EL 2104 McCALLUM CREEK

FINAL REPORT

JULY, 1981.

G. Hassall,
July, 1981.

ABSTRACT

EL 2104 McCallum Creek, was granted to AAR Limited on the 15th day of August, 1979 for a period of twelve months. An application for renewal was granted on the 15th August, 1980.

During 1980 the EL was geologically mapped at 1:25,000 scale using colour aerial photographs. Within the area Lower Proterozoic schists and quartzites belonging to the Wildman Siltstone and dolerites of the Zamu Dolerites crop out. The intrusion of the early Carpentarian Burnside Granite which occupies the central and western sections of the EL has caused doming of the overlying Lower Proterozoic rocks.

In conjunction with mapping rock-chip sample and ground radiometric surveys were conducted.

TABLE OF CONTENTS

			Page
ABSTRACT.			
1.	INTRODUCTION.		1
	1.1	Location and Access.	1
	1.2	Topography and Climate.	2
	1.3	Tenement Situation.	2
	1.4	Previous Work.	2
2.	REGIONAL GEOLOGY.		3
	2.1	Archean Basement.	3
	2.2	Lower Proterozoic Rocks.	4
	2.3	Cover Rocks.	5
3.	RESULTS OF FIELD INVESTIGATIONS.		5
	3.1	Geology.	6
	3.2	Intrusions.	6
	3.3	Geochemistry.	6
	3.4	Geophysics.	7
4.	CONCLUSIONS & RECOMMENDATIONS.		7
5.	REFERENCES.		8

LIST OF APPENDICES

Appendix	1.	Expenditure EL 2041.
Appendix	2.	Thin Section Descriptions.
Appendix	3.	Rock-chip Sample Assay Results.
Appendix	4.	Grid plan and Radiometric Results.
Appendix	5.	Resistivity Survey Results.

LIST OF MAPS

Map 1.	Geological Map EL 2104	Scale 1:25,000
Map 2.	Sample Location Map EL 2104	Scale 1:25,000

1. INTRODUCTION.

This report describes the results of work carried out on EL 2104, McCallum Creek, during the period August 1979 to July 1981.

The Exploration Licence was granted for all minerals on the 15th August, 1979.

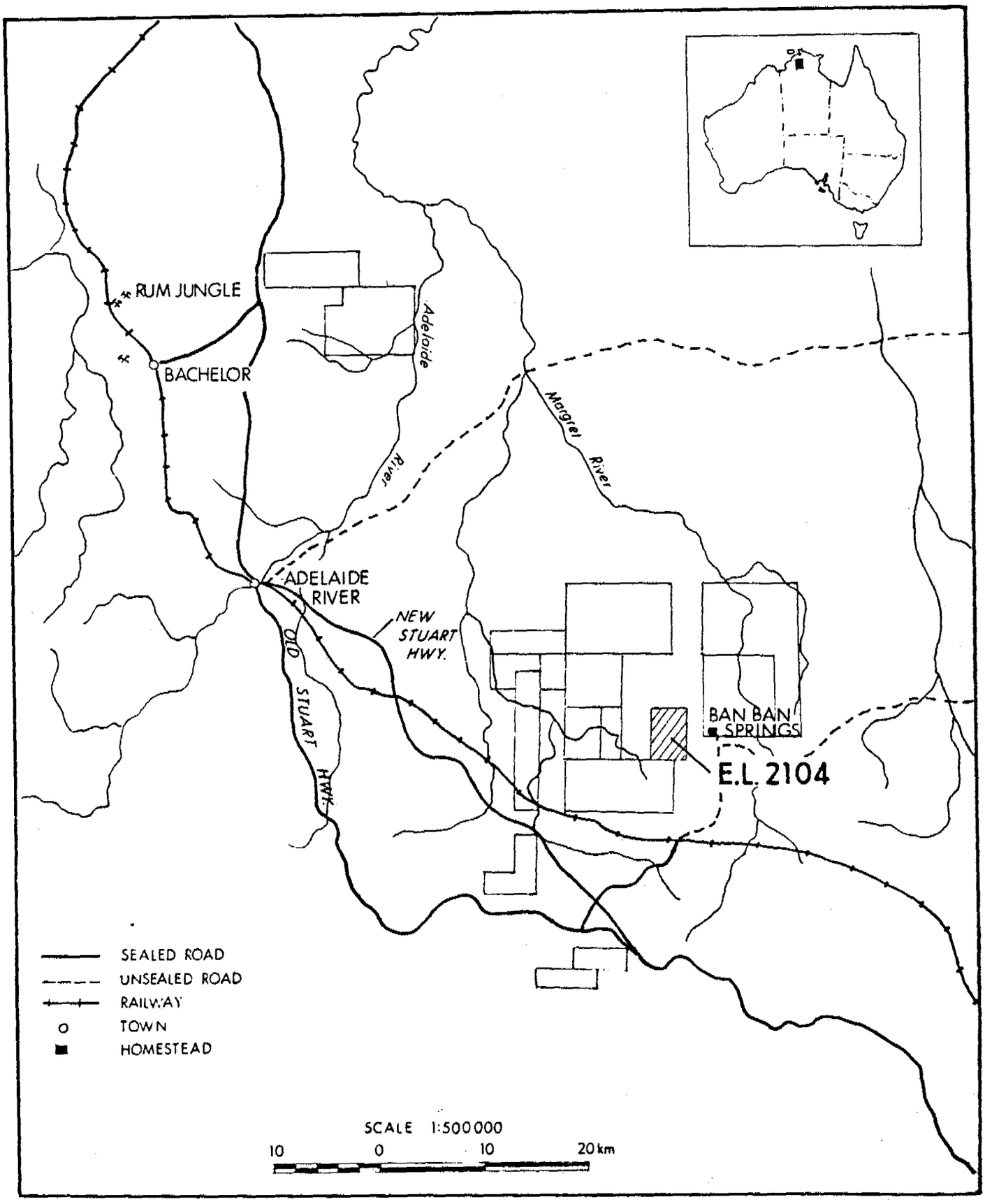
1.1 Location and Access

Exploration Licence 2104, McCallum Creek is located approximately 150 kilometres south-south-east of Darwin (Fig. 1). The area is contained within the Pine Creek 1:250,000 Geological Sheet and the Batchelor 1:100,000 Geological Sheet areas. A detailed description of EL 2104 is as follows:-

All that piece or parcel of land in the Northern Territory of Australia containing an area of 7.71 square miles (19.97 sq. km.) more or less, the boundary of which is described as follows:-

> Commencing at the intersection of latitude 13 degrees 21 minutes with longitude 131 degrees 27 minutes thence proceeding to the intersection of latitude 13 degrees 21 minutes with longitude 131 degrees 29 minutes thence proceeding to the intersection of latitude 13 degrees 24 minutes with longitude 131 degrees 29 minutes thence proceeding to the intersection of latitude 13 degrees 24 minutes with longitude 131 degrees 27 minutes thence proceeding to the intersection of latitude 13 degrees 21 minutes with longitude 131 degrees 27 minutes.

Access to McCallum Creek is gained via the Stuart Highway and bitumen side-road to Fountain Head. From there a formed dirt road to Ban Ban Station passes to the east of the EL. Tracks leading off the Ban Ban Station road afford easy access to the EL. Numerous tracks occur within the EL. All unsealed tracks are trafficable only during the 'dry' season.



LOCATION MAP.

E.L. 2104 ___ M^{c}CALLUM CREEK

Figure 1

1.2 Topography and Climate.

Within the EL the topography consists of low hills, with rocky outcrops having a relief of up to 30 metres. The creek valleys consist of "black soil" plains and occasionally swamps.

Climate is sub-tropical. The monsoonal season occurs from November to April, during which most of the annual rain falls in torrential storms. Rainfall averages more than 1 200 mm annually. Humidity is constantly high and temperatures range from 30-40^{o}C. During the remainder of the year the humidity is lower with daily changes in temperature ranging from 30^{o}C during the day to 10^{o}C or less at night.

1.3 Tenement Situation.

Exploration Licence 2104 was granted to AAR Limited on the 15th day of August, 1979 for a period of 12 months with a minimum expenditure of $1,250. An application for a twelve month renewal was granted on the 15th August, 1980.

Implementation of exploration programmes in the licence area is being undertaken by Mines Administration Pty. Ltd, a wholly owned subsidiary of AAR Limited.

1.4 Previous Work.

The earliest geological investigations of the Pine Creek region resulted from the discovery of gold in 1872. A number of the mining fields and mines were mapped with aerial photographs by the Aerial, Geological and Geophysical survey of Northern Australia between 1935 and 1939.

The BMR has carried out a number of regional mapping programmes which have included the EL. The area was studied at 1:63,360 scale in the Burnside Geological Series and at 1:250,000 scale in the Pine Creek Geological Sheet (Malone, 1962).

Walpole et. al., (1968) compiled all the existing data pertaining to the Katherine-Darwin Region and proposed a geological evolution of the Pine Creek Geosyncline. More recently mapping of the

1.4 Previous Work (Contd)

Batchelor area at 1:100,000 scale (1977) and the entire Pine Creek Geosyncline at 1:500,000 scale (Needham et. al., 1980) has included the EL.

Companies who have worked in the area include:-

Australian Mining and Smelting Company Limited	1954 - 1956
Enterprise Exploration Company Proprietary Limited.	1957
CRA Exploration Pty. Limited.	1976 - 1979
Geopeko Limited.	1976

Most of the previous work has been oriented toward base metal and gold with the major emphasis on the investigation of haematitic gossans? in the area.

2. REGIONAL GEOLOGY.

Exploration Licence 2104 is located near the centre of the Pine Creek Geosyncline. The regional geology of the Pine Creek Geosyncline has been described in detail by Needham et. al. (1980) and will be discussed only briefly in this report.

By correlating a Tuffaceous sequence Needham et. al., (op cit) have now defined the Pine Creek Geosyncline as a single intracratonic basin containing a thick sequence of mainly pelitic and psammitic Lower Proterozoic sedimentary rocks with interlayered tuff units resting on an Archean granitic basement. Cover rocks, of Carpentarian and younger age, unconformably overlie all of these rocks and conceal the basin margins (Table 1).

2.1 Archean Basement.

The Archean Basement is represented by the domes of the Rum Jungle/Waterhouse and Nanambu Complexes. Possible Archean rocks outcrop in the Woolner area. All the complexes consist mainly of gneisses, migmatites and leucocratic granites with minor schists, metasediments and banded iron formations. All of the Archean basement rocks have anomalous uranium concentrations

TABLE 1 - STRATIGRAPHIC UNITS (AFTER NEEDHAM ET. AL. 1980)

AGE	GROUP	FORMATION	LITHOLOGY
Cretaceous		Bathurst Island F.	Fine to medium grained marine sandstones.
Cambrian	Daly River Gp.	Jinduckin F. Tindall Limestone. Antrim Plateau Volc.	Ferruginous sandstone, siltstone, minor dolomite. Crystalline limestone. Massive vesicular basalt, minor agglomerate.
Lower Proterozoic	Tolmer Gp.	Depot Creek Sandstone.	Massive cross-bedded quartz sandstone, pebble bands.
(Carpentarian)	Katherine River Gp.	Kombolgie Form.	Medium to coarse quartz sandstone, minor andesite basalt and rhyolite.
Lower Proterozoic	Finniss River Gp.	Burrell Creek Form.	Siltstone, shale and greywacke.
	South Alligator Gp.	Kapalga Form.	Ferruginous siltstone, chert bands.
		Gerowie Tuff.	Black-green cherty tuff, green argillite, green tuffaceous greywacke
		Koolpin Form.	Ferruginous siltstone with chert bands, pyritic carbonaceous shale, silicified dolomite minor jasper.
	Mount Partridge Gp.	Nourlangie Schist	Quartz mica schist,mica quartz schist,minor quartzite.
		Wildman Siltstone.	Siltstone, in places carbonaceous at depth, red and cream laminated siltstone, minor quartzite and quartz greywacke.

Table (Contd)

AGE	GROUP	FORMATION	LITHOLOGY
	Mount Partridge Gp. (Contd)	Acacia Gap Sandstone Member.	Quartz sandstone and feldspathic sandstone with pyritic carbonaceous siltstone and quartz siltstone interbeds.
		Mount Hooper Sandstone.	Medium quartz sandstone and quartzite with some chert fragments, siltstone, phyllite, feldspathic quartzite, pebbly in places, chert pebble conglomerate cross-bedded.
		Mundogie Sandstone	Coarse medium quartz sandstone and orthoquartzite, commonly pebbly, quartz pebble conglomerate, siltstone cross-bedded scoured and graded beds. Minor schist amphibolitic in places.
	Namoona Group	Stage Creek Volcanics	Mafic volcanic breccia hawaiite, tuff, tuffaceous shale, tuffaceous greywacke.
		Cahill Formation	Mica feldspar quartz schist, quartz mica schist, with garnet, amphibole and kyanite in places, carbonaceous schist, crystalline dolomite-magnesite, and calc-silicate gneiss near base.
		Masson Formation	Ferruginous shale (mostly pyritic and carbonaceous at depth) fine-coarse calcareous and volcanic greywacke, calcarenite, sandstone, limestone.
	Batchelor Gp.	Coomalie Dolomite.	Dolomite, magnesite, dolomite breccia tremolite schist, calcilutite algal structures and evaporite pseudomorphs in places.
		Crater Formation.	Feldspathic sandstone, pebble conglomerate, siltstone, pyritic in part, basal ferruginous conglomerate in places.
		Celia Dolomite	Dolomite, magnesite, silicified or with algal structures in places, tremolite schist, minor sandstone, arkose, carbonaceous sediments.

Tab[redacted]1 [redacted]td)

AGE	GROUP	FORMATION	LITHOLOGY
	Batchelor Group. (Contd)	Beestons Formation.	Arkose, feldspathic sandstone, conglomerate, siltstone.
	Kakadu Group.	Munmarlary Quartzite.	Gneissic massive to friable orthoquartzite, minor schist.
		Mount Howship Gneiss	Very coarse white feldspathic leucogneiss, minor schist, rare garnet and amphibole.
		Kudjumarndi Quartzite.	Orthoquartzite, quartz gneiss, minor schist, rare cross-bedding, rare amphibole.
		Mount Basedow Gneiss	White-grey-pink coarse muscovite biotite gneiss, granitoid gneiss minor schist.
Archaean		Rum Jungle Complex Waterhouse Complex Nanambu Complex.	Gneiss, migmatite, leucocratic granite, biotite - chlorite schist, amphibolite and quartzite.
Upper Proterozoic (Carpentarian)	Granite.	Margret Granite. Cullen Granite Fenton Granite. Burnside Granite Mt. Bundy Granite Jim Jim Granite Mt. Shoobridge Granite.	Porphyritic adamellite, fine grained granite, hornblende - biotite granite and aplite dykes.
Lower Proterozoic		Zamu Dolerite.	Differentiated continental tholeiitic basalt sills, olivine dolerite, metamorphosed to amphibolite in places.

and are possible source rocks for the deposits in the Pine Creek Geosyncline.

2.2 Lower Proterozoic Rocks.

The oldest known Lower Proterozoic rocks are those of the Batchelor and the Kakadu Groups which rest unconformably on Archean basement. The Batchelor Group, which surrounds the Rum Jungle/Waterhouse complex contains arkosic rudites, psammites, conglomerates, and minor shales of the Beetsons and Crater Formations interbedded with massive crystalline carbonates of the Celia and Coomalie Dolomities. The Kakadu Group is best developed adjacent to the Nanambu Complex and is comprised mainly of meta-arkose and paragneiss.

These two basal groups are overlain by the pelites and psammites of the Namoona Group. The dominant unit in this group is the Masson Formation which extends from west of the Rum Jungle/ Waterhouse Complex almost to the South Alligator River. Further east it is thought to be equivalent to the lower member of the Cahill Formation, a partly calcareous and carbonaceous sequence of micaceous quartz-feldspathic schist, with lenses of massive carbonate. These two units are the hosts to the major uranium deposits in the Rum Jungle and Alligator Rivers areas. In the centre of the geosyncline the Masson Formation is unconformably overlain by the Stag Creek Volcanics. Elsewhere the Masson Formation is overlain by the sandstone-siltstone assemblage of the Mount Partridge Group which contains the Mundogie Sandstone, Mount Hooper Sandstone and Wildman Siltstone and correlates with the Acacia Gap Sandstone in the Rum Jungle area. East of the South Alligator River the Mundogie Sandstone correlates with feldspathic quartz schist of the upper Cahill Formation and the overlying Wildman Siltstone correlates with the Nourlangie Schist.

Overlying the older rocks is the South Alligator Group which comprises the Koolpin Formation, Gerowie Tuff and Kapalga Formation. Together with the Koolpin Formation, the overlying Gerowie Tuff provides the main evidence for correlating the strata of the western and central parts of the geosyncline. The Kapalga Formation is the youngest unit in the South Alligator Group and represents a transitional sequence between the South Alligator

Group and the overlying Finniss River Group.

The Finniss River Group is the youngest Lower Proterozoic Group and consists of a monotonous sequence of siltstone, slate, shale and greywacke. The Finniss River Group is made up of the Burrell Creek Formation, the Fisher Creek Siltstone and the Chilling Sandstone. The Burrell Creek Formation grades laterally and upwards into the Chilling Sandstone. The Fisher Creek Siltstone is present in the South Alligator Valley area and is a correlative of the Burrell Creek Formation.

At or near the end of sedimentation in the Lower Proterozoic the rocks were intruded by a suite of dolerites, mainly sills, known as the Zamu dolerities. At approximately 1 800 m.y. the sills and sedimentary rocks were deformed and regionally metamorphosed. Both the grade of metamorphism and degree of deformation increases towards the north east of the geosyncline. The metamorphics were then intruded and in places domed by early Carpentarian granite plutons. This was followed by the intrusion of a series of tholeitic lopoliths known as the Oenpelli Dolerites.

2.3 Cover Rocks.

The Lower Proterozoic rocks of the Pine Creek Geosyncline are unconformably overlain by the sandstone and minor volcanics of the Tolmer and Katherine River Groups. The northern and southern margins of the geosyncline are concealed by Palaeozoic rocks of the Daly River Group and Mesozoic strata of the Bathurst Island and Petrell Formations.

3. RESULTS OF FIELD INVESTIGATIONS.

Geological mapping of EL 2104 at a scale of 1:25,000 using colour aerial photographs was commenced in July, 1980 (Map I). Base and airphoto interpretation maps had been prepared in January 1980 by Hunting Geology and Geophysics (Australia) Pty. Ltd.

In conjunction with the mapping a foot-borne radiometric survey was completed. 16 line kilometres of gridding had been completed in November 1979. A rock-chip sampling programme was also undertaken during 1980. Sample locations are presented as Map 2. During October - November 1980 a resistivity survey was conducted over the EL (Appendix 5).

3.1 Geology.

The oldest rocks which crop out in the project area belong to the Wildman Siltstone and are comprised of quartz sandstones, quartzites and micaceous schists. The quartz sandstones are white grey in colour, medium to coarse grained and consist of sub-angular to sub-sounded quartz grains in a matrix of clay. The quartzites are metamorphosed equivalents of the sandstones and consist of fused aggregates of quartz grains and interstitial muscovite. Interbedded with the sandstones and quartzites are micaceous schists which are coarse grained and slightly haematitic and probably represent metamorphosed siltstones.

Pld 4, also part of the Wildman Siltstone, outcrops in the south-eastern corner of EL 2104. The rocks are grey-black carbonaceous and haematitic metasiltstones. They are fine grained and have a poorly developed schistosity. Thin section M.Ck. 6 (Appendix 2) describes a typical sample from Pld 4.

3.2 Intrusions.

The Lower Proterozoic sedimentary rocks within the EL have been intruded by a suite of dolerites belonging to the Zamu Dolerites. The rocks range in thickness from less than 10 metres to more than 500 metres. The rocks are dark green-black in outcrop, fine to coarse grained and have been deformed with the sedimentary rocks.

The dominant lithology within the EL is the early Carpentarian Burnside Granite. Mineralogically the rock consists of porphyritic microcline crystals, coarse prismatic plagioclase crystals, quartz and minor muscovite. Lithologically the rock is a muscovite adamellite. Doming of the overlying Lower Proterozoic sedimentary and igneous rocks has been caused by the intrustion of the granite.

3.3 Geochemistry.

Six rock-chip samples were collected and assayed for Cu, Pb, Zn, W and U. One sample was also analysed for As and Au. Results are presented as Appendix 3.

Some relevant statistical data is given below as Table 2.

TABLE 2.

Element.	Cu	Pb	Zn	W	U
Range	5-65	25-135	5-60	10-50	4-8
Mean	20	68	33	20	5

No assay results are considered anomalous.

3.4 Geophysics.

In conjunction with the geological mapping a ground radiometric survey was conducted using a GIS - 3 spectrometer. 16 line kilometres of gridding had been completed on 250 x 250 metre centres during 1979. Readings were taken every 20 metres along the east-west lines. A grid plan and the results are presented as Appendix 4.

During October - November 1980 a resistivity survey was completed over the EL by Murdoch Geophysics Pty. Ltd. Results indicate an area of generally high apparent resistivity. The most conductive area was located in the south-eastern corner of the area. This corresponds to the outcropping of a small amount of graphitic shales which belong to the Wildman Siltstone (Appendix 5).

4. CONCLUSIONS AND RECOMMENDATIONS.

Geological mapping of EL 2104, McCallum Creek, delineated rocks belonging to the Wildman Siltstone, the youngest formation of the Mt. Partridge Group. Outcropping doleritic rocks of the Zamu Dolerites occur.

The Lower Proterozoic rocks were intruded and domed by the early Carpentarian Burnside Granite.

From the results of the mapping and resistivity survey it is concluded that the most favourable environment for an economic accumulation of uranium would be in the south-eastern corner of EL 2104. However, rock-chip samples from this area failed to detect any significant concentrations of uranium.

It is therefore recommended that no further work be undertaken in EL 2104 and that the area be relinquished.

5. REFERENCES.

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APPENDIX 1.

BRISBANE.

10th August, 1981.

MINES ADMINISTRATION PTY LIMITED

STATEMENT OF EXPENDITURE

McCULLUM CRK EL 2104

YEAR ENDED 12.7.81

REF: AC/MDE

	$
Salaries and Wages	6,003
Travel & Accommodation	214
Vehicle Hire	400
Communications	3
Freight	56
Drafting, Air Photography, Printing, etc.	175
Geophysics Contractor - Other	3,591
Surveying Consumables	296
	10,738

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for G.T. Hall,
Accountant.

APPENDIX 2.

THIN SECTION DESCRIPTIONS.

SAMPLE NO.	ROCK TYPE - COMPOSITION	FABRIC	MINOR MINERALS	COMMENTS.
M.Ck. 1	Metaquartzite. Irregular interlocking medium and coarse quartz grains; small interstitial aggregates of fine muscovite, replacing matrix-cement.	Clastic textures recognisable, but modified. Grain-sizes up to 1 mm.	Interstitial goethite-limonite staining. Trace authigenic tourmaline.	Originally an ortho-quartzite; very mildly contact-metamorphosed, with formation of intergranular muscovite.
M.Ck. 6	Tourmalinised Schist. Fragments of fine quartzsericite schist, replaced by bands of coarse radiating tourmaline, vein-quartz; all ferruginised.	Coarse tourmaline bands conformable with schistosity. Replacement textures.	Poorly-defined masses of cloudy, leucoxenic rutile.	Schist may be carbonaceous; Tourmaline presumably pneumatolytic hydrothermal.

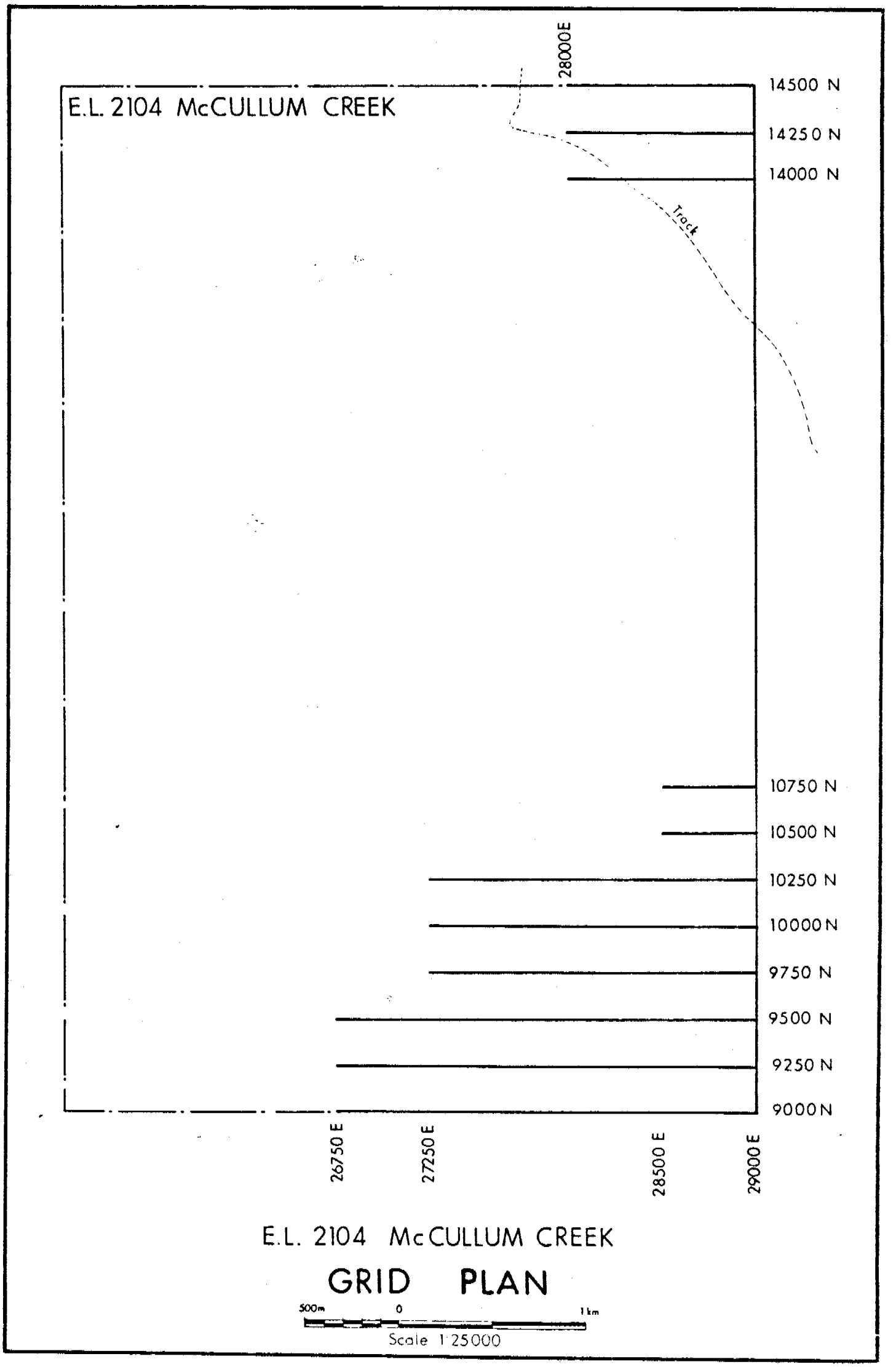
APPENDIX III

ROCK-CHIP SAMPLES ASSAY RESULTS

SAMPLE NO.	Cu.	Pb.	Zn.	U.	W.	As	Au.
M.Ck. 1	15	110	50	4	<10		
M.Ck. 2	10	135	40	4	20		
M.Ck. 3	5	35	60	4	<10		
M.Ck. 4	10	55	5	4	20		
M.Ck. 5	15	25	10	8	<10		
M.Ck. 6	65	50	30	8	50	440	0.1

* All values in ppm.

APPENDIX 4.



E.L. 2104 McCULLUM CREEK

GRID PLAN

500m 0 1km

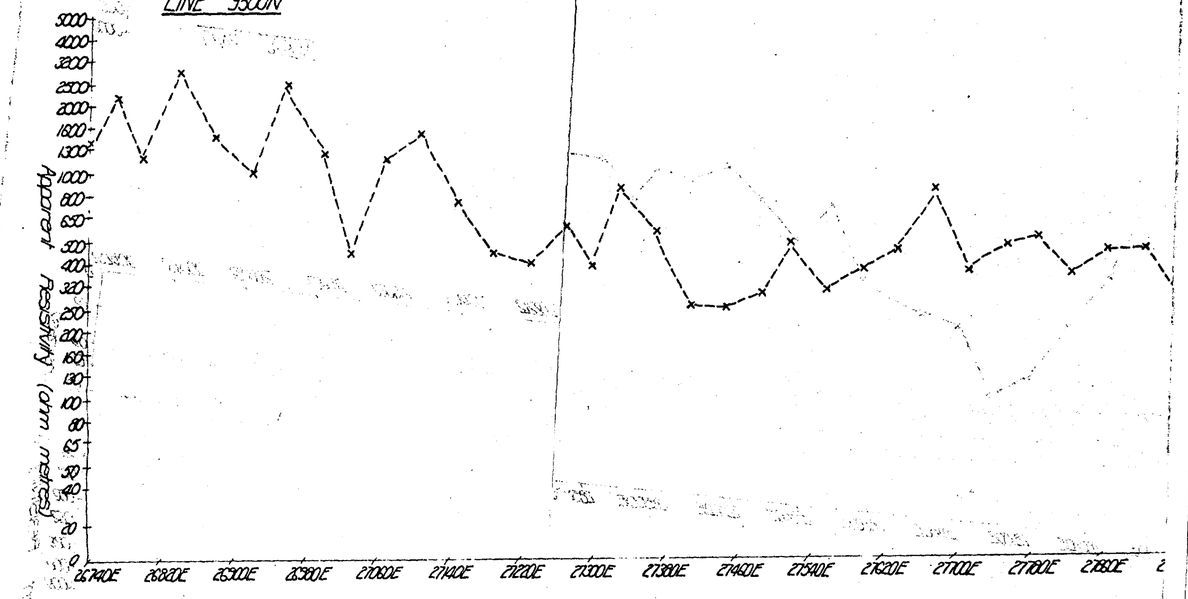
Scale 1:25000

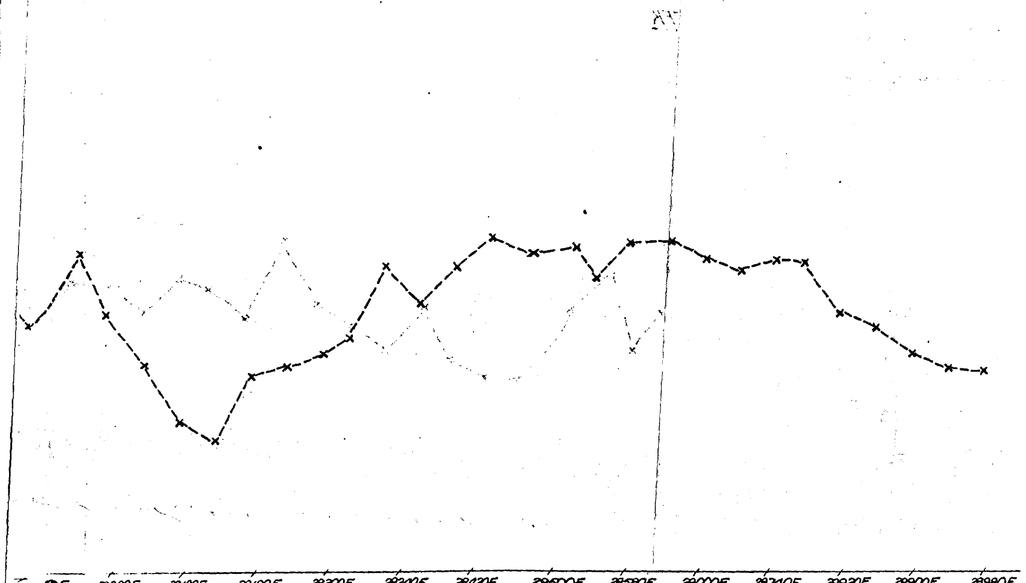
140	26750	26760	26780	26800	26820	26840	26860	26880	26900	26920	26940	26960	26980
9500	43	34	39	38	38	46	45	41	43	44	64	65	54
9250	49	44	41	42	45	37	36	36	34	34	32	31	35
9000	25	25	22	21	20	20	23	29	26	34	30	29	30
141	27000	27020	27040	27060	27080	27100	27120	27140	27160	27180	27200	27220	27240
9500	50	52	40	45	47	42	40	34	30	30	30	31	34
9250	38	32	27	28	31	35	36	32	31	34	34	30	28
9000	31	30	24	30	28	26	25	27	25	23	26	25	24
142	27250	27260	27280	27300	27320	27340	27360	27380	27400	27420	27440	27460	27480
10250	60	59	62	48	49	52	50	59	56	60	63	62	70
10000	50	55	51	51	42	39	38	37	34	37	42	46	38
9750	51	50	47	48	49	51	50	48	45	40	43	42	40
9500	35	32	36	34	33	35	33	28	26	24	20	22	18
9250	29	29	30	24	25	25	26	22	22	21	19	19	18
9000	22	21	20	18	16	16	18	18	20	26	26	32	38
143	27500	27520	27540	27560	27580	27600	27620	27640	27660	27680	27700	27720	27740
10250	80	68	63	70	50	36	35	37	33	29	34	36	32
10000	34	34	42	40	40	47	28	30	28	23	20	21	21
9750	38	33	36	35	32	34	36	28	33	27	30	29	28
9500	27	25	23	21	19	25	27	25	26	25	27	22	22
9250	19	19	23	21	23	28	30	31	33	30	33	22	15
9000	41	38	34	24	24	24	22	21	21	21	22	25	23
144	27750	27760	27780	27800	27820	27840	27860	27880	27900	27920	27940	27960	27980
10250	29	33	27	29	28	29	34	30	26	24	24	24	26
10000	30	40	32	28	37	30	26	20	28	30	28	23	16
9750	28	28	27	20	22	26	29	33	32	29	27	20	20
9500	22	23	24	23	20	23	26	26	29	29	27	30	34
9250	14	14	13	12	13	15	18	20	21	23	25	28	27
9000	26	26	28	26	27	27	26	21	18	18	17	16	14
145	28000	28020	28040	28060	28080	28100	28120	28140	28160	28180	28200	28220	28240
14500	20	36	38	26	27	27	28	30	28	28	26	25	21
14250	38	40	39	39	38	32	35	38	38	30	30	35	30
14000	27	29	29	30	40	36	33	35	30	27	22	24	24
10250	26	27	23	21	19	19	22	23	19	20	22	27	28
10000	18	23	18	21	29	38	28	29	26	25	29	29	26
9750	25	27	29	30	27	27	28	24	27	20	18	23	23
9500	35	29	23	23	22	20	20	18	20	20	20	18	17
9250	28	26	23	16	16	13	14	13	15	14	12	13	13
9000	14	16	13	12	13	12	12	13	15	14	16	14	10
146	28250	28260	28280	28300	28320	28340	28360	28380	28400	28420	28440	28460	28480
14500	17	14	13	13	12	10	11	10	8	8	8	8	9
14250	27	28	24	25	23	25	23	21	22	20	17	18	17
14000	25	30	32	34	33	28	26	27	27	28	29	31	35
10250	25	25	25	21	26	22	26	25	24	23	23	18	14

10000	27	28	28	33	31	25	17	18	20	20	28	26	26
9750	25	26	26	27	27	34	28	24	18	18	20	16	17
9500	14	14	14	15	14	15	14	14	15	14	14	12	13
9250	14	14	15	13	11	12	10	12	13	12	12	13	14
9000	9	9	11	9	13	10	14	14	13	15	16	15	18
147	28500	28520	28540	28560	28580	28600	28620	28640	28660	28680	28700	28720	28740
14500	8	8	8	10	9	9	11	10	12	12	9	12	12
14250	17	17	17	16	14	18	14	15	12	13	14	12	12
14000	34	31	29	30	26	30	32	32	24	30	27	27	21
10750	27	26	28	27	26	20	22	26	22	17	22	18	24
10500	27	28	27	26	25	24	23	18	18	15	14	13	14
10250	16	18	23	24	23	23	21	22	20	22	22	20	21
10000	25	28	21	15	14	15	14	14	14	14	13	15	15
9750	16	16	17	15	13	14	16	18	17	15	14	12	15
9500	12	12	10	13	13	14	13	11	12	12	13	12	12
9250	14	14	14	18	17	18	16	17	16	14	16	17	17
9000	17	16	14	14	17	21	24	20	22	19	17	15	17
148	28750	28760	28780	28800	28820	28840	28860	28880	28900	28920	28940	28960	28980
14500	12	12	12	12	14	14	21	23	24	28	31	29	28
14250	14	11	13	10	8	9	7	8	10	9	9	10	10
14000	22	27	23	27	25	29	21	19	24	18	21	22	19
10750	27	28	28	19	19	16	18	14	12	15	17	15	14
10500	16	16	15	14	14	12	14	14	17	19	18	12	13
10250	22	21	20	19	17	16	17	18	16	16	15	14	16
10000	13	10	14	13	11	13	10	10	9	6	9	8	8
9750	17	12	10	12	14	13	12	12	12	12	13	10	14
9500	12	14	15	14	15	14	13	13	13	12	13	14	12
9250	20	21	24	24	26	26	23	24	25	26	26	34	35
9000	17	19	32	36	35	34	38	36	35	37	36	38	34
149	29000												
14500	25												
14250	10												
14000	20												
10750	14												
10500	14												
10250	11												
10000	10												
9750	13												
9500	12												
9250	40												
9000	36												

RESISTIVITY PROFILES - Mc CULLUM CREEK

LINE 3500N





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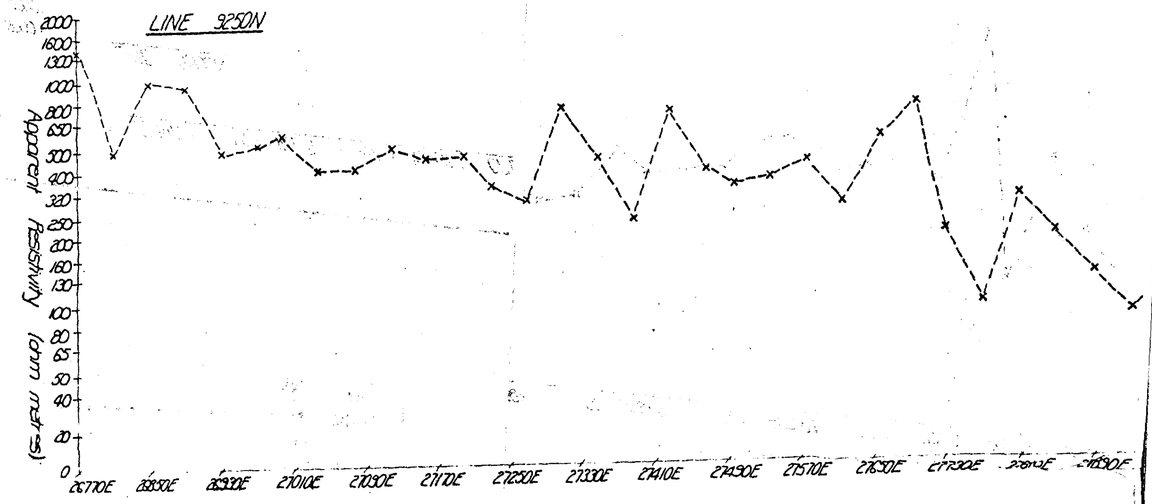
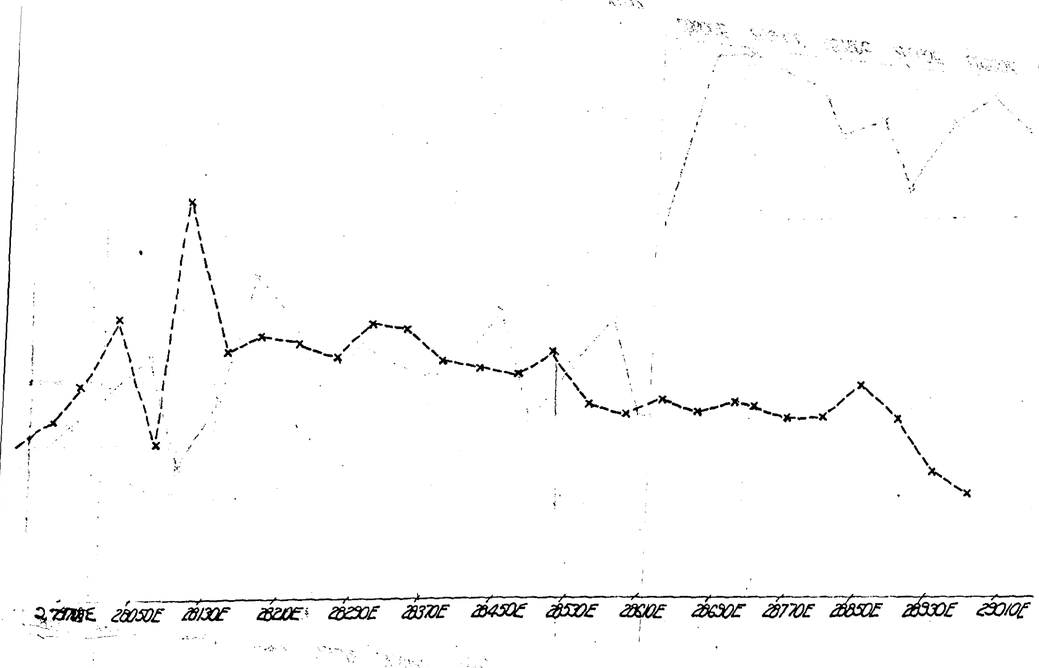
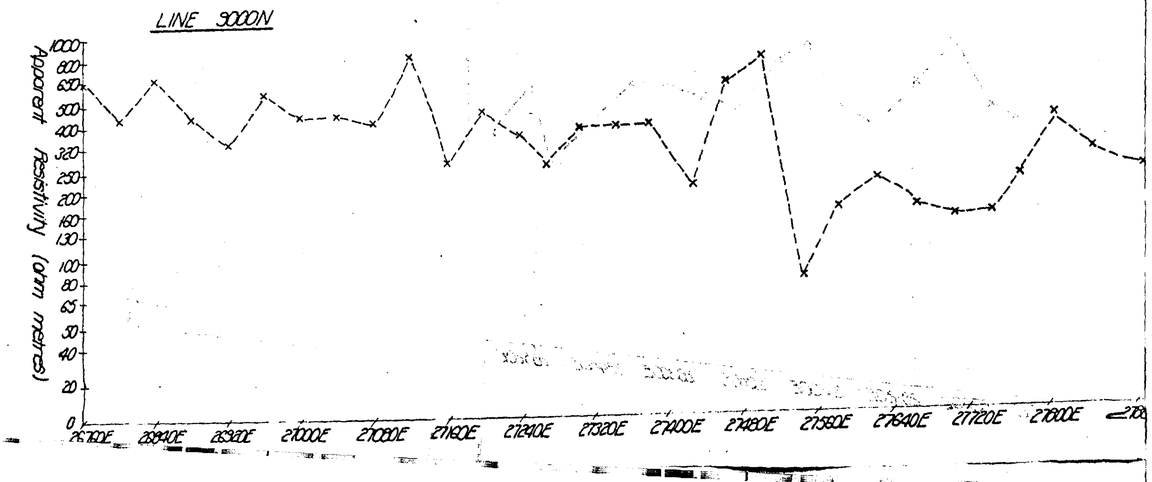
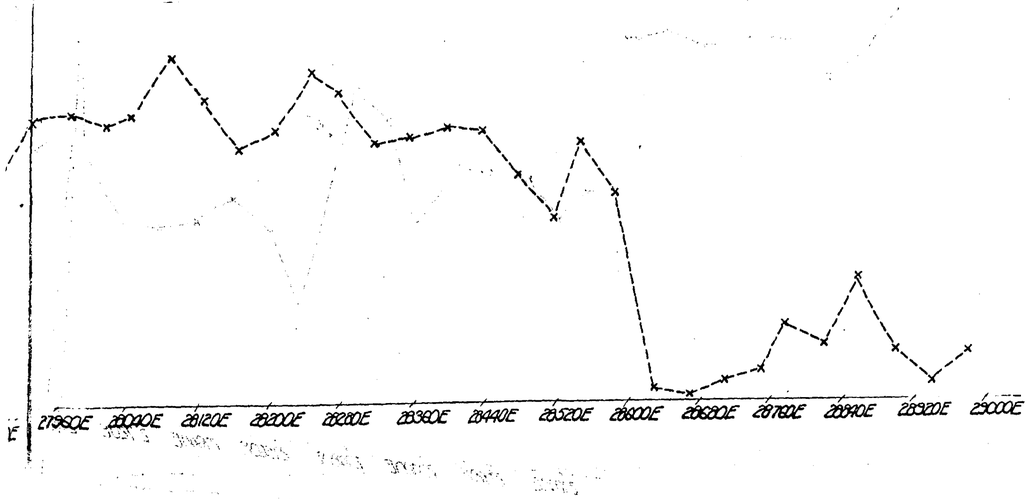




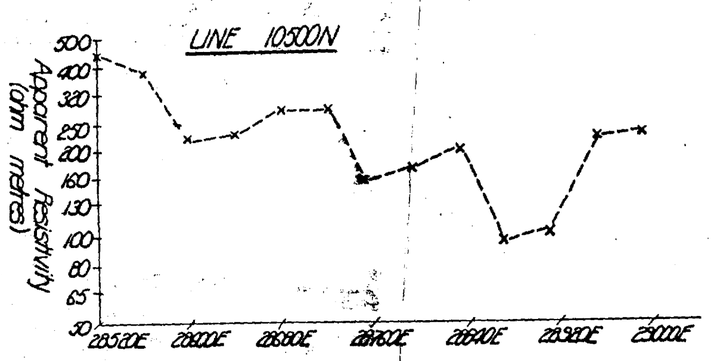
LINE 3000N





RESISTIVITY PROFILES - Mc CULLUM CREEK

LINE 10500N



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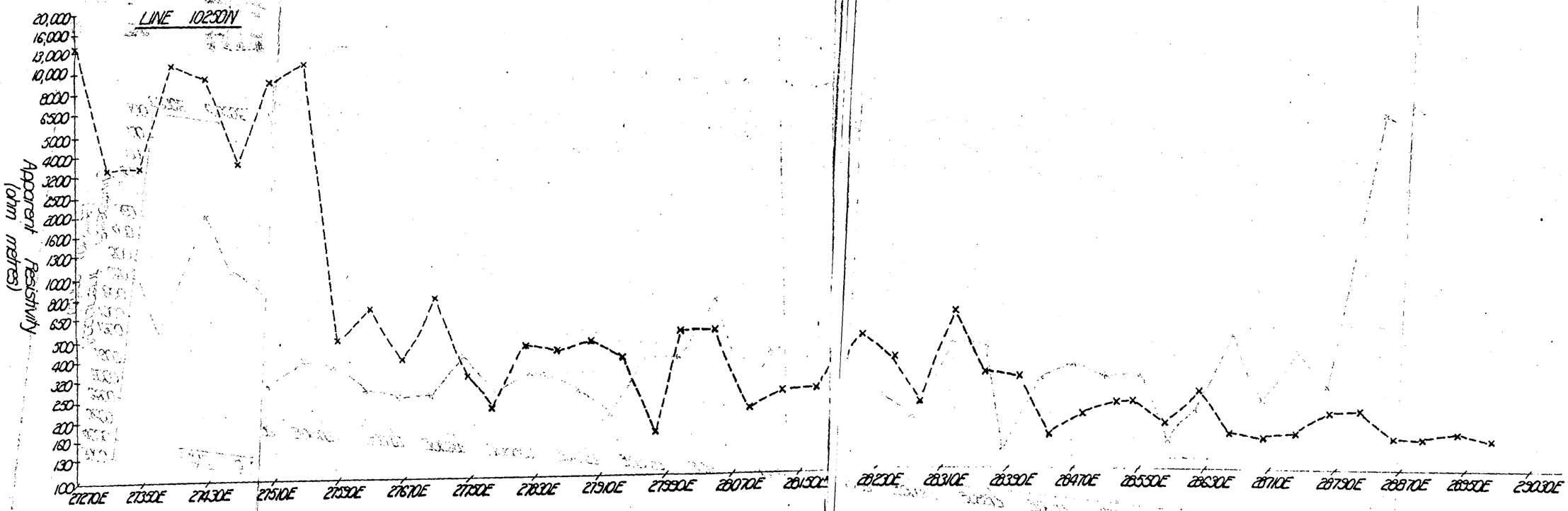
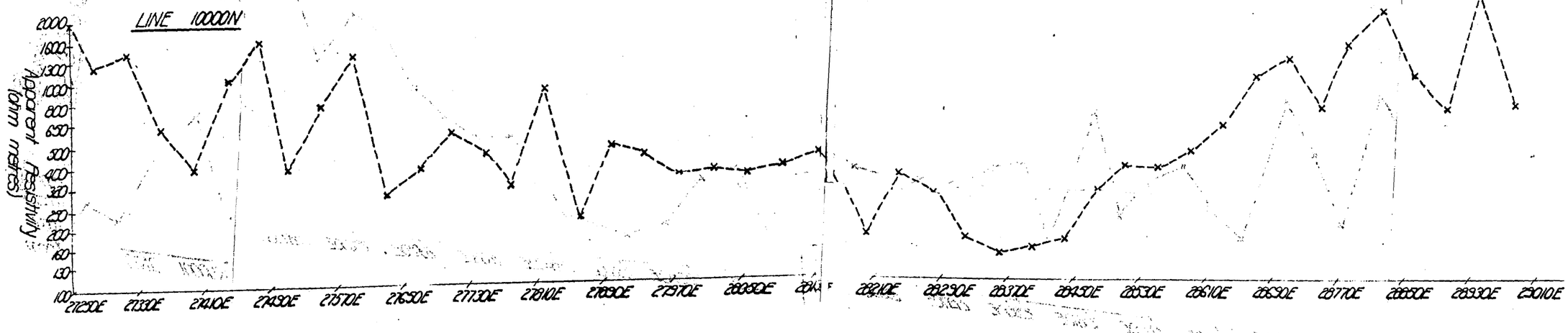


LINE 10000N

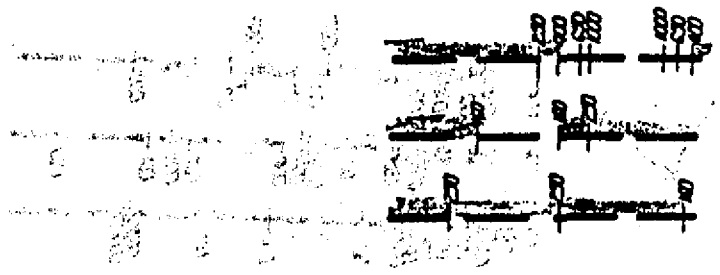


LINE 9750S

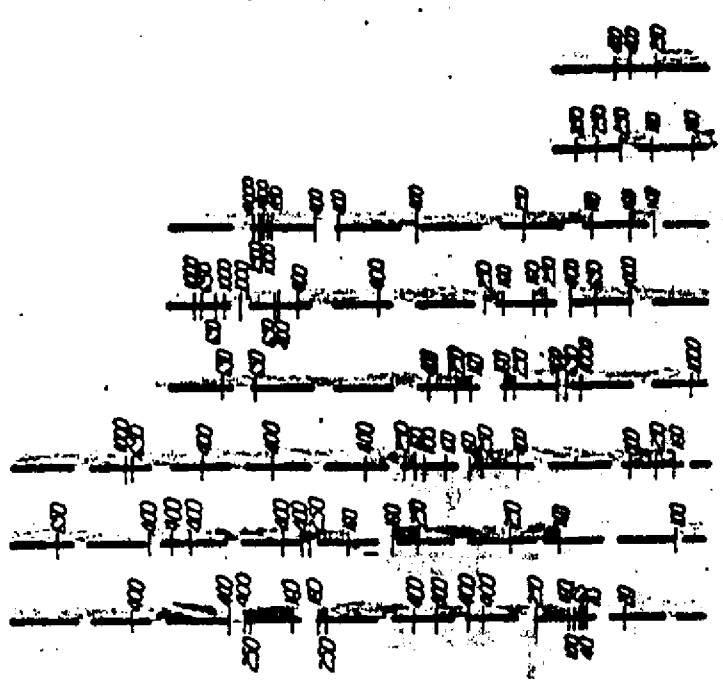
MURDOCH GEOPHYSICS (AUSTRALIA) PTY LTD.

RESISTIVITY SURVEY

24,500E 25,000E 25,500E 26,000E 26,500E 27,000E 27,500E 28,000E 28,500E 29,000E 29,500E 30,000E 30,500E 31,000E 31,500E



LINE 14500N
LINE 14250N
LINE 14000N



LINE 10750N
LINE 10500N
LINE 10250N
LINE 10000N
LINE 9750N
LINE 9500N
LINE 9250N
LINE 9000N

N

LEGEND

Apparent resistivity traverses.

Apparent resistivity values.

Interpreted geo-electrical zones.

MURDOCH GEOPHYSICS (AUSTRALIA) PTY LTD.

RESISTIVITY SURVEY

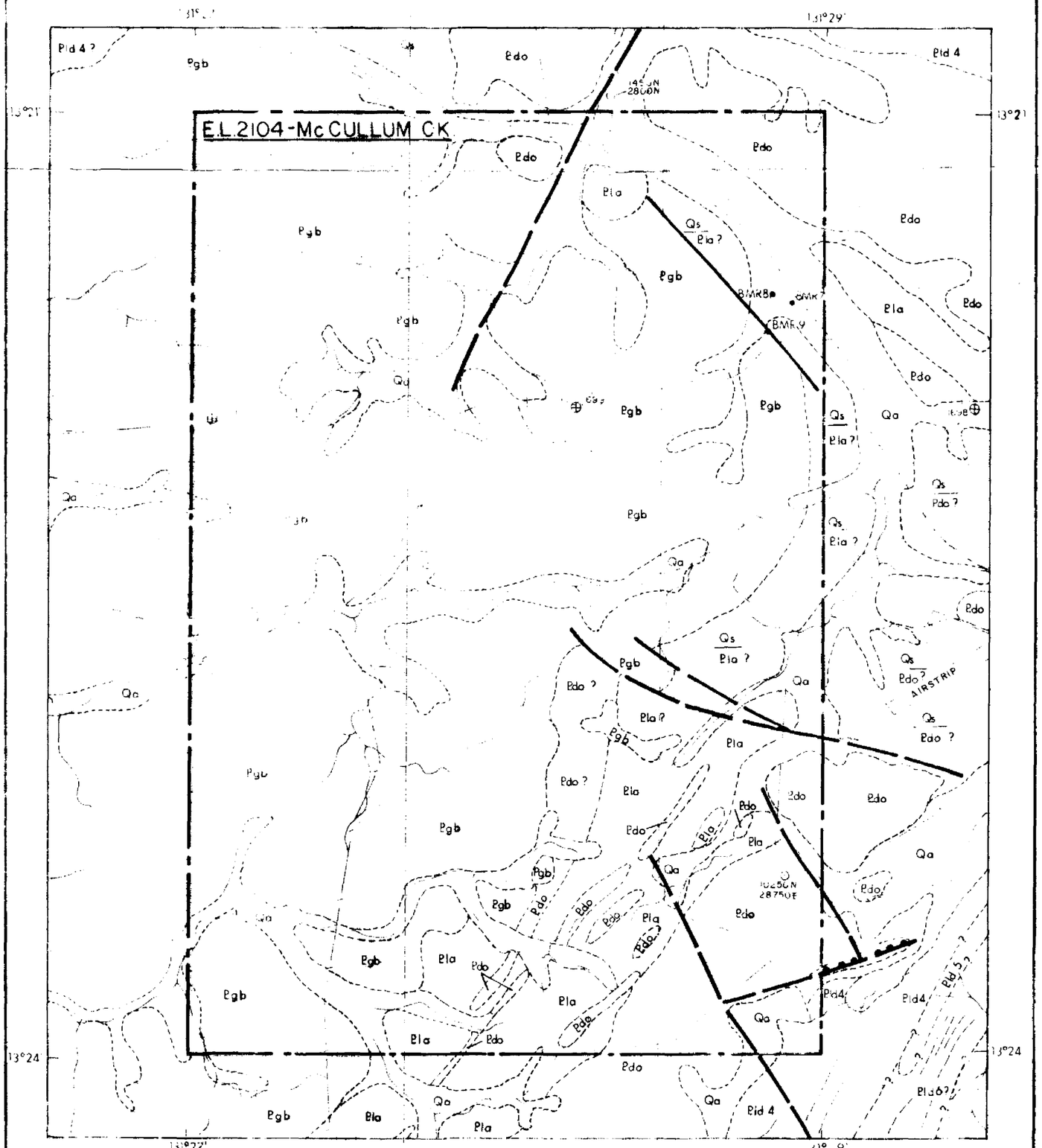
CLIENT: Mines Administration

LOCATION: Mc Cullum Creek - Northern Territory

Location plan showing distribution of apparent resistivities.

Scale - 1 : 25,000

Plate No: 8 Report No: 491 Date: February '81



CAINOZOIC

QUATERNARY
- Qs — Undivided, unconsolidated soil, sand & scree deposits
- Qa — Silt, clay, sand, black soil and alluvium

CARPENTARIAN
- Pgb — Coarse grained muscovite biotite adamellite

LOWER PROTEROZOIC

SOUTH ALLIGATOR GROUP
- GEROWIE TUFF — Pld 7 — Quartz sandstone, thin bedded siltstone mingrchert
- ZAMUDOLERITE — Pdo — Dolerite siltstone
- KOOLPIN FORMATION — Pld 6 — Massive hematite ironstone, thin bedded carbonaceous shale, haematitic siltstone

MOUNT PARTRIDGE GROUP
- WILDMAN SILTSTONE — Pld 5 — Quartz sandstone & Siltstone
- Pld 4 — Grey siltstone, red knotted phyllite, ferrug. siltstone
- Pla — Quartz sandstone with interbedded dolerite and scattered granite

- GEOLOGICAL CONTACT
- ? INFERRED GEOLOGICAL CONTACT
- FAULT
- ? INFERRED FAULT
- QUARTZ VEIN IN FAULT
- 38 STRIKE AND DIP
- TRACE BEDDING

- BMR 28 BMR EXPLORATORY DRILL HOLE
- 2651 PHOTOCENTRE
- RAILWAY
- TRACK
- FENCE
- EXPLORATION LICENCE BOUNDARY
- DRAINAGE

MINES ADMINISTRATION PTY LIMITED

Mc CULLUM CREEK — E.L.2104 — N.T.

GEOLOGICAL MAP

AUTHOR J. HASSALL

DWG NO

FILE NO

DATE SEPTEMBER 1980

131°27'

131°29'

13°21'

13°24'

EL 2104-McCULLUM CK

145UN 28OOM

BMR8

BMR7

BMR 9

1699

1700

1698

M.Ck.2

M.Ck.1

1025ON 28750E

M.Ck.6

M.Ck.3

M.Ck.4

M.Ck.5

AIRSTRIP

LEGEND

o M.Ck.1. Rock Chip Sample Location

• 8 B.M.R Exploratory drill hole

Drainage

10 p1700 Photocentre showing run and photo number

Fence

Track

Exploration licence boundary

NT

SA

Note This map was compiled from 4 photogeological worksheets by Hunting Geology and Geophysics (Australia), Pty Limited Canberra, September 1979, GA88/79

MINES ADMINISTRATION PTY. LIMITED

Mc CULLUM CREEK-E.L.2104 - N.T.

SAMPLE LOCATION MAP

2000m

G.HASSALL

SEPTEMBER 1980