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BAUHINIA DOWNS E.L. 879, N.T.

RECONNAISSANCE GEOCHEMICAL SAMPLING

OF THE BARNEY CREEK FORMATION

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Date : 17th December, 1974

Submitted to : I. R. Johnson

Report No. : 7668

Copy to : N.T. Administration,
Mines Branch.

CONTENTS

1. SUMMARY

Reconnaissance soil geochemistry has been conducted over thirty kilometers of strike length of the Barney Creek Formation within Bauhinia Downs E.L. 879. Assay results are not encouraging.

2. CONCLUSIONS AND RECOMMENDATIONS

No significant zone of anomalous base metal values occurs within the Barney Creek Formation in the area of E.L. 879.

No further work is justified and it is recommended that the E.L. be relinquished.

3. INTRODUCTION

Geological mapping of the E.L. area in 1973 indicated previously unrecognised Barney Creek Formation outcropped as a zone trending northerly for a distance of 30 km from the southern boundary of the E.L. (Johnston 1974). Although the maximum development of the Formation appeared to be no greater than 80 m, compared to 530 m at McArthur River, where the formation hosts the large H.Y.C. lead-zinc body, the recommendation was made that reconnaissance geochemistry be conducted over the extent of the formation. This report outlines the work undertaken as a result of that recommendation.

4. THE BARNEY CREEK FORMATION

The Barney Creek Formation is a member of the Umbolooga Sub-Group of the Carpentarian McArthur Group. The

extent of the formation within the E.L. area is shown on Plan NTd. 460. In the south, near Four Mile Creek the formation comprises approximately 80 metres of dark grey carbonaceous dolomitic siltstones with thin interbeds of cherty dololutite and minor pink tuffaceous shales. In this area, beds dip at 8-10° to the west. The formation thins gradually along strike to the north.

Accompanying the decrease in thickness is a marked decrease in carbon content of sediments and an increase in the amount of tuffaceous material.

Between Tawallah and Blackfellow Spring Creeks the formation is represented by 20 metres of buff to grey slightly carbonaceous dolomitic siltstone overlain by 5-12 m of grey dololutite with interbedded potassic tuffs. The tuffs are pink, cherty in appearance, have a well developed cross fracturing and range in thickness from 5 mm to 3 cm. Bedding is sub-horizontal but is often locally disrupted due to dissolution and collapse of the underlying Emmerugga Dolomite.

No evidence of any kind of mineralisation was seen in outcrop of the formation.

5. GEOCHEMISTRY

As the Barney Creek Formation outcrops poorly a power auger was employed to obtain bedrock samples. Twenty-nine samples at one kilometer spacing were collected during the initial reconnaissance. All samples were assayed for Pb, Zn, Cu, Ni, Co, Cr, Mn and Ag.

Sample locations and assays for lead, zinc and copper are plotted on Plan NTd. 461.

Most samples assayed in the range 11-170 ppm Pb and 9-560 ppm Zn. One sample, 228604, assayed 1480 ppm Pb and 900 ppm Zn. These results were considered to be sufficiently anomalous to warrant further sampling. An additional 18 samples were collected on a 500 m grid centred on locality 228604.

Assays for this second group of samples had an overall range of 34-640 ppm Pb and 9-360 ppm Zn. Most fell in the range 60-240 ppm Pb and 21-57 ppm Zn.

Sample 228644 assayed 640 ppm Pb and 360 ppm Zn. Its location is approximately 1800 m south-east of sample 228604. Samples at intermediate points between these localities assayed less than 100 ppm combined Pb and Zn. The results indicate that although the Barney Creek Formation within the grid area is slightly anomalous in lead and zinc, significantly anomalous values are sporadically distributed. There is no evidence to suggest that continuity of mineralisation occurs over any substantial area.

All other base metals assayed for returned no significantly anomalous values.

W. H. Johnston

KEYWORDS

Lead, zinc, black shale, chert, dolomite, shale, Proterozoic-md., geochem-soil.

LOCALITY

Bauhinia Downs	SE 53-3
Mount Young	SD 53-15

REFERENCE

Johnston, W.H. 1974 Bauhinia Downs E.L. 879, N.T. Report for Year Ended December 1973. CRAE Report No. 7480.

ATTACHMENTS

Geochemical Soil Sampling Ledgers	7 sheets

LIST OF PLANS

Plan No.	Title	Scale
NTd. 460	Bauhinia Downs E.L. 879 (SD 53-15, SE 53-3) Geological Map	1:50,000
NTd. 461	Bauhinia Downs E.L. 879 (SD 53-15, SE 53-3) Geochemistry Plan	1:50,000

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GEOCHEMICAL SOIL SAMPLING LEDGER

AREA BAUHINIA DOWNS E.L. 879 SAMPLE Nos. 228601 - 228616 COLLECTED BY W.H. JOHNSTON DPO 15003

MAP OR PHOTO REFERENCE NTd 358 ANALYSED BY ZINC CORPORATION

Grid Co-ordinate	Sample No.	Soil composition					Soil horizon	Sample			Bedrock			Metal content, p. p. m.										Geological observations
		Rock %	Laterite %	Sand %	Silt %	Clay %		Depth (inches)	Colour (Munsell) Chart No.	pH	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As	
	228601						C	1				'		19	39	33	32	20	10	1000	<1				0-1m Brown clay soil on weathered dolomitic siltstone.
	228602						C	4				'		87	48	29	19	12	10	380	<1				0-0.5m White soil 0.5-2m Red brown clay soil 2-3m Khaki clay mottled yellow and broken with fragments of white siltstone.
	228603						C	3				'		47	75	23	21	13	10	530	<1				0-1m Yellowish brown clay soil 1-3m Reddish brown clay soil with fragments of khaki siltstone.
	228604						C	2				'		1480	900	34	42	20	10	430	<1				0-1m Yellow brown clay soil. 1-2m Yellow brown clay soil with fragments of carbonaceous siltstone.
	228605						C	3				'		170	54	53	21	24	20	1260	<1				0-2.5m Bright red clay soil 2.5-3m Pinkish clay soil with weathered dololutite.
	228606						C	3.5				'		79	30	77	16	21	20	690	<1				0-2.5m Red clay soil 2.5-3.5m Weathered yellow dolomitic siltstone.
	228607						C	3.5				'		83	17	51	28	20	10	4400	<1				0-0.5m Grey clays 0.5-3m Brown clay soil 3-3.5m Grey brown clay soil with weathered dolomitic siltstone and cherty dololutite.
	228608						C	3.5				'		79	23	31	26	26	20	1980	<1				0-1m Light brown clay soil. 1-3m Orangebrown sandy clays. 3-3.5m Red clay soil on weathered dololutite.
	228609						C	3.5				'		33	440	77	97	110	20	8500	1				0-2m Brown clay soil 2-3m Red clay soil 3-3.5m Red soil with

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GEOCHEMICAL SOIL SAMPLING LEDGER

AREA /BAUHINIA DOWNS E.L. 879

SAMPLE Nos. 228601 - 228616

COLLECTED BY W.H. JOHNSTON DPO 15003

MAP OR PHOTO REFERENCE NTd. 358

ANALYSED BY ZINC CORPORATION

Grid Co-ordinate	Sample No.	Soil composition					Soil horizon	Sample			Bedrock			Metal content, p. p. m.										Geological observations
		Rock %	Laterite %	Sand %	Silt %	Clay %		Depth (inches)	Colour (Munsell) Chart No.	pH	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As	
	228610						C	6.5				'		19	18	8	11	8	10	60	<1			0-2m Grey clay with sandstone alluvium. 2-3m White clay soil 3-5.5m Yellow brown clay soil. 5.5-6.5m Weathered light grey mudstone.
	228611						C	3				'		19	89	11	28	13	10	110	1			0-1m Grey clay 1-2m Khaki clay 2-3m White clay with chert fragments.
	228612						C	3				'		110	39	28	14	8	10	480	<1			0-2.5 Red dolomitic soil 2.5-3m Ditto with fragments of dark grey well laminated silicified dololutite.
	228613						C	2				'		47	76	20	30	28	20	2200	<1			0-2m Terra rosa on Emmerugga Dolomite.
	228614						C	1.5				'		37	36	20	30	20	10	2200	<1			0-1.5m Orange yellow clay soil with fragments of buff dolomitic siltstone.
	228615						C	2				'		53	103	19	38	18	20	370	<1			0-2m Orange yellow clay soil with fragments of buff dolomitic siltstone.
	228616						C	2				'		19	78	17	18	17	10	960	<1			0-2m Light brown clay soil on white siltstone.

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GEOCHEMICAL SOIL SAMPLING LEDGER

AREA BAUHINIA DOWNS E.L. 879 SAMPLE Nos. 228617 - 228629 COLLECTED BY W.H. JOHNSTON DPO 15003

MAP OR PHOTO REFERENCE NTd ANALYSED BY ZINC CORPORATION

Grid Co-ordinate	Sample No.	Soil composition					Soil horizon	Sample			Bedrock			Metal content, p. p. m.										Geological observations
		Rock %	Laterite %	Sand %	Silt %	Clay %		Depth (inches)	Colour (Munsell) Chart No.	pH	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As	
	228617						C	2.5				"		19	33	16	14	9	10	540	<1			0-0.5m Scree & river gravel 0.5-2m Yellow brown clay soil 2-2.5m Ditto with fragments of buff leached chloritic siltstone
	228618						C	1				'		21	9	8	6	13	<10	650	<1			0-1m Light brown soil with fragments of yellow silicified dololutite.
	228619						C	2				'		110	33	34	13	10	<10	570	<1			0-1.5m Yellow clay soil 1.5-2m Brownish red clay soil with fragments of light grey siltstone
	228620						C	2				'		67	23	29	14	10	<10	54	<1			0-1.5m Red brown clay soil 1.5-2m Yellow brown clay soil with fragments of dolomitic siltstone and dololutite.
	228621						C	5.5				'		11	14	21	20	20	<10	240	5			0-1.5m Red outwash soil 1.5-4m Cream clay soil 4-5.5m Khaki clay soil with fragments of mottled grey argillite.
	228622						C	2.5				'		43	45	25	34	24	<10	1540	<1			0-1m Yellow brown clayey soils with river gravels. 1-2.5m Light brown clay soil with fragments of brown chert.
	228623						C	1				'		75	27	23	34	26	10	990	<1			0-1m Light grey soil with fragments of chert and grey siltstone.
	228624						C	6.5				'		130	560	86	220	210	20	2300	<1			0-1m Alluvium. 1-2.5m Reddish brown soil 2.5-6m Dark brown clay with rounded fragments of chert and silicified dolomite. 6-6.5m Dark brown clay with pink ? tuff fragments

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GEOCHEMICAL SOIL SAMPLING LEDGER

AREA BAUHINIA DOWNS E.L. 879 SAMPLE Nos. 228617 -228629 COLLECTED BY W.H. JOHNSTON DPO 15003

MAP OR PHOTO REFERENCE NTd ANALYSED BY ZINC CORPORATION

Grid Co-ordinate	Sample No.	Soil composition					Soil horizon	Sample			Bedrock			Metal content, p. p. m.										Geological observations
		Rock %	Laterite %	Sand %	Silt %	Clay %		Depth (inches)	Colour (Munsell) Chart No.	pH	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As	
	228625						C	4.5				'		79	26	29	28	35	10	2200	<1			0-0.5m Red brown sandy soil 0.5-3m Orange red clay soil 3-4.5m Red clay soil on dololutite.
	228626						C	1				'		75	13	28	30	26	20	750	<1			0-1m Pinkish brown clay soil on pink ? chert.
	228627						C	2				'		13	11	19	14	17	10	710	<1			0-2m Red soil on silicified dololutite.
	228628						C	2				'		90	44	25	38	30	20	2800	<1			0-1m Black soil. 1-2m Red clay soil developed on very ferruginous weathered siltstones.
	228629							1.5				'		110	35	41	46	50	20	6200	1			0-0.5m Red outwash soil 0.5-1.5m Ferruginous pisolitic laterite.

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D.P.O. 15006

AREA BAUHINIA DOWNS - E.L. 879

SAMPLE Nos. 228630 - 228639

COLLECTED BY W.H.J.

MAP OR PHOTO REFERENCE NTd. 358

ANALYSED BY ZINC CORPORATION LTD.

Grid Co-ordinate	Sample No.	Soil composition					Soil horizon	Sample			Bedrock			Metal content, p. p. m.										Geological observations
		Rock %	Laterite %	Sand %	Silt %	Clay %		Depth M	Colour (Munsell) Chart No.	pH	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As	
	228630						C	1.5						110	26	25	33	26	20	3400	<1				0-0.5m Light grey clay soil. 0.5-1m Light brown soil 1-1.5m Brown clay soil with fragments of dark grey well laminated dolomitic siltstone
	228631						C	3.5						160	89	25	38	26	20	1150	<1				0-0.5m White clay soil. 0.5-2m Ferrug. soil Fe concretions. 2m-3m Khaki soil. 3-3.5m Weathered cream siltstone.
	228632						C	2						210	16	38	40	47	20	2400	<1				0-0.5m Grey clay soil with scree silic dolomite. 0.5-2m Red brown clayey soil developed on dolomite ? Reward Dolomite.
	228633						C	3.5						130	31	25	10	14	20	940	<1				0-3.5m Bright red clay soil on dolomite Emmerugga Dolomite.
	228634						C	1.5						170	57	74	26	26	10	1040	<1				0-0.5m Grey clay soil. 0.5-1.5m Yellow clay soil developed on tuffac eous dolomite.
	228635						C	4.5						160	48	58	14	16	40	900	<1				0-0.5m Red brown clay soil 0.5-4m Bright red soil 4-4.5m Bright red soil with fragments of silic. dolomite.
	228636						C	1						60	36	16	25	13	20	1230	<1				0-1m Yellow brown soil developed on weathered ferruginous siltstone
	228637						C	3.5						240	18	32	50	31	20	6900	<1				0-0.5m Light brown clay soil 0.5-2m Brown clay soil 2-3.5m Dark brown ferrug. dolomitic siltstone probably carbonaceous.

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AREA BAUHINIA DOWNS - E.L. 879 SAMPLE Nos. 228630 - 228639 COLLECTED BY WHJ - D.P.O. 15006

MAP OR PHOTO REFERENCE NTd. 358 ANALYSED BY ZINC CORPORATION LTD.

Grid Co-ordinate	Sample No.	Soil composition					Soil horizon	Sample			Bedrock			Metal content, p. p. m.										Geological observations
		Rock %	Laterite %	Sand %	Silt %	Clay %		Depth M	Colour (Munsell) Chart No.	pH	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As		
	228638						C	1						57	12	25	44	35	20	2800	<1				0-0.5m Light brown clay soil. 0.5-1m Yellow soil with fragments of pink dolomulite
	228639						C	1.5						63	9	31	27	16	10	3200	<1				0-0.5m Light brown clay soil 0.5-1.5m Red brown clay soil with fragments of well laminated dolomitic siltstone.

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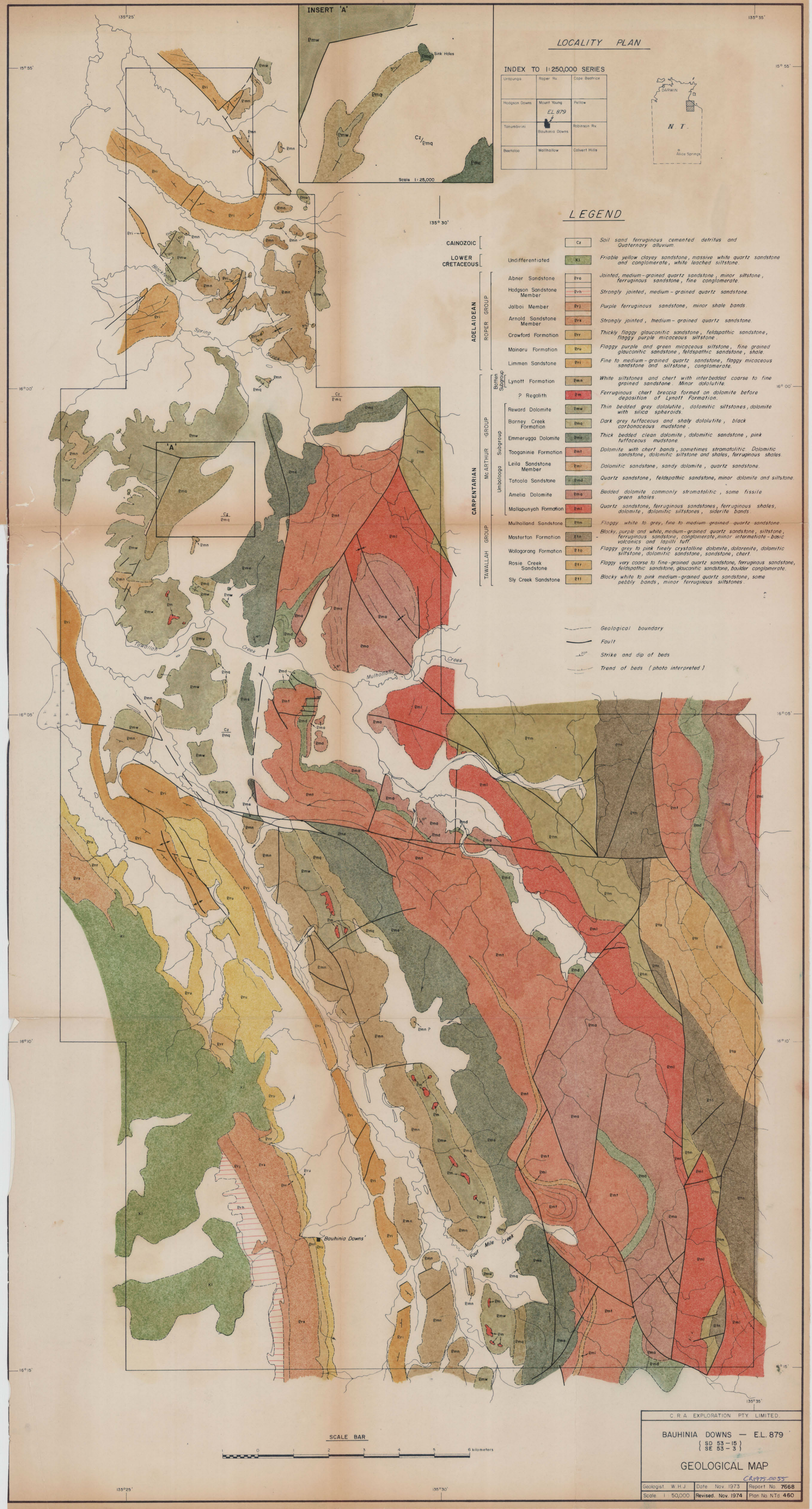
AREA BAUHINIA DOWNS - E.L. 879 SAMPLE Nos. 228640 - 228647 COLLECTED BY W.H.J. - D.P.O. 15006

MAP OR PHOTO REFERENCE NTd. 358 ANALYSED BY ZINC CORPORATION LTD.

Grid Co-ordinate	Sample No.	Soil composition					Soil horizon	Sample			Bedrock			Metal content, p. p. m.										Geological observations
		Rock %	Laterite %	Sand %	Silt %	Clay %		Depth M	Colour (Munsell) Chart No.	pH	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As	
	228640						C	1						57	21	19	22	14	20	580	<1				0-1m Yellow clay soil on weathered carbonaceous siltstone.
	228641						C	3						48	28	17	10	4	10	210	<1				0-0.5m Light brown clay soil. 0.5-1.5m Orange clay soil. 1.5-2m White clay soil. 2-3m Bleached white siltstone
	228642						C	1.5						90	38	24	25	14	10	820	<1				0-1m Bright red clay soil. 1-1.5m Pink soil with frags. of silic dololutite.
	228643						C	3						270	149	17	29	14	10	870	<1				0-0.5m Khaki soil. 0.5-2.5m Yellow clay soil. 2.5-3m Yellow soil with fragments of carbonaceous ferrug. dolomitic siltstone.
	228644						C	1.5						640	360	64	35	21	<10	530	<1				0-0.5m Scree dololutite 0.5-1.5m Light brown clay soil on ferrug. dolomitic siltstone.
	228645						C	1.5						90	28	35	16	14	20	670	<1				0-0.5m Yellow soil 0.5-1m Bright red clay soil 1-1.5m Pink clay soil on dololutite
	228646						C	3						71	28	35	25	21	20	1280	1				0-1m Yellow brown clay soil 1-3m Red brown clay soil on weathered dark brown siltstones
	228647						C	0.5						34	21	15	20	13	20	840	1				0-0.5m Yellow clay soil on well laminated dolomitic siltstone.



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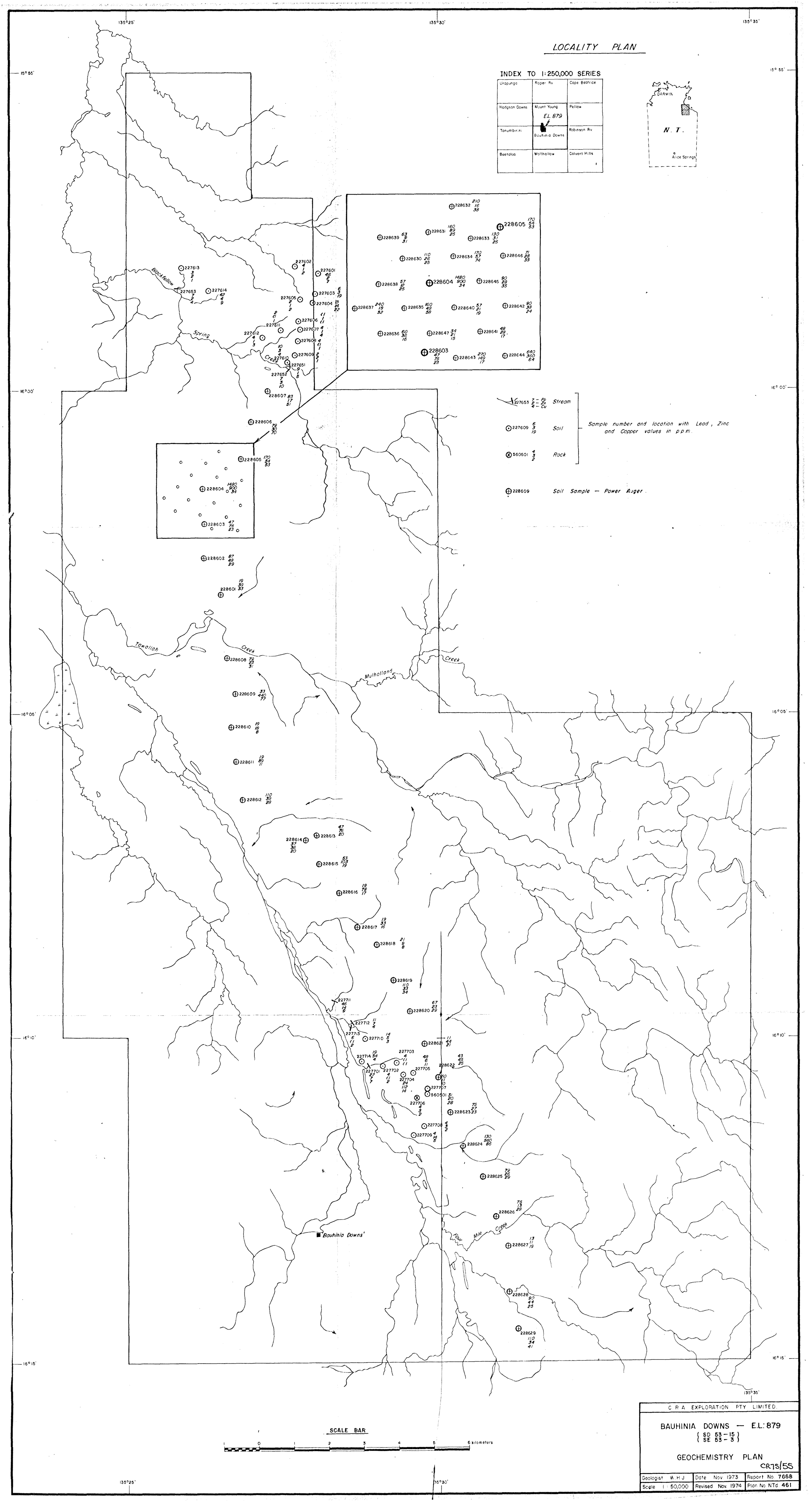
BAUHINIA DOWNS — E.L. 879

(SD 53 – 15)
(SE 53 – 3)

GEOLOGICAL MAP

CR1975-0055

Geologist W.H.J.	Date Nov. 1973	Report No. 7668
Scale 1 : 50,000	Revised: Nov. 1974	Plan No N.T.d. 460



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BAUHINIA DOWNS — E.L. 879

{ SD 53-15 }
{ SE 53-3 }

GEOCHEMISTRY PLAN

CR75/55

Geologist W.H.J.	Date Nov. 1973	Report No. 7668
Scale 1:50,000	Revised Nov. 1974	Plan No. NTG 461