over 6 m were obtained. The surface anomaly extended for 900 x 400 m.

Curdimurka Subgroup rocks in the Peake and Denison Ranges have recorded several Pb-Zn stream, soil & rock chip anomalies which have not been followed up.

Boucaut Volcanics at Mutooroo Ridge have associated rock chip sample anomalies worthy of further investigation both at this locality and elsewhere.

Minor lead and zinc mineralisation in veins and fissures occur in many Adelaidean units, particularly the Wonoka and Tapley Hill Formations. While these are generally too small to be of interest, the possibility of major structurally controlled orebodies cannot be ruled out. Areas such as Eukaby - Baratta and Wadnaminga have potential for Au and Pb orebodies.

TABLE 2

Adelaidean Units associated with Pb & Zn prospects

Type of Mineralisation
S - denotes stratiform
V - vein or fissure fill
A - geochemical anomaly, origin unknown.

STRATIGRAPHIC UNIT	LOCALITY/PROSPECT	REFERENCE NO. (AG... in this report	TYPE OF MINERALISATION
WILPENA GP.			
Billy Springs Beds	Gilead P. Beck Mine	18	V
	Ooloo Mine	18	V
Wonoka Fm.	Nevada Mine	37,38	V
	Appealinna Well, Oodnapanicken Mines	40	V
	Waukawoodna Creek area	41	V
Bunyeroo Fm.	North of Puttapa Gap	35	S
	Patawarta Zinc Prospect	36,39	S
	Near Pinda Spings Mine	24	S
	Constitution Hill Mine	37	V
Brachina Fm.	Pinda Springs, Jubilee Mines	42	V
	Bullock Head Gap	42	A
UMBERATANA GP.			
Amberoona Fm.	Billy Springs Mine	18	V?
Enorama Shale	Eringa, Boomerang, Coo-ee Mines	103	V
Etina Fm.	Wepowie Mine	36,39	V
Balcanoona Fm.	Mt Ogilvie, Bedowie Well areas	27	A
	Mt Serle area	37	A
Woocalla Dolomite	Winnie Pinnie-Trevenna area	7,8,9	S
Tapley Hill Fm.	Pond Well	6	S
	South of Island Lagoon	10	S
	Myall Creek	112	S
	Great Gladstone Mine	18	V
	Welcome Mine	21	V
	Eukaby-Barratta Mines are	65,66,67	V
	Willow Springs area	59	A
	Truro area	85	A

TABLE 2 (continued)

	Riverton area	86	A
	Medina Mine area	79	A
	Manunda Creek	104	A
-Eudunda Arkose Member	Eudunda, Kapunda area	87,88,89	A
Tapley Hill Fm. - Merinjina Tillite contact	Various on COPLEY	23	A
Appila Tillite	Winklers prospect Dalkey-Mildaltie Mine area	101,102	V?
(?)	Chalk Cliffs area	82	V?
(& kimberlite?)	Ulooloo Copper Mine	81	?
	Twighams prospect	81	?
Wilyerpa Fm.	Benda Range	105	V or S?
Bolla Bollana tillite	Hamilton Creek	17	V
BURRA GP.			
Mintaro Shale	Commodore Mine, Giles Nob	105,106	V
Saddleworth Fm.	Eke Hill	80	A
	Wadnaminga Goldfield	106	V
	Cudlee Creek area	83	A
Myrtle Springs Fm.	Avondale Mine	26	V
Woolshed Flat Shale	Gawler area	84	A
	Almanda Mine	88,99,100	V
Skillogalee Dolomite	Northeast of O'Donoghue's Castle Mine	22,25	S?
Wortupa Quartzite	Blue Mine - Wheal Turner area	19	S?
River Wakefield Subgroup	Yednalue Anticline	77	A
	Copper Claim Prospect	78	S?
CALLANA GP.			
Curdimurka Subgroup	Coominaree Mine, Peake area etc.- Peake & Denison Ra.	1,2,3,	V & A
Kirwan Siltstone	South of Kirwan Mine	64	A
Boucaut Volcanics	Mutooroo Ridge	107	S?
Wywyana Fm.	Mt. McDonnell Mine area	20	A
Diapiric breccia	Grindell Hut area	22	V
	Patawarta & Nuccaleena Diapirs	30,39	A
	Oraparinna Diapir	59	A

Early-Mid Proterozoic Inliers and Ordovician Granites

In the Peake and Denison Ranges, Pb soil and stream sediment anomalies have been found in the 'North Peake' and 'South Peake' areas. Source of the anomalies is unknown but host rocks are Wirriecurrie Granite intruded by basic dykes and Peake Metamorphics with infaulted Duff Creek Beds respectively (AG1).

Near Prospect Hill at the northern end of the Mount Babbage Inlier, an area of stream sediment anomalies up to 2165 ppm Pb was found associated with Mount Neill Granite Porphyry and infaulted Adelaidean blocks (AG 15). Near Mount Babbage, anomalous Pb and Zn were located in an area of Yerila Granite intruded by Ordovician Mudnawatana Granite (AG 15).

In the Mount Painter Inlier, some Pb mineralisation was found in pyritic schist and schistose porphyry (sheared Mount Neill Granite Porphyry?) at the Gunsight (Copper) Prospect (AG 16). At the British Empire Mine, Cu, U, Pb, Zn mineralisation occurs in Freeling Heights Quartzite adjacent to intrusive Mudnawatana Granite. Minor Pb, Zn stream sediment anomalies are also associated with this contact elsewhere (AG 16, 17). Anomalous Zn and Pb stream sediment values were found near the Parabarana copper prospect (AG 17).

Anomalous Pb was located in quartz veins and greissen zones within Ordovician Bendigo Granite east of Terowie. (AG 82).

East of Burra, on the margin of the Murray Basin, a chloritic schist of unknown age, intersected in a drillhole contained up to 2173 ppm Zn (AG 108).

RECOMMENDATIONS

Further work comprising stream sediment, soil and rock chip geochemistry, RAB drilling with bottom hole coring, detailed geophysical surveys is recommended in the following areas:

Cambrian

- Lower Hawker Group Regional evaluation and prospect follow-up of the following localities
  - Spencer Shelf.

- Flinders Ranges.
- Areas where Hawker Group is at relatively shallow depth and are likely to contain favourable structures, require appraisal.
- Known prospects outlined in this report require additional investigations.

. Normanville Group. In the Sellick Hill - Carrickalinga area and other areas of Normanville Group.

. Lake Frome Group.

Adelaidean

. Tapley Hill Formation (and Woocalla Dolomite) particularly on the Stuart Shelf.

. McDonald Shear Zone. Test for mineralisation adjacent to shear zone and evaluation of Winklers and Dalkey-Mildaltie prospects.

. Ulooloo Prospect (Appila Tillite).

. Boucaut Volcanics. Mutooroo Ridge and other areas require further investigations.

. Geochemical anomalies in Bunyeroo, Balcanoona, Wilyerpa Formations, Skillogalee Dolomite, Wortupa Quartzite and Curdimurka Subgroup, as listed in Table 2.

Basement Inliers

. Anomalies in Peake area and at Prospect Hill.

. Evaluation of mineralisation at British Empire and Gunsight prospects etc.

Ordovician Granites

- Ordovician granites (e.g. Bendigo) and surrounding rocks to test potential for economic mineralisation derived from late magmatic fluids.

R. S. Robertson

R.S. ROBERTSON

GENERAL REFERENCES

Daily, B., 1976. The Cambrian of the Flinders Ranges. In: Excursion Guide No. 33A. 25th International Geological Congress, Sydney, 1976.

Dalgarno, C.R., 1964. Lower Cambrian Stratigraphy of the Flinders Ranges. Transactions of the Royal Society of South Australia, 88: 129-144.

Horn, C.M., 1988. Review of Lead-Zinc Mineralisation in South Australia - Willyama Inlier and Curnamona Cratonic Nucleus. South Australian Department of Mines and Energy report (in preparation).

Morris, B.J., 1988. Review of Lead-Zinc Mineralisation in South Australia - Kanmantoo Trough. South Australian Department of Mines and Energy report RB 88/22.

Muller, D.W., 1972. The Geology of the Beltana Willemite Deposits. Economic Geology, 67:1146-1167.

Preiss, W.V., 1987. The Adelaide Geosyncline. Late Proterozoic Stratigraphy, Sedimentation, Palaeontology and Tectonics. Bulletin of the Geological Survey of South Australia, 53.

Townsend, I.J., 1988. Review of Lead-Zinc Mineralisation in South Australia - Gawler Craton. South Australian Department of Mines and Energy report (in preparation).

Wopfner, H., 1969. The Cambrian Period. In: Parkin, L.W. (Ed.), Handbook of South Australian Geology. Geological Survey of South Australia Gov. Printer, Adelaide, pp. 84-97.

APPENDIX

Summaries of references.
All references are open file unless otherwise stated.

Abbreviations:

SML	Special Mining Lease
EL	Exploration Licence
ML	Mineral Lease
MC	Mineral Claim
Env	Company report in SADME Envelope System
RB	SADME unpublished report
RI	SADME Report of Investigations
Bull	SADME Bulletin
MRR	SADME Mineral Resources Review
MR	SADME Mining Review

Locations are shown on Figs. 2 - 24 using the AG reference number.

(a), (b) etc. distinguish different localities with the same reference number on the location maps.

COMPANY	North Broken Hill Ltd.
TENEMENT	SML 125, 134
ENVLELOPE	694, 941
1:250 000	WARRINA
TARGET	Company: Stratiform Cu mineralisation This Study: Unexplained Pb/Zn geochemical anomalies.
AGE/ROCK UNITS	Mid. Proterozoic Wirriecurrie Granite. Adelaidean Rockwater Beds and Duff Creek Beds.
EXPLORATION SUMMARY	Regional stream sediment sampling. Soil ('ridge & spur' & grid) sampling. Rock chip sampling. Ground magnetics. I.P. Diamond drilling (3 holes).

MINERALISATION/PROSPECTS

Company exploration focussed exclusively on copper prospects. Anomalous Pb/Zn geochemical results ignored. Anomalous areas:

(a) . 'South Peake' - Soil samples, maximum Pb 1000 ppm, Cu 100 ppm, Zn not analysed. Area adjacent to fault forming eastern boundary of block of dolomite of the Duff Creek Beds within Peake Metamorphics

(b) . 'North Peake' - Stream sediment samples, maximum Pb 670 ppm, Zn 165 ppm. Wirriecurrie Granite intruded by basic dykes.

(c) . Coominaree Mine - Stream sediment samples, maximum Pb 205 ppm, Zn 165 ppm. Soil grid samples maximum Pb 400 ppm, Zn not analysed.

In addition, in geochemical results sheets, suite of 120 samples with maximum Pb 9.7%, many other values with Pb several hundred ppm to 7000 ppm, Cu max. 480 ppm. No location given for samples. 120 samples would correlate with sampling of DDH Peake 1 (600' total depth) at 5' intervals. However W.M.C.(See AG2) chip sampled core from N.B.H. hole and found no anomalous Pb.

COMMENTS

Anomalies require follow up to assess potential.

COMPANY	Western Mining Corporation Ltd
TENEMENT	E.L. 192
ENVELOPE	2525
1:250 000	WARRINA
TARGET	Reef or stratiform gold. Stratiform copper.
AGE/ROCK UNITS	Mainly Adelaidean sediments.
EXPLORATION SUMMARY	Re-sampling of North Broken Hill diamond drillholes. Rock chip sampling - follow up of North Broken Hill stream sed. Cu anomalies. Soil sampling and geological mapping traverses across Adelaidean sediments.

MINERALISATION/PROSPECTS

Rock chip samples 4 km southwest of Peake ruins ferruginous veins in Curdimurka Subgroup Pb 3550 ppm, Zn 610 ppm, Pb 1250, Zn 950.

Rock chip sample northwest of Mt. Younghusband in pyritic blue dolomite Pb 280 ppm, Zn 300 ppm.

Resampling of North Broken Hill core produced no significant Pb/Zn results.

COMPANY: Utah Development Co. Ltd.

TENEMENT: EL 968

ENVELOPE: 3771 (Vol. 1-4)

1:250 000 SHEET: WARRINA

TARGET: Not Pb-Zn (Stratabound copper in Adelaidean sediments, gold in Adelaidean and older units).

AGE/ROCK UNITS: Torrensian, Willouran, Mid-Lower Proterozoic; Burra Group, Callanna Beds, Margaret Inlier.

STRUCTURAL CONTROL: -

EXPLORATION SUMMARY:

Extensive stream sediment and rock chip sampling, geological mapping, one (180 m) drill hole. Aerial magnetic survey data available.

MINERALISATION/PROSPECTS:

1) Anomalous zinc up to 155 ppm with lead up to 85 ppm recorded on regional traverse CMT007. High values are associated with ferruginous vein material (float) occurring in an area of subcrop to no outcrop. Traverse over area mapped as Willouran Duff Creek Beds.

DRILL SAMPLE STATUS:

NP 001

COMPANY	Altarama Search Pty. Ltd.
TENEMENT	SML 390
ENVELOPE	1328
1:250 000	MARREE
TARGET	Base metals in the Willouran Ranges.
AGE/ROCK UNITS	Adelaidean River Wakefield Subgroup - Bungaree Quartzite?
EXPLORATION SUMMARY	Stream sediment sampling and grid soil sampling.

MINERALISATION/PROSPECTS

From stream sediment sampling area of anomalous Ag values (max 1.1 ppm). Area 5 km south and south-west of Mt. Norwest. Only anomalous Ag found in survey. Some Pb anomalies in area but these don't correlate with Ag anomalies. However grouping of anomalies may suggest analytical error.

COMPANY/AUTHOR	Asarco (Aust) Pty. Ltd.
TENEMENT	SML 396
ENVELOPE	1366
1:250 000	ANDAMOOKA
AGE/ROCK UNITS	Cambrian Andamooka Limestone
EXPLORATION SUMMARY	Regional grid rock chip sampling. Follow up closer-spaced rock chip sampling. On Peninsula Prospect - Bulldozer trenching, 12 rotary/percussion drillholes (total 639m).

MINERALISATION/PROSPECTS

(a) Peninsula Prospect In Andamooka Limestone, light brown porous partly recrystallized and dolomitised, numerous archaeocyatha, overlain by dark chert horizon. Mineralisation confined to near surface weathered limestone and unconsolidated sediments overlying. Main Cu minerals tennantite and malachite with minor covellite, chalcocite, chalcopyrite.

Best values - bulldozer trenches	Cu	2700	ppm
	Pb	440	ppm
	Zn	810	ppm
- drillholes	Cu	4300	"
	Pb	1700	
	Zn	550	

Appears to be mainly secondary, near surface enrichment.

(b) Rock chip sample anomaly Pb 400 ppm, Zn 250 ppm.

COMPANY: Australian Selection Pty. Ltd., Carpentaria Exploration Co. Pty. Ltd.

TENEMENT: EL 226/389/676/1046/1205

ENVELOPE: 2703, 3245, 3693

1:250 000 SHEET: TORRENS

TARGET: Stratiform base metal deposits associated with Adelaidean sediments (Zambian and Kupferschieffer (shale hosted) analogies) and metal deposits associated with basement sourced gravity/magnetic anomalies (Olympic Dam type).

AGE/ROCK UNITS: Sturtian Tapley Hill Formation, Pre Pandurra Formation Lower? Proterozoic units of the Gawler Craton.

STRUCTURAL CONTROL:

Basement highs; major linear tectonic features and intersections of the same.

EXPLORATION SUMMARY:

Extensive ground magnetic and gravity surveys, small aerial magnetic and radiometric survey, limited seismic reflection and CSAMT surveys. Drill testing both stratigraphic and gravity/magnetic targets. (25 holes, 8709 m).

MINERALISATION/PROSPECTS:

a) Pond Well prospect. Significant copper-zinc and lesser lead-silver intersected in several drill holes at the base of the Tapley Hill Formation. Assays from various holes included 1.71% Cu and 138 g t Ag over 1.9 m from 186 m; 0.57% Zn, 6.5 g t Ag over 4.2 m from 178 m and 7.15% Zn over 4 m from 184 m. Follow-up drilling has partly downgraded this prospect.

b) Red Lake area. Drill hole SAR 8 intersected a laminated siltstone breccia with low grade pyrite, chalcopyrite, sphalerite and lesser galena mineralisation over the interval 1015-1218 m.

Includes narrow high grade zones (e.g. 0.3 m at 15% Cu, 6.9% Zn, 1.8% Pb and 75 g t Ag and 0.5 m at 2.25% Cu, 6% Zn and 15 g t Ag. Siltstone breccia unit appears to underlie Gawler Range Volcanics. Drill hole on flank of gravity anomaly, a hole designed to more directly test this anomaly (SAR 9) provided some elevated zinc values only.

DRILL SAMPLE STATUS:

PRL 1 - 23 (?)
SAR 1 - 10 (CORE for SAR 1 - 9
held at SADME, Glenside)

COMPANY/AUTHOR	Noranda Aust. Pty. Ltd.
TENEMENT	SML 152
ENVELOPE	886
1:250 000	TORRENS
TARGET	Mt. Gunson type copper
AGE/ROCK UNITS	Pandurra Formation and Adelaidean of the Stuart Shelf.
EXPLORATION SUMMARY	Geological mapping, interpretation of airborne magnetics, geochemistry of outcrop rock samples and cuttings from water bores.

MINERALISATION/PROSECTS

Maximum values in rock samples:-

Whyalla Sandstone	Pb	750 ppm	(sample 3230)
Pandurra Formation	"	1850 ppm	(sample 3229)
Woocalla Dolomite	"	1550 ppm	(sample 3534)

See also AG8,9

COMPANY/AUTHOR	Noranda Aust. Pty. Ltd.
TENEMENT	SML 256
ENVELOPE	1043 See also R.I. 42.
1:250 000	TORRENS
TARGET	Base metals
AGE/ROCK UNITS	Adelaidean - particularly Woocalla Dolomite and Pandurra Formation
EXPLORATION SUMMARY	Rotary percussion drilling in areas found to be anomalous in previous rock chip sampling. Holes WP1 - WP30

MINERALISATION/PROSPECTS

Winnie Pinnie - Trevenna Area Pb & Zn sulphides - galena, sphalerite and pyrite in black clay and shale of Woocalla Dolomite. Dark shales occupy lows in Pandurra Basement. Two areas located:-

- zone 0.8 x 1.6 km in area, 6 - 9 m thick, average Pb 0.2%, Zn 0.3%. Depth from surface varies from 12m to 41m.
- zone 0.8 x 3.2 km in area, 6 - 9 m thick, average Pb 0.1%, Zn 0.1%, Ag 7ppm Depth from surface varies from 9 m to 31 m.

COMPANY/AUTHOR — SADME, R.K. Johns

TENEMENT — Various Noranda SML's

REFERENCE — Summarised in Report of Investigations 42 from Env's 1043, 1541

1:250 000 — TORRENS

TARGET — Base metals in Adelaidean

AGE/ROCK UNITS — Adelaidean particularly Woocalla Dolomite & Pandurra Formation.

EXPLORATION SUMMARY — Rotary percussion drilling as in Env 1043. Also seven widely spaced holes rotary-percussion and diamond cored, LD1-LD7.

MINERALISATION/PROSPECTS

Pb & Zn in black shale of Woocalla Dolomite; similar to earlier drilling (Env 1043).

Maximum values	Cu	Pb	Zn	Ag
LD1	4660 ppm	1600 ppm	2200 ppm	4.8 ppm
LD2	500	3133	13	11.9
LD3	631	2269	9200	8.8
LD4	200	550	1323	-
LD5	403	1250	435	-
LD6	1224	200	170	-
LD7	1800	1900	150	-

COMPANY/AUTHOR	Australian Selection Pty. Ltd.
TENEMENT	E.L. 301
ENVELOPE	2996
1:250 000	TORRENS
TARGET	Base metals
AGE/ROCK UNITS	Adelaidean of Stuart Shelf, Pandurra Formation, Gawler Range Volcanics.
EXPLORATION SUMMARY	Percussion drilling - 18 holes (PIL 1-18). Ground magnetics. Down-hole radiometric logging. Diamond drilling-1 hole. (SAI-1)

MINERALISATION PROSPECTS

Anomalous Pb & Zn in top of Tapley Hill Formation in several holes. Maximum values:

PIL 8	Pb	1180 ppm	Zn	2700 ppm
PIL 10		6000		2520

COMPANY Aquitaine Aust. Minerals

TENEMENT E.L. 181, 315

ENVELOPE 2551, 3041

1:250 000 MAITLAND

TARGET Lead, zinc & copper in Early Cambrian

AGE/ROCK TYPES

Early Cambrian Hawker Group Kulpara Limestone & Parara Limestone

EXPLORATION SUMMARY

Aeromagnetics, regional bedrock sampling (RAB drilling - 241 holes), rotary-percussion (stratigraphic) drilling 6 holes, follow-up soil sampling, I.P.

MINERALISATION/PROSPECTS

Several Pb & Zn anomalies located. Galena & sphalerite mineralisation also found in Cambrian rocks in other stratigraphic holes e.g. Minlaton Bore Pb 960 ppm, Zn 330 ppm Best anomaly: Curramulka Mineralisation (galena) in stromatolitic Kulpara Limestone close to disconformable contact with overlying Parara Limestone. Max. value Pb 0.65%, Zn 0.48% over 2 m interval.

COMMENTS Possibilities for MVT orebodies. Curramulka occurrence appears to be a similar environment to the 'Flinders unconformity'.

COMPANY Aquitaine Aust. Minerals

TENEMENT EL 180, 314

ENVELOPE 2550, 3040

1:250 000 MAITLAND

TARGET Lead, zinc & copper in Early Cambrian.

AGE/ROCK TYPES

Early Cambrian Hawker Group Kulpara Limestone & Parara Limestone.

EXPLORATION SUMMARY

Stream sediment sampling, aeromagnetics, regional bedrock sampling (RAB drilling - 211 holes), rotary-percussion (stratigraphic) drilling 5 holes, induced polarization survey.

MINERALISATION/PROSPECTS

Anomalous bedrock samples Clinton & Dowlingville- best anomaly. Max. Pb 900 ppm, Zn 440 ppm. Zone 1 km long. Coincident I.P. anomaly. Kulpara Limestone is host rock, but source of anomaly was not defined.

COMPANY North Broken Hill

TENEMENT EL 248, 420

ENVELOPE 2749, 3311

1:250 000 WHYALLA

TARGET Base metals in Pre Cambrian & Cambrian rocks.

AGE/ROCK TYPE
Early Cambrian Hawker Group Kulpara Limestone.

EXPLORATION SUMMARY
Aeromagnetics, basement geochemistry along auger drill traverses, diamond drilling; follow-up percussion drilling, I.P. & ground magnetics.

MINERALISATION/PROSPECTS
Auger drilling found many anomalous Pb & Zn values (90 samples > 1000 ppm) principally in an area 2.5 km northwest of Bute. Max. values Pb 1.85%, Zn 0.9%. Host rock is siltstone and dolomite of the Kulpara Limestone. Anomalous values said to 'fade downdip'.

COMMENTS Potential for MVT orebodies.

COMPANY: BHP Minerals Ltd.

TENEMENT: EL 499/906/1112

ENVELOPE: 3567 (Vol. 1-6)

1:250 000 SHEET: Maitland

TARGET: MV type Pb-Zn in Cambrian limestones and base metals associated with Precambrian magnetic/gravity complexes.

AGE/ROCK UNITS: Precambrian units, Lower Cambrian Parara Limestone, Lower-Middle Cambrian Ramsay Limestone.

STRUCTURAL CONTROL:
Large faults in Cambrian strata, unconformities.

EXPLORATION SUMMARY:
Evaluation of aerial magnetic data, seismic reflection, ground magnetic, radiometric, gravity and Sirotem surveys, radon gas surveys, rock chip sampling, bedrock geochemistry drilling 520 holes-11266 m, 13 deep drillholes 3182 m on Cambrian and Precambrian targets.

MINERALISATION/PROSPECTS:
1) Trace Galena, sphalerite, chalcopyrite mineralisation within the Lower Middle Cambrian Ramsay Limestone intersected in DDH CUR D1B. Best 715 ppm Zn, 130 ppm Pb over 1 m intervals.

2) Blebs of fluorite beneath the Lower Cambrian unconformity between the Kulpara Limestone and the overlying Minlation Formation intersected in CUR D7. Associated lead, zinc values show background levels only. Highest F value 2650 ppm between 303 and 304 m.

DRILL SAMPLE STATUS:
CUR D1-12
PJ 1A
C1-520

COMPANY/TENEMENT/ENVELOPE

(1) Eastern Prospectors Pty. Ltd., (Mid East Minerals), SML 196, Env. 1074
(2) North Flinders Mines, SML444, Env. 1442
(3) North Flinders Mines, SML 704, Env. 2034

1:250 000 CALLABONNA

TARGET Uranium (mainly), base metals.

AGE/ROCK UNITS Mid Proterozoic 'Older Granite Suite' and Adelaidean Umberatana Group

EXPLORATION SUMMARY Stream sediment sampling (-80 mesh analysed for Cu, Pb & Zn).

MINERALISATION/PROSPECTS

(1) Mt. Babbage (a)

Area of anomalous stream sediment samples (13 samples) Max. Cu 150 ppm, Pb 930 ppm, Zn 470 ppm. Area of pegmatites intruding feldspar porphyry? On Mt. Painter 1:125 000 map Yerila Granite & Mudnawatana Granite.

Prospect Hill (b)

Anomalies (6 samples) in stream draining eastern slopes.

Max. Pb 2165 ppm, Ag 59 ppm. Host rock migmatitic granite(?) On Mt. Painter 1:125 000, Mt. Neill Granite Porphyry and infaulted Adelaidean 'slices'

(2) Both areas resampled in reconnaissance stream sediment survey for North Flinders Mines by McPhar Geophysics. Uniformly low Pb values (<20 to 30 ppm) were obtained.

(3) Mt. Babbage area resampled by North Flinders using much closer spaced stream sediment sampling. Most Pb values 20 - 30 ppm. Max. Pb 85 ppm., Zn 70 ppm.

COMPANY/TENEMENT/ ENVELOPE	(1) Kennecott Exploration (Aust.) SML 588, 704 Env. 1639, 2034. (2) North Flinders Mines SML 199 Env. 1006, 1309
1:250 000	COPLEY, FROME
TARGET	Company - mainly U and Cu.
AGE/ROCK UNITS	Lower Proterozoic (?) Mt. Painter Complex
EXPLORATION SUMMARY	Regional & follow-up stream sediment sampling. Radiometrics and magnetics. Geological mapping. Rock chip sampling. Diamond and rotary percussion drilling at Gunsight and Parabarana prospects.

MINERALISATION/PROSPECTS

(2)

Gunsight Prospect.(a)1 diamond drillhole (out of 11 diamond and 11 percussion drillholes) found Pb > 1%, Zn 1000 ppm over 1.53 m (5 ft.) PB 2 90-95 ft in dark grey pyritic schist and some schistose porphyry (?).

On Mount Painter 1:125 000 map located near fault separating Terrapinna Granite and Mount Neill Granite Porphyry. Petrology of gossan textures indicating pyrite, chalcopyrite, magnetite and rare galena. 1 Gossan sample contained 1500 ppm Pb (Env. 1639).

(1) and (2)

British Empire Mine (b) Localized Cu, U, Pb, Zn mineralisation comprising secondary Cu minerals, kasolite (U, Pb mineral) & pyromorphite in hematite - barite veins in fractures in Freeling Heights Quartzite adjacent to Mudnawatana Granite intrusions. 12 rock chip sampling lines. Max. Pb. 1800 ppm, Zn 500 ppm.

Breccia of quartzite blocks with interstitial chlorite adjacent to mine area. Pegmatite bodies in shear zones, part of zone of pegmatitisation flanking Mudnawatana Granite.

COMPANY/TENEMENT/ ENVELOPE	(1) Anaconda Aust. Inc.;SML 112; Env. 663 (2) North Flinders Mines; SML297; Env.1221
1:250 000	COPLEY, FROME, MARREE, CALLABONNA
TARGET	Copper, Lead Zinc
AGE/ROCK UNITS	Adelaidean and early to mid-Proterozoic Mount Painter Complex.
EXPLORATION SUMMARY:	Regional (widely spaced) stream sediment geochemistry. Geological mapping.

MINERALISATION/PROSPECTS

(1) Freeling Heights (a) 3 km southeast and 6 km east-southeast. Isolated stream sediment anomalaies, Pb 129 ppm and 64 ppm. Mudnawatana Granite intruding Freeling Heights Quartzite.

Hamilton Creek (b) 2 km north of Mt. Shanahan Mine. Anomalous Zn (10 samples). Values 644-117 ppm. Cu & Pb - background only. Host rock is faulted Bolla Bollana Tillite. Anaconda attributed anomalies to a network of fault related, thin (1-30 cm), discontinuous quartz veins containing sphalerite.

Parabarana Copper Prospect Area (c) 1 km south of Parabarana Hill. 7 Pb, Zn anomalies. Max. Pb 82, Zn 136 ppm. - in same area North Flinders Mines (2) found stream sediment anomalies, max. Pb 200 ppm.

COMPANY/AUTHOR/ REFERENCE: (1) SADME; Coats and Blissett; Bull. 43. (2) Mid East Minerals; Env 1325. (3) Petromin; Env 1779 4) Clarence Oil and Minerals, Env 2414.

1:250 000: COPLEY, MARREE, CALLABONNA, FROME

AGE/ROCK UNITS: Adelaidean Wilpena & Umberatana groups northwest of Mt. Painter Inlier.

MINERALISATION/PROSPECTS

Gilead P. Beck (Duck Pond Hill) Mine (a) Galena and cerussite with quartz and hematite in fissure lode cross cutting quartzite, siltstone and shale of the Billy Springs Beds. Lode about 0.5 m - 1.0 m wide over 25 m length where worked. Total length 0.5 km, but thin and irregular.

Great Gladstone Mine (b) Galena reported in breccia zone (fault?) extending for 600 m cross cutting Tapley Hill Formation siltstone and shale.

Ooloo (Rieck's) Silver-Lead Mine (c) Irregular lenses of quartz, limonite, galena and sphalerite in two zones cross cutting calcareous siltstone and shale of the Billy Springs Beds. 'Trace of gold' in several samples. Mid East Min (2) carried out an I.P. survey of the mine area. Petromin (3) carried out soil sampling, magnetics and 9 percussion drillholes. Best intersections 1.75%, 1.05% Pb over 1.5 m intervals. Mostly less than 500 ppm Pb.

Billy Spring (Mount Fitton, Good Luck) Mine (d) Irregular veins and masses of quartz, iron oxides, chalcocite, galena, malachite, cerussite, smithsonite, willemite in a zone 21 m x 4 m. Host rock is metamorphosed siltstone, shale and dolomite of the Amberoona Formation.

COMMENTS: All appear to be small fissure lodes. Little information on Great Gladstone Mine.

COMPANY/ TENEMENT/ENVELOPE	(1) Australian Selection Pty. Ltd.; SML 66; Env. 390 (2) Fox Mining & Exploration Pty. Ltd.; SML 394, 679, EL71. Env. 1337, 1883, 2313
1:250 000	COPLEY
TARGET	Company - Copper mineralisation
AGE/ROCK UNITS	Adelaidean Burra Group south of Mt. Painter Block. Wortupa Quartzite & Skillogalee Dolomite.
EXPLORATION SUMMARY	Regional stream sediment sampling for Cu only. Follow-up soil sampling grids also for Cu only except Blue Mine and Wheal Turner area for Cu & Zn. Geological mapping, I.P., resistivity, magnetics, 8 diamond drillholes, 11 percussion drillholes.

MINERALISATION PROSPECTS

(1) Blue Mine soil sampling grid found anomalous Zn values >200 ppm over 750 m strike length; > 800 ppm over 350 m strike length (Env. 390). Bulletin 43 describes the host for mineralisation as shear zones parallel to bedding in arkosic quartzite with bands of conglomerate and siltstone (Wortupa Quartzite) overlain by actinolitic and tremolitic marble (Skillogalee Dolomite). Mineralisation is specular hematite, azurite, malachite and minor pyrite and chalcopyrite associated with veins and masses of quartz. No zinc minerals mentioned.

(2) (Env. 1337). Further soil sampling of Blue Mine and Wheal Turner areas. Several areas of anomalous Zn over the 4.5 km between the two mines. Rock samples contained sphalerite and willemite with max. Zn 2.6%.

Env. 1883. Diamond drilling of geochemical anomalies and I.P. anomalies. Only 1 hole sited to test Zn anomaly (max. Zn .25% over 1.5 m).

Env. 2313. Further geological mapping of Wheal Turner and Blue Mine areas. Some further soil sampling did not produce any anomalous Zn values. 11 percussion drillholes analysed for Cu only.

COMMENTS Worthwhile checking correlation of geophysical and geochemical anomalies and drillholes.

COMPANY/AUTHOR	Kennecott Explorations (Aust.) Pty. Ltd.
TENEMENT	SML 236
REFERENCE	Env. 1008
1:250 000	COPLEY
TARGET	Copper and Uranium
EXPLORATION SUMMARY	Trench and rock chip sampling, ground radiometrics, diamond drilling.
AGE/ROCK UNITS	Adelaidean Lower Callana Beds bordering Mount Painter Complex.

MINERALISATION/PROSPECTS

Shamrock Mine (a) Cu and U occurs in fissures infilled with quartz and actinolite in metasomatised calc-silicate rocks. Sampling of extension of lode to west found one sample Pb 1400 ppm, Cu 2.8%, U_3O_8 1.3 lb/ton. A diamond drillhole at this locality found no mineralisation at depth.

Mt. Mc Donnell Mine area (b) One rock chip sample contained Zn 1.1% in banded actinolite rich marble of Wywyana Formation.

COMPANY/AUTHOR	Geosurveys of Aust. Pty. Ltd.
TENEMENT	SML 188
REFERENCE	Env 946
1:250 000	COPLEY
TARGET	Copper
AGE/ROCK UNITS	Adelaidean Tapley Hill Formation (Umberatana Group) in faulted contact with Wooltana Volcanics (Callana Group).
EXPLORATION SUMMARY	Geological mapping, rotary percussion drillholes (13 holes at Welcome Mine).

MINERALISATION/PROSPECTS

Welcome Mine (1 km west of Welcome Mine shown on Mount Painter map) - drillhole No. 2. Max., Pb 410 ppm, Zn 1500 ppm, Au 4.9 ppm (1.5 m interval). Apart from drillholes 1 & 2, all other holes analysed for Cu only.

COMMENTS Gold intersection is interesting.

COMPANY North Flinders Mines

TENEMENT SML 294

ENVELOPE 1226

1:250 000 SHEET COPLEY

TARGET Base metals

EXPLORATION SUMMARY

Stream sediment sampling, rock chip sampling. Rotary percussion drilling at O'Donoghue's Castle & McLeashes copper prospects.

MINERALISATION/PROSPECTS

(a) Skillogalee Dolomite northeast of O'Donoghue's Castle Mine. Stream sediment Zn anomalies over about 10 km strike length. Max Zn 380 ppm. Rock chip sampling traverses across Skillogalee Dolomite. Max. Pb 2100 ppm, Zn 4500 ppm.

(b) Grindell Hut area Stream sediment anomalous area. Max. Zn 240, Pb 220 ppm. Diapiric breccia within Brachina Formation - Ulupa Siltstone. Cupriferous veins within diapir contained Zn 0.28%, 0.39% - source of stream anomalies?

COMPANY: DEPT OF MINES & ENERGY

REFERENCE: R.S. Robertson. 'Geochemical sampling of the Sturtian Tillite and Basal Tapley hill Fm., Copley. MRR 150.

1:250 000: COPLEY.

TARGET: Base metal mineralisation Tindelpina Shale Member - base of Tapley Hill Formation.

AGE/ROCK UNIT: Adelaidean Sturtian Tillite and Tapley Hill Formation.

EXPLORATION SUMMARY: Geochemistry-24 traverses spaced 4-10 km from Myrtle Springs in the NW to Mt. Goddard in the S.W. and Arkaroola Area. 71 Rock chip and 684 Soil Samples

MINERALISATION: Low order Zn anomalies above and below Tapley Hill Fmn. - Sturtian Tillite boundary. Max. Zn 320 ppm - line CT 18 (AG 23 on map). Best Cu and Pb values near the Great Boulder Cu Mine Max. Cu > 1.0%, Pb 110 ppm.

COMPANY: DEPT. OF MINES AND ENERGY

AUTHOR: B.A. Eberhard

REFERENCE: M.R.R. 146 P29.

1:250 000: COPLEY

TARGET: Base metal deposits

AGE/ROCK TYPES: Adelaidean Wilpena Group Bunyeroo Formation

EXPLORATION: 1200 soil samples were collected on 16 traverses, 45 km apart across Bunyeroo Formation.

MINERALISATION: Pb-Zn anomaly with 270 ppm Zn and 185 ppm Pb extending for 90 m. 1 km N of Pinda Springs Ag Pb Zn Mine (see AG42) on line 10 B.

.A Cu-Pb anomaly 290 ppm Pb over 40 m on line 11 B.

Note: Locations not shown in this report.

COMMENTS: May indicate stratiform mineralisation in Bunyeroo Formation.

COMPANY: SADME 1979

REFERENCE: RB. 80/83, K.A. SALGO

1:250 000: COPLEY, BURRA

TARGET: Prospecting for metals and non-metals.

AGE/ROCK UNIT: Adelaide Geosyncline.

EXPLORATION SUMMARY:
Summary of 12 prospecting trips visiting old mines and prospects, sketch mapped and photographed. Ag-Pb mines visited are Ediacara, Mt. Hack, Oodnapanicken. Only a few samples assayed.

MINERALIZATION: Ediacara - galena, malachite and azurite in narrow veins (up to 30 cm) scattered over large area. See AG28 Mt. Hack: Galena in narrow veins in dolomite and limestone of Wonoka Formation. See AG41.
O'Donoghue Castle Copper Mine: Samples assayed showed up to 4420 ppm Zn, and 120 ppm Ag. Probably in Skillogalee Dolomite. See AG22.
Oodnapanicken Ag-Pb Mines: bunches and stringers of galena and lead carbonate with quartz strike length 200 m in Wonoka Formation. See AG40.

COMMENT: Ag-Pb-Zn potential in Wonoka Fm. Skillogalee and Ajax on Copley.

COMPANY/AUTHOR/ TENEMENT/REFERENCE	(1) SADME; R. G. Wright and P. J. Binks; M.R.R., 130:35-61 (2) Bridge Minerals Pty. Ltd.; SML 427; Env. 1449. (3) Clarence Oil & Minerals N.L.; North West Oil and Minerals; Various Mineral Leases; Env. 2414.
1:250 000	COPLEY
TARGET	Base Metals
AGE/ROCK UNITS	Adelaidean - Burra Group - Myrtle Springs Fm, diapiric breccia
EXPLORATION SUMMARY	(1) SADME Stream sediment sampling, geophysics - I.P., soil sampling (5 lines - 250 m intervals), rock chip sampling (1 line only), rotary-percussion drilling - 9 holes. (3) Geological mapping, rock chip and costean sampling, 4 diamond drillholes.

MINERALISATION/PROSPECTS

(1) Avondale Mine Area. Soil zinc anomaly, 1.5 km along strike in siltstone and quartzite of the Burra Group. Coincident I.P. anomaly. Rock chip samples; Max. Pb 330 ppm, Zn 6800 ppm. Rotary percussion samples ; max. Pb 650 ppm, Zn 4500 ppm. Mineralisation at Avondale Mine comprises lead carbonates, galena and sphalerite associated with four veins cross-cutting bedding. However large Zn anomaly not fully explained. Drilling and geochemical sampling is widely spaced.
Lead Mine 1.6 km east of Avondale Mine.
Thin galena (up to 2 mm) on joint plans and in a breccia zone in siltstone and dolomite.

(3) Avondale Mine (contin.). Surface sampling found reasonable Pb and Zn values however diamond drillhole intersections of the lodes at depth were disappointing.

COMPANY/AUTHOR	(4) Cultus Pacific N.L.
TENEMENT	E.L. 35
REFERENCE	Env. 2232
1:250 000	COPLEY
TARGET	Base Metals, mainly copper, uranium
AGE/ROCK UNITS	Adelaidean - Burra Group; Myrtle Springs Formation, Tapley Hill Formation, diapiric breccia, diorites.
EXPLORATION SUMMARY	Soil and rock chip sampling, percussion drillholes (3 holes at Avondale mine)

MINERALISATION/PROSPECTS

(4) Avondale Mine Area

Percussion drilling of east lode, downdip, found max. Pb 0.25%, Zn 0.71%; west lode, max. Pb 0.2%. Zn 0..45%.
Drilling downdip of dolomite band in Burra Gp. rocks which contained max. Zn 0.6% failed to find any Zn mineralisation.
No location given for drillholes.

COMMENTS

'Lodes' too narrow and low grade. However SADME Zn anomaly not fully explained.

COMPANY/AUTHOR/ TENEMENT/REFERENCE	(1) Andromeda Pty. Ltd.; SML 429; Env 1526. (2) SADME; R.S. Robertson RB 78/23; 78/151.
1:250 000	COPLEY
TARGET	Base metals
AGE/ROCK UNITS	Adelaidean Umberatana Group - Balcanoona Formation.
EXPLORATION SUMMARY	Stream sediment sampling, 3 rock chip sampling traverses (no results in Env 1526), several isolated rock samples.

MINERALISATION/PROSPECTS

Mt. Ogilvie area. (a) Low order Pb and Zn stream sediment anomalies (max. Pb 130, Zn 370 ppm) derived from Balcanoona Formation dolomite and limestone. One rock sample of Balcanoona Formation had Pb 640, Zn 550 ppm.

1.2 km. north of Bedowie Well. (b) Single rock sample - ferruginous nodule derived from Balcannona Formation - contained Cu 300, Pb 8000, Zn 450, Ag 3 ppm. This area of Balcanoona Formation has a poorly defined drainage system and was not covered by stream sediment sampling.

COMMENTS Suggests Balcanoona Formation may be prospective. Locality north of Bedowie Well worthy of follow up.

COMPANY/AUTHOR TENEMENT/REFERENCE	CRA; SML 77; Env. 740. Drew G. J. & Both R. A. Aust.; Journal of Earth Sciences, Vol. 31, No. 2. Nixon (1967), Mining Rev. 120. Sheridan (1967), MR 120. Johns, R.K.; Rept. Investigations 37. Trans. Aust. Exploration Pty. Ltd.; Env. 892. Electrolytic Zinc Co.; SML 309; Env. 1160. Carpentaria Expl.; SML 353; Env. 1246. Carpentaria Expl.; SML 637; Env. 1835. Carpentaria Expl.; E.L. 46; Env. 2254. Moeskops P.G. & White A.H.; Journal of Geochemical Exploration. Vol. 12 : 275-278
1:250 000	COPLEY
TARGET	Pb, Zn and Cu - Ediacara
AGE/ROCK UNITS	Basal Cambrian Parachilna Formation and Ajax Limestone.
EXPLORATION SUMMARY	Diamond drilling - 48 holes (total). Rotary percussion - 45 holes. Geophysics - magnetics, E.M., I.P.
MINERALISATION/PROSPECTS	Ediacara Mineral Field - Ediacara Mine (Greenwood Workings and Morish Adit) and Beltana Mine (Southern Workings) produced 24000 tonnes high grade Ag - Pb ore. Black Eagle Mine produced much smaller tonnage of secondary Cu carbonates. Ore is stratabound, principally galena and pyrite, in conformable zones in dolomites of the Ajax Limestone. Two lenses of mineralisation delineated:- - 12 Mt averaging .84% Pb - 17 Mt averaging 1.23% Pb Some Carpentaria rotary-percussion holes (Env. 1835) drilled along the Ediacara Fault away from the Ediacara Field contained anomalous Pb and Zn and barite.
COMMENTS	Exploration has shown mineralisation to be uneconomic.

COMPANY Electrolytic Zinc Co.

TENEMENT E.L. I. M.L. 4369, 4370, 4371.

REFERENCES
. Rangott, M.F. & Sear, J.H. Mineral Resources Review 141, pp 36-40.
. Horn, R.A. AIMM Monograph 5, pp 548-553.
. Rangott, M.F. AIMM Monograph 10, pp 202-204.
. Muller, D.W. Economic Geology, Vol 67, pp 1146-1167.

1:250 000 COPLEY

TARGET Copper Lead & Zinc in the Lower Cambrian.

AGE/ROCK TYPE
Lower Cambrian Ajax Limestone and Parachilna Formation.

EXPLORATION SUMMARY
Stream sediment sampling, rock chip sampling, geological mapping, drilling.

MINERALISATION/PROSPECTS

(a) Puttapa (Beltana) Willemite Deposit. Zinc silicate willemite orebody results from supergene enrichment of primary sulphide orebody in Cambrian Ajax Limestone bounded by faults and diapiric breccia. Before mining commenced estimated reserves were 863 000 tonnes at 37.9% Zn, 2.3% Pb

(b) Aroona Willemite Deposit. Estimated reserves 150000 tonnes at 34.4% Zn, 1.6% Pb.

Other willemite occurences/prospects - Aroona, Emu, Mooloolo, Aristotle.

COMMENTS Puttapa being mined. Other deposits have been assessed by E.Z. Prospects of locating further significant deposits of this type are not high.

COMPANY/AUTHOR	Anaconda Aust. Inc.
TENEMENT	SML 113
ENVELOPE	733, 732
1:250 000	COPLEY
TARGET	Copper, Lead & Zinc.
AGE/ROCK UNITS	Adelaidean - Umberatana Group and Wilpena Group, Cambrian - Hawker Group, diapirc breccias.
EXPLORATION SUMMARY	Regional stream sediment sampling. Geological mapping. Discovery and follow up of Puttapa Zinc deposit - mapping and rock chip sampling.

MINERALISATION/PROSPECTS

Puttapa Zinc

Currently worked by E.Z. See AG29.

Old Nuccaleena Mine

(a) 2.5 km north to 2.5 km south. Low order anomalous stream sediment samples - Max. Zn 290 ppm. Nuccaleena Diapir.

Patawarta Gap

(b) 2 km. southwest. Anomalous stream sediment samples. Max. Pb 87, Zn 210 ppm. Patawarta Diapir.

COMPANY Amoco Minerals

TENEMENT EL 563

ENVELOPE 3735

1:250 000 COPLEY

TARGET Cu-Pb-Zn mineralisation in Cambrian and Au in Angepena area.

AGE/ROCK UNITS

Adelaidean and Cambrian Wilkawillina Limestone & Parachilna Formation.

EXPLORATION SUMMARY

Most work concentrated in Angepena area - rock chip sampling, mapping, gravity, magnetics, stream sediment sampling, RAB drilling. Elsewhere limited rock chip sampling and 2 soil sampling traverses in Mt Hack syncline.

MINERALISATION/PROSPECTS

(a) Sliding Rock Mine Ironstone sample contained Zn 4750 ppm.

(b) Northeast of Puttapa Springs 'Gossan' in Wilkawillina Limestone, Pb 360 ppm, Zn 3000 ppm

(c) Northwest of Mt Hack Chip sample manganiferous Parachilna Fmn Zn 1750 ppm. Wilkawillina Limestone, Zn 420 ppm.

COMPANY/AUTHOR	Electrolytic Zinc. Co.
TENEMENT	SML 178, 283
REFERENCE	(1) Env. 961, (2) Env.1130
1:250 000	COPLEY
TARGET	Cu, Pb, Zn
AGE/ROCK UNITS	Adelaidean and Cambrian units.
EXPLORATION SUMMARY	Stream sediment geochemistry, follow-up grid soil and rock chip sampling.

MINERALISATION/PROSPECTS

North of Black Range Spring, east of Sliding Rock. (1) Stream sediment, max. Pb 300 ppm, Zn 550 ppm. Merinjina (Sturtian) tillite in faulted contact with Cambrian Hawker group rocks. Some diapiric (?) breccia mapped along contact.

Soil and rock chip sampling grid, max. Pb 770, Zn 2800 ppm. Anomaly about 1 km x 150 m. However location of grid not shown accurately.

(2) Geological mapping (1:1200) of sampling grid showed anomalies located in Oraparinna Shale although a massive dolomite (recrystallised archaeocyatha limstone?) appears to be the major host rock. (See also AG34; same area (?) sampled and drilled by Endeavour Oil).

COMPANY/AUTHOR	Mt. Isa Mines Ltd.
TENEMENT	SML 171
REFERENCE	Env 928
1:250 000	COPLEY
TARGET	Cu, Pb, Zn
AGE/ROCK UNITS	Adelaidean and Cambrian units. Anomaly in Cambrian Wilkawillina Limestone.
EXPLORATION SUMMARY	Stream sediment sampling, soil sampling (ridge) lines.

MINERALISATION/PROSPECTS

Headwaters of Sliding Rock Creek. Stream sediment sampling max. Pb 340, Zn 800 ppm. (-20 + 60 mesh fraction). Soil sampling, Line 7, Zn 2000 ppm in same area.

Host rocks are upper Wilkawillina Limestone near boundary with Oraparinna Shale i.e. M.V.T. area of interest.

COMPANY/AUTHOR — Endeavour Oil Co.

TENEMENT — S.M.L. 536, E.L. 72

ENVELOPE — (1) 1585,(2) 2341

1;250 000 — COPLEY

TARGET — Base metals, principally copper.

AGE/ROCK UNITS — Faulted Adelaidean Wilpena and Umberatana Groups and diapiric breccia and Cambrian Hawker Group.

EXPLORATION SUMMARY — Grid soil sampling, rock chip sampling, geophysics (VLF.EM), rotary-percussion drilling (6 holes Cu, Zn, Co only analysed). Diamond drilling (2 holes).

MINERALISATION/PROSPECTS

(1) Sliding Rock (Copper) Mine area. (a) Anomolous Pb (max. 1500 ppm) and Zn (max. 450 ppm) in soil 0.8 km southwest of mine at base of Ajax Limestone near Sliding Rock Fault. Drillhole PDSL3 found max. Zn 2200 ppm at old workings.

Green Rock Mine (b) Quartz and ironstone lodes cut Brachina Formation shale. Mullock sample contained Cu 1%, Pb 1.8%, Zn 0.2%. Soil grid found max. Pb 820, Zn 340 ppm near mine.

Black Range Spring area (c) Pb and Zn anomalies found by E.Z. (Envs. 961, 1130) in Cambrian Hawker Group. VLF-EM geophysical anomalies located.

(2) Soil and rock chip sampling grid. Pb (disseminated galena) and Zn (willemite) in upper Wilkawillima Limestone adjacent to diapir. Max. Zn 2.0%, Pb 1200 ppm. Drillholes collared in diapir. BRD 2 intersected Wilkawillina Limestone at depth. Max. Zn 1.6% Pb 680 ppm.

COMMENTS — Possible MVT mineralisation at Sliding Rock and Black Range Spring. Green Rock Mine probably narrow fissure lodes only.

COMPANY/AUTHOR Exoil N.L. and Transoil N.L.

TENEMENT SML 428, 585.

REFERENCE Env 1547, 1693

1:250 000 COPLEY

TARGET Lead and Zinc

EXPLORATION SUMMARY Stream sediment sampling, one percussion drillhole.

AGE/ROCK UNITS Adelaidean, lower Bunyeroo Formation.

MINERALISATION/PROSPECTS

North of Puttapa Gap

Lower Bunyeroo Formation bordering diapiric breccia. Stream sediment samples - single sample anomaly Pb 600, Zn 200 ppm. Follow-up soil sampling max. Pb 800, Zn 410 ppm. Percussion drillhole BE 2 (47.3 m) found anomalous Pb & Zn 0 - 30 m in fawn and grey shale. Max. Pb 610, Zn 2400 ppm. Petrological examination showed sphalerite and galena associated with framboidal pyrite.

COMMENTS Suggests presence of stratiform Pb/Zn mineralisation in Bunyeroo Formation.

COMPANY/AUTHOR/ TENEMENT/ENVELOPE

(1) North Flinders Mines; SML 557; Env 1638.
(2) SADME, Langsford, N.R.; MRR 136 : 99-104.

1:250 000

COPLEY, PARACHILNA

TARGET

Base Metals

AGE/ROCK UNITS

Adelaidean & Cambrian

EXPLORATION SUMMARY

Stream sediment sampling, reconnaissance and follow-up, soil and rock chip sampling, geological mapping, 2 percusion drillholes.

MINERALISATION/PROSPECTS

(1) Wepowie Mine (a) Galena & polysphaerite in calcite, siderite and quartz veins up to .25m within fault zone(s) in Etina Formation on the southern margin of the Oratunga diapir. Workings extend for 1 km.

(1) Patawarta Zinc Prospect (b) Stratiform Zn rich gossan; weathered quartz-calcite-pyrite-sphalerite body found intermittently over 1.5 km strike length in Bunyeroo Formation south of Patawarta diapir. Extensive soil sampling found many Zn values up to 400 ppm. Max. Zn 1400 ppm. 2 percussion holes in pyritic siltstone gave max. Zn 2600 ppm. Langsford (2) found anomalous Zn (max. 430 ppm) in streams draining Bunyeroo Formation south of the western end of the diapir.

(1) Wilkawillina Gorge. (c) Stream sediment anomalies, max. Pb 260, Zn 490 ppm. Soil sampling max. Pb 260, Zn 920 ppm. About 2 km north of Wilkawillina Gorge.

(1) Wirrapowie Creek (d) 2 km west of Mt. Brooke. In stream sediments max. Zn 280 ppm. 'Duricrust' rock chips max. 1200 ppm Zn. Wilkawillina Limestone and Parara Limestone.

COMMENTS

Stratiform mineralisation in Bunyeroo Formation is of some interest. Wilkawillina Gorge area is partly in Flinders Ranges National Park, part in B.H.P. E.L. 1463 (Linda Prospect). Wirrapowie Creek area worthy of follow up. Wepowie Mine area has narrow vein mineralisation only?

COMPANY/AUTHOR	Fox Mining and Exploration Pty. Ltd.
TENEMENT	SML 422, 708
REFERENCE	Env. 1481, 2081
1:250 000	COPLEY
TARGET	Base Metals
EXPLORATION SUMMARY	Stream sediment sampling, rock chip sampling.
AGE/ROCK UNITS	Adelaidean Umberatana and Wilpena Groups, Cambrian Hawker Group.

MINERALISATION/PROSPECTS

Nevada Mine (a) Quartz and calcite veins with galena in Wonoka Formation.

North of Mt. Serle. (b) Nodule in shale (Hawker Group Nepabunna Siltstone overlain by Parara Limestone) contained Pb 1300 ppm; found in follow up of stream sdiment anomaly Pb 80 ppm.

Constitution Hill Ag/Pb/ochre mine. (c) Galena in calcite veins in dolomite of the Bunyeroo Formation faulted against Pound Quartzite.

Rock chip sampling profile across the Balcanoona Formation gave max. Pb 800 ppm. Follow up rock chip and soil sampling on copper anomalies gave only low Pb & Zn values.

COMMENTS Anomaly north of Mt. Serle may be worth checking. Anomalous Pb in Balcanoona Formation is of interest.

COMPANY: Electrolytic Zinc Company of Australasia Ltd.

TENEMENT: EL 1235

ENVELOPE: 6651

1:250 000 SHEET: COPLEY

TARGET: Stratiform lead-zinc mineralisation (Sedex style-sedimentary exhalative) associated with clastic sedimentary units.

AGE/ROCK UNITS: Cambrian, Uratanna Formation, Oraparinna Shale, Narina Greywacke, Angepena Syncline.

STRUCTURAL CONTROL:
Syndepositional faulting.

EXPLORATION SUMMARY:
Geological mapping (1:50 000), stream sediment (311) and limited rock chip (14) sampling.

MINERALISATION/PROSPECTS:

a) Zone of anomalous zinc stream sediment values about 5 km WSW of Angepena homestead. Values apparently derived from lateritic ironstones on the Wilkawillina Limestone.

b) Nevada mine, situated low in the Wonoka Formation. Primary mineralisation comprises quartz-ankerite-calcite veins with pyrite-galena-chalcopyrite. Weathering has leached carbonates, formed ironstone gossan and oxidised sulphides to malachite, azurite, ? anglesite and smithsonite. Ore sample assayed 2% Cu, 11.9% Pb and 2.8% Zn.

c) Two small prospecting pits about 2 km WSW of Angepena homestead. Minor galena in calcite veinlets with lesser ankerite and quartz. Occurrence situated about 8 m from the top of the Wilkawillina Limestone.

COMPANY: Electrolytic Zinc Company of Australasia Ltd.

TENEMENT: EL 1208

ENVELOPE: Env. 5473

1:250 000: COPLEY, PARACHILNA

TARGET: Stratiform or sedimentary exhalative (Sedex) lead-zinc mineralisation.

AGE/ROCK UNITS: Upper Proterozoic, Lower Cambrian, Wilpena Group, Umberatana Group.

STRUCTURAL CONTROL:
Syndepositional faulting, faulted calcareous rocks.

EXPLORATION SUMMARY:
Intensive geochemical sampling (2146 stream sediment, 660 rock chip and 356 soil) and geological mapping (1:25 000) concentrated on diapirs and areas of major faulting.

MINERALISATION/PROSPECTS:

a) Lady Lehman-Lady Lennon-Mt. Rugged prospect revealed extensive Cu-As (± minor Zn-Pb-Co-Ni-Sb) anomalism. The area contains numerous sulphide-bearing carbonate veins which may be the source of the anomalies. Two samples of brecciated and silicifed black shales gave values to 580 ppm Zn and 530 ppm Pb. One later sample of black limestone assayed 9250 ppm Zn, 5300 ppm Pb and 7 ppm Ag.

b) Patawarta Zinc Gossan (Pendulum Well) consists of a thin base metal anomalous gossan within a black shale interval in the Bunyeroo Formation. Discovered by North Flinders Mines in 1970-71 the gossan appears to be a narow, poorly outcropping but continuous (1000 m) stratiform bed.

c) Wepowie Mine. A series of small shafts and pits have been sunk along a N-S trending fault/fracture zone at the southern end of the Oratunga Diapir. Mineralisation comprised disseminated pyromorphite and galena in the breccia associated with this fracture zone.

COMMENTS: Most anomalous zones were downgraded by follow-up sampling but none were drill tested. The envelope is well worth a more detailed review.

COMPANY/AUTHOR TENEMENT/REFERENCE	(1) SADME; K.R. Warne; MC 5251; MRR 130. (2) SADME; M.G. Mason; MC 5267; RB 69/126. (3) SADME; R.S. Robertson; RB 78/151. Boolooroo Mining Co.; SML 366; Env. 1272. Southern Cross Exploration N.L.; SML 385; Env. 1339.
1:250 000	COPLEY
TARGET	Lead, silver.
EXPLORATION SUMMARY	Rock chip sampling, geological mapping. Stream sediment sampling.
AGE/ROCK UNITS	Adelaidean - Wilpena Group. Wonoka Formation.

MINERALISATION/PROSPECTS

(1) Oodnapanicken Lead-Silver Prospect (a) Lead-silver mineralisation is in narrow quartz veins within a shear zone cross cutting bedding in calcareous siltstone of the Wonoka Formation. Lodes are lenticular and galena distribution patchy.

(3) Stream sediment sampling showed low order anomalies (max. Pb 120, Zn 320) in Wonoka Formation in the surrounding area.

(2) Appealinna Well Lead Prospect (b) - 3 km east of Oodnapanicken Prospect. Galena occurs in small lenses and pods within narrow quartz-calcite-siderite veins over a length of 30 m. Host rock is Wonoka Formation along strike from Oodnapanicken Prospect.

COMPANY/AUTHOR/TENEMENT/REFERENCE

SADME; R.S. Robertson; R.B. 80/86.
Westgate Drilling Co. Pty. Ltd.; SML 519; Env 1653.
SADME; A.H. Blissett; RB. 71/7.

1:250 000 COPLEY

TARGET Base metals

EXPLORATION SUMMARY Stream sediment sampling, rock chip sampling, geological mapping.

AGE/ROCK UNITS Adelaidean Wilpena Group - Bunyeroo Formation and Wonoka Formation.

MINERALISATION/PROSPECTS

Waukawoodna Creek area. Galena, pyrite, chalcopyrite and malachite is associated with a system of lensoidal quartz, siderite and limonite veins in Bunyeroo and Wonoka Formations. Mineralisation is very limited in extent although at least one rich pod of galena was present.

Stream sediment sampling produced an anomaly (Pb 200 ppm, Zn 120 ppm) associated with the richest galena pod. However the source of galena fragments found in Waukawoodna Creek upstream of known mineralisation has not been explained.

COMMENTS Mineralisation appears to be limited to small pods.

COMPANY/AUTHOR/ TENEMENT/REFERENCE	S.A.D.M.E.; R.S. Robertson; RB 80/86. Noranda Aust. Ltd.; SML 321; Env 1194. North Flinders. SML 293; Env 1227. North Flinders; SML 557; Env 1638. Australian Anglo American; E.L. 107; Env. 2379.
1:250 000	COPLEY
TARGET	Base metals
EXPLORATION SUMMARY	Stream sediment sampling. Geological mapping and rock chip sampling of various deposits.
AGE/ROCK UNITS	Adelaidean Wilpena Group.

MINERALISATION/PROSPECTS

Pinda Springs Mine (a) Narrow (about 0.10 m) galena/quartz/calcite vein in Brachina Formation. Low order Pb anomalies (max. Pb 200 ppm) in Brachina Formation 2.5 km to southeast.

Jubilee Mines (b) Galena in .10-.30 m wide quartz/ironstone vein, fault controlled, in Brachina Formation. No Pb or Zn anomalies in Noranda sampling.

Bullock Head Gap/Pinda Springs Homestead (c) North Flinders stream sediemnt sampling found max. Pb 540, Zn 1500 ppm 1.5 km northwest of Pinda Springs H.S. in Brachina Formation in faulted contact with diapiric (?) breccia. Soil sampling grid (not properly located ?) found max. Pb 2700, Zn 2300 ppm. Rock chip sampling grid found max. Pb 2600, Zn 6000 ppm. Aust. Anglo American stream sediment sampling found max. Pb 200, Zn 700 ppm in same general area. No follow up.

COMMENTS Pinda Springs and Jubilee are small vein deposits at best suitable for 1-2 person operations. Pinda Springs Homestead anomaly is worth checking.

COMPANY/AUTHOR	Electrolytic Zinc. Co.
TENEMENT	SML's 184 and 184A
REFERENCE	Env 937
1:250 000	COPLEY
TARGET	Base metals
EXPLORATION/SUMMARY	Stream sediment geochemistry, limited follow-up rock chip sampling.
AGE/ROCK UNITS	Cambrian Hawker Group.

MINERALISATION/PROSPECTS

McKinlay Creek - Italowie Gorge area. Large area (about 15 km strike length) anomalous Pb in stream sediments. Max. Pb 1700, Zn 380 ppm. Many Pb values greater than 300 ppm. Anomalies associated with Wilkawillina Limestone. See also AG44.

COMMENTS No follow up work appears to have been undertaken, however area is now part of Gammon Ranges National Park.

COMPANY: CRA EXPLORATION

TENEMENT: SML 202

ENVELOPE: 975

1:250 000: COPLEY

TARGET: Base metals in Early Cambrian sediments

AGE/ROCK TYPE: Early Cambrian Wilkawillina Limestone and Parachilna Formationn

EXPLORATION: Vehicle and helicopter stream sediment sampling

MINERALISATION/PROSPECTS: (a) Mt McKinlay Creek area. Anomalous stream sediment values Pb up to 500 ppm, Zn up to 200 ppm.
(b) Narina Spring - Small anomalous areas. Max. Zn 350 ppm. See also AG43.

COMPANY/AUTHOR — Electrolytic Zinc. Co.

TENEMENT/REFERENCE — (1) SML 217 A; Env. 1104.

(2) SML 217b; Env. 1390

1:250 000 — COPLEY, PARACHILNA

TARGET — Base metals, uranium.

AGE/ROCK UNITS — Cambrian - Hawker Group

EXPLORATION SUMMARY — Stream sediment sampling grind rock chip sampling. Geological mapping., One diamond drillhole.

MINERALISATION/PROSPECTS

(1) Moorowie (Copper) Mine Area. (a) Stream sediment sampling max. Zn 2,300 ppm. Rock chip sampling max. Zn 7.2%, Pb 430 ppm. Host rock is megabreccia limestone.

Mt. Chambers (Copper) Mine Area (b) (1) Stream sediment Pb, Zn anomaly, total area 3 km x 1 km. Max. Pb 6000 ppm. Zn 500 ppm.

(2) Geological mapping shows host rock as Upper Wilkawillina massive grey limestone. Grid rock chip sampling found max. Pb 6500, Zn 1300 ppm. Diamond drillhole reportedly found no mineralisation but was apparently wrongly located 300 m east of intended location.

COMMENTS — See also AG56.

COMPANY/TENEMENT/ REFERENCE	(1) Mt. Isa Mines Ltd.; SML 170; Env.1162 (2) Carpentaria Exploration Co. Pty. Ltd.; SML 525; Env 1701.
1:250 000	COPLEY
TARGET	Copper, principally.
AGE/ROCK UNITS	Cambrian Hawker Group, Adelaidean Wilpena Group and Callanna Group in diapiric (?) breccias.
EXPLORATION SUMMARY	Geological mapping, stream sediment sampling, soil sampling traverses, rock chip sampling, air-track drilling - 13 holes (445 m total). Two holes only (Red Range) analysed for Pb & Zn.

MINERALISATION/PROSPECTS

Red Range (1) Limonitic (gossanous) zone near base of Ajax Limestone. Two holes (33 m each). Manganiferous dolomite grading down into sandstone. Pb varies 450 to 5200 ppm, Zn 240 to 12 000 ppm.

Soil sampling across above zone, max. Pb 4800, Zn 3000 ppm.

Also soil samples taken higher in Ajax Limestone near upper (faulted) contact. Max. Pb 725, Zn 370 ppm.

(2) Stream sediment sampling of southern part of Ajax Limestone. Max. Pb 750, Zn 510 ppm. Soil and rock chip sampling traverses of northern area Max. Pb 1500 ppm Zn 8% (rock chip samples).

COMMENTS	Very little drilling done. Area has potential for MVT deposits.

COMPANY/AUTHOR/ TENEMENT	(1) Kennecott; SML 91; ENV. 564, 695. (2) North Flinders Mines; SML 293; Env. 1227. (3) North Flinders Mines; SML557; Env. 1638
1:250 000	COPLEY
TARGET	Base Metals
AGE/ROCK UNITS	Early Cambrian Hawker Group - Parachilna Formation and Wilkawillina Limestone.
EXPLORATION SUMMARY	Stream sediment geochemistry for Cu, Pb and Zn. Rock chip sampling. Soil sampling traverses. Geophysics - 12 self potential lines. 6 diamond drillholes.

MINERALISATION/PROSPECTS

(1) Arrowie & Moro Gorge areas. Stream sediment anomalies for Pb and Zn (& Cu) Max. Pb 1180 ppm, many samples > 100 ppm. Max. Zn 2250 ppm, many samples > 200 ppm. Several anomalous areas. Country rocks Parachilna Formation and Wilkawillina Limestone. Anomalies concentrated particularly around hinge of anticline north of Balancoona Cu mine.

Three soil sampling traverses, Max. Pb 1250 ppm, basal Wilkawillina (traverse FF). Diamond drilling concentrated on lower Wilkawillina Limestone and Parachilna Fmn. Max. Pb 180, Zn 915 ppm.

(2) and (3)
Further stream sampling. Rock chip sampling grid 2 km southwest of Moro Springs found Max. Pb 5700 ppm, Zn 1800 ppm. A thin bed within the Wilkawillina Limestone just below the Parara Limestone contained Pb up to 5000 ppm.

Continued next page

COMPANY/AUTHOR	Carpentaria Exploration Co.
TENEMENT	E.L.78
ENVELOPE	2317
1:250 000	COPLEY
TARGET	Copper
AGE/ROCK UNITS	Cambrian Wilkawillina Limestone & Parachilna Formation overlying Adelaidean Pound Quartzite.
EXPLORATION SUMMARY	Rock chip sampling grid (100 x 100 m) and follow up (50 x 50 m), induced polarisation survey, 6 percussion and 4 diamond drillholes.

MINERALISATION/PROSPECTS

Moro Gorge - Balcanoona Mine Area
Rock chip sampling max. Pb 1300 ppm, Zn 1.25%.
Percussion drillholes analysed for Cu only. Diamond drillhole DDHH1, anomalous zone 174 - 177 m. Max. Cu 0.26%, Pb 0.19%, Zn 0.395% DDHM2, 2 zones, basal Wilkawillina, Max. Cu0.5%, Pb 600 ppm, Zn 0.95%, basal Parachilna, Max. Cu 4.7%. DDHM3, basal Parachilna, Max. Cu 2.4%.
Area of best Zn rock chip anomaly was not drilled.
See also AG48.

COMMENTS

Amount of exploration in area downgrades potential somewhat, but drilling has focussed mainly on Cu. Possibility remains of 'poddy' MVT mineralisation. Need to check later B.H.P. work in area.

COMPANY: BHP Minerals Ltd., Esso Australia Ltd.

TENEMENT: EL 526/934

ENVELOPE: 3641 (Vol. 1 - 2)

1:250 000 SHEET: COPLEY

TARGET: MV type Pb-Zn mineralisation in shallow carbonate sequences.

AGE/ROCK UNITS: Lower Cambrian, Wilkawillina Limestone, Wonoka Formation, Parachilna Formation.

STRUCTURAL CONTROL:
Unconformities, karst topography, reef complexes, faults.

EXPLORATION SUMMARY:
Geological mapping (1:50 000, 20 000, 5 000), stream sediment (166) and rock chip (43) sampling, IP survey, two diamond drilling programmes (total 11 holes; 2 800 m)

MINERALISATION/PROSPECTS:
a) Moro Gorge prospect; outcropping Pb-Zn and minor Cu mineralisation in faulted karsted bioherm in Lower Cambrian Wilkawillina Limestone. Mineralisation associated with unconformity surface occurs as galena, hydrozincite, sphalerite and willemite in reefal, mottled limestone unit. Sporadic Pb - Zn intersected in six drill holes, best 1 m at 2.35% Zn, 0.4% Pb and 5 m at 0.75% Zn in hole MD3 at about 295 m. IP anomalies due to graphitic and pyritic shaley limestone units.

b) Numerous other small occurrences of Pb - Zn mineralisation have been defined. (See figure)

DRILL SAMPLE STATUS:
MD 1 - 7
MPD 1 - 4

COMMENT: See also AG47

COMPANY: Electrolytic Zinc Company of Australasia Ltd.

TENEMENT: EL 1235

ENVELOPE: 5647

1:250 000 SHEET: COPLEY

TARGET: Epigenetic fault related base (± precious) metals and stratiform or sedimentary exhalative (Sedex) Zn-Pb mineralisation.

AGE/ROCK UNITS: Cambrian carbonate rocks, calcareous/dolomitic limey units of the Adelaidean Wilpena and Umberatana Groups.

STRUCTURAL CONTROL:
Growth faults, faulted calcareous lithologies.

EXPLORATION SUMMARY:
Intensive stream sediment (885) and rock chip sampling (111), limited geological mapping. Follow-up sampling of minor geochemical anomalies.

MINERALISATION/PROSPECTS:
No significant mineralisation, minor geochemical anomalies at Mt. Serle and Pinda Springs downgraded by follow-up sampling.

DRILL SAMPLE STATUS:
No drilling undertaken.

Part of above data also included in Env. 6759/EL 1345.

COMPANY: BHP Minerals Ltd./Esso Australia Ltd.

TENEMENT: EL 894/1188

ENVELOPE: 4449

1:250 000 SHEET: COPLEY

TARGET: MV type Pb-Zn mineralisation in shallow carbonate sequences.

AGE/ROCK UNITS: Lower Cambrian

STRUCTURAL CONTROL:
Unconformities, solution collapse breccias, karst topography, reef complex.

EXPLORATION SUMMARY:
Geological mapping (1:20 000 scale) only.

NO DRILLING UNDERTAKEN:

COMMENT: Area may be prospective for extensions of mineralisation as encountered at the adjacent Donkey Bore prospect.

COMPANY: Mines Exploration Pty Ltd

TENEMENT: S.M.L. 115, 129, 130/130A, 131/131A.

ENVELOPE: 2356, 2357, 2358, 2359

1:250 000: ANDAMOOKA, PARACHILNA

TARGET: Base metals (especially Pb) in basal Cambrian carbonates, especially where flatlying and likely to be at shallow depth.

AGE/ROCK UNITS: Lower Cambrian Hawker Group: - Parachilna Formation, Wilkawillina Limestone (Arrowie Basin) and Andamooka Limestone (Stuart Shelf).

EXPLORATION SUMMARY:

1) Regional geochemical stream sediment and rock chip sampling.
2) Chip sampling of drillcore: Santos Wilkatana #1, #2, #3, #4.
3) SML 130/130A
   a) geochemical follow-up (also SML 129)
   b) IP survey lines in area 16 km east of Andamooka
   c) three vertical diamond holes totalling 195.7m (LTA1 to LTA3).
4) SML 131/131A
   a) geochemical follow-up
   b) geological mapping of Cambrian sequence from north of Parachilna Gorge to Edeowie Gorge, and west of Elder Range.
   c) Hand auger soil geochemistry traverses over "gossanous" outcrops.
   d) Four diamond holes on "Gossan A", total 556.0 m (LT1 to LT4).
   e) Ground magnetics and I.P. traverses over occurrences of galena + sphalerite and "gossan"
   f) One diamond hole (207.6m) at Parachilna Gorge to test I.P. anomaly, (LT5)
   g) Consultant geophysicist examined possibility of shallow basal Cambrian in covered area west of Flinders Ranges.

MINERALISATION/PROSPECTS:

1) SML 129: No base metal mineralisation found.
2) SML 130/130A: Weakly anomalous Pb-Cu-Zn in Fe/Mn stained basal Cambrian horizon. No sulphides found.
3) SML 131/131A;
   a) Consistent anomalous Pb (100-1000 ppm) and Zn (100-800m) in stream sediment samples from north of Parachilna Gorge to south of Bunyeroo Gorge, supported by rock chip geochemistry.
   b) Mapping indicates persistent, but feeble, base metal mineralisation in oolitic/algal limestones of Wilkawillina Limestone from north of Parachilna Gorge to south of Bunyeroo Gorge. Several horizons 0.6 to 1.2m thick and up to 250 m in strike length containing disseminated and veinlet galena+sphalerite+pyrite together with oxidation products such as haematite, limonite, anglesite, cerussite and copper carbonates. Minor fracture-fill galena was noted in stratigraphically higher massive archaeocyathid limestone.
   c) Several Mn/Fe-oxide "gossans" occur within or near the mineralised horizon, and yield anomalous base metal values. The largest of these, "Gossan A", is up to 60m in width and up to 1000-1200m in strike length, and rock chip sampling consistently returned 0.8-0.9% Zn and 0.2-0.4 oz/ton Ag. However, drilling revealed gossan-like developments consistently assaying 1.0-1.8% Zn down to 150m below the surface, with boxworks developed after carbonate rhombs instead of sulphides. Therefore, the Mn-Fe oxides were considered to be unrelated to weathering sulphides and merely scavenged Zn (Pb, Cu) from nearby mineralised horizons.
      LT2: 30.5-43.3m, 0.6%Zn, 0.46oz/ton Ag.
      LT3: 150.1-151.5m, 1.05% Zn
      153.4-155.4m, 1.32% Zn;
      LT4: 18.2-37.3m, 0.78% Zn, 0.36oz/ton Ag.
      18.2-30.6m, 0.43% Pb.
      57.0-65.2m, 1.23% Zn, 0.16oz/ton Ag
      66.8-79.9m, 1.00% Zn, 0.16oz/ton Ag.

82.9-89.6m, 1.85% Zn, 0.15oz/ton Ag.

d) "No geochemical, geological or geophysical investigations suggested any economic concentrations of base metals within this zone, or indicated a direction in which concentrations could be expected".

DRILL SAMPLE STATUS:

LT1 - 5
LTA1 - 3

COMMENTS: Within Flinders Ranges National Park. Possible MVT mineralisation in same area investigated by SADME. See AG52,53.

COMPANY/AUTHOR	Electrolytic Zinc Co.
TENEMENT	SML's 302, 576
ENVELOPE	1157, 1660
1:250 000 SHEET	PARACHILNA
TARGET	Base metals
AGE/ROCK UNITS	Early Cambrian Hawker Group Wilkawillina Limestone.
EXPLORATION SUMMARY	Regional stream sediment sampling, geological mapping, rock chip sampling, 4 diamond drillholes (total depth 63.1).

MINERALISATION/PROSPECTS

Toondana Prospect. Several willemite occurrences. Rock chip sampling best values, 2 1.5 m intervals 11% & 8% Pb + Zn. Drillholes sited on willemite outcrops found up to 31% Zn over 1.2 m. Concluded mineralisation was derived by supergene enrichment along faults.

COMMENTS Part of Flinders Ranges National Park covered by later SADME exploration. See AG 51, 53.

COMPANY/AUTHOR SADME B.J. MORRIS

REFERENCE RB 86/18

1:250 000 SHEET PARACHILNA

TARGET MVT lead-zinc in Cambrian Hawker Group

AGE/ROCK UNITS Early Cambrian Hawker Group Wilkawillina Limestone.

EXPLORATION SUMMARY Regional geological mapping, stream sediment & rock chip sampling delineated 8 prospective areas. Follow-up exploration comprising rock chip & soil sampling, geological maping & geophysical surveys (I.P. & Sirotem) defined four prospects as having most potential for MVT mineralisation.

MINERALISATION/PROSPECTS

(a) Southern Coincident Pb, Zn rock chip sample anomalies, geophysical anomalies, smithsonite gossans & possible karsting at an unconformity at top of porous calc-dolomite unit.

(b) Manga Coincident lead, zinc & manganese rock chip anomalies, geophysical anomalies, karsting & dolomitization below palaeo-surface, adjacent to major syndepositional cross fault.

(c) Concert Prospect Anomalous Pb & Zn soil sample assays within a major karstic feature, 200 m across, immediately below the palaeo-surface.

(d) Willa Prospect Coincident Pb & Zn rock chip sample anomalies, silicification, faulting and surface Pb, Zn mineralisation below a palaeo-surface.

COMMENTS Flinders Ranges National Park.

COMPANY: BHP Minerals Ltd.
Esso Australia Ltd.

TENEMENT: EL 726/1080

ENVELOPE: 3969

1:250 000 SHEET: PARACHILNA

TARGET: MV type Pb-Zn mineralisation in shallow carbonate sequences.

AGE/ROCK UNITS: Lower Cambrian, Wilkawillina Limestone

STRUCTURAL CONTROL:
Unconformities, solution collapse breccias, karst topography, reef complexes.

EXPLORATION SUMMARY:
Review of past exploration by Mines Exploration Pty. Ltd. in which regional geochemical sampling delineated several areas of anomalous lead and zinc mineralisation, reconnaissance mapping and sampling, photogeology (1:20 000 scale) geological mapping - Tea Cosy Reef (1:5 000 scale).

MINERALISATION/PROSPECTS:
Two types of mineralisation detected during 1980 reconnaissance. (A) Fracture fill Pb and Zn mineralisation within the dolomitic unit of the Wilkawillina limestone unit as detected by MEPL. One sample from nodular chert horizon assayed 4450 ppm Zn and 1900 ppm Pb. (B) Major mineralisation noted along and beneath an unconformity at the top of the Wilkawillina Limestone unit. Samples from this unconformity surface assayed up to 42% Zn and 5% Pb.

Tea Cosy Reef Prepared ground in reef complex at Tea Cosy creek but no observed mineralisation.

NO DRILLING UNDERTAKEN

NOTE: Exploration for coal and diamonds also undertaken.

COMMENTS:
Adjacent to Flinders Ranges National Park.
See AG51, 52 & 53.

COMPANY: BHP Minerals Ltd./Esso Australia Ltd.

TENEMENT: EL 727.1084

ENVELOPE: 3970 (Vol. 1 - 2)

1:250 000 SHEET: PARACHILNA

TARGET: MV type Pb-Zn mineralisation in shallow carbonate sequences.

AGE/ROCK UNITS: Lower Cambrian, Chace and Druid syncline, Mern Merna syncline.

STRUCTURAL CONTROL:
Unconformities, solution collapse breccias, karst topography, reef complexes, faults.

EXPLORATION SUMMARY:
Intensive stream sediment (1120) and pipeline trench (610) sampling. Follow-up soil/rock chip (147) sampling at the Vanessa prospect. Geological mapping (1:20 000 scale) and 1: 5000 scale at Vanessa prospect.

MINERALISATION/PROSPECTS:

a) Vanessa. Barite and copper mineralisation associated with a faulted block of Lower Cambrian carbonates in the Mern Merna syncline. Follow-up rock chip and soil sampling results not encouraging. (South dipping massive Wilkawillina Limestone is fault bound to the north against westward dipping shaley Parara Limestone, mineralisation associated with this fault zone.)

b) Chace and Druid Syncline Anomalous stream sediment results from the southern limb have not been followed up. Maximum values 42 ppm Cu, 100 ppm Pb, 300 ppm Zn, 70 ppm Co. Three occurrences of known Pb-Zn mineralistion shown on attached map.

NO DRILLING UNDERTAKEN

NOTE: Limited exploration for diamonds also undertaken.

COMPANY: BHP Minerals Ltd.
Esso Australia Ltd. (1984-1985)

TENEMENT: EL 538/807/1138

ENVELOPE: 3722

1:250 000 SHEET: PARACHILNA, COPLEY

TARGET: Mississippi Valley-type (MVT) Pb-Zn mineralisation.

AGE/ROCK UNITS: Lower-Middle Cambrian, Wilkawillina Limestone. Parara Limestone.

STRUCTURAL CONTROL:
Collapse zone, major fault structures, unconformitites, (dolomitization)

EXPLORATION SUMMARY:
Regional geological mapping/photo interpretation (1:20 000 scale) and prospecting; detailed geological mapping (1:10 000 scale); stream sediment and rock chip smapling; IP survey; diamond (10 holes; total 2257 m) and RAB/percussion drilling (152 holes; total 1923 m).

MINERALISATION/PROSPECTS:
a) Wilnuroona/ERIC prospects; highly anomalous stream sediment geochemical values (up to 0.6% Pb, 0.4% Zn) detected draining a possible collapse zone of lower Cambrian carbonates; shallow-dipping facies of the lower Cambrian Wilkawillina Limestone have been severely disrupted by major fault structures during deposition, resulting in at least three unconformities and a possible collapse zone; the Wilnuroona prospect (grid A, northwest of geochemical zone) is a high grade pod of surface mineralisation with average grade of 7.5% Pb+Zn over 300 m^2 and maximum values of 19% Pb, 33% Zn and 158 g/t Ag; drilling of the zone of anomalous drainage geochemistry defined the ERIC prospect, a lead anomalous channelway for mineralised fluids in either Recent/Holocene or Delamerian sediments possibly comprising colluvium of metal rich carbonate units and transported aeolian products; these sediments fill the previously karsted surface; drill results from ERIC include DEP 3 with an average 3.6% Pb between 0-26 m; at ERIC metal values fall off in the Cambrian bedrock.

b) Moorowie prospect; comprises areas of Cu, Pb and Zn mineralisation associated with diapiric breccia, sparry dolomite and fracture and fault breccias in lower Cambrian carbonates. Rockchip sampling (by EZ) defined areas of copper (up to 16%) and zinc (up to 30%) mineralisation associated with north-south trending linear features and silicified zones. Follow-up IP survey and drill hole were not encouraging.

Other small occurrences of Pb-Zn mineralisation have been delineated.

DRILL SAMPLE STATUS:

DDF 1-5
DDM 1
PWP 1-7
DEP 1-4
REP 1-145

Note: See also 'Open File' Envelope 5016 for details of relinquished area.

COMPANY: BHP Minerals Ltd.
Esso Australia Ltd. (1984-85)

TENEMENT: EL 436/809/1129

ENVELOPE: 3427

1:250 000 SHEET: PARACHILNA, COPLEY

TARGET: Mississippi Valley-type (MVT) Pb-Zn mineralisation

AGE/ROCK UNITS: Lower-Middle Cambrian, Wilkawillina Limetone, Parara Limestone, Wirrealpa Diapir, Billy Creek Formation.

STRUCTURAL CONTROL:
Karst features, unconformities, breccia development, faulted contacts (dolomitization).

EXPLORATION SUMMARY:
Regional geological mapping (1:50 000 scale) and prospecting; detailed geological mapping (1: 10 000 scale) and prospecting; stream sediment sampling adjacent to diapir, rock chip sampling Donkey Bore and Titree Gorge; diamond (22 holes; total 5543 m) and reverse circulation (7 holes; total 496 m) principally at Wirrealpa mine and Donkey Bore prospect.

MINERALISATION/PROSPECTS:
a) Donkey Bore prospect; lead and zinc mineralisation associated with a major Cambrian Karst topography developed beneath the Flinders Unconformity; prospect lies on northeast limb of an asymmetric syncline which here abuts the northwest extension of the Wirrealpa Diapir; a major unconformity is apparent between massive biohermal limestone and the overlying thin bedded Parara Limestone; development of breccias below the unconformity provides adequate ground preparation for mineralising solutions; surface mineralisation (principally galena with subordinate hydrozincite/smithsonite) occurs as open space fill in biohermal limestone which outcrops discontinuously over 6 km; the karsted/mineralised system could extend a further 6 km to the northewest; best drillintercept 10 m at 1.2% Pb+Zn in DH WD 18 within 40 m of coarse breccia.

b) Wirrealpa mine; discovered 1883; total production about 1000 t of high grade Ag-Pb ore; produced 60 t at 70% Pb, 5-8 oz/t Ag in 1888; lies within archaeocyathid-rich limestones below an unconformity adjacent to the faulted contact between the lower Cambrian and the Wirrealpa Diapir; observed mineralisation includes galena, cerussite, azurite, malachite, barite, hydrozincite and sphalerite with elevated values of silver and gold; occurs as open space filling associated with the diapir contact fault and in pods below the unconformity; surface exposure of prepared ground and associated mineralistion extends about 5 km southeast from the main shaft. 1984 drill hole DWM1A intersected 6 m at 1.1% Pb.

c) Enegunda fault zone; anomalous stream sediment geochemistry, surface mineralisation and suitable ground preparation have been detected alongh the faulted contact between the southern end of the Donkey Bore Syncline and the Wirrealpa Diapir.

d) Numerous other small occurrences of Pb-Zn mineralisation have been defined (see figure).

DRILL SAMPLE STATUS:

DDH WD 1 - 19
DWM 1 AND 1A
DDB 1
PDP 1 - 7

COMPANY Kennecott Exploration

TENEMENT SML 95, 137

ENVELOPE 601, 843 Summarised in Rept. Investigations 37

1:250 000 PARACHILNA

TARGET Base metals

AGE/ROCK UNITS
Lower Cambrian Wilkawillina Limestone

EXPLORATION SUMMARY
Rock chip sampling, stream sediment sampling, geophysics - self potential and induced polarisation, drilling -2 rotary holes and five diamond holes.

MINERALISATION/PROSPECTS
Reaphook Hill zinc prospect
Stream sediment anomalies. Max Zn 1170 ppm, Pb > 100 ppm. Follow-up sampling found chalcophanite & scholzite in ferruginised and manganiferous Wilkawillina Limestone. Near surface concentration of secondary Zn minerals, 'small tonnages' of 2-4% Zn.
Galena in calcite veins in underlying Wonoka Formation.

COMMENTS Surface mineralisation too small but possibility of MVT mineralisation.

COMPANY: ASARCO (AUSTRALIA) PTY. LTD.

TENEMENT: SML 166

ENVELOPE: 965

1:250 000: PARACHILNA

TARGET: Base metals particularly Cu in diapiric breccia.

AGE/ROCK TYPES:
Diapiric breccias and associated sediments, Adelaidean and Lower Cambrian.

STRUCTURAL CONTROLS:
Lineaments crossing Wilkawillina Limestone and Parachilna Formation.

EXPLORATION SUMMARY:
Field mapping, stream sediment sampling, photo interpretation, drilling

MINERALISATION:
(a) Oraparinna Diapir Area. Asbestos Mine area - anomalous Zn in stream sediments. Zn 410 ppm. Single sample within diapiric breccia.

(b) Willow Springs Area Area of low order Pb anomalies in stream sediments. Max. Pb 210 ppm. In Tapley Hill Formation.

Anomalous Pb Zn values also obtained in Wirrealpa & Third Plain Creek/Wilkawillina Gorge areas. See AG 57, 60, 61, 62, 63.

COMPANY: KENNECOTT EXPLORATIONS (AUST) PL

TENEMENT: SML 143

ENVELOPE: 800; Summarised in R.I. 37.

1:250 000: PARACHILNA

TARGET: Zinc mineralisation in carbonates

AGE/ROCK TYPES: Lower Cambrian, Wilkawillina Limestone

EXPLORATION SUMMARY: Surface mapping, stream sediment and rock chip sampling trenching and drilling (23 rotary percussion)

MINERALISATION/PROSPECTS:

Third Plain Zn Prospect Reconnaissance stream sampling found anomalous Zn > 400 ppm. Follow-up sampling found several lenticular outcrops of willemite with up to 55% Zn. Outcrops are surrounded by areas of hematitic dolomite with Zn 0.1 - 1.0%. See also AG 61, 62.

COMMENTS: Prospective for MVT mineralisation.

COMPANY: NORTH FLINDERS MINES

TENEMENT: SML 290 (THIRD PLAIN WILLEMITE)

ENVELOPE: 1146

1:250 000: PARACHILNA

TARGET: Extension of Third Plain Willemite (Zn) deposit

EXPLORATION SUMMARY:
Rotary percussion drilling programme based on stream sediment studies and air track drilling which encountered problems in cavernous dolomite.

MINERALISATION: Third Plain Willemite
Zinc mineralisation proven over 500 m strike length. Willemite up to 3.7 m thick down to 11.6 m established from Kennecotts drill sections. Later phase of drilling showed the main zinc body to be of small size and at an unfavouarable attitude (>60^{o} Dip) and down graded the prospect. Reserves estimated at approx. 50 000 tons averaging 15-20% Zn.
See also AG60, 62.

COMPANY: BHP Minerals Ltd.
Esso Australia Ltd. (1984-1985)

TENEMENT: EL 725/1085

ENVELOPE: 3968 CONFIDENTIAL

1:250 000 SHEET: PARACHILNA

TARGET: Mississippi Valley-type (MVT) Pb-Zn mineralisation.

AGE/ROCK UNITS: Lower-Middle Cambrian, Wilkawillina Limestone, Parara Limestone, Wirrealpa Limestone.

STRUCTURAL CONTROL:
Karst features, reef complexes, unconformities (dolomitization).

EXPLORATION SUMMARY:
Regional geological mapping (1:20 000 scale) and prospecting, stream sediment sampling, geological mapping (1:5000 scale) and rock chip/soil sampling of prospects. Drilling at Linda (21 reverse circulation drill holes for 502 m and 2 diamond drill holes for 302 m) and Third Plain (2 diamond drilholes for 186 m) prospects.

MINERALISATION/PROSPECTS:
a) Linda prospect; widespread surface mineralisation in pods containing up to 20% Pb-Zn is associated with a reef complex (Wilkawillina Limestone). Major components of this complex include archaeocyathid-rich biohermal limestones, inter-reef calcarenties and interbedded massive calcarenties and thin calcilutites as onlapping facies. The depositional environment was controlled by basin margin faults. Fracturing of the reef complex and deep karsting at varous levels have produced considerable open space. Surface mineralisation occurs as fracture-fill and as disseminated blebs and has been observed over a stratigraphic interval of aproximately 400 m. Twenty-one shallow (about 25 m) reverse circulation drill holes in 1984 and 2 diamond drill holes (100 and 200 m) in 1985 produced encouraging but sub-economic mineralised intersections. (Best 1984, DH-PLP 17 with 5 m at 2% Pb+Zn; best 1985, DH-DLP1 with 11 m at 1.3% Zn incl. 1 m intervals at 4.4%, 3.9% and 2.8% Zn). This remains a major prospect requiring follow-up drilling.

b) Third Plain deposit, shallow drilling by Kennecott and North Flinders Mines indicated about 80,000 tonnes at 20% Zn (as willemite). The deposit is located in an easterly dipping basal Cambrian carbonate sequence (Wilkawillina Limestone) on the western edge of the Wirrealpa Basin, and lies within a minor graben structure. At least two unconformities have been recognised within the graben and subseqent karsting has provided spaces for mineralising solutions. The surface willemite mineralisation occurs as white radiating spherulitic aggregates, colloform bands and spherules in dolomite. The potential for sulphide ore at depth was ineffectively tested by 2 diamond drill holes (44 and 144 m) in 1985 and the shallower hole (DTP2) should be extended to test this possibility.

c) Reaphook Reef prospect 3 areas of anomalous geochemistry have been outlined, one of which is associated with a faulted reef complex. Surface gossans contain anomalous Pb, Zn and Ni.

DRILL HOLE STATUS: PLP 1-20
DLP 1 and 2
DTP 1 and 2

COMPANY: AUSTRAL PACIFIC MINING

TENEMENT: SML 397 (PARACHILNA) - 10 mile Creek

1:250 000: PARACHILNA

ENVELOPE: 1548

TARGET: Base metal sulphides adjacent to willemite (oxidised) bodies

AGE/ROCK TYPE: Early Cambrian Wilkawillina Limestone

EXPLORATION: Stream sediment sampling of suitable areas in SML 397. 4798 samples @ 18.8 per square mile
Geological mapping and rock chip sampling.

MINERALISATION/PROSPECTS:
Ten Mile Creek (Wilkawillina Gorge) Area showed high Pb Zn from stream sediment sampling; more detailed work showed.

- Pb up to 640 ppm confined to Limestone - irregular and related to fissures rather than stratiform.
- Zn ranged from 40-70 and probably fissure related also.

Earlier stream sediment sampling gave Pb values up to 1000 ppm
Zn: 4 anomalous values between 270 and 340 ppm.
Ten Mile Creek is an area of possible Pb-Zn mineralisation similar to Third Plain. High Pb-Zn attributed to possible absorption effects caused by manganese oxides.

COMMENTS: See also AG36, 62.

COMPANY	Utah Development Co. Ltd.
TENEMENT	E.L. 1260
ENVELOPE	6021
1:250 000	PARACHILNA
TARGET	Shale hosted Pb/Zn in Callanna Group.
AGE/ROCK UNITS	Willouran - Callanna Group.
EXPLORATION SUMMARY	7 Geochemical traverses - soil and rock chip samples at 25 m intervals. Total 5400 metres. Lines spaced about 1 km apart.

MINERALISATION/PROSPECTS

Maximum Pb value 590 ppm, Zn 2150 ppm in Kirwan Siltstone south of Kirwan Mine (Cu).

COMPANY: SADME

TENEMENT: ML 2048, 2049 F.C. Hughes (30-6-84)
ML 1944 G.S. Marshal (30-6-88)
Baratta Silver Lead field.

REFERENCE: MR 130 " (Johns 1969).
RB 82/83 S.A.D.M.E. (Newton, Crettenden, Fradd).
Summarises & exploration by SADME and numerous companies.

AGE/ROCK TYPE: Adelaidean Tapley Hill Fm

1:250 000: PARACHILNA

EXPLORATION SUMMARY:
Geological mapping, soil & rock chip sampling, geophysics - I.P., ground magnetics & gravity, drilling - diamond (19 holes), percussion (15 holes) auger (24 holes).
Intensive search for large low grade silver - Pb-Zn over Baratta area during 1960-1973. No economic discovery but widespread low grade mineralisation is present, plus gold.

MINERALISATION: Eukaby - Baratta
Total recorded production between 1920 and 1968 is
- 200 tonnes of Pb (Galena)
- 260 kg of Ag
- 3330 g of Au
- Estimated by Johns production from discovery to 1968 is 2000 tonnes of concentrate containing 25% lead and .3 kg per tonne silver (Johns 1969).

Mineralisation is galena, silver, sphalerite & gold in structurally controlled quartz veins.

COMMENTS: Possibility of mineralisation along strike.

COMPANY	North Broken Hill Ltd 1972
TENEMENT	SML 603
ENVELOPE	1727
1:250 000	PARACHILNA
TARGET	Lead, zinc, silver, gold
AGE/ROCK UNIT	Proterozoic, Umberatana Group
STRUCTURAL CONTROL	Eukaby Syncline, cleavage?
EXPLORATION SUMMARY	Geological mapping, rock chip sampling (Cu, Pb Zn, Ag), channel sampling of Eukaby Hill workings (Cu, Pb, Zn, Ag) and 5 diamond drillholes. Gravity survey and percussion drilling, soil sampling.
MINERALISATION	Primary mineralisation is galena, sphalerite, chalcopyrite and pyrite in veins of quartz, calcite and siderite, infilling tension openings, generally concordant to bedding with shallow westerly pitch related to crenulation cleavage?. Rock chip assays high with up to 2.1% Pb, 2.4%Zn and 35 ppm Ag. Channel samples showed average of 5.6% Pb, 0.7% Zn and 1.7ppm Ag over 16.6m; also up to 6 ppm Au. Diamond holes EUI (251m) and EU2 (159m) weakly mineralised with 1.5m of 0.6%Pb and 1.3% Zn in EU1. EU3 (207m) - 0.9%Pb, 0.7%Zn and 11ppm Ag from 116m to 136m. EU4 - 2.3%Pb, 1.9%Zn, 19.8ppm Ag from 200.6m to 214m.

COMPANY: COMINCO EXPL. P.L.

TENEMENT: S.M.L. 102

ENVELOPE: 606

1:250 000: PARACHILNA

TARGET: Base metals

AGE/ROCK TYPES: Willochra Formation

STRUCTURAL CONTROL: Assymmetric anticline trending ENE and faulting trending NNE associated with economic mineral occurrences, jointing paralleling the fold axes carry galena.

EXPLORATION SUMMARY: Geological mapping, measurements of jointing, cleavage for structural controls, vein types and directions and drilling.

MINERALISATION/PROSPECTS

Eukaby Blocks: 5 veins of galena were exposed. Widespread mineralisation warranted further exploration.

COMPANY: KENNECOTT EXPLORATIONS (AUST) PTY LTD

TENEMENT: SML 108 MT. ARDEN

ENVELOPE: 684, 641. Summarised in R.I. 37.

1:250 000: ORRORO0

TARGET: Copper, lead and zinc in Early Cambrian

AGE/ROCK TYPES:
Wilkawillina Limestone and Parachilna Formation

EXPLORATION: Stream sediment and rock chip sampling. 8 bulldozer trenches. Geophysics - self potential & induced polarisation. Rotary drilling, 4 holes.

MINERALISATION:
Anomalous Cu and Zn in stream sediments occur in basal Wilkawillina Limestone and Parachilna Formation over a strike length of 27 km. Best area: Ragless Range (west flank) Stream sediment max. Zn 1740 ppm. Follow-up rock chip sampling showed Zn 0.2-1.0% over 6-15 m stratigraphic width in basal Wilkawillina & Parachilna Fmn. Trench samples max.

Zn 0.64% (30 m sample interval)
" 1.17% (21 m sample interval)
Drillholes max. Zn 1% (3.8 m)

COMPANY	S. Aust. Dept. of Mines 1972
TENEMENT	-
REFERENCE	RI 37, RB 67/122
1:250 000	ORROROO, PARACHILNA, COPLEY, ANDAMOOKA
TARGET	Base metal mineralisation
AGE/ROCK UNITS	Cambrian, basal Wilkawillina Limestone, Parachilna Fm, Ajax Lmst, Andamooka Limestone
STRUCTURAL CONTROL	-
EXPLORATION SUMMARY	Report summarises company exploration for base metals between 1965 and 1969. Summarises geochemical, geophysical and drilling programmes.

MINERALISATION

Details exploration results for prospects:

- Ediacara mineral field
- Puttapa
- Mt. Arden - Comstock area
- Radford Creek area
- Kanyaka area
- Reaphook Hill
- Third Plain zinc prospect
- Moro area
- Lake Torrens area
- Roxby Downs area
- Andamooka area
- Parachilna area

COMMENTS	All areas summarised have strongly anomalous Pb-Zn. Most localities listed elsewhere in this report.

COMPANY	Electrolytic Zinc Co. of Australia Ltd. 1971.
TENEMENT	SML 584
ENVELOPE	1698
1:250 000	ORRAROO and PARACHILNA
TARGET	1. Base metal sulphide deposits in Lower Cambrian sediments - Syngenetic mineralization in Parachilna Formation. 2. Search for kimberlite/carbonatites in the Kanyaka area - Investigation of previously recorded rare earth anomaly.
AGE/ROCK UNITS	Lower Cambrian Sediments (Parachilna Formation)
STRUCTURAL CONTROL	Crush zone - faulting - Dispersion of primary, possibly syngenetic, mineralisation within Parachilna Formation along faults.
EXPLORATION SUMMARY	Stream sediment sampling of creeks draining Lower Cambrian limestone. Brief geological study of portion of the lease.

MINERALISATION/PROSPECTS

Several lead-zinc anomalies were located and found to be related to the Parachilna Formation at the base of the Cambrian. Intensity of these anomalies is of the order of seven times background. A more intense anomaly with lead values up to 0.1% was located in streams draining a crush zone 4 km west of Kanyaka Hill. Anomalous rare earth values recorded by Kennecott in 1968 were not duplicated. No statistical treatment of geochemical data included.

DRILL SAMPLE STATUS — No drilling undertaken.

COMPANY	AMOCO Minerals Aust. Co.
TENEMENT	EL 242
ENVELOPE	2750
1:250 000	ORRORO0
TARGET	Base metal massive sulphide mineralisation
AGE/ROCK UNITS	Cambrian, Parachilna Fm, Wilkawillina Limestone
STRUCTURAL CONTROL	Ragless Range Syncline
EXPLORATION SUMMARY	Geological mapping, resistivity survey and soil sampling using hand auger to sample 'B' horizon. -80 mesh fraction assayed for Cu,Pb,Zn, Ag.
MINERALISATION	Ragless Range Soil up to 78ppm Cu, 1750ppm Pb, 4000 ppm Zn and 3.2 ppm Ag. Anomalies associated with Fe-Mn gossans near base of Parachilna Formation Anomalies due to Fe-Mn scavenging rather than reflecting sulphides at depth. See also AG68

COMPANY	AMOCO Minerals Aust. Co. 1977
TENEMENT	EL 273
ENVELOPE	2958
1:250 000	ORROROO
TARGET	Base metal massive sulphide
AGE/ROCK UNITS	Cambrian Parachilna Formation
STRUCTURAL CONTROL	Comstock syncline
EXPLORATION SUMMARY	Soil sampling, 455 samples, 80 mesh assayed for Cu, Pb, Zn, Mn. Ten rock chip samples assayed for Cu, Pb, Zn, As, Ag, Mn Sb, Sn. Two diamond drill holes - BSA77-1 inclined 60°, 298 m deep; BSA77-2 inclined 80°, 207 m deep. Parts of hole assayed for Cu, Pb, Zn, Ag & Mn. Magnetic, I.P. and resistivity surveys.
MINERALISATION	Mt Arden-Comstock Soil samples showed anomalies in Parachilna Formation associated with Fe-Mn gossans, assays up to 500pp-Cu, 1650 ppm Pb and 1500 ppm Zn. Rock chip samples - some 'petted' as Fe-Mn tuffaceous sulphide bearing arenite, assays up to 950 Cu, 170 Pb, 2500 Zn, 1%Mn, 13As, 5.4 Ag 2008b and 100 Sn. Diamond drillholes sited on magnetic, IP and geochemical anomalies at Comstock Prospect near Comstock and Donnelly ironstone quarries and in Mn ironstone and Mn-carbonate of Parachilna Formation BSA77-1 0-43m, 272ppm Cu, 539ppm Pb, 4005 ppm Zn and 4ppm Ag. BSA77-2 58.4m - 85.9m, 205ppm Cu, 177ppm Pb, 5917 ppm Zn and 2ppm Ag.

See also AG73.

COMPANY	UTAH Development Co. 1970-72
TENEMENT	SML 455, 709
ENVELOPE	1466
1:250 000	ORROROO
TARGET	Base metals
AGE/ROCK UNITS	Cambrian, Parachilna Formation, Wilkawillina Limestone.
STRUCTURAL CONTROL	Two adjacent NE plunging synclines, Arden Syncline and Ragless Sycline
EXPLORATION SUMMARY	Geological mapping, soil sampling (1226 samples), rock chip (738 samples), channel samples of costeans (155 samples), stream sediment (1503 samples) and auger sampling (1176 samples). Geochemical samples assayed for Cu,Pb,Zn, Co and Ni. Some samples for multi-element scan. Ground magnetic survey and one diamond drillhole (AMD-1 to 61m). Main prospect was Mt. Arden Mine area.
MINERALISATION	Parachilna Formation and basal Wilkawillina Limestone anomalous in base metals. Max values were-

	Cu	Pb	Zn
Channel samples	2 100	2 100	6 500
Stream sediments		130	1 200
Soil samples	4 900	900	580
Rock chip	>10 000	1 600	4 000
Auger sampling	6 000	3 600	6 600
AMDI (15.2m-22.9m)	2 400	234	1 530

Jasperoid bodies at core of Ragless Syncline overlying Parachilna Fm commonly contains 1-2%Zn.

See also AG72.

COMPANY Kennecott Explorations

TENEMENT SML 94, 109

ENVELOPE 600, 642, 685 Summarised in R.I. 37.

1:250 000 ORRORO0

TARGET Base metals in Early Cambrian & Adelaidean.

AGE/ROCK TYPES

Early Cambrian Wilkawillina Limestone & Parachilna Formation.

EXPLORATION SUMMARY

Stream sediment sampling, soil & rock chip sampling follow-up. Geophysics - S.P. & I.P. Trenching. Rotary drilling 2 holes.

MINERALISATION/PROSPECTS

Radford Creek Stream sediment samples contained max. Pb 1000 ppm, Zn 700 ppm. Follow-up sampling found anomalies coincident with iron and manganese oxides in the Parachilna Formation & basal Wilkawillina Limestone over 1.5 km strike length.

Rock chip samples max.	Pb 3.8%, Zn 1.15%.
Trench samples max.	Pb 0.46% (37 m sample interval)
	Zn 0.62% (44 m sample interval)
Drillholes max.	Pb 0.30%, Zn 0.34% over about 6 m stratigraphic width

COMMENTS Area should be checked for MVT 'pods'.

COMPANY: KENNECOTT EXPLORATIONS (AUST) PTY LTD

TENEMENT: SML 110 (KANYAKA)

ENVELOPE: 686, 643 Summarised in R.I. 37.

1:250 000: ORROROO

AGE/ROCK TYPE:
Parachilna Formation and Wilkawillina Limestone (Early Cambrian).

STRUCTURE: Syncline dipping N.E.

TARGET: Early Cambrian carbonates containing base metals particularly copper.

EXPLORATION: Stream sediment sampling, rock chip sampling. Drilling (11 rotary holes), 12 trenches.

Geophysics - self potential and induced polarisation.

MINERALISATION:
Kanyaka Copper Mine Area. Drilling outlined low grade stratiform Zn & Cu mineralisation in Parachilna Formation. Max. Zn 2.75% over 3 m.

COMPANY	Cyprus Mines Corp. 1970
TENEMENT	SML 313
ENVELOPE	1306
1:250 000	ORROROO
TARGET	Copper, Lead, Zinc
AGE/ROCK UNITS	Cambrian, Parachilna Formation, Wilkawillina Limestone
STRUCTURAL CONTROL	Syncline structure with faulting
EXPLORATION SUMMARY	Geological mapping, ground magnetics, IP survey, soil geochemistry, rock chip sampling. Soil samples assayed for Cu,Pb,Zn. Rock chips assayed for Cu,Pb,Zn and multi element scan. Two prospects - Kanyaka Mines and Worm Burrows. Also summary of Kennecott rotary drilling of 11 holes near Kanyaka Mines, drilled 1965-66.
MINERALISATION	Cu,Pb and Zn mineralization associated with Parachilna Formation - Wilkawillina Limestone contact zone. Soil samples upto 1735 ppm Cu, 1885ppm Pb and 5300ppm Zn. IP anomalies associated with geochemical anomalies at Kanyaka Mines and Worm Burrows Prospects. Kennecott drilling indicated sub-economic mineralization in Parachilna Formation Best intersection 3.8m of 0.5%Cu and 2.75% Zn. 10 million tonnes indicated in area of $74m^2$ to depth of 76m averaging 600ppm Cu and 1200ppm Zn. Pyrite, chalcopyrite, chalcocite, sphalerite and galena.

See also AG70, 75.

COMPANY	UTAH Development Co. 1972
TENEMENT	SML 720
ENVELOPE	2120
1:250 000	ORROROO
TARGET	Stratiform copper
AGE/ROCK UNITS	Proterozoic, River Wakefield Group.
STRUCTURAL CONTROL	Yednalue anticline
EXPLORATION SUMMARY	Mapping, regional stream sediment (195 samples) soil samples (223 samples), rock chip (75 samples) plus 'C' horizon rotary drill sampling (827 samples). The -80 and -20 mesh fraction of samples assayed for Cu, Pb, Zn, Co, Ni plus a multi element scan of selected samples.
MINERALISATION	Geochemical assays gave maximum values of 1750 ppm Cu, 75ppm Pb and 310ppm Zn. In general assays low.

COMPANY	UTAH Development Co. 1970-71
TENEMENT	SML's 347, 614 Eurelia-Carrieton
ENVELOPE	1218, 1777. Also summarised in RB 81/89.
1:250 000 SHEET	ORROROO
TARGET	Stratiform copper
AGE/ROCK UNIT	Proterozoic, Burra Group, River Wakefield Sub Group.
STRUCTURAL CONTROL	Domed plunging anticline
EXPLORATION SUMMARY	Regional stream sediment survey, -20 mesh analysed for Cu,Pb,Zn,Ni and Co; geological mapping; auger geochemistry (C horizon) -80 mesh assayed for Cu,Pb,Zn,Ni and Co; IP; ground magetics; rock chip survey; soil sampling survey; diamond drilling; and rotary precussion drilling. Best prospect Copper Claim.
MINERALISATION	Copper Claim Prospect Pb and Zn values in stream, soil and auger geochem programmes all gave uniformly low values - Pb generally 10-30ppm (max. 135ppm), Zn generally 15-50ppm (max. 440ppm). 4 percussion holes PH01 (82.4m), PH03 (89.7m), PH04 (91.5m), PH05 (47.3m) with best intersection in PH03 of 0-11m at 7000ppm Cu. 3 diamond holes EDO1 (91.5m) 0-15.3m 0.369% Cu 71.4-86.9m 0.24% Cu EDO2 (305m) 260.3-260.9m 0.25% Cu EDO3 (488m) 478.9-480.7m 0.75% Cu 434-435.6m 0.60% Cu Pb and Zn values generally low; max. of 570ppm Pb and 1750ppm Zn. Volcanics, tuffs etc mentioned in logs?

COMPANY	S. Aust. Dept. of Mines 1968
TENEMENT	-
ENVELOPE	MRR 129 RB 67/73
1:250 000	ORROROO
TARGET	Base metals and gold
AGE/ROCK UNITS	Proterozoic, Tarcowie Siltstone, Tapley Hill Formation, Tindelpina Shale member, Appila Tillite, Burra Group and Mount Grainger Diapir.
STRUCTURAL CONTROL	Anticline with diapir in core
EXPLORATION SUMMARY	Stream sediment survey of 500 samples. -80 mesh fraction assayed for Cu,Pb,Zn Co and Ni. Follow up rock chip sampling.
MINERALISATION	Anomalous stream sed. samples for Pb,Zn near Medina Copper Mine (Pb > 46ppm and Zn > 111ppm). Rock chip samples showed up to 450ppm Zn associated with Tindelpina Shale.

COMPANY	Progress and Properties (Mining) Pty. Ltd.
TENEMENT	SML 398
ENVELOPE	1549
1:250 000	ORRORO0
TARGET	Base metal sulphide deposits in Adelaidean sediments.
AGE/ROCK UNITS	Adelaidean Burra Group - Saddleworth Formation, Umberatana Group.
STRUCTURAL CONTROL	Faulting associated with anticlinal & synclinal folds. Syngenetic accumulations in sediments - shale hosted?
EXPLORATION SUMMARY	Reconnaisance stream sediment sampling over 130 sq. km Total of 1287 samples (16.1/1.6 sq. km)

MINERALISATION/PROSPECTS

Copper - values ranged from <2 to 50ppm three possibe anomalies.
Lead - values ranged from <20 to 160 ppm 12 possible (60-115ppm), 2 probable (120-175ppm) and 1 definite (180 - over ppm) anomalies located. Anomalies fall in a well-defined zone centred 3.2 km south of Eke Hill and are related to the nose of an anticline within the Torrensian Burra Group. Some anomalous values are related to a NNE-SSW fault with overlying Yudamutana sub-group about 1.6 km west of the anticline.
Zinc - values range from 5-220 ppm. 17 possible (90-170ppm) and 2 probable (180-260ppm) anomalies. Thirteen anomalies were related to anomalous Pb values in the nose of the Eke Hill anticline.

DRILL SAMPLE STATUS	No drilling undertaken

COMPANY: CSR Ltd., 1977

TENEMENT: EL 158 and 270

ENVELOPE: 2489, 2904

1:250 000: BURRA

TARGET: Gold and base metals.

AGE/ROCK UNIT: Adelaide, Umberatana Group - Burra Group unconformity.

EXPLORATION SUMMARY

Stream sediment sampling (Cu, Pb, Zn, Ag) located 3 main prospects Twighams, Twighams South and Ulooloo Copper Mine. Rock chip sampling, soil sampling, auger sampling, I.P. magnetics and percussion drilling with some coring at prospects. Four holes drilled at Twigham, 2 at Twigham South and 9 at Ulooloo Copper.

MINERALISATION:

Pyrite was only sulphide observed, minor malachite seen at Ulooloo Prospect.
(a) Twighams Prospect. Best intersection in TW-3 of 1660 ppm Zn from 44.92 to 45.4 m and 820 ppm Pb, 65.88-67.68 m.
(b) Ulooloo Prospect Best intersection UL4 1.35% Zn, 14-20 m, and 860 Cu, 10-20 m. UL6 0.5% Pb, 10-40 m, and 1486 Cu 10-40 m. Mineralization in UL4 in olive green puggy clay with orange mica flakes (kimberlite?). Anomalous surface zone 900x400 m, ferruginous gossans mainly in dolomitic sandstone.

COMPANY: SADME 1969

ENVELOPE: RB.69/122, N. LANGSFORD

1:250 000: BURRA

TARGET: SE corner of BURRA between Geranium Plains and World's End Creek.

AGE/ROCK UNIT: BURRA Group and Ordovician Granite.

STRUCTURAL CONTROL:
Kooringa Fault and parallel structure 5 - 7 km to east.

EXPLORATION SUMMARY and MINERALISATION:
Rock chip sampling (non-systematic). Breccias on both fault zones gave low Cu, Pb, Zn, and V values.
(a) Chalk Cliffs Area quartz-FeO-MnO 100 m long and up to 5 m wide cut weathered yellow siltstone (Appila Tillite?). Cu (80-500), Pb (25-50), Zn (70-1200), Co (60-270), Ni (130-470), Mo (5-8).

(b) Bendigo Area	Bendigo granite
quartz vein	Pb (40-710), Mo (12-690), Cu (900-3600)
greissen	Pb (5-85), Mo (5-210)
granite	Pb (5-30), Mo (5-25)

COMMENTS: Possible follow up (1) Chalk Cliffs Area,
(2) Bendigo Area

COMPANY: SADME 1975

REFERENCE: RB.75/94 R.S. Robertson

1:250 000: ADELAIDE

TARGET: Base metals, gold.

AGE/ROCK UNIT: Adelaidean Burra Group

STRUCTURAL CONTROL:
Adelaide Geosyncline

EXPLORATION SUMMARY
Regional stream sediments sampling - Adelaide 1:63 360 sheet 3300 samples; - 80 mesh assayed for Cu, Zn, Bi, Au, W, Mo, Nb, Pb, Mn, Co. Threshold values 60 ppm Cu, 70 ppm Pb, 110 ppm Zn.

MINERALISATION: Highest value up to 2020 ppm Cu, 500 ppm Pb, 1900 ppm Zn. Anomalies generally scattered but some association of Cu, Pb, Zn to Balhannah Shale Member and Saddleworth Formation.

COMPANY: SADME 1976

ENVELOPE: RB.76/49 R.P. Schlichting

1:250 000: ADELAIDE

TARGET: Base metals, gold.

AGE/ROCK UNIT: Adelaide, Cambrian, Ordovician.

STRUCTURAL CONTROL:
Adelaide Geosyncline.

EXPLORATION SUMMARY
1730 stream sediments samples collected on eastern half of Gawler 1:63 360 sheet.
-80 mesh fraction assayed for Cu, Pb, Zn, Au, Bi, Co, Nb, Mo, Mn and W.

MINERALISATION: Pb up to 230 ppm and Zn up to 1020 ppm detected in Woolshed Flat Shale. High base metals associated with pegmatites and quartz veins intersecting Woolshed Flat Shale.

COMPANY: SADME 1976

ENVELOPE: RB.76/100 R.S. Robertson

1:250 000: ADELAIDE

TARGET: Base metals, gold.

AGE/ROCK UNIT: Adelaidean, Cambrian.

STRUCTURAL CONTROL:
Adelaide Geosyncline.

EXPLORATION SUMMARY:
Steam sediment survey of western portion of Truro 1:63 360 sheet. - 80 mesh fraction of 2 657 samples assayed for Cu, Pb, Zn, Bi, Au, W, Mo, Mn, Co and Nb.

MINERALISATION: Cu, Pb, Zn anomalies appear associated with base of Tapley Hill Formation, probably near Tindelpina Shale Member. High of 150 ppm Pb and 1400 ppm Zn in Tarcowie Siltstone. Follow up rock chip of ferruginous siltstone contained 0.73% Zn and 0.18% Pb.

COMPANY: SADME 1976

ENVELOPE: RB.76/134 B.A. Eberhard

1:250 000: ADELAIDE

TARGET: Base metals, gold.

AGE/ROCK UNIT: Adelaidean, Cambrian, Ordovician.

STRUCTURAL CONTROL:
Adelaide Geosyncline.

EXPLORATION SUMMARY:
Stream sediment survey of Riverton and Eudunda 1:63 360 sheet. -80 mesh fraction of 1500 samples assayed for Cu, Pb, Zn, Au, W. Mo, Nb, Co & Mn.

MINERALISATION: Pb-Zn values generally low, but higher values associated with Appila and Pepuarta Tilites, also siltstones of Saddleworth, Tapley Hill and Woolshed Flat Formation.

COMPANY: UTAH Development Co.

TENEMENT: EL 222

ENVELOPE: 2729

1:250 000: ADELAIDE

TARGET: Copper

AGE/ROCK UNIT: Adelaidean, Eudunda Arkose Member

STRUCTURAL CONTROL:
Adelaide Geosyncline

EXPLORATION SUMMARY:
Orientation steam sediment sampling, rock chip sampling, geological mapping. 13 stream sed. samples and rock chips assayed for Cu, Pb, Zn, Co, Ag.

MINERALISATION: No anomalous value except Eudunda Arkose gave up to and over 200 ppm Pb (background 24 ppm).

COMPANY: Northland Minerals - UTAH Development Co. 1976

TENEMENT: EL 239

ENVELOPE: 2705

1:250 000: ADELAIDE

TARGET: Cu

AGE/ROCK UNIT: Adelaidean, Umberatana Group

STRUCTURAL CONTROL:
North plunging syncline.

EXPLORATION SUMMARY:
Rotary drag bit drilling - Allendale East area NE of Kapunda Mine - extension of mine series. Also diamond drilling.

MINERALISATION: Some anomalous Zn - 180 ppm to about 300 ppm.

COMPANY: UTAH DEVELOPMENT CO. 1974-1978

TENEMENT: EL.240

ENVELOPE: 2706

1:250 000: ADELAIDE

TARGET: Cu

AGE/ROCK UNIT: Adelaidean, Umberatana Group

STRUCTURAL CONTROL:
Syncline and double plunging anticlinal dome.

EXPLORATION SUMMARY:
Mainly drilling program in vicinity of Kapunda Mine plus extension of mine series sediments. Diamond drilling, percussion drilling, dragbit drilling. Geochem. on drill results assayed for Cu, Pb, Zn.

MINERALISATION: Good Cu results - sub economic 0.1-3% Cu plus erratic Zn values up to about 600 ppm. No Zn sulphides seen in drill samples.

COMPANY: CRA Exploration Pty. Ltd. 1978

TENEMENT: EL 381

ENVELOPE: 3233

1:250 000: ADELAIDE

TARGET: Base metals.

AGE/ROCK UNIT: Adelaidean Appila Tillite, Tindelpina Shale
Cambrian - Karinya Shale.
Cambrian - Eudunda Arkose, Truro Volcanics.

STRUCTURAL CONTROL:
Adelaide Geosyncline.

EXPLORATION SUMMARY:
Stream sediment survey with follow up rock chip sampling Cu, Pb, Zn, U.

MINERALISATION: Eudunda Arkose - Truro Volcanics - only a few single sample Cu and Pb anomalies.
Karinya Shale - Few isolated high Cu, Pb and Zn values probably from minor thin mineralised veins.
Appila Tillite - Tindelpina Shale contact zone - a Cu anomaly of 1100 ppm over 50 m in Appila Tillite but no significant lateral extent found and anomaly probably represents superficial supergene enrichment.

COMPANY: SADME 1963

REFERENCE: MR 118, p. 127-133 RB. 56/110, also RB.54/123.

1:250 000: BARKER

AGE/ROCK UNIT: Lower Cambrian (Wangkonda Fm.).

STRUCTURAL CONTROL:
Adelaide Geosyncline

EXPLORATION SUMMARY:
Channel samples - rock chip. Samples assayed for Cu, Pb, Zn.

MINERALISATION: No lead minerals seen but assays gave up to 5000 ppm Pb for basal silty arkose at base of Cambrian, unit about 6 m wide. Anomalous zone about 6 km long. Cu up to 100 ppm, Zn up to 250 ppm. Sellick Hill.

COMPANY: SADME

REFERENCE: RB.64/109, MR126

1:250 000: BARKER

AGE/ROCK UNIT: Cambrian: Mt. Terrible Formation, Wangkonda Limestone, Sellick Hill Limestone. Normanville Group (Hawker Group equivalent).

EXPLORATION SUMMARY: Steam sediment survey, rock chip and soil sampling. I.P. survey over Sellick Hill Prospect.

MINERALISATION: Steam seds. showed up to 480 ppm Pb and 300 ppm Zn near Pipeline Prospect.
Rock chips at Sellick Hill Prospect gave up to 300 ppm Pb and 1400 ppm Zn, overlying soils contain 400 ppm Pb and 200 ppm Zn.
Anomalous Pb and Zn in Wangkonda and Fork Tree Limestone and anomalous Pb in Mt. Terrible Fm.
Pipeline Prospect and Sellick Hill Prospect located in recrystallized calcite zone in mottled upper member of Fork Tree Limestone.
Calcite, sphalerite and galena in thin veins.

COMPANY: SADME 1967

REFERENCE: RB 65/108

1:250 000: BARKER

AGE/ROCK UNIT: Cambrian

EXPLORATION SUMMARY:

Forktree Prospect - Ground magnetics, radiometric, I.P. over geochemical anomalous zone. (metal not mentioned, prob. Pb/Zn, refer to report by R.G. Wright).
* Also mentions drilling in progress.

MINERALISATION: If anomalies are associated with geochem. anomalies concludes intensive exploration drilling is warranted.

COMPANY: SADME 1968

REFERENCE RB 66/41, MRR 128

1:250 000: BARKER

AGE/ROCK UNIT: Cambrian Normanville Group. Forktree Limestone, Wangkonda Limestone.

STRUCTURAL CONTROL:
Black Hill Fault.

EXPLORATION SUMMARY:
Report covers area south of Myponga Beach to Carrickalinga Head. Stream sediment sampling, soil sampling, Halco down hole hammer drilling, IP survey. Forktree Prospect. 8 holes drilled up to 35 m deep.

MINERALISATION: Pb-Zn stream sed. anomalies draining. Forktree Prospect. Soil geochem. of Forktree Prospect gave up to 250 ppm Pb and 800 ppm Zn mainly centred on fault breccia about 120 m wide east northeast separating Wangkonda and Forktree Limestone. Best drill result in FW1 and FW3 from about 713 - 912 m (24-30') 1500 ppm Pb and up to 400 ppm Zn.

COMMENTS: Appears to be minor remobilised mineralisation in joints, veins, shears and stringers.

COMPANY: SADME 1970

REFERENCE: MRR 132 RB 70/044

1:250 000: BARKER

AGE/ROCK UNIT: Cambrian Normanville Group. Forktree Limestone, Wangkonda Limestone.

STRUCTURAL CONTROL: Black Hill Fault

EXPLORATION SUMMARY: Relates to Forktree Prospect. 12 extra holes (extra to MRR 128) Halco down hole hammer up to 45.7 m deep mainly in fault breccia area and adjacent Wangkonda Limestone. Holes assayed for Pb, Zn and some for Ag. Also soil sampling for Pb, Zn and Ag over Barritt's Mine, Pipeline Prospect and Forktree Prospect.

MINERALISATION: Small Ag anomalies associated with galena-bearing shears.
Pb up to 3000 ppm, Zn up to 735 ppm, Ag up to 350 ppb. Drill results showed manganiferous fault breccia contained 50-1500 ppm Pb and 30-700 ppm Zn.
Wangkonda Limestone is oolitic with associated pyrolusite and psilomelane, with Pb content 12-500 ppm and Zn 20-600 ppm. Anomalous Pb-Zn values mainly associated with manganese oxides.

COMMENTS: Chasing secondary Pb-Zn associated with manganese oxides in fault zones.

COMPANY: Electrolytic Zinc. Co. 1970

TENEMENT: SML 305

ENVELOPE: 1158

1:250 000: BARKER

AGE/ROCK UNIT: Cambrian: Sellick Hill Limestone, Wangkonda Formation. Normanville Group (Hawker Group equivalent).

EXPLORATION SUMMARY:

Soil sampling with gemco and hand auger to get below transported cover. Assayed for Cu, Pb, Zn. Four prospects located near Aldinga Bay.
North Pipeline Grid: soil samples up to 740 ppm Zn, 4000 ppm Pb
South Pipeline Grid: soil samples up to 210 ppm Zn, 2400 ppm Pb
South Wangkonda Grid: soil samples up to 350 ppm Zn, 9100 ppm Pb
North Wangkonda Grid: soil samples up to 60 ppm Zn, 1500 ppm Pb
2 percussion holes AB1, AB2 in North Pipelines Grid.
3 percussion holes AB3, AB4 & AB5 in South Wangkonda Grid.

MINERALISATION: Wangkonda Prospect Only 1 hole AB4 encountered mineralisation in Wangkonda Limestone (possibly Forktree Limestone near mottled member?)

19.3-21.3 m	3.10% Pb	0.01% Zn
21.3-24.4 m	6.00% Pb	0.01% Zn
24.4-27.4 m	1.40% Pb	0.01% Zn
27.4-30.5 m	0.73% Pb	0.01% Zn

Mississippi Valley style?

COMPANY: PREUSSAG Aust. Pty. Ltd. 1987

TENEMENT: EL.197

ENVELOPE: 2607

1:250 000: BARKER

AGE/ROCK UNIT: Cambrian, Normanville Group. Fork Tree Limestone, Wangkonda Formation.

EXPLORATION SUMMARY: Search for stratabound Pb-Zn-(Cu) of Mississippi Valley type in lower Cambrian carbonates. Soil sampling assayed for Cu, Pb, Zn, Rock chip sampling assayed for Cu, Pb, Zn, Ag & Au. Ground magnetic and IP surveys. Rechecked South Wangkonda Prospect of EZ.

MINERALISATION: High background values found in Wangkonda Fm. and Forktree Limestone. Virtually no sphalerite seen, galena and pyrite main sulphides. Mineralisation was fracture fill type. No prospects worthy of detailed follow up were encountered. I.P. over South Wangkonda prospect was recommended by consultant but was not carried out. Soil geochem suggested karst zone with associated magnetic anomalies at South Wangkonda prospect 10 m of 3.2% Pb in EZ, AB4 drillhole.

COMMENTS: Further exploration of the Normanville Group is warranted.

COMPANY: SADME 1969

TENEMENT: 2.6 km^2 reserved from operation of mining act includes Secs. 1396, 1397, 1398, 1426, 1427, 229 and 232 Hd. Noarlunga.

REFERENCE: RB 68/100

1:250 000: BARKER

AGE/ROCK UNIT: Proterozoic, Burra Group. Stonyfell Quartzite and overlying phyllites.

STRUCTURAL CONTROL:
East-west fault zone.

EXPLORATION SUMMARY:
Almanda Cu-Ag-Pb Mine. Soil samples, - 80 mesh soil samples assayed for Cu, Pb, Zn one diamond drillhole to 54.6 m angled at 45° to 180°.

MINERALISATION: Geochem. and I.P. anomalous zone 1 to 1.5 m wide and 853 m long. Geochem. assays, soil samples Cu, Pb and Zn best values all >500 ppm (Max. values not shown). Diamond drill hole DAL.1 at western end of anomalous zone gave best intersection of 1.5 m at 960 ppm Cu, 1300 ppm Pb, 8100 ppm Zn and 4 ppm Ag in phyllite above Stonyfell Quartzite. DAL.1 did not reach shear zone due to artesian water in Stonyfell Quartzite.

See also AG 99, 100.

COMPANY: SADME 1969

TENEMENT: 1 sq. mile reserved from operation of Mining Act, includes Secs. 1396, 1397, 1398, 1426, 1427, 229 and 232, Hd. Noarlunga.

REFERENCE: RB 69/127

1:250 000: BARKER

AGE/ROCK UNIT: Proterozoic, Burra Group, Stonyfell Quartzite and overlying phyllites.

STRUCTURAL CONTROL:
East-west shear zone.

EXPLORATION SUMMARY:
Almanda Mine. Two diamond drill holes DAL3 and DAL4. DAL3 designed to test lode beneath eastern workings, - depth 187 m angled 60° to 180°.
DAL4 designed to test shear zone in Stonyfell quartzite midway between DAL1 and DAL3 - depth 104 m angled 65° - 180°. 1.5 m intervals crushed and -80 mesh assayed for Cu, Pb, Zn and Ag.

MINERALISATION: DAL3: Shear zone cut at 106.7 m to 108.5 m giving assays of 1150 ppm Cu, 2200 ppm Pb, 5500 ppm Zn and 20 ppm Ag. Stonyfell Quartzite not cut, rock was mainly carbonaceous siltstone/shale.
DAL4: Shear zone cut at 96 m - 97.5 m giving assays up to 150 ppm Cu, 340 ppm Pb and 6400 ppm Zn. 1 ppm Ag. Stonyfell Quartzite not cut, rock mainly carbonaceous siltstone/shale.

See also AG 98, 100.

COMPANY: Northern Mining Corp. Ltd.

TENEMENT: SML 598

ENVELOPE: 1708

1:250 000: BARKER

AGE/ROCK UNIT: Proterozoic, Burra Group, Stonyfell Quartztie and overlying phyllites.

STRUCTURAL CONTROL:
East-west shear zone.

EXPLORATION SUMMARY:
9 surface rock chip samples and 11 soil samples. Drilled diamond drill hole DAL-2 as proposed previously by SADME. Drilled to 91.7 m inclined 60° to 180°.

MINERALISATION: Rock chips of mineralised material from Almanda Mine gave up to 2000 g/t Ag, >10000 ppm Cu, 200 ppm Pb, 1000 ppm Zn. >10000 ppm As, 5000 Sb and 10000 ppm Bi. As associate with Cu & Ag. Pb & Zn values separate. DAL 2 intersected down pitch extension of mineralised shoot between 65 m and 72.5 m, crush zone extends to 79.2 m. Did not reach Stonyfell Quartzite.

Interval	True width	Cu	Pb	Zn	As	Ag
65.8-67 m	0.6 m	0.2	2950	6750	360	5
67-68.9 m	0.9 m	0.81	261	543	1.1%	184
68.9-27.5 m	1.8 m	0.18	250	1150	4000	3
72.5-76.2 m	1.8 m	0.01	1180	5700	20	3
76.2-78 m	0.9 m	0.01	480	880	20	3
78-79.2 m	0.6 m	0.71	370	1100	320	19
79.2-91.7 m	6.1 m	0.01	810	3660	-	5

Lode 0.9 m wide av. 0.81% Cu and 184 ppm Ag; reserve 6000 tons.

COMMENTS: See also AG 98, 99.

COMPANY/AUTHOR	Aust. Ores & Minerals/S.B. Warne
TENEMENT	EL 1189
ENVELOPE	5299
1:250 000	OLARY
TARGET - Company:	- Copper - gold mineralisation at the Premier & Luxemburg Mines.
- This Study:	Lead-Zinc-Silver mineralisation along the McDonald shear.
AGE/ROCK UNITS	Adelaidean Sturtian Tillite and Early Proterozoic Willyama Supergroup.
STRUCTURAL CONTROL	McDonald Shear zone. Adelaidean sedimentation in active fault controlled graben. Adelaidean complexly folded & intruded by amphibolite bodies.
EXPLORATION SUMMARY	Surface sampling of mineralised outcrops only.

MINERALISATION/PROSPECTS

Winkler's Prospect Pb-Zn-Ag-As mineralisation in a 1-2 m wide shear zone between grey siltstone and bouldery tillite or basal conglomerate. Galena veins and lenses up to 0.3 m wide. Stolzite (lead tungstate) and wulfenite (lead molybdate) also reported. Trace gold (0.3 gm/tonne). Earlier work by Sundowner Minerals (Envs 1343 & 1389) reported mineralisation for a total length of 500m, both observed and by I.P. (See AG 102)

DRILL SAMPLES	Sundowner holes L1, L2 and L4 (Luxemburg Area) sampled but sulphide intersections missing.

COMPANY	Sundowner Minerals N.L.
TENEMENT	SML 207,420,724
ENVELOPE	1343, 1389, 2250
1:250 000	OLARY
TARGET	Mainly copper
AGE/ROCK UNITS	Adelaidean Umberatana Group and Early Proterozoic Willyama Supergroup
STRUCTURAL CONTROL	MacDonald Shear
EXPLORATION SUMMARY	Geological mapping, sampling of numerous prospects in the Olary region. Geophysics - magnetics & I.P. Drilling (diamond & percussion) & soil sampling grid in Luxemburg/Queen Bee mine areas. Winkler's Prospect - geological mapping & I.P., no drilling. Dalkey-Mildaltie Mine area sampling of old workings. Geological mapping.

MINERALISATION/PROSPECTS

Winklers Prospect (a) Shallow inclined shafts scattered over 300m. Vein 0.15-0.45m wide with secondary lead minerals & minor galena. In Adelaidean (?) slate & schist near contact with metamorphosed & granitised tillite (?). I.P. suggests mineralisation extends for another 200m. 0.75 km north of Luxemburg Well single point soil sampling anomaly Pb 1400, Zn 400 ppm.
See also AG101

Dalkey - Mildaltie Mine area (b) Most workings in Cu & Ag mineralisation. One rock chip sample from Mildaltie diggings contained Pb 1.0%, Zn 0.8%. 'Sheared schistose boulder tillite' is host rock.

COMPANY	Sundowner Minerals N.L.
TENEMENT	SML 419
ENVELOPE	1436
1:250 000	OLARY
TARGET	Base metals
AGE/ROCK UNITS	Early Proterozoic Willyama Supergroup and Adelaidean Umberatana Group
EXPLORATION SUMMARY	Exploration concentrated on Olary Silver Mine area (Willyama Supergroup). At Eringa Mine 7 samples of mullock(?) & outcropping lode. I.P. & magnetic survey. Two percussion drillholes EPI 52m, EP 2 27.5 m. Boomerang & Coo-ee Mine area. 8 rock chip samples. I.P. & magnetic survey.

MINERALISATION/PROSPECTS

Eringa Mine (a) Quartz vein, 1.5-1.8m wide. Max. Pb >> 1.0%, Zn 1.0%, Ag 327 ppm 4 I.P. anomalies including the one below the outcropping lode. 2 percussion holes did not intersect 'economic mineralisation'.

Boomerang & Coo-ee Mine area (b) Galena & chalcopyrite in narrow veinlets in a 0.6m - 1.2m wide quartz vein. Other, smaller veins parallel. Max. Pb 6.7%, Ag 2.5%.

Both localities in Enorama Shale.

COMMENTS Size potential small?

AG104

COMPANY	Rhodes Exploration Pty Ltd
TENEMENT	SML 424
ENVELOPE	1474
1:250 000	OLARY, ORROROO
TARGET	Base metals
AGE/ROCK UNITS	Adelaidean Umberatana Group
EXPLORATION SUMMARY	Regional stream sediment sampling. Analysed for Cu,Pb,Zn,V. 4221 samples collected in 2570 km^2 area. No follow-up work reported.

MINERALISATION/PROSPECTS

Best Pb/Zn anomaly south of Manunda Creek. 11 samples, max. Pb 210 ppm, Zn 450 ppm. Area 2.5 x 1.5 km. Tapley Hill Formation.

COMMENTS Worth checking source of anomaly.

COMPANY	Mines Administration Pty Ltd
TENEMENT	SML 556
ENVELOPE	1637
1:250 000	OLARY
TARGET	Copper/base metals
AGE/ROCK UNITS	Adelaidean Burra & Umberatana Groups
EXPLORATION SUMMARY	Geological mapping, rock chip sampling (502 samples), stream sediment sampling (1034 samples), soil sampling.

MINERALISATION/PROSPECTS

Commodore Mine - Giles Nob area (a) Rock chip samples showed 12 samples with Pb > 1%, 1 with Zn > 1%. Ferruginous gossans & quartz veins, at & around old pits & shafts. Host rock is Mintaro Shale. See also AG106.

Benda Range (northern flank) (b) Shafts & pits on crush zone in dolomite band within tillitic Wilyerpa Formation. Rock chip sampling found max. Pb 1.8% in sample across crush zone, 0.6 - 1.8m width. Max. Zn 0.64%. Soil sampling traverses located anomalous zone (max. Pb 750, Zn 700 ppm) away from line of workings. Other occurrences in similar stratigraphic position along Benda Range.

COMMENTS Size potential may be limited.

COMPANY/AUTHOR	SADME, B.J. Morris
TENEMENT	EL 16
REFERENCE	RB 73/28, RB 75/39
1:250 000	OLARY
TARGET	Copper & molybdenum in & around Anabama Granite
AGE/ROCK UNITS	Adelaidean Burra Group & Ordovician Anabama Granite.
EXPLORATION SUMMARY	Geological mapping, soil & rock chip sampling traverses. Underground sampling. Geophysics-resistivity. All at Wadnaminga Goldfield in New Milo-Thunderqueen area.

MINERALISATION/PROSPECTS

Commodore Mine (see also AG105)
Two feruginous quartz reefs contained lenticular masses of galena, sericite, pyrite & copper minerals 5 diamond drillholes drilled in 1927 gave discouraging results. Sample of mineralised quartz & calcite from working contained Pb > 10 000 ppm, Ag 50 ppm, Zn > 800 ppm.

Wadnaminga Gold Fields
Diggings extend for 10 km in shallow dipping quartz reefs. Gold is associated with pyrite, chalcopyrite, copper carbonate and galena. Host rock is Saddleworth Formation & Mintaro Shale
Gossanous quartz from the New Milo mine contained Cu 2000 ppm, Pb > 1%, Zn 1%, Ag 250 ppm, Au 2500 ppm.
In soil samples max. Pb 1600, Zn 920 ppm but only isolated anomalous values, mostly background.

COMPANY/TENEMENT/ ENVELOPE	(1) Longreach Minerals N.L.; SML 274, 551,; Envs 1178, 1632. (2) Carpentaria Exploration Co; EL 255; Env 2819 (3) Newmont Pty. Ltd. & Dampier Mining Co. Ltd.; EL 309; Env 2988.
1:250 000	OLARY
TARGET	Base metals
AGE/ROCK UNITS	Adelaidean Boucaut Volcanics
EXPLORATION SUMMARY	Geological mapping, soil and rock sampling, ground magnetics, I.P., diamond drilling (10 holes). Exploration of Mutooroo Ridge Copper Prospect.

MINERALISATION/PROSPECTS

Mutooroo Ridge

Copper and silver mineralisation in dacitic tuff at contact between andesite & altered rhyolite - volcanogenic footwall stringer zone. 2 (out of 10) diamond drill holes analysed for Pb & Zn gave background only. Surface rock samples away from drilled area contained up to Pb 1060 ppm, Zn 460 ppm Ag 5 ppm. Ferruginised rocks with oxidized stratiform sulphides.

COMMENTS Volcanogenic association. Boucaut Volcanics are worth checking regionally.

COMPANY: Western Mining Corporation Ltd.

TENEMENT: EL 1306

ENVELOPE: 6460

1:250 000 SHEET: CHOWILLA (BURRA)

TARGET: Not Pb/Zn

AGE/ROCK UNITS: Unit of interest for possible Pb-Zn is a chloritic schist overlain by possible equivalent of (Adelaidean) Braemar Iron Formation.

STRUCTURAL CONTROL:
Unknown

EXPLORATION SUMMARY:
Gold exploration only: reprocessing previous aerial magnetic data, reconnaissance sampling, ground magnetic and Sirotem traverses, 4 reverse circulation drill holes (aggregate 399 m).

MINERALISATION PROSPECTS:
Drill hole FLORC-4 intersected chloritic schist with elevated Ni, Co, V, Y, zinc and REE levels. Best zinc value 2173 ppm. The implications of this are unknown but no follow up has been undertaken.

DRILL SAMPLE STATUS:
FLORC - 4?

COMPANY:	CRA Exploration Pty. Ltd.
TENEMENT:	EL 1196
ENVELOPE:	5403 Vol. 1&2.
1:250 000:	CURDIMURKA, ANDAMOOKA, MARREE, COPLEY
TARGET:	Stratiform black shale and Mississippi Valley style lead-zinc mineralisation.
AGE/ROCK UNITS:	Adelaidean; Callana Group; Rischbieth Formation, Skillogalee Sub-Group, Burra Group; Tapley Hill Formation, Umberatana Group.
STRUCTURAL CONTROL:	Local basins, growth faults; reef structures, solution collapse, brecciation.
EXPLORATION SUMMARY:	Major and thorough exploration review, geological mapping and reconnaissance, rock chip and stream sediment sampling.

MINERALISATION/PROSPECTS:

- Locally Tapley Hill Formation and the base of the Umberatana Group are anomalous in zinc.
- (a) Kersantite and (b) Delusion Hill areas where previously samples with anomalous values 1100 ppm Zn, 600 ppm Pb by BHP and 5000 ppm Pb by H.R. Gillespie respectively were either not duplicated or not adequately followed up.

COMPANY: Electrolytic Zinc Company of Australasia Ltd.

TENEMENT: EL 1039/1269

1:250 000: COPLEY

TARGET: Zinc and lead sulphides in carbonate and pyritic carbonaceous host rocks and oxidised zinc mineralisation.

AGE/ROCK UNITS: Cambrian, Ajax Limestone, Hawker Group, Beltana Diapir?

STRUCTURAL CONTROL: Fault association (Ajax Fault, Norwest Fault).

EXPLORATION SUMMARY: Re-logging and sampling previous drillholes including water bore, geologcal mapping (1:100 000,1:500 000), stream sediment and rock chip sampling, IP surveys, RAB, RC, and percussion drilling (161 holes; 2115 m)

MINERALISATION/PROSPECTS:

(a) Beltana zinc mine oxidised zinc (willemite) deposits include Main, Northern, Southern, Lead, Moolooloo, Emu, Anaconda and Aristotle. Two types of ore bodies have been recognised, in-situ and transported. The initial resource at Beltana (Main, Northern, Southern, Lead) was estimated at 750 000 tonnes at 38% Zn, 2% Pb, Moolooloo was estimated at 30 000 tonnes at about 20% Zn, 10% Pb, and Aroona I and II deposits (about 2.5 km northwest of the EL) have an estimated resource of 150 000 tonnes at 34% Zn, 1.6% Pb.

(b) Copper King area ; drill intersection of variably weathered, strongly altered Ajax Limestone with anomalous Zn (0.7 - 4.9%), As (465-2460 ppm), Fe (6-39%) Mn (1.4 - 4.4%) and some Pb (82-550 ppm) from 8 m to EOH at 104 m.

(c) Northwest Fault; anomalous zinc, lead and arsenic values recorded in Northwest Fault melange downgraded by four percussion drillholes.

DRILL SAMPLE STATUS: RAB
RC
P 286 - 292

All samples probably stored at EZ Beltana mine area.

COMPANY: ASARCO (Aust) Pty. Ltd. 1972

ENVELOPE: 1880

1:250 000: State of S. Aust.

EXPLORATION SUMMARY:

Assay of existing drill hole material held at SADME core library. Assayed for Cu, Pb, Zn, Ni, Mn also some for Ag, Au, U.

MINERALISATION: Santos stratigraphic hole, Lake Frome No. 1.

	Cu	Pb	Zn
186 m to 192 m	470	1250	2900
387 m - 399 m			5650
643 m - 649 m			1.6%
527 m - 570 m		257	2028
637 m - 655 m			7866

Lake Frome No. 2

564 - 570		1.7%
692 - 704		1.9%

Lake Frome No. 3

286 - 408	580	4116
402 - 408	3900	1.3%

All assays in Cambrian Lake Frome Group

Eucla Basin Nullarbor Plain No. 6 (31°09', 131°12')

Pidinga Formation (Tertiary)	122 - 131	4200
Lower Cretaceous (S.S.)	186 - 192	5000

COMPANY Australian Selection, Sims Metals.

TENEMENT EL 187, 329, 374, 421

REFERENCE Env 2072, MRR 151 pp 58-64

1:250 000 PORT AUGUSTA

TARGET Zambian Copperbelt type orebodies.

AGE/ROCK UNITS Adelaidean Tapley Hill Formation (basal)

MINERALISATION/PROSPECTS

Myall Creek (Copper) Prospect

Copper and lesser lead and zinc sulphides intersected over an area 15 x 3 km in a thin white sandstone unit and overlying silt-dolo-laminite at the base of the Tapley Hill Formation. Grade & thickness is low and inconsistent. e.g. drillhole SAU-20 max. Cu 1.45%, Zn 0.43%, Pb 0.13%, Ag 43 ppm.

COMMENTS Grades low but unit is of interest perhaps in a more favourable structural environment.

COMPANY: SADME 1982

REFERENCE: RB 82/12

1:250 000: All

AGE/ROCK UNIT: All

EXPLORATION SUMMARY:

State wide sampling of groundwater via water bores. Samples assayed for pH, Ca, Mg, Na, K, Cl, HCO_3, SO_4, No_3, TDS, FE, F, PO_4, B, SiO_2, Al, Ba, Cd, Cu, Pb, Mn, Hg, Ni, Se, Ag, Zn and As. 194 bore samples analysed for heavy metals.

MINERALIZATION: Possible poly-metallic sulphide mineralization in the following area:

- Musgrave Block
- Yardea
- Paratoo
- Snowtown
- Orroroo
- Port Augusta
- Tarcoola
- Southern Yorke Peninsula
- Mount Gambier

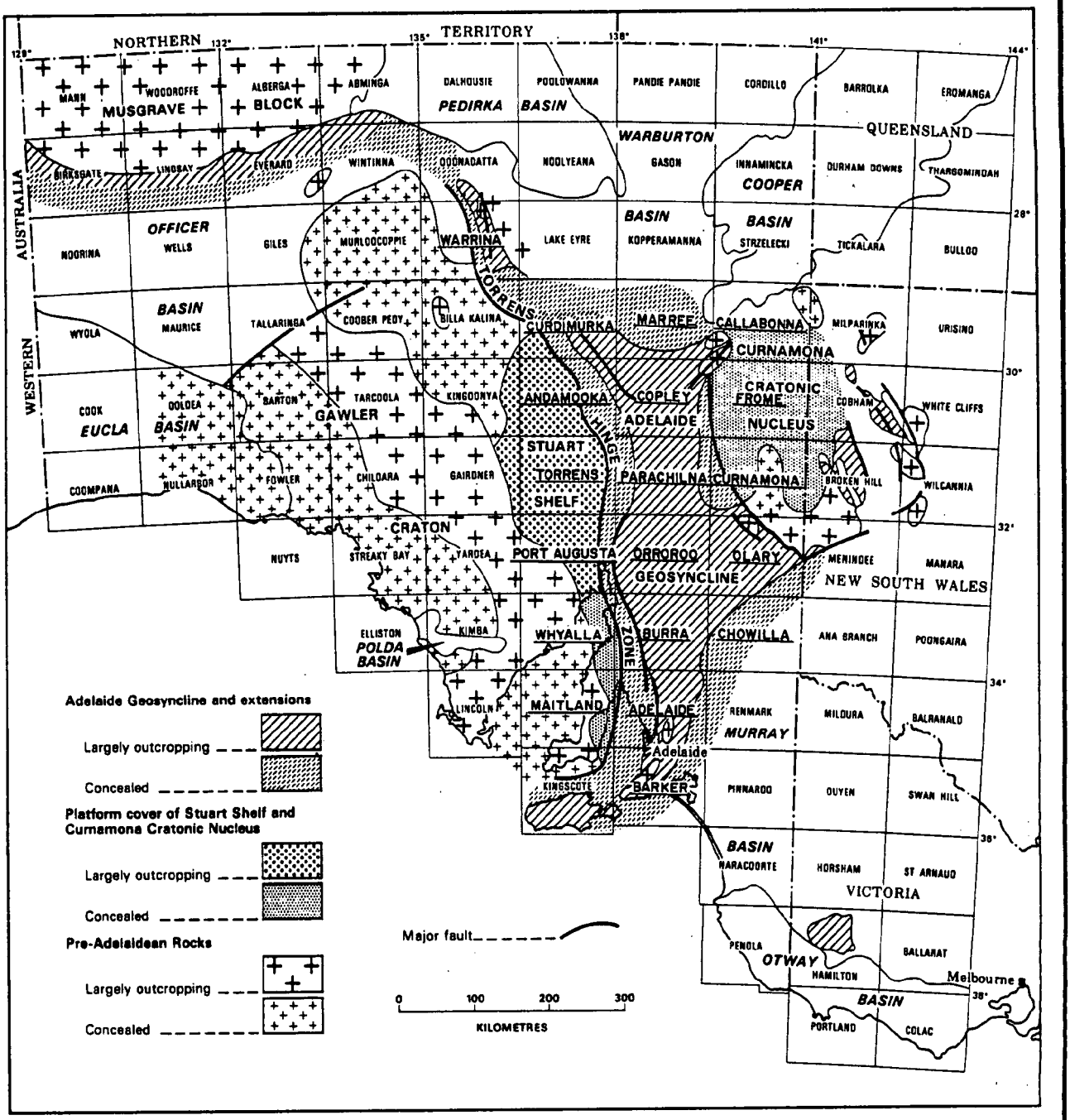
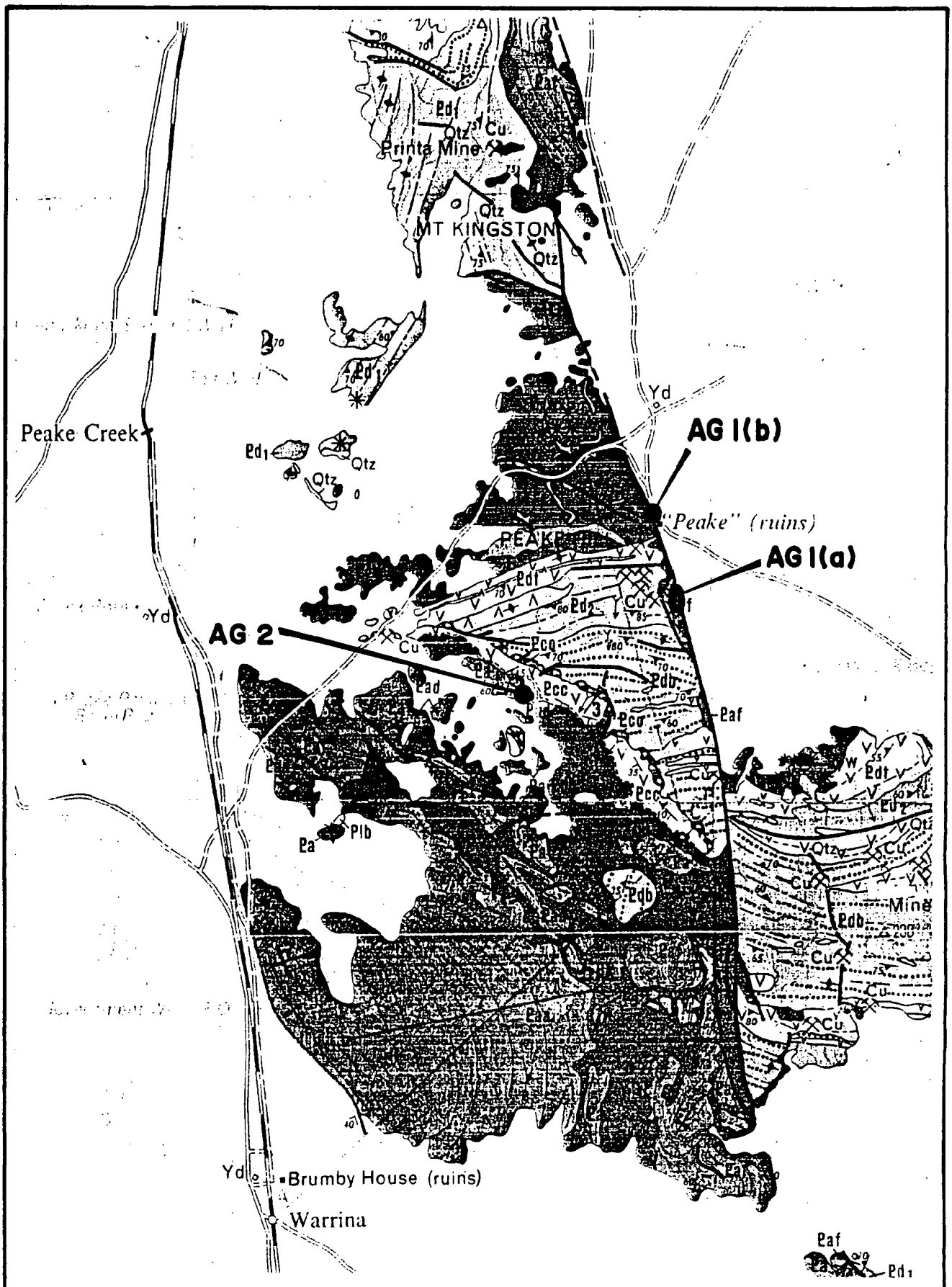


FIG. 1

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED S. Robertson	C.D.O. DATE
LEAD - ZINC REVIEW ADELAIDE GEOSYNCLINE AND STUART SHELF GEOLOGICAL PROVINCES AND 1:250 000 SHEET AREAS	DRAWN E. Colabio	SCALE As shown
	DATE Feb.'88	PLAN NUMBER S 19951
	CHECKED	



Prospect number . . . . . **AG 2**

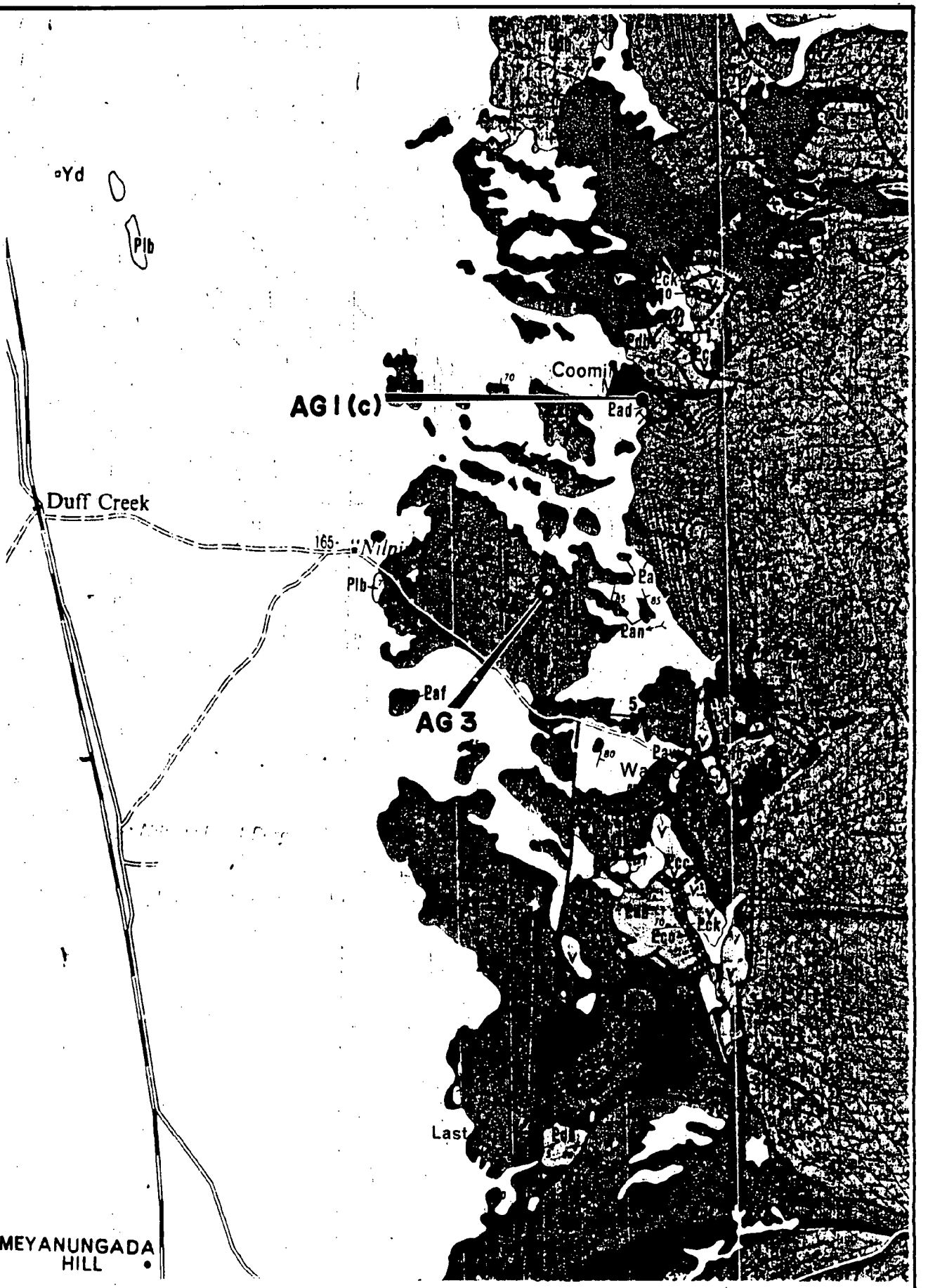
SCALE

2 0 2 4

KILOMETRES

FIG. 2

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED *S. Robertson*	C.D.O. DATE
LEAD – ZINC REVIEW ADELAIDE GEOSYNCLINE AND STUART SHELF PEAKE AND DENISON RANGES 1:100 000 WARRINA 1:250 000 AG 2, AG 1(a),(b)	DRAWN *E. Calabio*	SCALE *1:100 000*
	DATE *Feb. '88*	PLAN NUMBER
	CHECKED	S 19952



Prospect number . . . . . **AG 3**

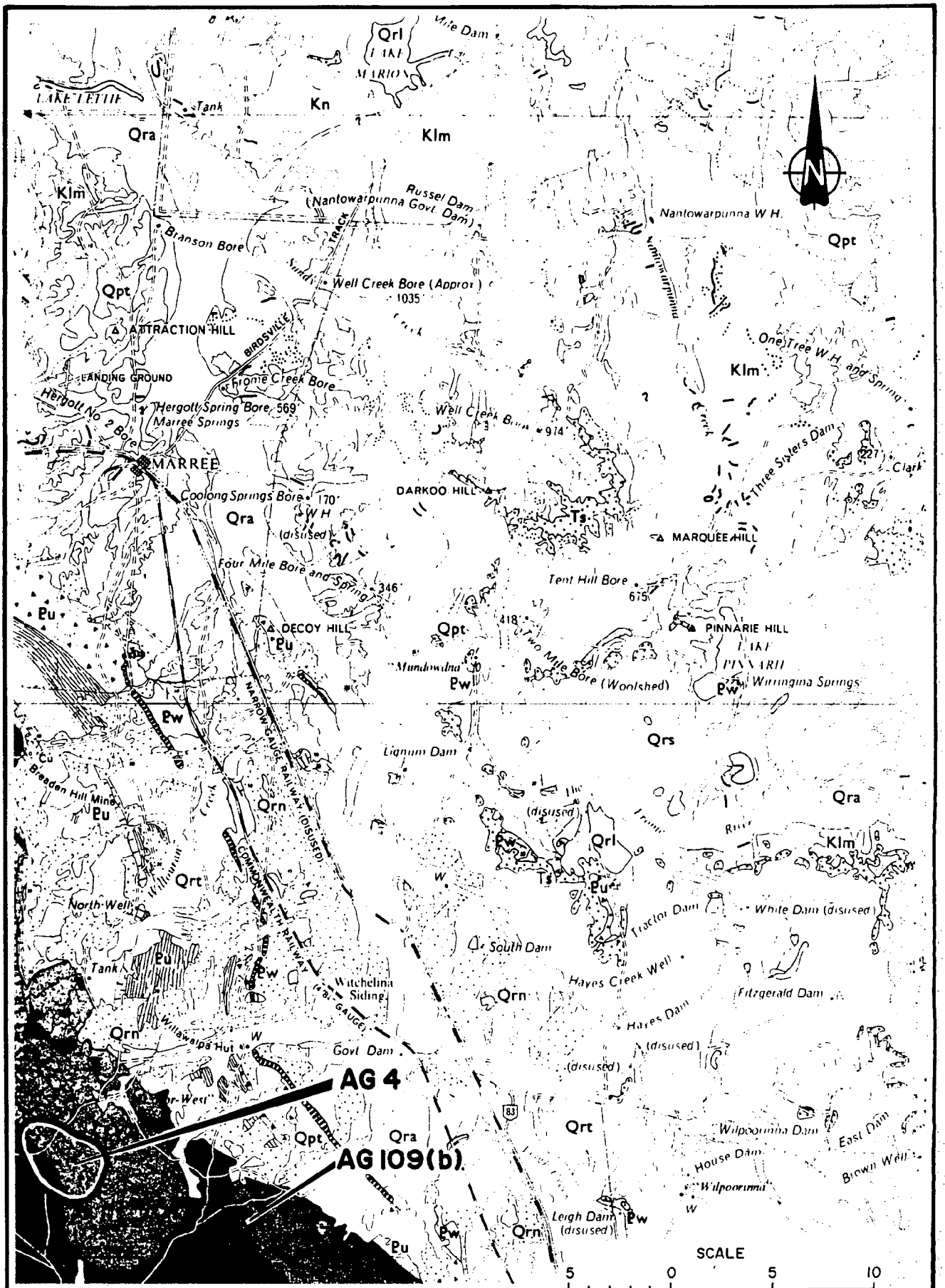
FIG. 3

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

COMPILED: S. Robertson — C.D.O. — DATE

LEAD - ZINC REVIEW
ADELAIDE GEOSYNCLINE AND STUART SHELF
PEAKE AND DENISON RANGES 1: 100 000
AG 3, AG 1(c)

DRAWN: E. Calabio
SCALE 1:100 000
DATE: Feb. '88
CHECKED
PLAN NUMBER: S 19953



Prospect number . . . . . **AG 4**

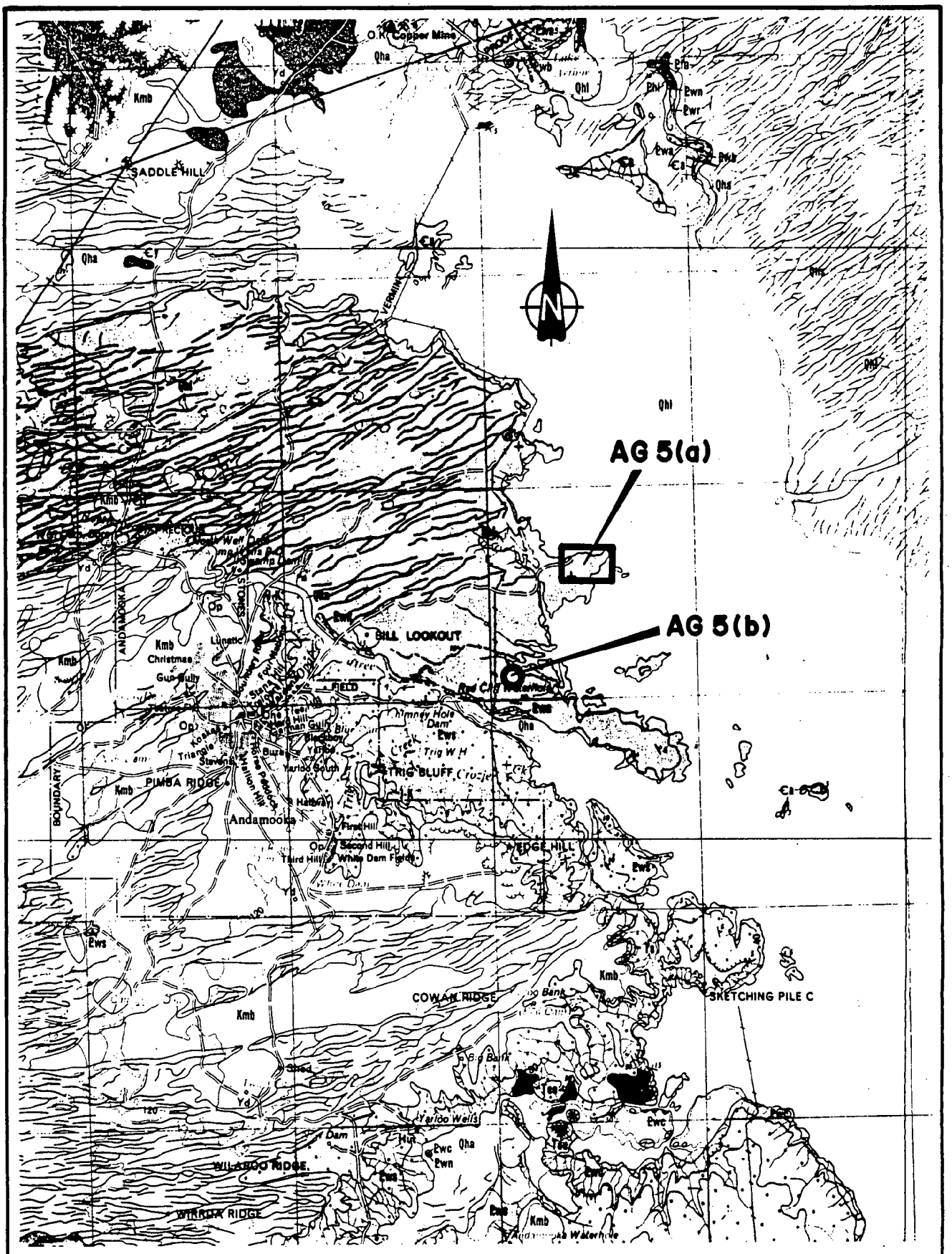
FIG. 4

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

COMPILED *S. Robertson*	C.D.O. DATE
DRAWN *E. Calabio*	SCALE *1:250 000*
DATE *Feb '88*	PLAN NUMBER **S 19954**
CHECKED	

LEAD - ZINC REVIEW
ADELAIDE GEOSYNCLINE AND STUART SHELF
MARREE 1:250 000
AG 4,109(b)

4564



Prospect number . . . . . **AG 5(a)**

FIG. 5

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED *S. Robertson*	C D O DATE
LEAD - ZINC REVIEW ADELAIDE GEOSYNCLINE AND STUART SHELF **ANDAMOOKA 1:250 000** AG 5(a),(b)	DRAWN *E. Calabio*	SCALE *1:250 000*
	DATE *Feb '88*	PLAN NUMBER **S 19955**
	CHECKED	

4564

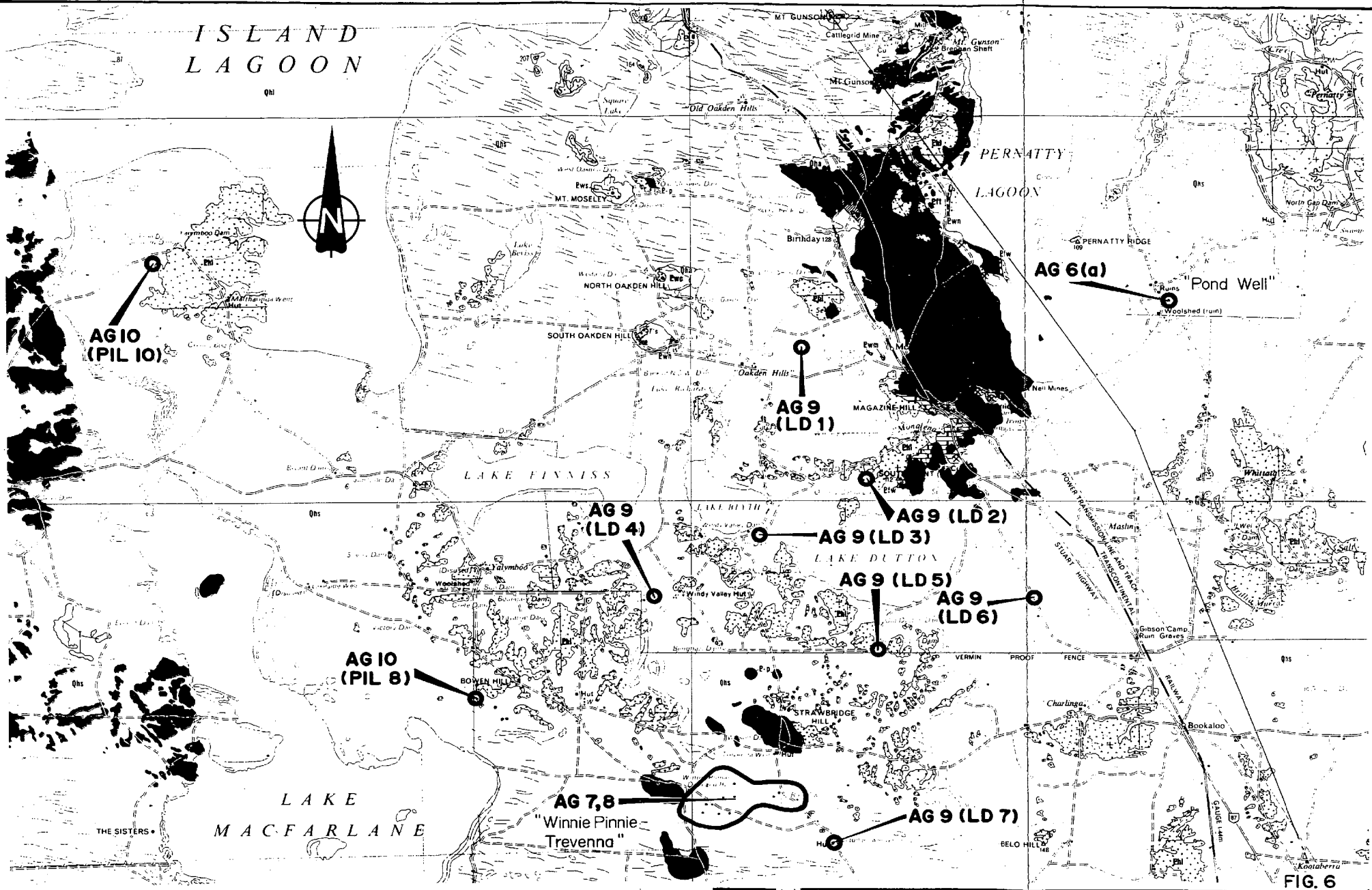


FIG. 6

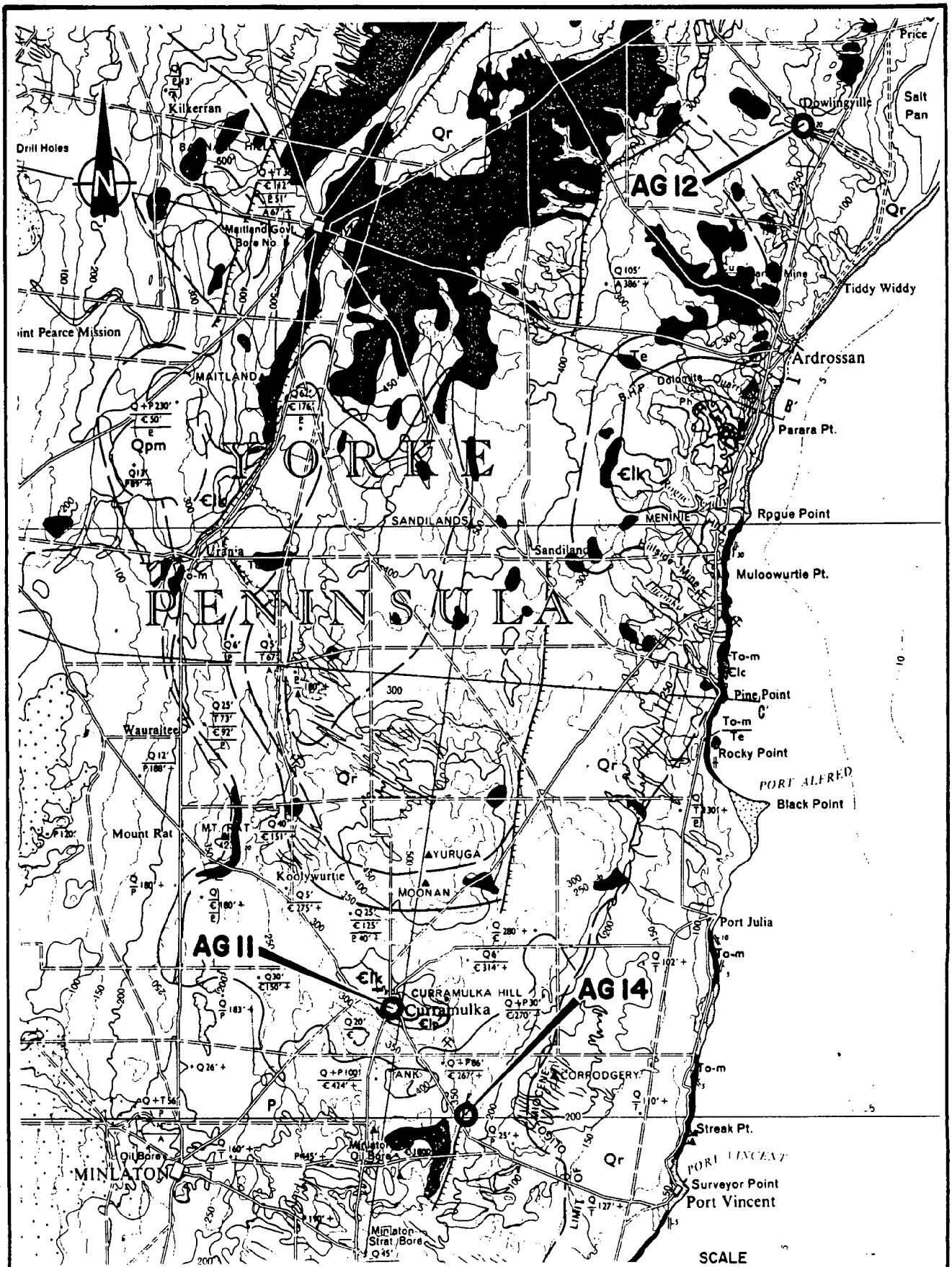
Prospect number ..... AG 10

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA

LEAD - ZINC REVIEW
ADELAIDE GEOSYNCLINE AND STUART SHELF
TORRENS 1:250000
AG 6,7,8,9,10

COMPILED S. Robertson	C.D.O. 22.7.88 DATE
DRAWN E. Calabio	SCALE 1:250 000
DATE Feb.'88	PLAN NUMBER 88-185
CHECKED	

4564

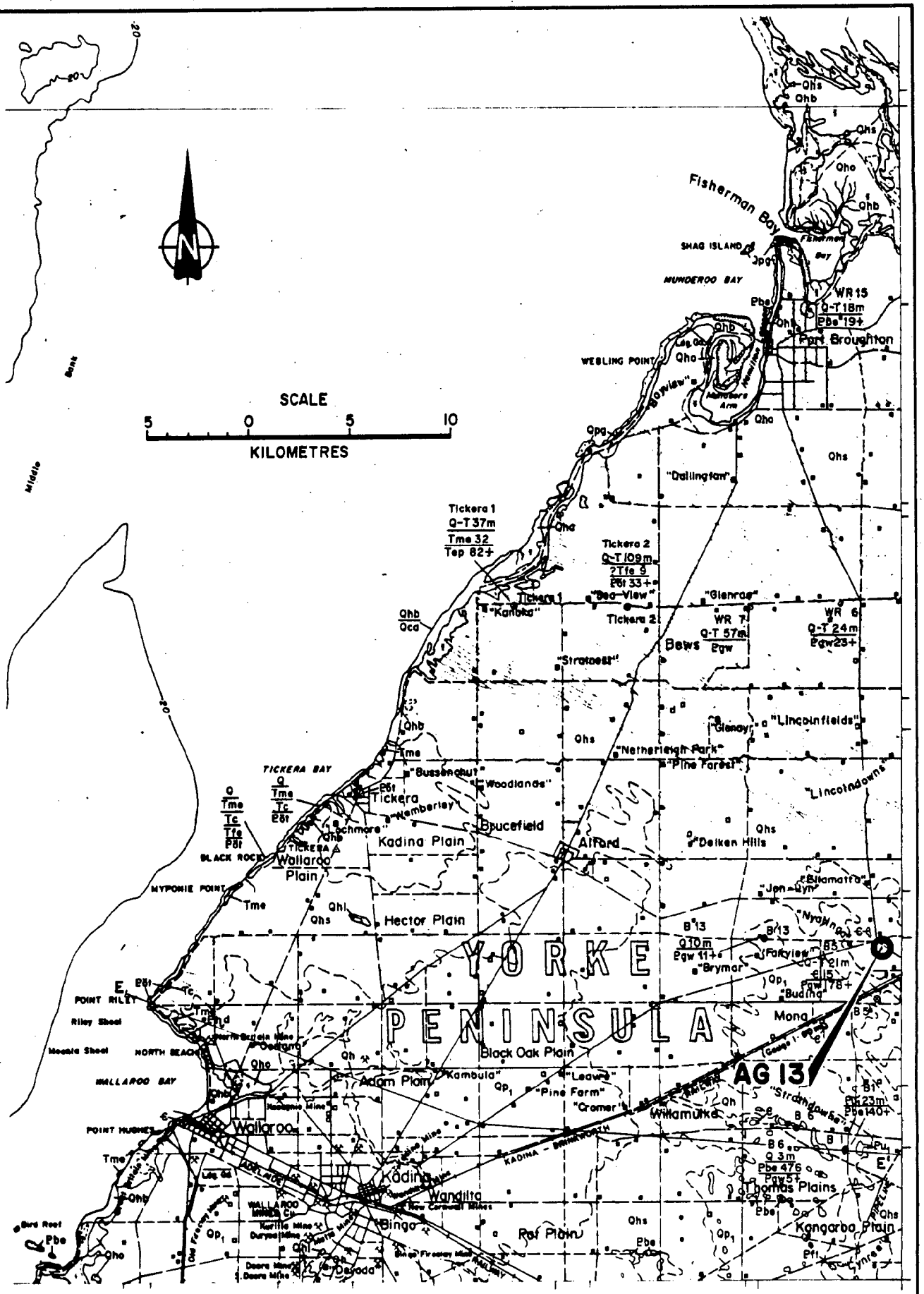


Prospect number . . . . . **AG 14**

FIG. 7

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED *S. Robertson*	C.D.O. DATE
LEAD - ZINC REVIEW ADELAIDE GEOSYNCLINE AND STUART SHELF MAITLAND 1:250 000 AG 11, 12, 14	DRAWN *E. Calabio*	SCALE *1:250000*
	DATE *Feb.'88*	PLAN NUMBER **S 19956**
	CHECKED	

4564

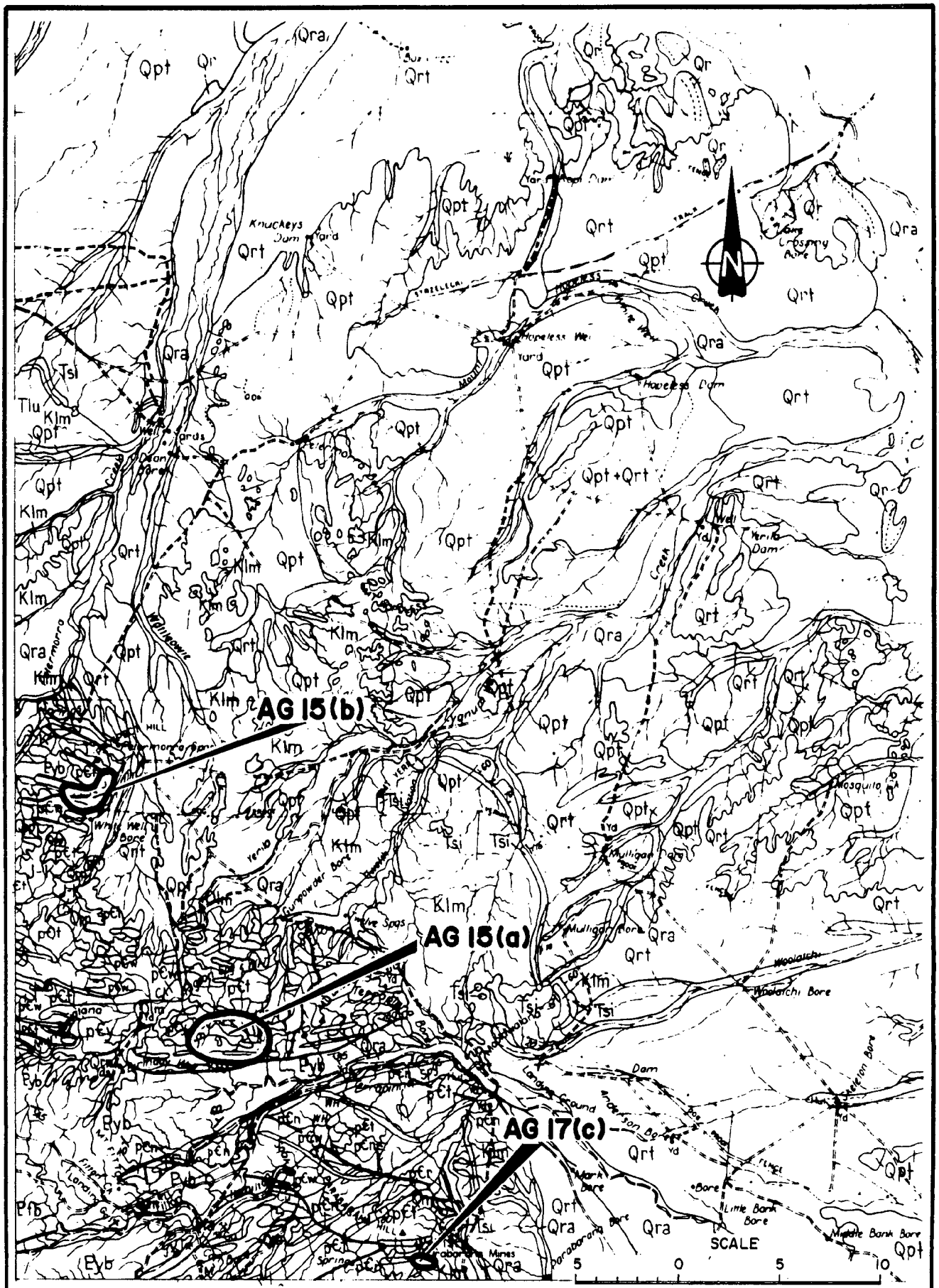


Prospect number . . . . . **AG 13**

FIG. 8

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED *S. Robertson*	C.D.O. DATE
LEAD - ZINC REVIEW ADELAIDE GEOSYNCLINE AND STUART SHELF **WHYALLA 1:250 000** AG 13	DRAWN *E. Calabio*	SCALE *1: 250 000*
	DATE *Feb.'88*	PLAN NUMBER
	CHECKED	**S 19957**

4564

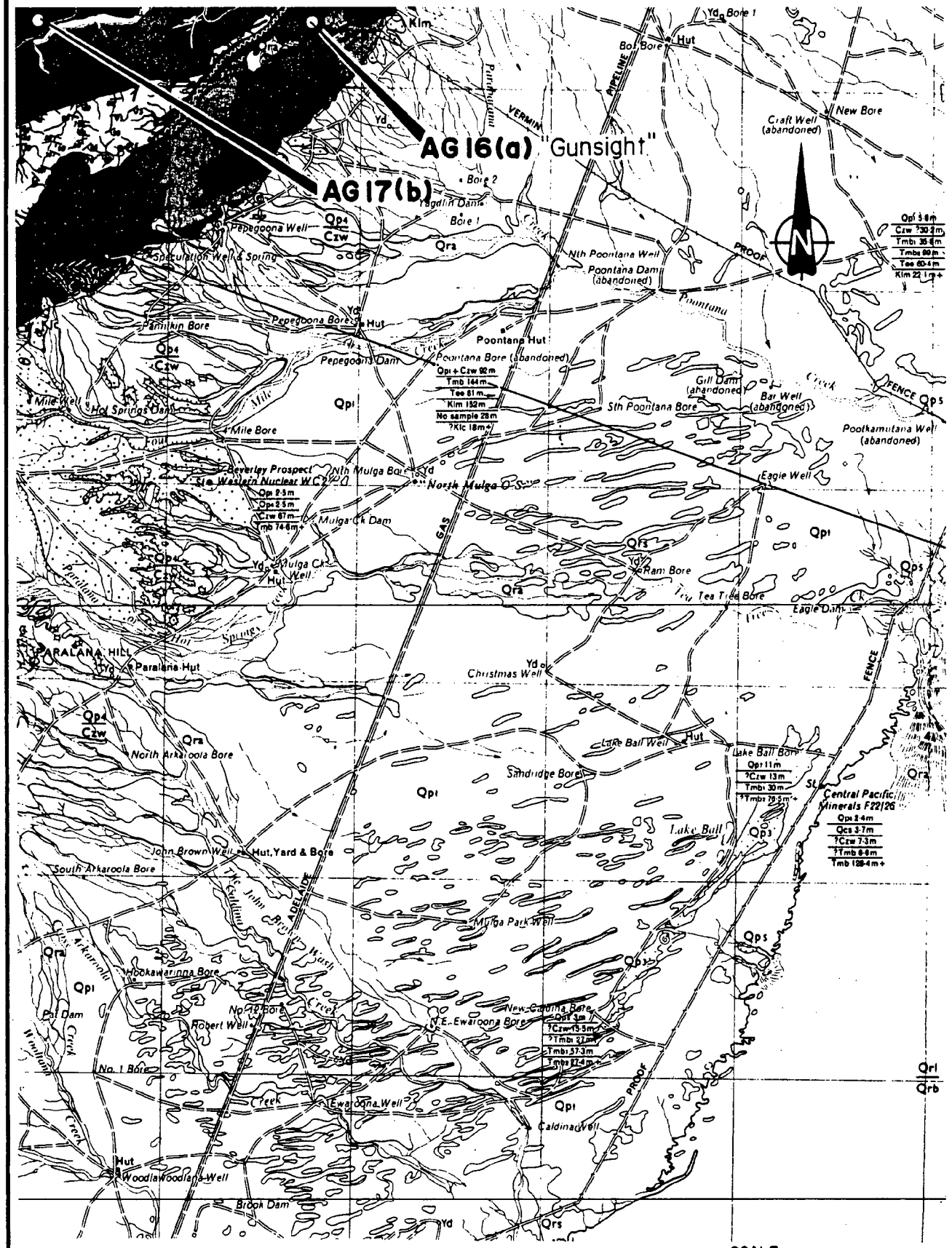


Prospect number . . . . . **AG 17(c)**

FIG. 9

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED *S. Robertson*	C.D.O. DATE
LEAD - ZINC REVIEW ADELAIDE GEOSYNCLINE AND STUART SHELF CALLABONNA 1:250 000 AG 15 (a),(b),17(c)	DRAWN *E. Calabio*	SCALE *1:250 000*
	DATE *Feb.'88*	PLAN NUMBER
	CHECKED	S 19958

4564

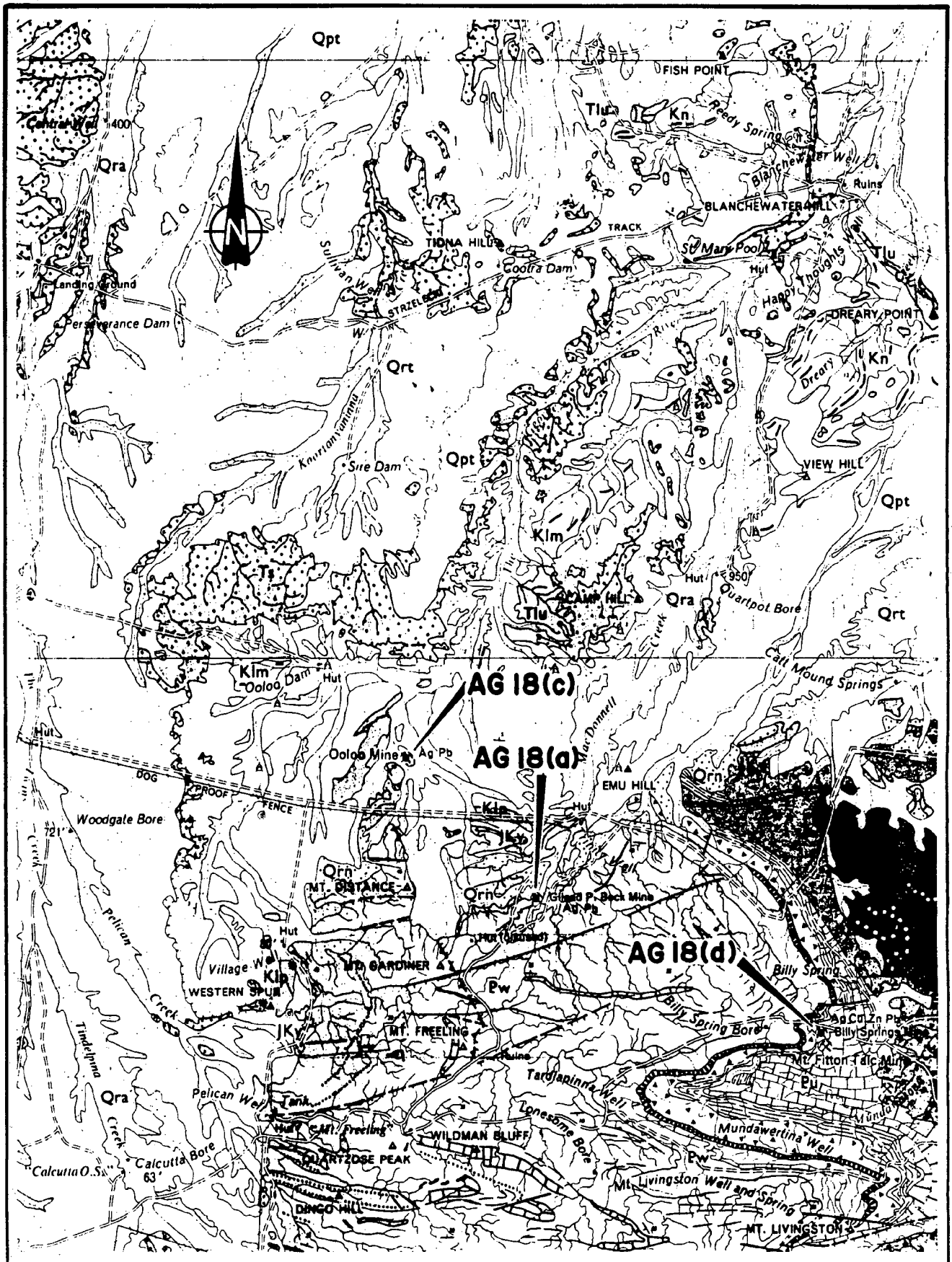


Prospect number . . . . . **AG 16(a)**

FIG. 10

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED *S. Robertson*	C.D.O. DATE
LEAD - ZINC REVIEW ADELAIDE GEOSYNCLINE AND STUART SHELF FROME 1:250 000 AG 16(a), 17(b)	DRAWN *E. Calabio*	SCALE *1:250 000*
	DATE *Feb. '88*	PLAN NUMBER **S 19959**
	CHECKED	

4564



Prospect number . . . . . **AG 18 (d)**

FIG. 11

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

COMPILED *S. Robertson*	C.D.O. DATE
DRAWN *E. Calabio*	SCALE *1: 250 000*
DATE *Feb '88*	PLAN NUMBER **S 19960**
CHECKED	

LEAD - ZINC REVIEW
ADELAIDE GEOSYNCLINE AND STUART SHELF
MARREE 1:250 000
AG 18(a),(c),(d)

4564

AG 18(b)
AG 20(a)
AG 20(b)
AG 17(a)
AG 16(b)
AG 19
AG 26
AG 27(a)
AG 21
AG 27(b)
AG 40(g)
AG 40(b)
AG 22(a)
AG 22(b)
AG 23
AG 37(b)
AG 49
AG 37(a)
AG 38(a)
AG 37(c)
AG 43
AG 44(a)
AG 48
AG 47
AG 29(b)
AG 110(c)
AG 110(b)
AG 29(a), 110(a)
AG 35
AG 33
AG 34(b)
AG 31(b)
AG 31(c)
AG 32, 34(c)
AG 31 (a),(b)
AG 41
AG 28
AG 46
AG 44(b)
AG 42(c)
AG 30(a)
AG 42(a)
AG 30(b), 39(a)
AG 36 (d)
AG 36(b), 39(b)
AG 50
AG 42(b)
AG 45(a), 56(b)
AG 56(a)

SCALE

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

Prospect number ..... AG 50

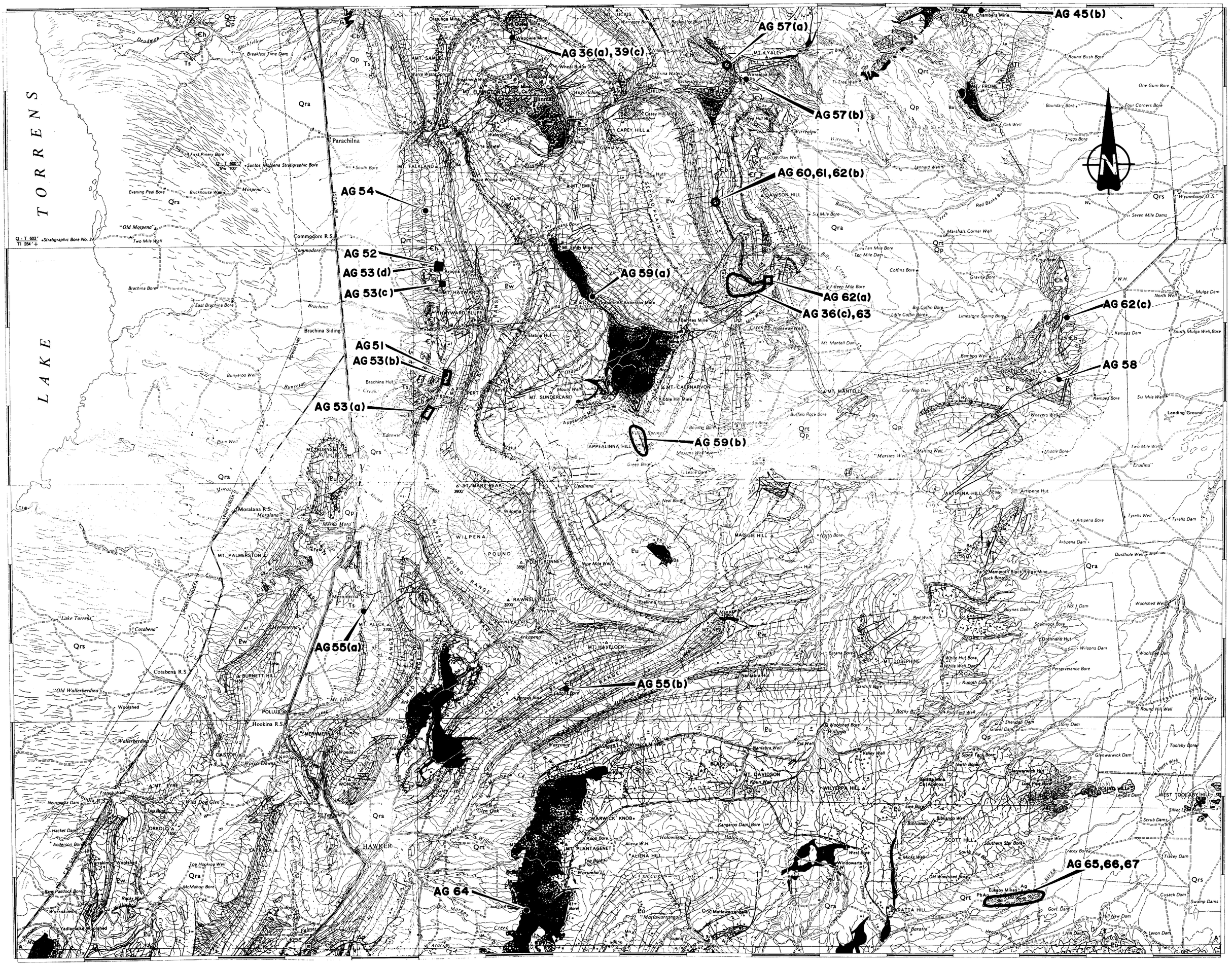
FIG. 12

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

LEAD - ZINC REVIEW
ADELAIDE GEOSYNCLINE AND STUART SHELF
COPLEY 1: 250000
AG 16 - 23, 26-50, 56, 110

COMPILED	S. Robertson		22.7.88
		C.D.O.	DATE
DRAWN	E. Calabio	SCALE	1:250000
DATE	Feb. '88	PLAN NUMBER	88-186
CHECKED			

4564



Prospect number ..... **AG 64**

SCALE

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

FIG. 13

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

LEAD - ZINC REVIEW
ADELAIDE GEOSYNCLINE AND STUART SHELF
PARACHILNA 1:250 000
AG 36, 39, 45, 51 - 55, 57 - 67

COMPILED S. Robertson	22.7.88 C.D.O. DATE
DRAWN E. Calabio	SCALE 1:250 000
DATE Feb '88	PLAN NUMBER 88-187
CHECKED	

4564

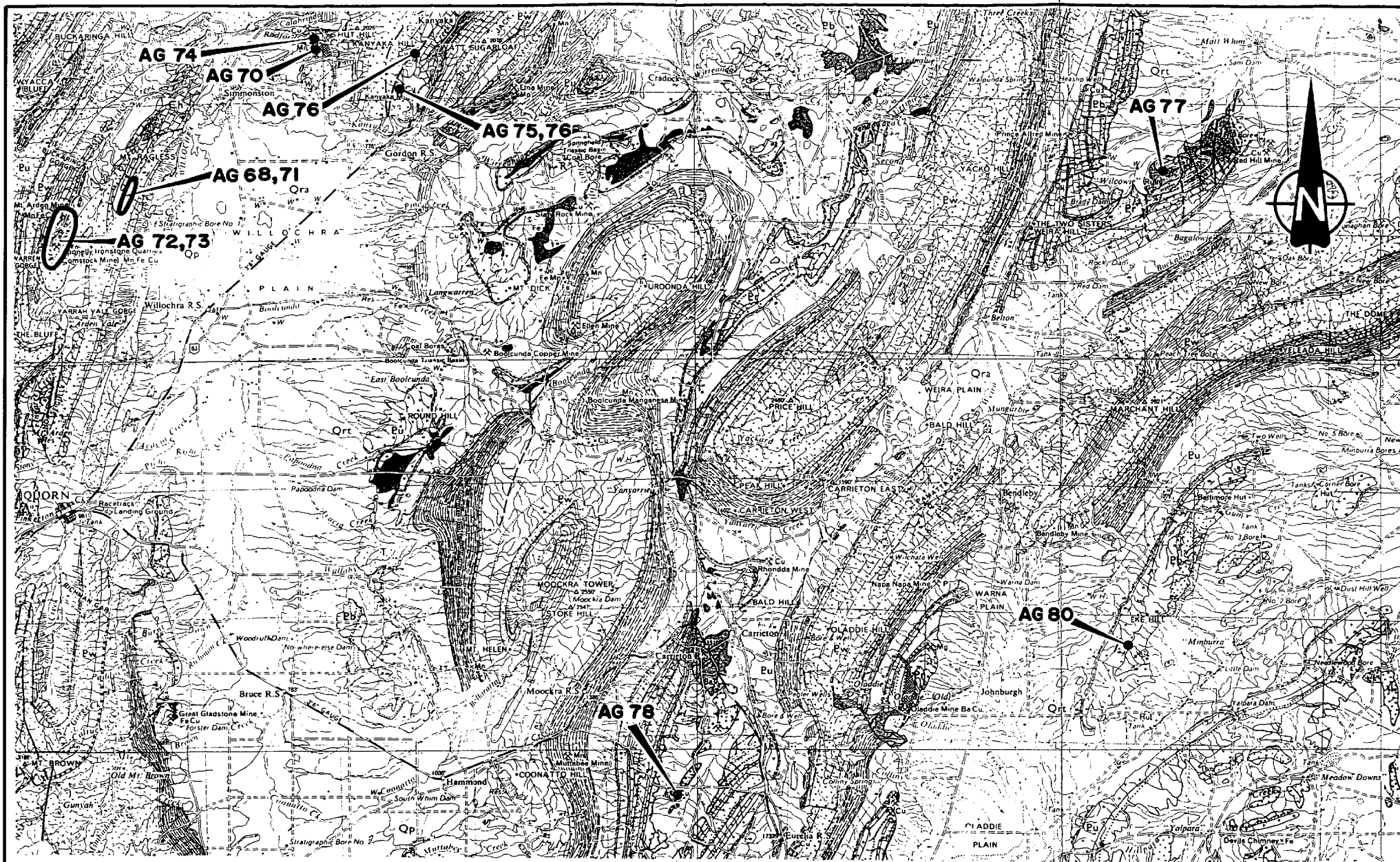


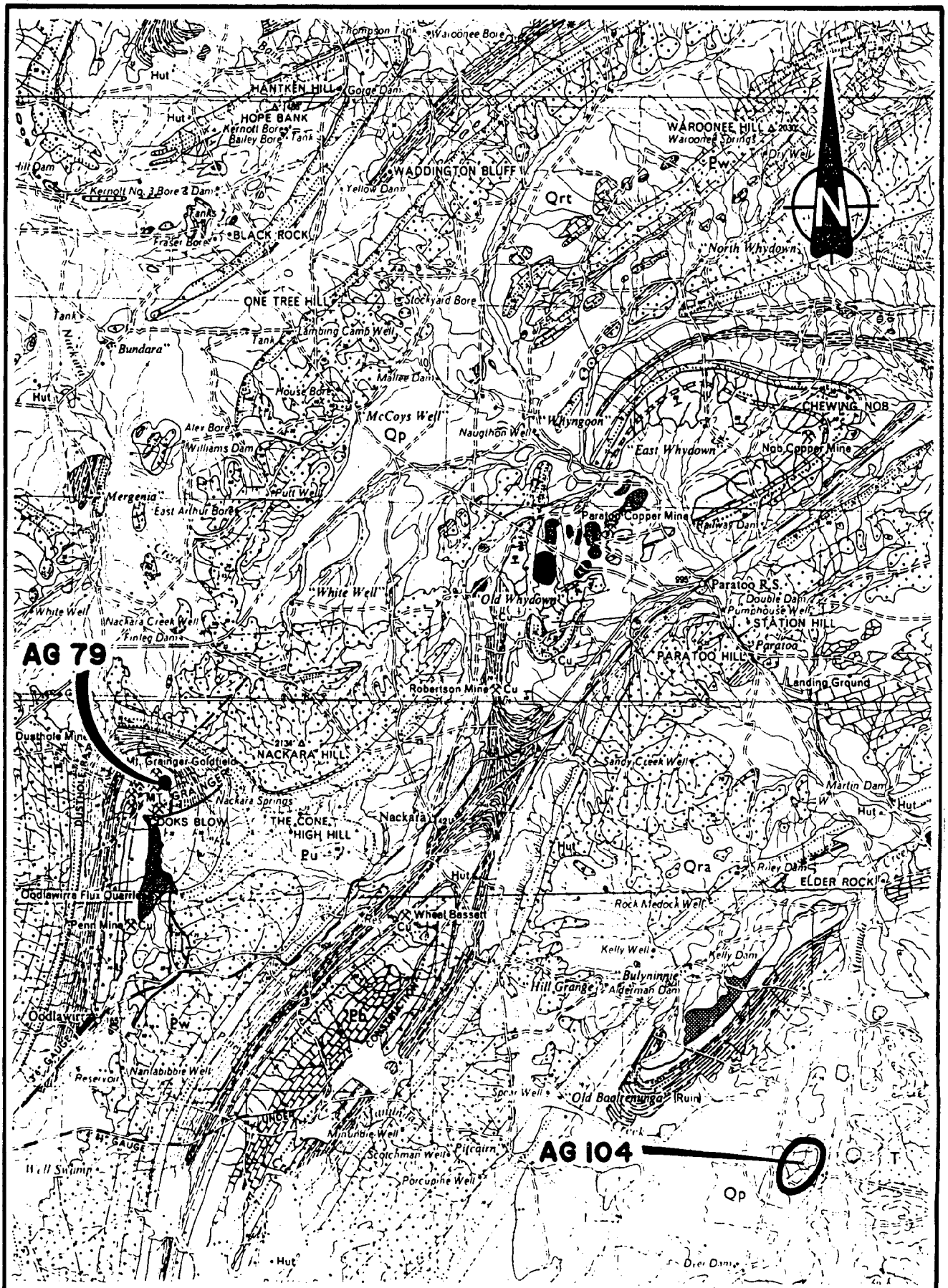
FIG. 14

Prospect number ..... **AG 80**

SCALE
5 0 5 10
KILOMETRES

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED S. Robertson	CDO DATE
LEAD – ZINC REVIEW ADELAIDE GEOSYNCLINE AND STUART SHELF ORRORO 1:250 000 AG 68, 70 – 78, 80	DRAWN E. Calabio	SCALE 1:250 000
	DATE Feb. '88	PLAN NUMBER 88-188
	CHECKED	

4564



SCALE

5 0 5 10

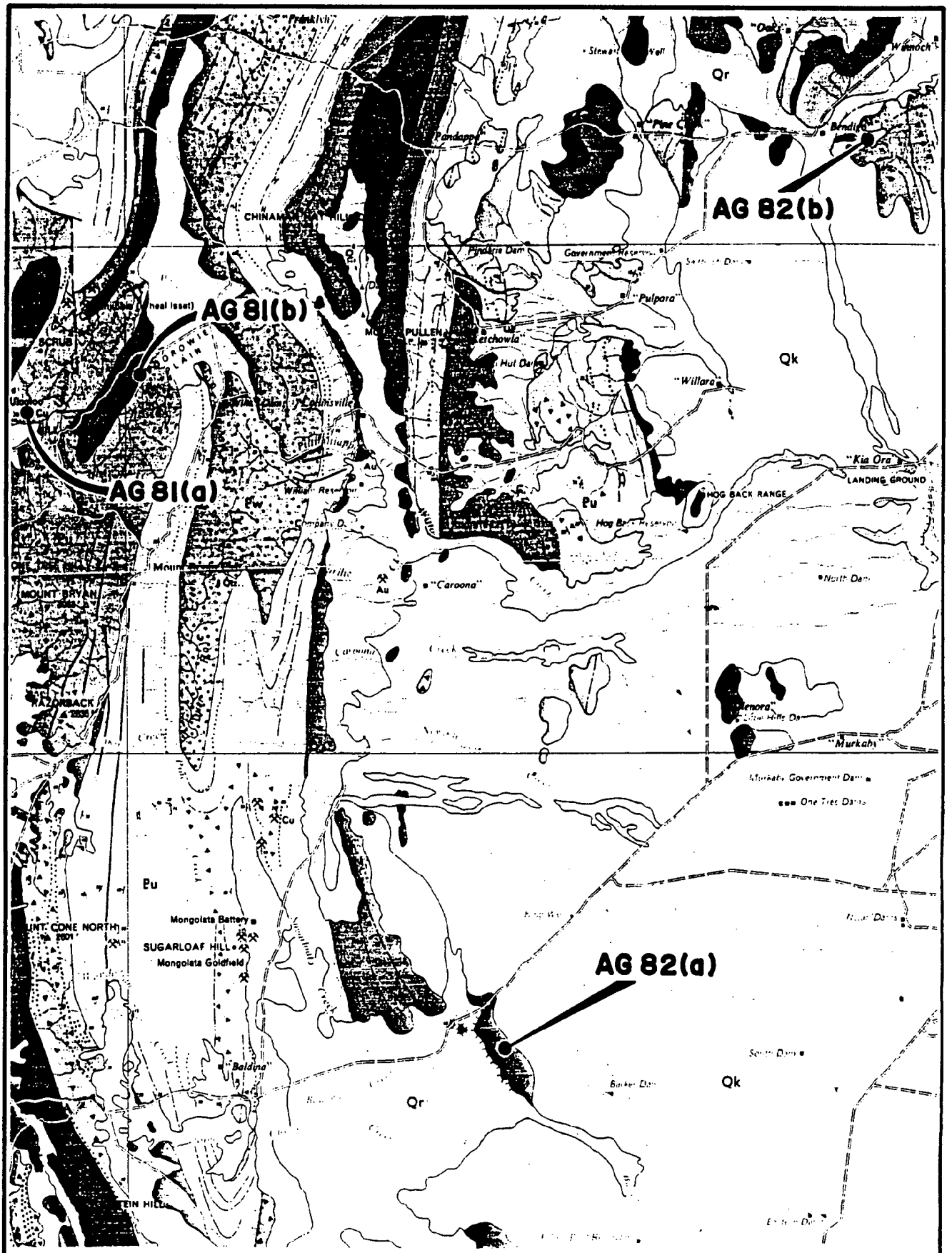
KILOMETRES

Prospect number..... **AG 79**

FIG. 15

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED S. Robertson	C.D.O. DATE
LEAD – ZINC REVIEW ADELAIDE GEOSYNCLINE AND STUART SHELF ORROROO 1:250 000 AG 79, 104	DRAWN E. Calabio	SCALE 1:250000
	DATE Feb. '88	PLAN NUMBER S 19961
	CHECKED	

4564

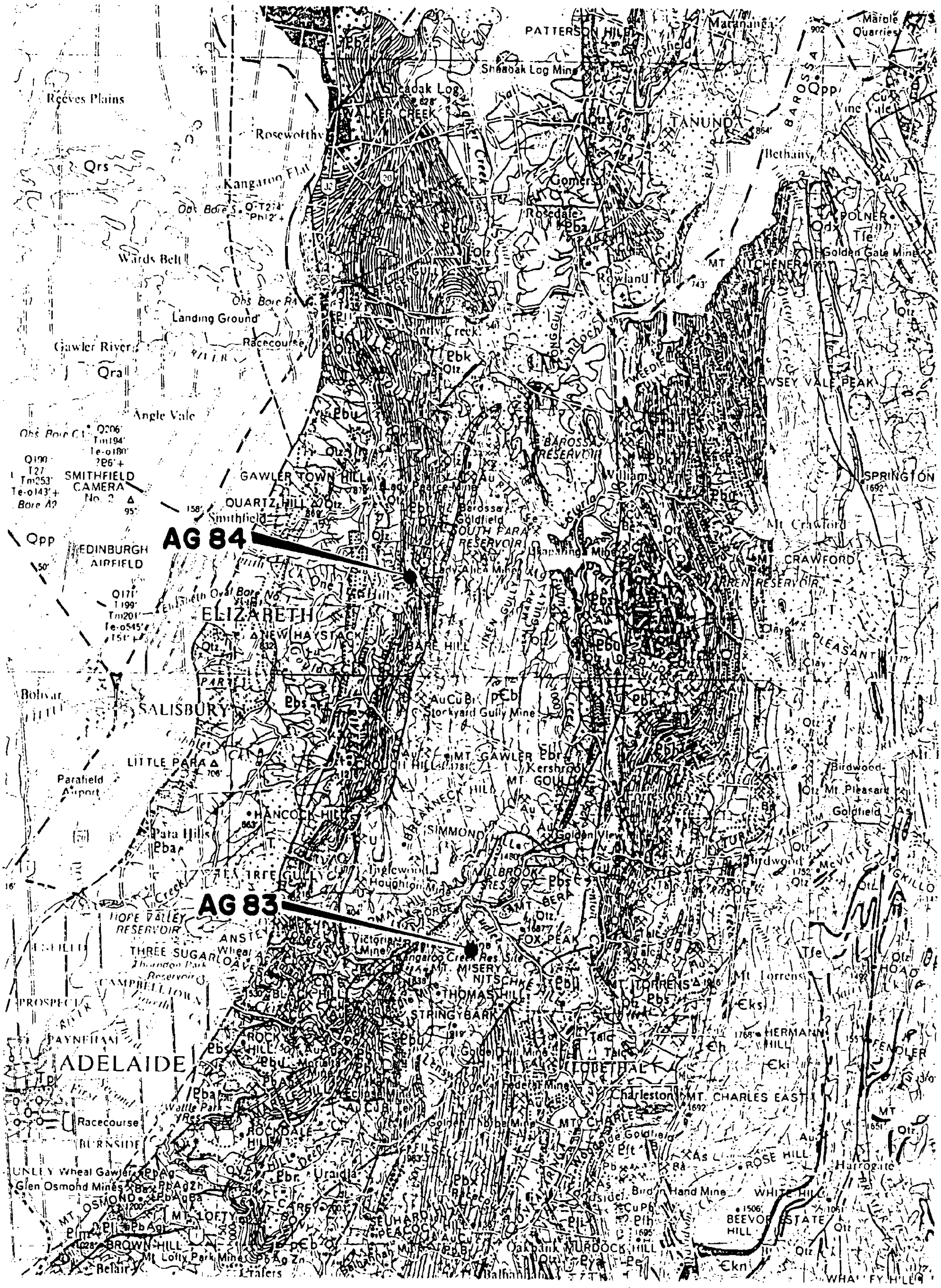


Prospect number . . . . . **AG 81(a)**

SCALE
5 0 5 10
KILOMETRES

FIG. 16

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED S. Robertson	C D O DATE
LEAD - ZINC REVIEW ADELAIDE GEOSYNCLINE AND STUART SHELF BURRA 1: 250 000 AG 81(a),(b),82(a),(b)	DRAWN E. Calabio	SCALE 1:250 000
	DATE Feb.'88	PLAN NUMBER S 19962
	CHECKED	



Prospect number .... **AG 84**

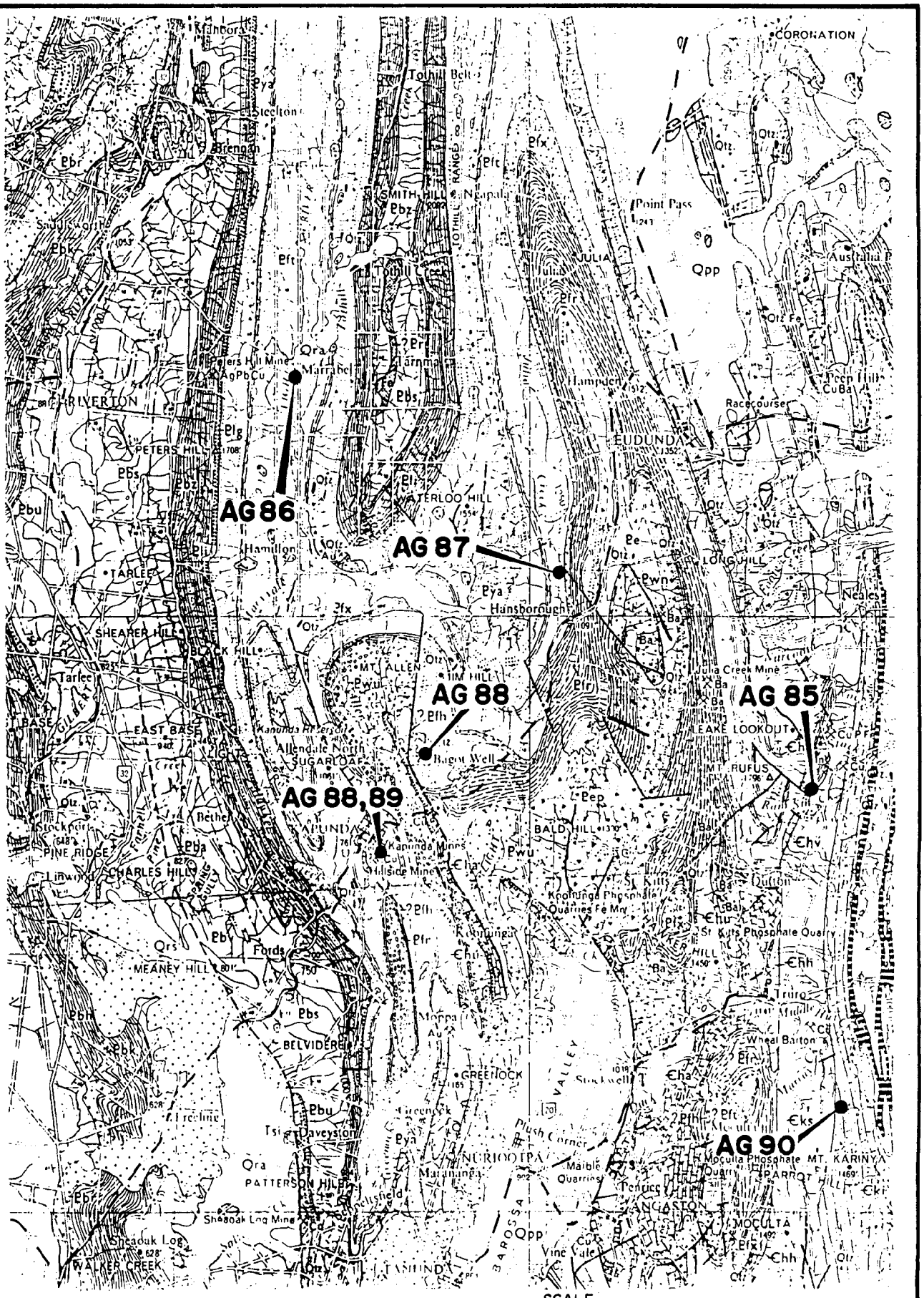
SCALE

5 0 5 10

KILOMETRES

FIG. 17

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED S. Robertson	C.D.O. DATE
LEAD - ZINC REVIEW ADELAIDE GEOSYNCLINE AND STUART SHELF	DRAWN E. Calabio	SCALE 1:250 000
ADELAIDE 1:250 000 AG 83, 84	DATE Feb. '88 CHECKED	PLAN NUMBER S 19963



SCALE

Prospect number..... **AG 90**

5 0 5 10

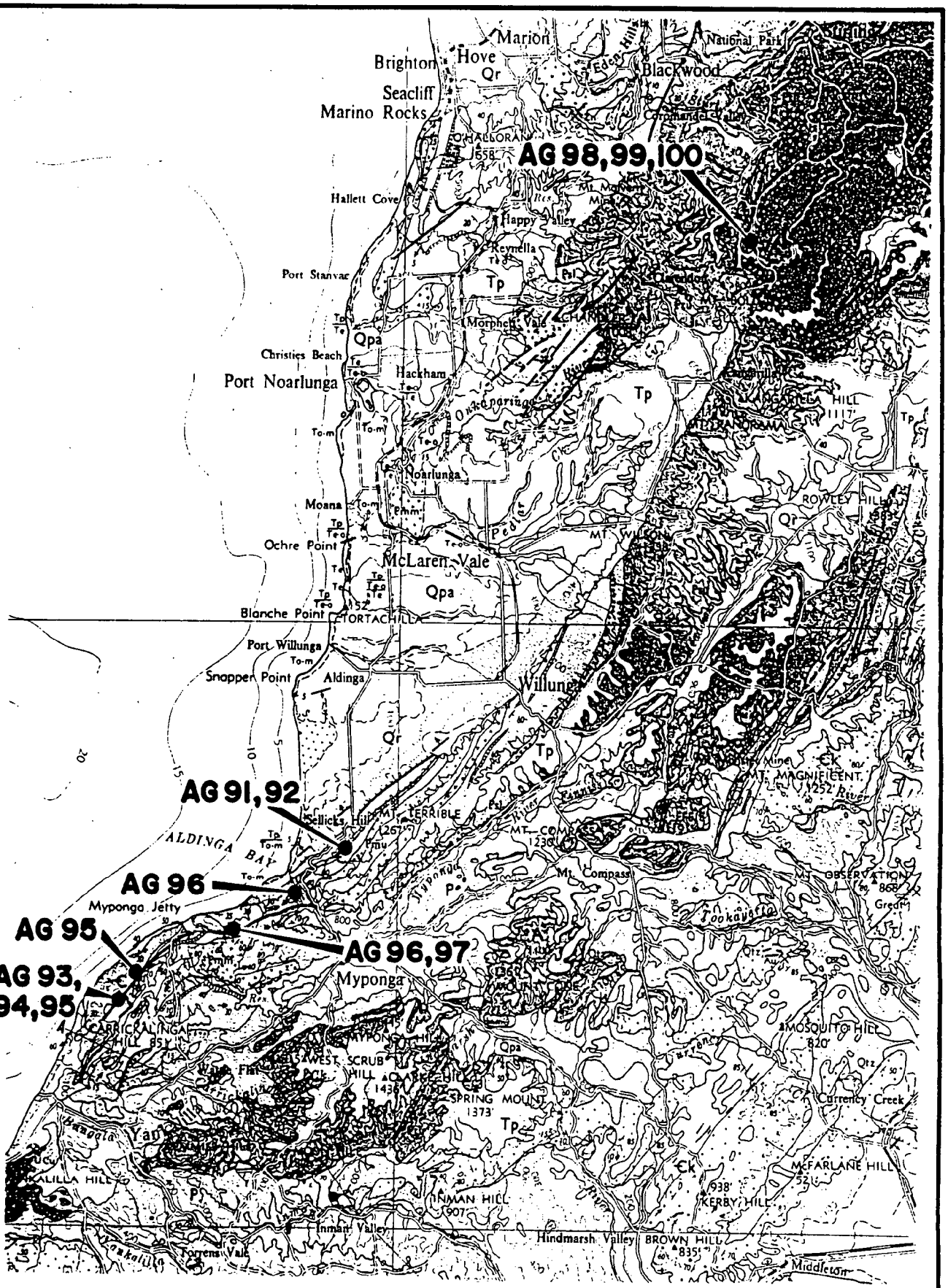
KILOMETRES

FIG. 18

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

LEAD - ZINC REVIEW
ADELAIDE GEOSYNCLINE AND STUART SHELF
ADELAIDE 1:250 000
AG 85 - 90

COMPILED: S. Robertson	C.D.O. DATE
DRAWN: E. Calabio	SCALE 1:250 000
DATE: Feb. '88	PLAN NUMBER: S 19964
CHECKED	



Prospect number . . . . . **AG 95**

FIG. 19

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED *S. Robertson*	C D O DATE
LEAD – ZINC REVIEW ADELAIDE GEOSYNCLINE AND STUART SHELF BARKER 1:250 000 AG 91 – 100	DRAWN *E. Calabio*	SCALE *1: 250 000*
	DATE *Feb. '88*	PLAN NUMBER
	CHECKED	S 19965

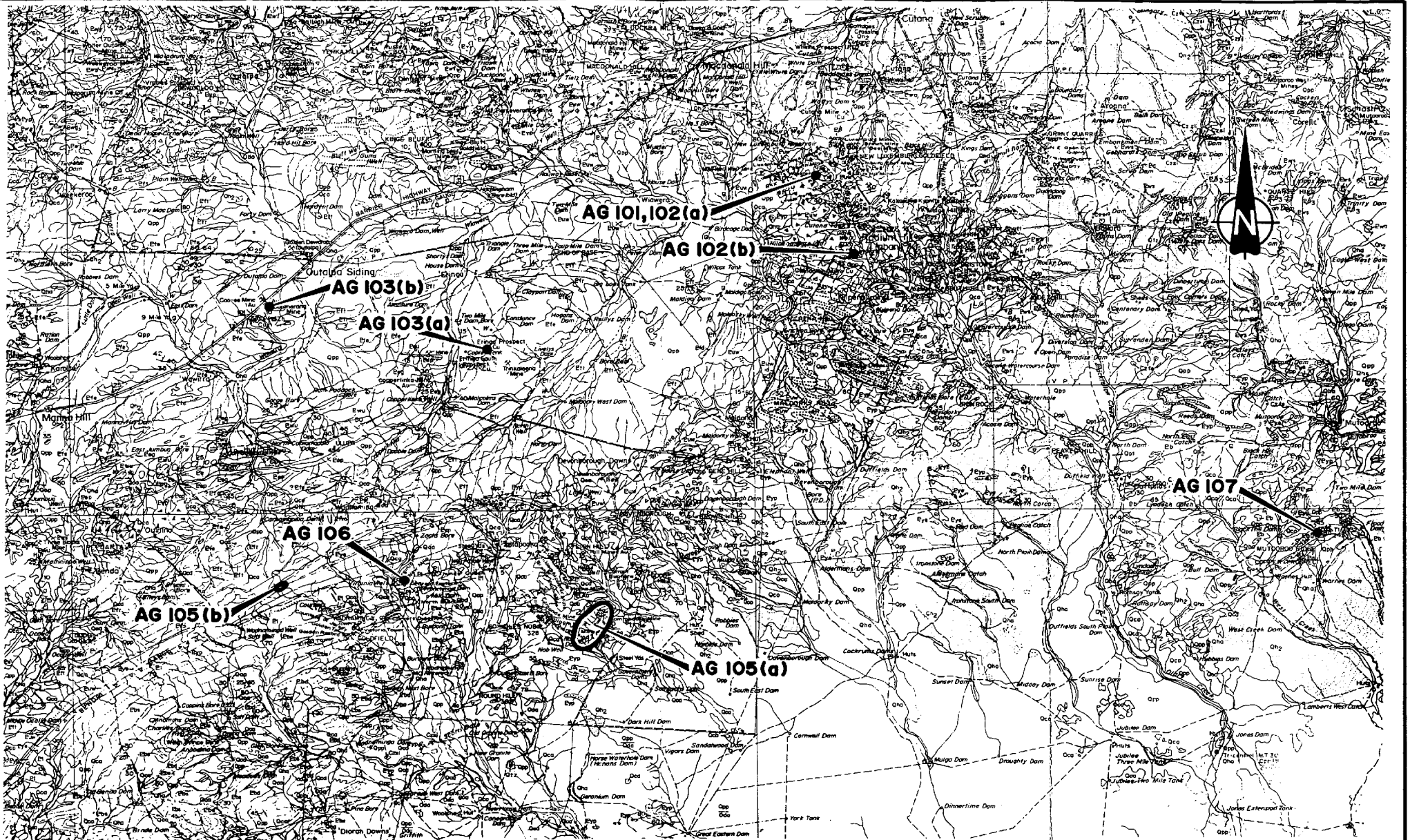


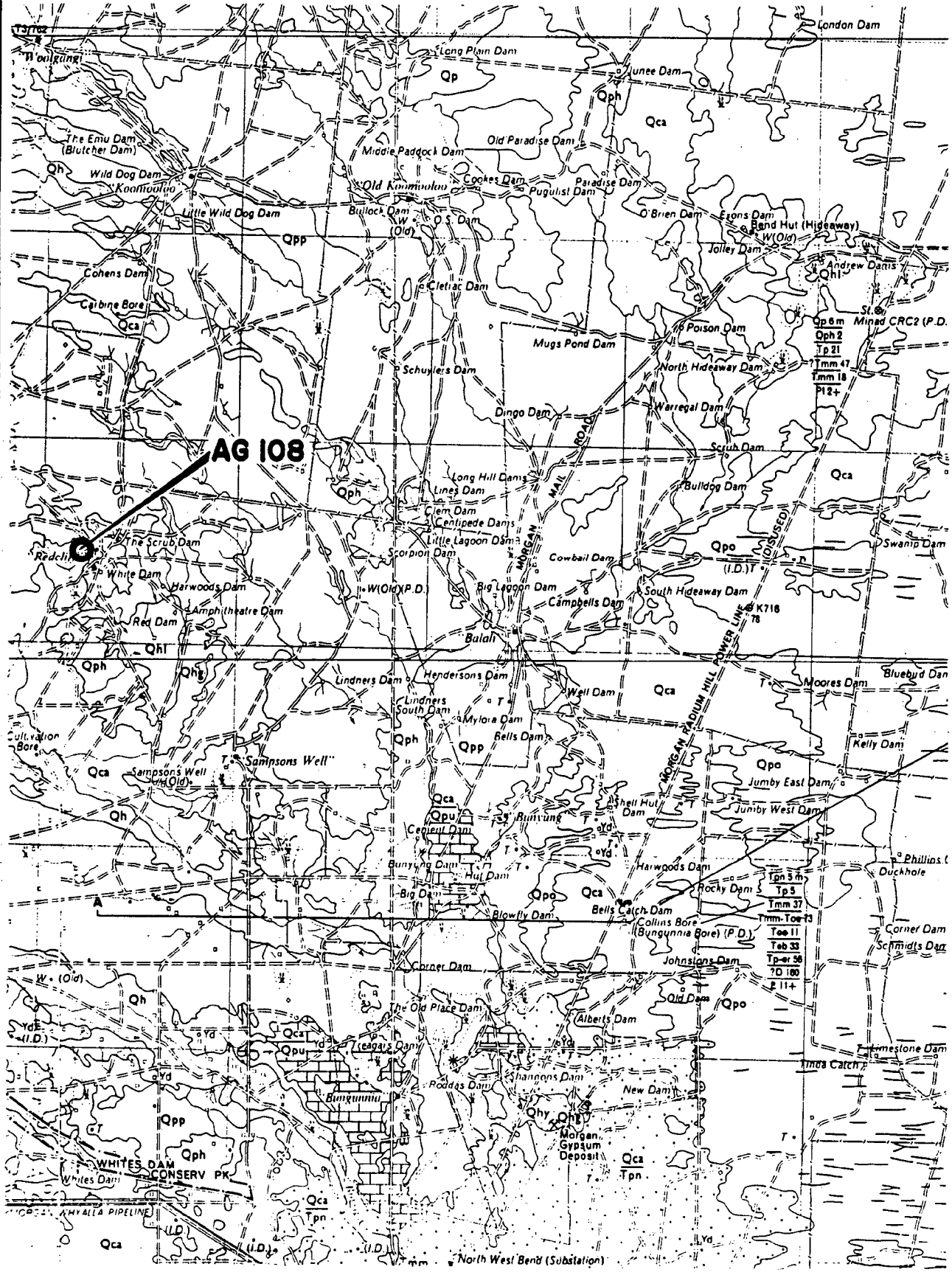
FIG. 20

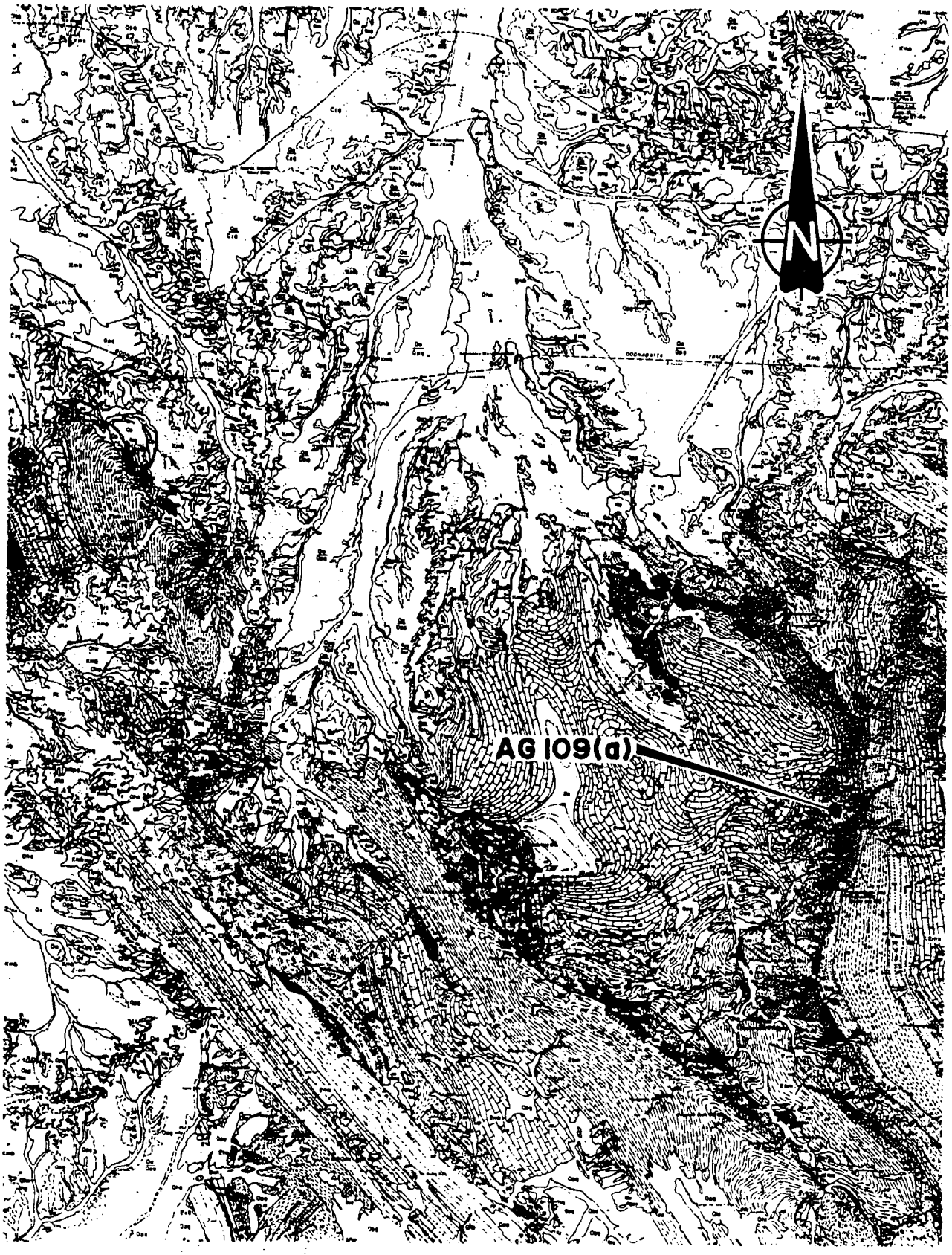
Prospect number ..... **AG 106**

SCALE
5 0 5 10
KILOMETRES

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED S. Robertson	C.D.O. DATE
LEAD - ZINC REVIEW ADELAIDE GEOSYNCLINE AND STUART SHELF OLARY 1:250 000 AG 101 – 103, 105 – 107	DRAWN E. Calabio	SCALE 1:250 000
	DATE Feb. '88	PLAN NUMBER 88-189
	CHECKED	

4564


AG 108
Prospect number . . . . . AG 108
SCALE
5 0 5 10
KILOMETRES
FIG. 21
DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA
LEAD - ZINC REVIEW
ADELAIDE GEOSYNCLINE AND STUART SHELF
CHOWILLA 1:250 000
AG 108
COMPILED S. Robertson
DRAWN E. Calabio
DATE Feb. '88
CHECKED
C.D.O. DATE
SCALE 1:250000
PLAN NUMBER
S 19966



Prospect number ..... **AG 109(a)**

SCALE
5 0 5 10
KILOMETRES

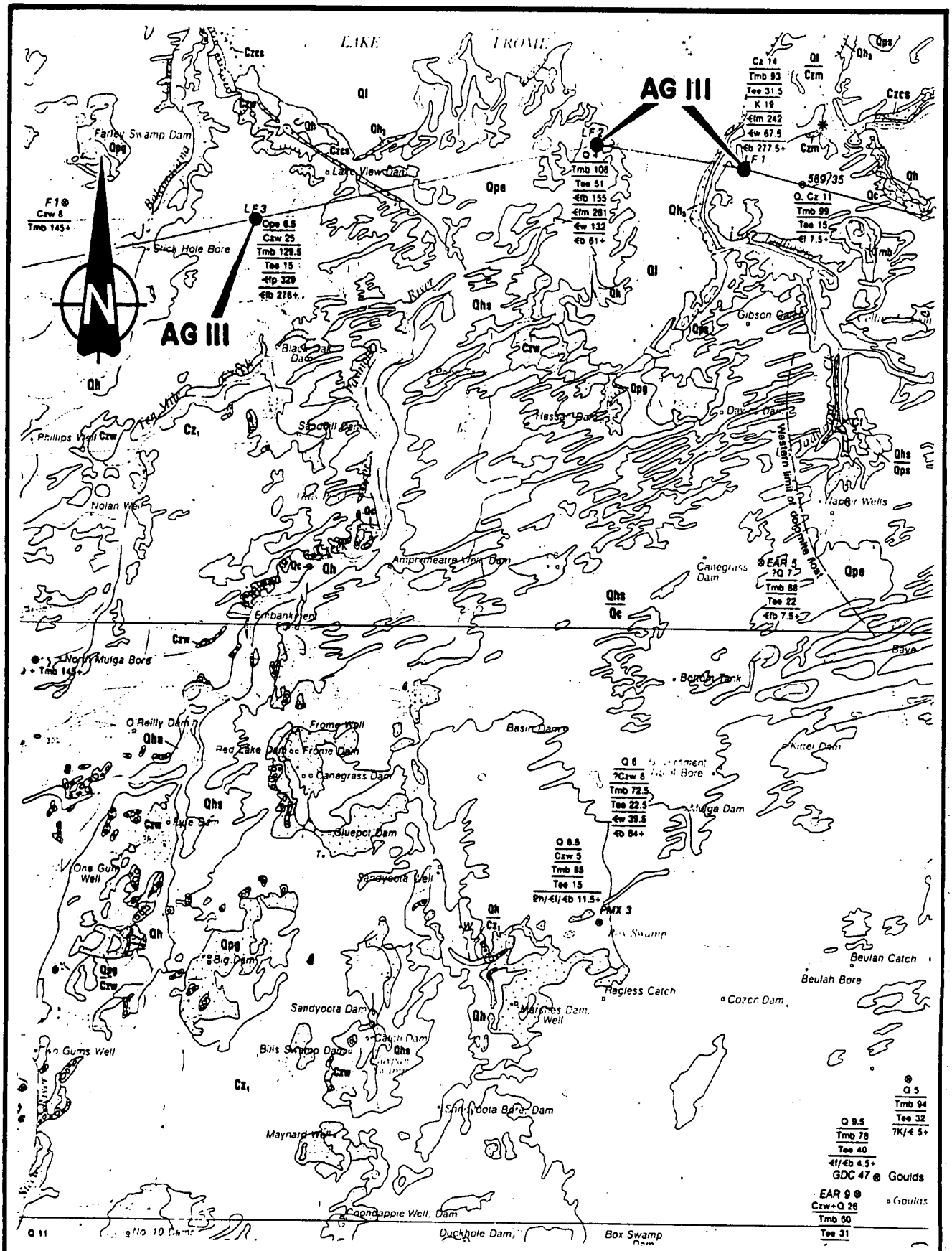
FIG. 22

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

LEAD - ZINC REVIEW
ADELAIDE GEOSYNCLINE AND STUART SHELF
CURDIMURKA 1:250 000
AG 109(a)

COMPILED *S. Robertson*	C.D.O. DATE
DRAWN *E. Calabio*	SCALE *1:250 000*
DATE *Feb.'88*	PLAN NUMBER
CHECKED	S 19967

4564



SCALE

5 0 5 10

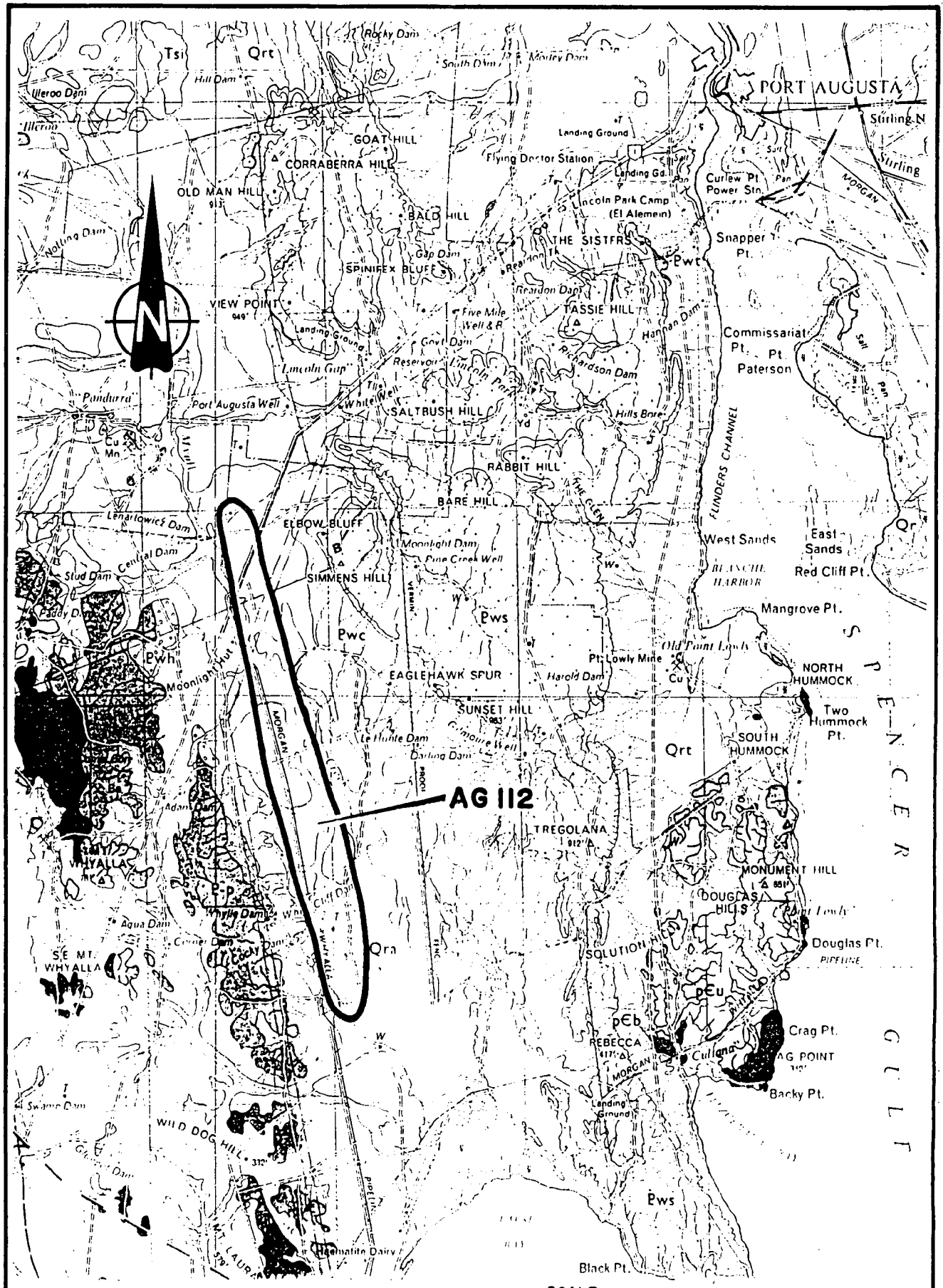
KILOMETRES

Prospect number . . . . . **AG III**

FIG. 23

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA	COMPILED S. Robertson	C.D.O.	DATE
LEAD – ZINC REVIEW ADELAIDE GEOSYNCLINE AND STUART SHELF CURNAMONA 1:250 000 AG III	DRAWN E. Calabio	SCALE 1:250000	
	DATE Feb.'88	PLAN NUMBER S.19968	
	CHECKED		

4564



Prospect number . . . . . **AG 112**

SCALE

5 0 5 10

KILOMETRES

FIG. 24

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

COMPILED: S. Robertson
DRAWN: E. Calabio
DATE: Feb. '88
CHECKED:

C.D.O. DATE

SCALE 1: 250 000

PLAN NUMBER
S 19969

LEAD - ZINC REVIEW
ADELAIDE GEOSYNCLINE AND STUART SHELF
PORT AUGUSTA 1:250 000
AG 112

4564