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GEOCHEMICAL AND RADIOMETRIC INVESTIGATIONS, ACACIA AREA, NORTHERN TERRITORY, 1967

by

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CONTENTS

LIST OF PLATES

LIST OF TABLES

GEOCHEMICAL AND RADIOMETRIC INVESTIGATIONS, ACACIA AREA, NORTHERN TERRITORY, 1967

SUMMARY

Reconnaissance geological, geochemical, and radiometric investigations of the Acacia Area, Northern Territory, were carried out in 1967.

The geological succession is a continuation of that in the Rum Jungle East area, and has been folded about north-south trending axes.

Geochemical sampling outlined four areas of anomalous lead values, one zinc and one cobalt anomaly, and two low valued copper anomalies. No significant radiometric anomalies were outlined.

Detailed geochemical investigation of the four lead anomalies is recommended.

INTRODUCTION

This report describes the results of a reconnaissance geological, geochemical, and radiometric investigation of the Acacia area. Selection of the area was influenced by the location of the Coomalie Dolomite/Golden Dyke Formation contact; in the Rum Jungle East area, the Woodcutters L5 Prospect lies within a few hundred feet above this stratigraphic position.

Location and Physiography

The Acacia area (Plate 1) lies to the east of the Stuart Highway, between 35 to 45 miles south of Darwin, and covers an area of approximately 28 square miles.

Access is provided by the sealed Stuart Highway in the south-western corner of the area, by several unsealed tracks in the central and southern parts of the area, and by bulldozed baselines along 00EW and 176E in the northern part of the area.

The eastern and western sides are bounded by prominent arcuate outcrops of Acacia Gap Tongue sandstone; otherwise much of the area is flat, consisting of black soil plains which would be impassable after wet weather. Small rises within the area are related to resistant conglomerate beds of the Crater Formation.

The area is drained by Acacia Creek, which roughly bisects the area, and by Manton River which parallels the south-eastern boundary. Both streams, which run only during the wet season, flow easterly through Acacia Gap to join the Adelaide River.

History

The regional geology of the Acacia area has been described by Malone (1958). The geology is shown on the One-mile Geological Series sheet "Marrakai".

The Frazer Prospect was located by an airborne radiometric survey in 1952 (Wood and McCarthy, 1952) and one costean was bulldozed in 1953 (Crank, 1953). The radioactivity decreased rapidly with depth and no further testing was recommended.

An airborne radiometric survey in 1957 (Livingstone, 1959) indicated thirteen areas of above background radioactivity; these were subsequently investigated by ground parties (Warin, 1959). Ten of the anomalies were found to be associated with laterite, two were located on outcrops of conglomerate within the Crater Formation, and one coincided with the already known Frazer Prospect; no further work was recommended.

Methods

The Acacia area was covered with a grid of east-west traverse lines spaced at 2400-foot intervals. Auger holes were drilled at 400-foot intervals along each traverse, and wherever possible were drilled to identifiable weathered rock. In areas of outcrop, samples were collected with a mattock. All samples were submitted to the Australian Mineral Development Laboratories, Adelaide, for determination of copper, lead, zinc, nickel, and cobalt by atomic absorption spectrophotometer.

Auger holes were probed for radioactivity with a Harwell type 1368A ratemeter; readings were recorded at intervals of one foot.

Geological mapping was based on the nature of auger cuttings, supplemented by any available outcrop. Because of the extent of the area and the wide spacing of the traverse lines, geological, geochemical, and radiometric data were recorded on maps of 1" - 1000' scale.

Drilling commenced on September 21st and finished on November 1st, 1967. Two Gemco drills were employed, one owned and operated by the B.M.R., the other by the Mines Branch, Northern Territory Administration. A total of 14,830 feet was drilled.

STRATIGRAPHY

The geological succession in the Acacia area comprises a series of sediments of Lower Proterozoic Age, in part covered by a mantle of Cainozoic ferruginous detritus. The following units (in order of increasing age) were recorded (Plate 2):

Superficial Deposits

Acacia Gap Tongue

Golden Dyke Formation

Coomalie Dolomite

Crater Formation

The above units are the same as encountered in the Rum Jungle East area, and have been displaced four miles to the north-east from Rum Jungle East by the Giant's Reef Fault. They have previously been described by Dodson and Shatwell (1965), Shatwell (1966), and Semple (1968).

Crater Formation

The Crater Formation occupies the lower central portion of the Acacia Area between 120N - 24S and 44E - 72E as the core of an anticline. Quartz pebble conglomerate and fine quartz conglomerate are the dominant rock types.

Coomalie Dolomite

The Coomalie Dolomite occupies most of the central position of the Acacia area and is folded around the core of Crater Formation rocks. The Dolomite boundaries converge in the northern part of the area, indicating a northerly plunge for the anticline.

The only outcrops consist of fine grained quartzite; the non-outcropping areas are marked by a mantle of deep, well sorted quartz sand. Billabongs, assumed to be sink holes, are numerous.

On the western side, the Coomalie Dolomite is separated from the shales and schists of the Golden Dyke Formation by a transition zone of fine-grained dark-grey to black calcilutite. This contact is gradational in places; the transition zone does not occur on the eastern side of the Dolomite.

Due to repitition on a subsidiary anticlinal fold, a small inlier of Coomalie Dolomite occurs between 240N - 144N - and 20E - 40E.

Golden Dyke Formation

Rocks of the Golden Dyke Formation occurs on the eastern and western flanks of the main anticline. Only the lowermost beds are present in the area mapped; these are brown to purple schists, which pass upwards to black and brown siliceous slate and shale.

Zones of amphibolite are common within this formation.

Minor amounts of sandstone, lithologically identical to the Acacia Gap Tongue, otcrop in the far north of the area.

Acacia Gap Tongue

The Acacia Gap Tongue occurs as an arenaceous facies within the Golden Dyke Formation, and flanks both the eastern and western margins of the Acacia area.

Superficial Deposits

Undifferentiated Cainozoic residual and ferruginous sands and laterite cover parts of the southern and eastern portions of the area.

STRUCTURE

No detailed structural work was possible during the survey; the following interpretations are based largely on the observed trends of the geological boundaries.

The major structures are simple folds about north-south trending axes. The major anticline brings to the surface rocks of the Crater Formation and Coomalie Dolomite, and occupies the entire central portion of the Acacia area. The plunge of this anticline is to the north.

A conjugate syncline occurs in black siliceous slates of the Golden Dyke Formation in the north-western portion of the area. Amphibolite bands are also folded about the same axis.

Repetition of the Coomalie Dolomite in the vicinity of the Frazer Prospect is evidence of another anticline which parallels the major anticline.

The north-easterly trend of the Giant's Reef Fault which provides the southern boundary to the Acacia area, defines the major fault direction. Two small faults, which offset part of the eastern boundary of the Coomalie Dolomite, trend sub-parallel to the Giant's Reef Fault.

The Giant's Reef Fault is a tear fault with a horizontal displacement of approximately four miles. It separates the Acacia sequence from that at Rum Jungle East, the Formations in both areas being identical.

GEOCHEMICAL AND RADIOMETRIC RESULTS

The geochemical analyses and radiometric results are tabulated in Appendix 1.

Statistical Analysis

Copper, lead, zinc, nickel, and cobalt values from the auger samples were plotted as cumulative frequency curves on logarithmic probability paper (Plate 4). The purpose of the plots was to attempt a division of the values into anomalous and background populations. Table 1, summarizes the estimated background and threshold values.

TABLE 1

	Background	Threshold
Cu	40 ppm	150 ppm
Pb	25 - 40 "	120 "
Zn	60 "	200 "
Ni	30 - 50 "	100 "
Co	30 - 50 "	100 "

The limits of background and threshold values cannot be accurately deduced because of the presence of more than two populations, but a reasonable estimate can be made.

Geochemical Results

The geochemical contours are shown in Plate 3. The threshold values were used as the first contour level for each element. A summary of anomalies is given in Table 2.

Rocks of the Crater Formation and Coomalie Dolomite are noticeably devoid of anomalous geochemical values, except for nickel and cobalt on traverse 120N and for threshold values of lead, zinc and cobalt between 24N and 48S. At 24S, 28E, a value of 300 ppm lead was recorded; although not highly anomalous, significance can be attached to this result as it lies adjacent to the Coomalie Dolomite calcilutite contact.

Four areas with anomalous lead values were outlined in the Golden Dyke Formation. Because of the large spacing of traverse lines (2,400 feet apart) these anomalies represent only single point values. Nevertheless they may be significant as the lode of the Woodcutters L5 Prospect has a strike length of only 1600 feet and the anomalies to the north of L5 have even smaller lengths.

L1 has a peak value of 1050 ppm at 24N, 4E, and L2 a peak of 710 ppm at 96N, 4W. Both occur in shales. L3 is situated adjacent to the Coomalie Dolomite/Golden Dyke Formation contact and has a peak of 650 ppm at 264N, 84E in black slate. L4 of 440 ppm at 336N, 144E, has not been closed off.

One zinc anomaly, Z1, has a peak of 1000 ppm at 336N, 144E, corresponding to the peak of L4. A second high of 650 ppm zinc occurs at 312N, 152E.

Two low valued copper anomalies are present; C1 has peak of 320 ppm at 96N, 140E in Golden Dyke Formation shales adjacent to amphibolite, and C2 has a peak of 280 ppm at 72N, 00EW and corresponds to lead anomaly L2.

One cobalt anomaly, Co1, has a peak of 420 ppm at 240N, 48E; anomalous copper (220 ppm) and nickel (165 ppm) are associated. The anomaly lies in the Golden Dyke Formation on the eastern limb of the smaller of the two anticlines. At 216N, 8E, anomalous cobalt, (290 ppm), zinc (370 ppm), and nickel (175 ppm) probably represent the same straigraphic horizons as Co1, but on the western limb of this anticline.

Radiometric Results

No significant radiometric values were obtained from the Acacia area. On Plate 3 are marked all values greater than an assumed threshold of 0.015 mR/Hr. At the Frazer Anomaly (168N, 10E) 0.018 mR/Hr was recorded. Between 24S - 72S and 00EW - 40E, values of 0.021 mR/Hr and 0.020 mR/Hr were recorded.

CONCLUSIONS

Four lead anomalies of from four to ten times threshold values were outlined in the Golden Dyke Formation. Copper and zinc anomalies are associated with two of the lead anomalies. In general, results from the transition horizon of calcilutite proved disappointing.

Threshold copper, zinc, nickel and cobalt values were outlined in other parts of the Acacia area.

The radiometric results were most disappointing and few anomalous readings were recorded.

RECOMMENDATIONS

1. The western boundary of the Acacia area should be extended to the Acacia Gap Tongue sandstone ridge, which lies at a distance varying from a few hundred feet to about 6,000 feet from the present boundary at 8W. This would enable the remainder of the Golden Dyke Formation section to be drilled. Extension of the existing Authority to Prospect would be necessary. Additional surveying of about 46,000 feet on traverse lines from 48N to 312N and the drilling of about 120 holes at 400-foot intervals on the extended traverses would be involved. This would entail 2500 feet of auger drilling.

2. The individual lead anomalies L1 - L4 should be outlined in detail by follow-up drilling on traverses 400 feet apart. Initially, it is suggested that additional holes on a spacing of 100 feet be drilled on the existing traverses in the immediate vicinity of these anomalies, and on additional traverses to be put in 400 feet north and south of the

existing traverses. If the results of this work confirm the anomalies, the following supplementary grids are proposed:

(a) 120N - 00NS, 8W - 20E, 25 traverses each of 2800 feet, involving 70,000 feet of surveying and 350 holes at 200-foot intervals; plus redrilling of existing traverses, 90 holes.

(b) 00NS - 48S, 8E - 38E. Ten traverses each of 3000 feet, involving 30,000 feet of surveying and 150 holes; plus 48 holes on existing traverses.

(c) 288N - 240N, 80E - 88E. Ten traverses of 800 feet, involving 8,000 feet of surveying and 40 holes; plus 15 holes on existing traverses.

(d) An additional traverse at 360N, plus gridding between 360N - 288N, 140E - 156E. 15 traverses of 1600 feet, involving 24,000 feet of surveying and 120 holes; plus 27 holes on existing traverses.

Total footage to be drilled on follow-up work would entail about 17,000 feet, about 12 weeks work for one auger drill.

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TABLE 2

SUMMARY OF ANOMALIES

No. Type	Location	Value	Association	Remarks
L1	48N - 00NS 00EW - 8E	1050 ppm at 24N, 4E	465 ppm Zn	In Golden Dyke Formation
L2	120N - 72N 8W - 00EW	710 ppm at 96N, 4W	Anomaly C2	In purple-brown shales of Golden Dyke Formation
L3	288N - 240N 80E - 88E	650 ppm at 264N, 84E	Radiometric value of 0.016 mR/Hr	In black slate, adjacent to Coomalie Dolomite/Golden Dyke Formation contact
L4	336N - 312N 140E - 150E	440 ppm at 336N, 144E	Anomaly Z1 (1000 ppm Zn) Anomalous cobalt	In Golden Dyke Formation. Anomaly not closed off
Z1	336N - 288N 140E - 154E	1000 ppm at 336N, 144E 650 ppm at 312N, 152E	Anomaly L4 Anomalous cobalt and nickel	
C1	120N - 72N, 140E	320 ppm at 96N, 140E		Only twice threshold
C2	120N - 48N 4W - 4E	280 ppm at 72N, 00EW	Anomaly L2 Anomalous zinc	
Co1	288N - 216N 45N - 55E	420 ppm at 240N, 48E	Anomalous copper, nickel and radiometric of 0.016 mR/Hr.	

APPENDIX 1

GEOCHEMICAL DATA

Geochemical analyses of samples from the Acacia area traverses are listed by co-ordinate position and sample number. Samples were analysed at Australian Mineral Development Laboratories by Atomic Absorption Spectrophotometer and all results are in parts per million. A minus sign (-) in front of a number means "less than".

Mattock samples taken from outcrop on sub-outcrop are marked as such. All others are bottom hole auger samples with depth shown.

Auger holes were probed (Harwell 1368A ratemeter) for radioactivity, the value shown is the maximum for each hole.

Sample No.	Co-ordinate position		Cu	Pb	Zn	Co	Ni	Radioactivity (mR/Hr)	Sample depth (feet)
67124000	120S	18E	30	30	15	15	20	008	5
1		20E	150	30	65	20	50	011	23
2		24E	60	15	70	30	60	011	23
3		28E	60	15	20	180	35	Mattock sample	
4		32E	95	10	80	35	25	005	17
5		36E	160	10	120	75	60	005	23
6		40E	85	10	55	35	35	006	17
7		44E	40	10	90	40	30	006	17
8		48E	45	15	25	15	35	006	23
9		52E	40	10	55	20	60	008	11
10		56E	100	10	70	40	35	007	17
1		60E	100	10	110	40	35	009	17
2		64E	65	15	85	40	20	008	23
3		68E	40	10	15	20		007	13
67124014		72E	50	15	75	30	65	009	23
67124015	96S	72E	60	15	60	40	80	010	23
6		68E	65	15	95	45	50	010	23
7		64E	70	15	160	35	130	008	23
8		60E	55	20	90	20	55	010	23
9		56E	30	15	40	20	50	013	23
20		52E	15	15	30	20	35	010	17
1		48E	110	10	90	40	55	007	23
2		44E	150	15	210	65	95	009	23
3		40E	100	15	120	70	160	007	23
4		36E	65	10	50	50	60	011	23
5		32E	30	15	20	-5	15	011	23
6		28E	60	15	70	20	70	013	23
7		24E	45	15	40	60	50	005	5
8	72S	16E	55	15	40	20	65	021	23
9		20E	60	20	95	45	70	011	23
30		24E	80	25	65	20	50	011	23
1		28E	20	20	10	5	10	011	18
2		32E	25	15	10	-5	10	008	23
3		36E	40	40	30	10	25	010	14
4		40E	20	10	10	-5	15	007	23
5		44E	15	10	10	-5	5	006	11

Sample No.	Co-ordinate position	Cu	Pb	Zn	Co	Ni	Radio-activity (mR/Hr)	Sample depth (feet)
67124036	72S 48E	15	25	10	10	15	-	5
7	52E	20	5	10	5	10	008	11
8	56E	20	15	10	5	10	007	11
9	60E	85	10	85	170	50	011	23
40	64E	55	10	50	20	65	012	23
1	68E	60	5	50	30	35	005	23
2	72E	55	20	25	40	40	008	5
3	48S 72E	15	20	15	-5	15	-	16
4	68E	65	20	65	5	50	008	6
5	64E	20	70	15	25	25	008	11
6	60E	20	20	10	5	10	007	11
7	56E	20	15	10	-5	15	007	11
8	52E	15	20	10	-5	15	008	23
9	48E	15	15	10	-5	15	007	17
50	44E	15	15	5	-5	10	006	11
1	40E	20	20	15	5	25	009	17
2	36E	40	40	30	5	35	012	23
3	32E	15	15	10	5	15	010	23
4	28E	20	20	10	5	10	009	17
5	26E	25	110	50	10	25	014	23
6	24E	50	15	50	65	60	013	29
7	22E	35	20	70	10	65	020	23
8	20E	140	40	110	150	130	013	17
9	16E	70	20	75	30	60	014	23
60	12E	150	15	85	50	55	012	23
1	8E	50	45	45	40	60	020	23
2	4E	50	15	45	10	55	016	23
3	00EW	55	15	35	-5	25	015	23
4	24S 00EW	20	20	20	15	10	008	23
5	4E	25	35	35	100	30	007	6
6	8E	45	170	90	60	60	008	5
7	12E	170	10	80	60	220	010	23
8	16E	50	60	140	30	60	015	23
9	20E	25	20	90	35	60	015	23
70	24E	45	25	85	30	70	018	23
1	28E	15	300	30	-5	5	008	17
2	32E	-5	5	30	5	5	006	11
3	36E	5	10	40	15	10	009	23
4	40E	110	20	270	60	100	010	23
5	44E	30	35	95	40	50	008	9
6	48E	30	40	65	160	60	006	4
7	52E	55	70	120	85	50	011	15
8	56E	20	25	30	20	15	012	20
9	60E	35	35	55	60	40	010	5
80	64E	25	25	50	40	35	008	6
1	68E	30	5	15	5	5	010	8
2	72E	50	70	45	15	25	012	17
3	76E	20	15	55	20	30	011	17
4	00NS 8W	25	20	25	30	20	006	6
5	4W	50	15	90	40	70	009	23
6	00EW	170	10	100	90	70	008	23
7	4E	25	10	45	30	30	007	5
8	8E	20	15	40	20	35	008	11

Sample No.	Co-ordinate position		Cu	Pb	Zn	Co	Ni	Radio-activity (mR/Hr)	Sample depth (feet)
67124089	00NS	12E	20	20	45	30	35	008	5
90		16E	25	15	35	25	25	006	14
1		18E	25	10	15	20	20	007	11
2		20E	35	20	25	25	25	008	11
3		24E	65	90	95	60	80	010	23
4		28E	20	20	15	10	5	007	11
5		32E	20	30	15	10	5	007	11
6		36E	25	15	20	30	50	008	18
7		40E	5	5	25	5	5	010	23
8		44E	10	10	15	15	20	010	11
9		48E	35	10	375	140	75	007	11
100		52E	15	35	15	10	5	004	5
1		56E	15	75	15	10	10	010	11
2		60E	20	90	15	20	20	006	6
3		64E	30	140	25	10	5	012	17
4		68E	20	50	55	10	15	010	7
5		72E	10	25	15	10	5	007	11
6		76E	50	45	55	20	20	006	10
7		80E	-5	25	15	5	5	006	11
8		84E	15	20	15	10	5	006	11
9		86E	15	10	10	5	5	007	17
10		88E	15	25	15	15	15	008	11
1		90E	-5	20	15	10	15	006	17
12		92E	15	15	25	20	15	008	23
3		94E	25	35	50	25	30	011	23
4		96E	30	30	40	25	30	011	20
5		100E	35	15	40	30	25	009	17
6		104E	25	25	25	25	25	009	17
7	24N	124E	20	20	25	20	20	007	17
8		120E	-5	5	10	-5	-5	008	23
9		118E	10	5	10	-5	5	007	17
20		116E	10	10	10	15	15	007	17
1		112E	25	20	15	15	10	005	11
2		108E	35	40	20	35	20	006	11
3		104E	5	15	10	20	15	006	11
4		100E	20	20	15	20	15	006	11
5		96E	15	25	15	5	5	007	17
6		92E	25	35	20	20	20	006	11
7		88E	5	35	10	5	5	009	11
8		84E	15	25	20	20	20	006	11
9		80E	10	25	15	15	5	006	11
30		76E	10	20	15	10	10	006	6
1		72E	15	30	10	5	-5	011	17
2		68E	25	120	40	20	20	007	11
3		64E	15	30	15	15	15	007	11
4		60E	-5	15	10	5	5	008	17
5		56E	10	35	15	20	10	009	8
6		52E	15	90	105	15	15	017	17
7		48E	75	10	90	60	85	007	23
8		44E	10	15	25	15	10	009	23
9		40E	10	35	15	15	10	008	11
40		36E	15	45	25	25	20	010	17
1		32E	15	35	10	15	20	009	11

Sample No.	Co-ordinate position	Cu	Pb	Zn	Co	Ni	Radio-activity (mR/Hr)	Sample depth (feet)
67124142	24N 28E	45	5	30	40	55	010	17
3	24E	25	20	20	15	25	014	17
4	20E	65	20	45	60	75	013	17
5	16E	15	30	10	5	5	014	17
6	12E	90	30	50	15	35	010	17
7	8E	10	15	15	15	5	009	17
8	4E	45	1050	465	30	70	010	17
9	00EW	50	100	235	40	90	010	11
50	4W	40	20	45	25	60	011	17
51	8W	40	20	40	25	25	006	5
2	48N · 8W	15	20	105	65	10	007	23
3	4W	15	25	25	25	20	006	5
4	00EW	20	55	150	25	35	010	17
5	4E	130	20	45	20	65	009	23
6	8E	40	40	70	60	35	013	11
7	12E	10	10	50	15	10	008	23
8	16E	15	5	15	15	15	008	23
9	20E	70	40	230	70	130	007	23
60	24E	15	20	20	15	5	008	17
1	28E	70	15	70	65	50	010	23
2	32E	110	10	250	220	70	010	23
3	36E	15	25	10	20	20	009	23
4	40E	15	20	10	15	10	009	11
5	44E	10	10	10	15	5	014	17
6	48E	10	60	10	10	-5	010	17
7	52E	10	5	10	15	5	012	17
8	56E	10	85	20	5	5	009	23
9	60E	10	10	10	5	5	009	17
70	64E	15	5	30	15	10	006	5
1	68E	5	5	10	5	5	008	17
2	72E	25	15	80	10	10	007	11
3	76E	25	20	55	15	20	007	11
4	80E	15	35	10	15	15	008	11
5	84E	100	20	130	40	70	007	17
6	88E	30	15	15	20	30	007	11
7	92E	25	15	10	20	25	008	11
8	96E	20	20	10	20	25	007	11
9	100E	15	10	10	20	20	007	11
80	104E	15	15	10	20	20	007	11
1	108E	5	10	10	15	5	008	17
2	112E	5	10	10	15	5	007	11
3	116E	10	15	15	15	15	006	11
4	120E	130	20	175	50	150	009	23
5	124E	50	25	120	50	85	012	23
6	128E	25	25	35	30	40	007	23
7	132E	45	35	60	60	60	009	23
8	136E	25	20	20	20	25	009	9
9	140E	35	30	25	50	35	006	5
90	72N 148E	90	15	35	50	35	008	23
1	144E	45	20	20	35	35	015	17
2	140E	60	15	15	15	15	015	17
3	136E	30	20	25	20	20	010	23
4	132E	35	20	25	20	15	008	17

Sample No.	Co-ordinate position	Cu	Pb	Zn	Co	Ni	Radio-activity (mR/Hr)	Sample depth (feet)
67124195	72N 128E	155	25	105	60	200	008	23
6	124E	60	15	25	20	20	010	23
7	120E	10	15	5	-5	5	008	23
8	116E	25	25	10	15	10	007	17
9	112E	15	10	10	10	5	007	17
200	108E	5	10	10	10	5	006	11
1	104E	110	40	50	150	50	007	11
2	100E	20	10	10	10	5	008	17
3	96E	30	20	10	20	10	007	11
4	92E	25	20	10	15	15	006	11
5	88E	20	15	10	15	10	008	11
6	84E	20	15	10	15	15	008	11
7	80E	10	15	10	5	15	009	17
8	76E	40	30	65	15	40	007	11
9	72E	5	20	10	-5	10	010	17
10	68E	5	15	5	5	5	009	18
1	64E	5	45	5	5	15	009	17
3	56E	5	5	5	5	5	Mattock sample	
4	52E	5	10	5	5	5	012	17
5	48E	10	35	80	5	5	012	11
6	44E	5	-5	5	5	-5	011	17
7	40E	10	20	10	10	5	006	17
8	36E	45	5	40	35	60	010	17
9	32E	105	15	90	50	100	010	23
220	28E	20	5	20	15	10	009	17
1	24E	25	20	40	10	65	013	23
2	20E	45	25	40	10	35	013	7
3	16E	55	25	335	35	65	011	23
4	12E	60	60	10	10	5	013	17
5	8E	110	10	50	25	90	009	12
6	4E	140	15	325	80	95	007	23
7	00EW	280	10	205	100	95	009	23
8	4E	90	25	100	20	50	009	17
9	8W	50	35	60	20	25	009	23
30	96N 8W	80	15	185	20	75	009	17
1	4W	80	710	140	20	55	010	7
2	00EW	180	70	35	30	25	007	6
3	4E	80	15	45	20	50	010	17
4	8E	25	15	20	10	15	011	17
5	12E	55	25	100	15	35	013	17
6	16E	55	30	60	15	30	016	17
7	20E	45	40	180	50	105	013	23
8	24E	70	20	100	35	70	012	17
9	28E	65	15	55	30	55	010	23
40	32E	30	10	20	15	20	012	17
1	36E	50	10	55	35	40	010	23
2	40E	30	5	65	35	60	010	23
3	44E	20	15	15	35	15	011	23
4	48E	20	20	50	15	20	009	17
5	52E	5	5	10	5	5	012	17
6	56E	10	15	15	5	5	012	12
7	60E	15	35	10	10	15	012	17
8	64E	10	35	10	5	5	012	23

Sample No.	Co-ordinate position		Cu	Pb	Zn	Co	Ni	Radio-activity (mR/Hr)	Sample depth (feet)
67124249	96N	68E	15	25	20	5	5	009	17
50		72E	25	15	25	10	5	011	8
1		76E	45	35	60	35	25	010	11
2		80E	15	25	10	10	15	008	17
3		84E	30	20	20	15	35	007	11
4		88E	30	30	10	40	30	010	23
5		92E	25	40	10	15	25	007	11
6		96E	20	10	10	10	20	007	11
7		100E	25	35	10	30	25	009	17
8		104E	25	25	10	15	30	010	11
9		108E	20	65	10	10	15	008	23
60		112E	20	25	10	35	30	-	11
1		116E	45	40	20	35	30	010	17
2		120E	40	20	20	50	35	008	17
3		124E	10	10	10	5	5	007	17
4		128E	35	15	10	20	20	011	17
5		132E	40	20	35	35	40	007	23
6		136E	50	35	25	70	60	009	17
7		140E	320	10	195	80	80	009	23
8		144E	30	20	40	35	30	009	23
9		148E	20	15	30	35	40	011	23
70		152E	20	15	25	35	30	010	23
1		156E	40	10	30	20	25	012	23
2		160E	40	30	40	40	35	009	23
3	120N	196E	40	15	50	35	40	011	23
4		192E	30	15	25	40	25	009	14
5		188E	145	20	85	75	60	013	23
6		184E	50	15	80	40	50	009	23
7		180E	40	30	35	35	30	009	23
8		176E	75	30	115	50	85	010	23
9		172E	55	20	95	50	85	017	23
80		168E	55	15	55	30	55	020	23
1		164E	45	25	160	40	65	008	23
2		160E	100	30	90	35	65	017	23
3		156E	55	15	65	25	55	013	23
4		152E	30	20	25	35	20	011	23
5		148E	20	5	20	35	15	007	17
6		144E	20	10	25	25	10	007	23
7		140E	30	30	20	55	30	008	23
8		136E	35	25	20	60	35	006	23
9		132E	60	45	45	40	55	007	23
90		128E	100	15	45	55	125	009	23
1		124E	65	15	95	120	120	012	23
2		120E	20	25	25	10	10	006	23
3		116E	25	15	25	20	15	005	23
4		112E	55	45	40	40	25	006	23
5		108E	125	110	245	185	175	006	17
6		104E	80	10	20	15	30	010	23
7		100E	20	10	10	20	10	008	11
8		96E	40	50	215	160	240	006	17
9		92E	85	70	85	100	140	007	11
300		88E	25	15	15	30	20	006	17
1		84E	25	20	15	30	30	005	11

Sample No.	Co-ordinate position	Cu	Pb	Zn	Co	Ni	Radio-activity (mR/Hr)	Sample depth (feet)
67124302	120N 80E	10	10	10	10	25	006	17
3	76E	15	15	10	15	5	007	11
4	72E	20	15	20	15	5	008	17
5	68E	15	35	10	20	10	006	7
6	64E	10	10	10	15	10	008	11
7	60E	20	20	15	35	25	006	11
8	56E	10	-5	10	20	5	006	17
9	52E	45	5	115	60	100	009	23
10	48E	45	15	130	50	75	008	23
11	44E	55	10	60	70	35	007	23
2	40E	60	20	115	70	75	008	23
3	36E	45	-5	100	65	65	008	23
4	32E	75	10	105	40	90	010	23
5	28E	65	15	120	30	75	010	23
6	24E	40	20	45	15	20	011	18
7	20E	50	15	35	15	20	013	23
8	16E	40	45	30	20	25	011	6
9	12E	60	30	50	15	25	008	17
20	8E	55	35	80	15	40	012	23
1	4E	10	10	15	10	5	009	17
2	00EW	25	20	25	15	10	014	23
3	4W	85	25	65	25	45	010	23
4	8W	105	15	135	70	65	010	23
5	144N 8W	40	25	365	45	110	008	23
6	4W	80	10	140	20	40	011	23
7	00EW	100	25	60	35	75	015	23
8	4E	55	10	50	25	40	012	23
9	8E	10	20	10	-5	5	010	23
30	12E	10	5	10	10	5	010	17
1	16E	50	45	50	50	50	012	15
2	20E	20	10	20	10	15	013	23
3	24E	75	40	45	20	25	014	23
4	28E	60	20	170	80	155	013	23
5	32E	70	5	140	25	100	008	23
6	36E	40	20	65	35	60	009	23
7	40E	25	-5	60	35	45	008	23
8	44E	55	10	80	40	70	008	23
9	48E	50	5	70	40	70	008	23
40	52E	95	-5	60	50	100	009	23
1	56E	60	5	90	70	85	010	23
2	60E	30	15	20	30	20	009	17
3	64E	15	15	15	10	10	008	23
4	68E	10	20	5	10	5	008	17
5	72E	15	10	35	10	10	009	23
6	76E	20	20	10	20	10	009	23
7	80E	35	15	15	35	35	009	17
8	84E	45	10	15	85	55	007	17
9	88E	45	15	15	85	60	008	11
50	92E	20	5	15	20	15	008	23
1	96E	20	15	30	20	15	008	17
2	100E	120	10	25	60	25	007	23
3	104E	110	5	115	85	65	007	17
4	108E	60	15	30	20	15	008	23

Sample No.	Co-ordinate position		Cu	Pb	Zn	Co	Ni	Radio-activity (mR/Hr)	Sample depth (feet)
67124355	144N	112E	20	20	35	20	15	009	23
6		116E	40	15	30	80	40	010	23
7		120E	45	10	65	35	90	008	23
8		124E	40	5	30	25	60	012	12
9		128E	45	20	115	25	90	012	23
60		132E	80	10	45	35	75	017	23
1		136E	35	15	40	30	50	017	23
2		140E	40	5	35	35	20	011	23
3		144E	30	10	110	55	15	012	23
4		148E	35	10	40	30	40	010	23
5		152E	50	10	25	70	35	008	13
6		156E	35	20	30	25	25	008	23
7		160E	40	20	40	40	30	008	23
8		164E	30	10	25	20	20	007	23
9		168E	40	15	40	40	35	007	23
70		172E	25	15	25	30	20	008	23
1		176E	35	20	35	60	30	007	23
2		180E	25	10	20	20	15	008	23
3		184E	40	25	45	55	35	010	23
4		188E	40	15	25	80	35	007	8
5		192E	25	10	25	25	20	008	23
6		196E	45	35	35	80	40	010	11
7	168N	188E	30	20	30	45	35	006	7
8		184E	45	30	35	55	35	008	12
9		180E	35	10	60	30	65	016	23
80		176E	70	25	130	30	35	012	23
1		172E	50	60	140	50	85	011	23
2		168E	45	5	115	80	40	005	23
3		164E	55	10	185	80	60	006	23
4		160E	60	15	50	50	35	008	23
5		156E	60	10	300	105	80	007	23
6		152E	70	15	175	80	70	007	23
7		148E	50	15	25	30	25	006	6
8		144E	45	10	80	35	60	006	23
9		140E	55	10	215	70	55	007	23
90		136E	15	10	15	5	10	005	23
1		132E	20	5	25	10	5	007	23
2		128E	15	5	20	15	10	006	23
3		124E	15	15	15	10	10	006	17
4		120E	15	10	10	-5	5	008	23
5		116E	125	15	105	80	150	008	17
6		112E	105	10	235	80	90	006	23
7		108E	10	5	10	-5	5	005	11
8		104E	15	15	10	5	10	006	19
9		100E	20	5	10	10	10	007	11
400		96E	20	15	30	15	10	006	23
1		92E	10	10	10	15	20	006	17
2		88E	10	20	10	25	15	005	23
3		84E	10	15	15	5	15	005	11
4		80E	10	10	10	-5	10	007	23
5		76E	5	25	10	-5	10	005	17
6		72E	10	25	15	-5	10	006	17
7		68E	30	20	25	35	40	006	11

Sample No.	Co-ordinate position		Cu	Pb	Zn	Co	Ni	Radio-activity (mR/Hr)	Sample depth (feet)
67124408	168N	64E	10	5	25	5	20	006	17
9		60E	50	10	125	30	70	007	23
10		56E	90	90	160	10	35	006	11
1		52E	40	5	60	15	45	008	23
2		48E	40	-5	80	30	90	006	23
3		44E	25	70	360	30	130	007	23
4		40E	105	10	130	65	140	008	23
5		36E	45	15	30	20	55	012	23
6		32E	55	10	105	55	85	010	23
7		28E	55	15	70	25	65	010	23
8		24E	45	40	95	20	65	010	23
9		20E	50	25	120	35	85	009	23
20		16E	80	60	100	75	85	010	17
1		12E	40	20	35	35	70	010	23
2		10E	10	25	10	5	15	018	23
3		8E	120	10	90	20	90	017	23
4		4E	50	20	60	35	65	013	23
5		00EW	95	15	160	40	85	012	23
6		4E	55	20	130	55	90	007	23
7		8W	20	5	180	80	100	007	22
8	192N	8W	55	35	70	55	50	006	20
9		4W	250	10	85	65	65	006	23
30		00EW	60	45	180	35	70	006	23
1		4E	80	5	100	60	45	006	17
2		8E	90	5	100	60	55	007	23
3		12E	40	30	40	35	45	006	12
4		16E	20	10	15	10	20	009	23
5		20E	20	20	25	25	35	007	23
6		24E	30	10	60	55	110	007	23
7		28E	40	40	30	80	45	008	12
8		32E	30	30	35	90	40	008	23
9		36E	60	50	70	70	60	008	19
40		40E	20	20	45	25	30	007	23
1		44E	10	10	5	5	5	010	23
2		48E	25	25	35	15	25	009	23
3		52E	45	25	240	90	100	006	23
4		56E	40	50	15	75	55	006	6
5		60E	5	15	5	5	5	006	23
6		64E	130	70	150	95	140	007	23
7		68E	50	10	95	55	100	005	23
8		72E	75	70	100	70	90	007	11
9		76E	140	25	140	70	100	007	23
50		80E	40	35	130	75	80	007	23
1		84E	45	20	80	75	100	007	23
2		88E	30	25	25	45	35	006	23
3		92E	25	20	20	30	30	007	17
4		96E	30	25	80	70	80	006	23
5		100E	25	20	35	25	35	007	17
6		104E	20	50	40	5	20	006	23
7		108E	70	30	70	50	85	006	17
8		112E	40	20	50	25	60	007	17
9		116E	50	15	55	25	65	009	23
60		120E	50	40	30	60	50	006	17

Sample No.	Co-ordinate position		Cu	Pb	Zn	Co	Ni	Radio-activity (mR/Hr)	Sample depth (feet)
67124461	192N	124E	75	35	40	70	65	007	23
2		128E	35	15	30	10	30	007	23
3		132E	35	15	25	30	35	007	23
4		136E	55	35	55	45	60	006	23
5		140E	65	20	100	55	55	006	23
6		144E	45	25	30	35	40	006	23
7		148E	20	15	30	30	35	005	23
8		152E	40	20	110	25	45	005	23
9		156E	35	5	100	55	30	007	23
70		160E	70	15	100	40	30	006	23
1		164E	50	20	35	25	35	005	23
2		168E	50	30	35	35	45	007	23
3		172E	40	20	30	55	40	007	23
4		176E	55	25	45	65	60	007	23
5		180E	60	20	35	55	35	005	23
6		184E	75	20	35	40	35	006	23
7		188E	30	10	15	35	20	005	19
8		192E	25	20	15	15	25	005	8
9		196E	30	25	55	35	50	004	5
80	216N	196E	20	25	25	10	25	004	10
1		192E	25	30	25	25	30	005	11
2		188E	15	10	10	10	15	Mattock sample	
3		184E	30	30	25	20	25	005	6
4		180E	40	20	45	15	30	005	23
5		176E	80	30	75	55	45	005	12
6		172E	90	5	80	40	50	005	23
7		168E	10	15	110	25	55	006	23
8		164E	45	20	170	20	70	006	23
9		160E	70	20	90	45	35	007	23
90		156E	45	5	80	45	40	007	22
1		152E	100	20	340	20	140	007	23
2		148E	45	20	60	15	40	006	23
3		144E	100	10	80	60	60	-	23
4		140E	40	15	65	15	45	010	23
5		136E	45	30	90	20	45	008	23
6		132E	50	35	170	45	35	006	23
7		128E	110	10	55	45	55	007	23
8		124E	75	5	130	45	80	004	23
9		120E	35	10	45	10	45	011	23
500		116E	35	15	30	30	45	010	22
1		112E	35	15	35	20	50	006	23
2		108E	70	20	50	25	85	007	23
3		104E	10	10	5	-5	10	007	23
4		100E	5	15	5	5	10	005	17
5		96E	10	60	5	-5	5	008	23
6		92E	10	30	10	-5	10	005	11
7		88E	35	25	30	15	20	007	23
8		84E	20	45	15	5	20	006	5
9		80E	50	5	65	20	55	008	23
10		76E	30	15	50	25	65	011	23
1		72E	75	15	60	30	45	008	23
2		68E	55	10	100	30	65	007	17
3		64E	70	70	85	25	55	008	23

Sample No.	Co-ordinate position		Cu	Pb	Zn	Co	Ni	Radio-activity (mR/Hr)	Sample depth (feet)
67124514	216N	60E	65	40	50	60	55	008	17
5		56E	35	30	45	15	40	007	23
6		52E	60	30	75	45	90	010	17
7		48E	5	15	5	-5	-5	007	13
8		44E	70	15	115	55	65	007	17
9		40E	20	30	15	5	20	006	23
20		36E	10	15	10	-5	5	005	23
1		32E	10	20	10	5	5	005	23
2		28E	5	5	5	-5	5	005	23
3		24E	10	10	5	-5	5	005	17
4		20E	-5	10	-5	-5	5	006	23
5		16E	90	20	140	75	135	006	23
6		12E	55	15	70	40	80	006	23
7		8E	85	110	370	290	175	006	23
8		4E	45	55	60	15	35	006	23
9		00EW	5	5	-5	-5	5	006	23
30		0W	-5	10	-5	-5	5	006	23
1		8W	5	10	5	5	5	005	23
2	240W	8W	70	10	110	25	65	005	23
3		4W	10	10	-5	5	10	007	23
4		00EW	-5	10	5	-5	5	006	23
5		4E	15	20	20	10	15	005	23
6		8E	-5	-5	-5	-5	5	006	23
7		12E	10	15	30	10	10	006	23
8		16E	5	15	10	10	5	006	17
9		20E	25	15	150	20	75	006	23
40		24E	85	35	100	25	65	006	23
1		28E	30	25	25	10	45	006	23
2		34E	25	25	20	5	15	006	23
3		38E	120	25	65	45	105	006	23
4		40E	90	15	30	10	25	008	23
5		44E	60	25	55	30	50	008	23
6		48E	220	10	150	420	165	016	23
7		52E	55	25	65	35	65	012	23
8		56E	60	95	110	85	115	011	23
9		60E	65	30	40	15	65	014	23
50		64E	110	80	110	30	85	011	23
1		68E	50	25	50	25	55	012	23
2		72E	135	20	195	75	135	012	23
3		76E	40	15	60	35	55	015	23
4		80E	40	20	125	40	55	011	23
5		84E	20	25	10	5	20	006	17
6		88E	25	100	10	15	30	008	23
7		92E	25	30	10	5	25	006	17
8		96E	20	25	5	5	15	006	15
9		100E	105	15	45	20	65	012	20
60		104E	100	30	65	25	55	009	23
1		108E	40	35	20	5	20	012	23
2		112E	65	20	125	75	90	016	23
3		116E	45	35	35	35	40	012	17
4		120E	60	25	90	20	65	008	23
5		124E	60	35	25	20	40	009	23
6		128E	95	20	70	55	80	008	23

Sample No.	Co-ordinate position		Cu	Pb	Zn	Co	Ni	Radio-activity (mR/Hr)	Sample depth (feet)
67124567	240N	132E	100	20	75	40	55	012	23
8		136E	50	25	35	25	70	017	23
9		140E	50	30	50	20	50	019	23
70		144E	45	30	70	30	55	012	23
1		148E	60	30	65	35	40	005	23
2		152E	85	15	85	50	55	004	23
3		156E	105	20	80	35	30	004	23
4		160E	75	10	125	30	35	005	23
5		164E	20	25	65	20	35	005	23
6		168E	70	20	230	60	55	005	23
7		172E	10	10	10	-5	10	Mattock sample	
8		176E	35	5	75	15	70	005	23
9		180E	40	30	85	30	80	005	23
80		184E	170	5	145	50	40	004	23
1		188E	15	10	160	35	35	004	23
2		192E	35	25	30	15	20	005	23
3	264N	192E	30	35	30	35	30	Mattock sample	
4		188E	175	10	115	45	50	006	23
5		184E	110	5	120	50	55	004	23
6		180E	195	5	140	50	40	003	17
7		176E	20	15	115	20	60	006	23
8		172E	85	10	75	40	55	004	23
9		168E	45	5	150	55	65	004	23
90		164E	15	25	10	-5	20	004	20
1		160E	40	30	35	15	45	006	20
2		156E	25	25	10	5	15	007	23
3		152E	90	25	65	15	50	009	23
4		148E	60	10	35	15	35	011	23
5		144E	35	10	25	5	30	008	17
6		140E	35	10	35	10	50	009	23
7		136E	25	10	45	10	30	009	23
8		132E	65	50	70	15	50	009	23
9		128E	60	25	50	20	40	009	17
600		124E	95	10	195	95	90	004	23
1		120E	30	20	20	5	10	004	5
2		116E	95	10	75	20	55	008	23
3		112E	40	10	75	10	55	008	23
4		108E	80	15	20	-5	15	007	23
5		104E	45	10	50	10	40	012	23
6		100E	75	25	50	110	50	011	17
7		96E	75	25	50	20	50	008	23
8		92E	50	40	20	40	55	010	14
9		88E	60	90	60	65	75	014	23
10		84E	60	650	110	20	110	016	17
1		80E	60	30	90	15	30	011	23
2		76E	40	50	25	20	30	011	11
3		72E	90	45	180	55	100	012	17
4		68E	175	35	130	55	100	013	17
5		64E	115	20	90	65	30	608	23
6		60E	90	25	110	50	35	007	17
7		56E	95	20	60	75	55	006	17
8		52E	100	40	70	130	120	005	17
9		48E	100	20	70	20	39	006	23

Sample No.	Co-ordinate position		Cu	Pb	Zn	Co	Ni	Radio-activity (mR/Hr)	Sample depth (feet)
67124620	264N	44E	70	25	65	20	50	010	17
1		40E	35	20	40	10	25	005	5
2		36E	60	25	50	10	50	012	17
3		32E	80	30	130	50	50	008	17
4		28E	170	30	240	80	70	012	23
5		24E	65	35	180	40	90	009	23
6		20E	60	25	60	20	60	009	23
7		16E	80	30	120	35	80	009	23
8		12E	50	20	65	30	55	013	23
9		8E	65	15	65	30	50	010	23
30		4E	185	20	80	60	40	012	17
1		00EW	50	40	95	35	70	010	23
2		4W	55	30	50	20	55	010	23
3		8W	20	35	30	10	20	009	12
4	288N	8W	20	30	20	20	15	006	17
5		4W	20	25	40	5	25	006	23
6		00EW	20	25	30	10	10	006	23
7		4E	20	25	110	30	5	006	23
8		8E	30	40	30	40	20	006	12
9		12E	45	35	70	35	90	005	23
40		16E	30	30	20	25	25	005	6
1		20E	185	25	30	20	20	006	23
2		24E	65	25	50	25	50	004	23
3		28E	80	30	80	40	55	005	23
4		32E	110	35	100	55	40	006	17
5		36E	105	30	110	55	40	005	23
6		40E	40	25	30	15	20	003	3
7		44E	40	15	50	20	35	005	11
8		48E	35	25	35	10	30	006	23
9		52E	90	20	70	40	50	005	23
50		56E	145	20	170	50	100	008	23
1		60E	45	30	95	40	60	007	23
2		64E	90	35	90	50	50	007	23
3		68E	55	30	40	20	60	008	23
4		72E	90	35	60	30	35	009	23
5		76E	50	35	120	20	60	012	23
6		80E	55	25	90	65	65	008	23
7		84E	30	20	10	-5	5	008	23
8		88E	20	35	10	5	10	004	23
9		92E	45	45	30	30	35	009	23
60		96E	45	30	40	10	40	010	23
1		100E	40	30	40	15	90	019	23
2		104E	70	25	80	40	25	009	23
3		108E	10	35	80	20	50	005	23
4		112E	35	15	60	10	55	006	23
5		116E	145	15	50	40	35	003	17
6		120E	55	10	80	40	30	004	23
7		124E	40	15	30	10	20	008	23
8		128E	30	10	10	5	10	004	23
9		132E	35	30	20	15	20	004	23
70		136E	20	20	160	40	55	005	17
1		140E	35	20	120	40	50	009	23
2		144E	20	25	35	10	15	005	12

Sample No.	Co-ordinate position		Cu	Pb	Zn	Co	Ni	Radio-activity (mR/Hr)	Sample depth (feet)
67124673	288W	148E	50	35	110	60	15	004	23
4		152E	75	50	130	100	50	007	23
5		156E	110	30	90	40	30	006	17
6		160E	60	25	320	95	110	006	23
7		164E	125	30	250	60	85	004	17
8		168E	55	25	60	50	15	005	11
9		172E	40	35	360	25	90	007	23
80		176E	55	50	310	25	50	009	23
1		180E	180	35	160	60	30	004	23
2		184E	25	50	120	20	35	005	23
3	312N	180E	200	25	100	60	50	004	23
4		176E	40	30	80	20	35	006	23
5		172E	65	90	110	35	20	004	23
6		168E	70	25	80	20	50	008	23
7		164E	100	60	60	30	35	005	10
8		160E	120	30	80	60	60	004	23
9		156E	80	25	80	55	55	003	17
90		152E	50	35	650	40	140	006	21
1		148E	250	35	110	35	35	004	23
2		144E	110	30	95	60	40	003	23
3		140E	40	25	70	15	40	006	23
4		136E	175	25	150	100	80	005	23
5		132E	40	35	70	25	50	004	23
6		128E	100	75	60	25	40	003	7
7		124E	50	30	100	55	75	003	18
8		120E	130	15	60	40	35	005	17
9		116E	130	15	70	45	35	003	17
700		112E	100	20	80	45	40	004	23
1		108E	40	25	79	5	20	004	23
2		104E	40	25	60	10	25	009	23
3		100E	100	15	60	65	50	006	23
4		96E	70	45	60	20	60	008	23
5		92E	110	25	70	30	50	006	23
6		88E	35	20	15	10	20	008	23
7		84E	50	15	25	10	30	009	23
8		80E	200	35	200	100	160	008	9
9		76E	75	25	45	35	50	005	5
10		72E	65	25	65	20	60	009	23
1		68E	45	15	10	35	50	006	17
2		64E	105	30	45	25	25	005	11
3		60E	60	25	60	40	40	008	23
4		56E	75	25	50	45	50	005	17
5		52E	125	25	55	25	40	006	23
6		48E	80	30	180	30	90	007	23
7		44E	50	30	100	20	70	007	23
8		40E	95	25	85	55	35	005	23
9		36E	110	25	40	90	25	004	7
20		32E	100	45	15	40	50	005	11
1		28E	55	30	45	25	60	007	23
2		24E	25	25	15	15	20	005	9
3		20E	40	25	80	25	55	010	23
4		16E	40	15	45	15	40	005	23
5		12E	30	15	25	10	15	006	23

Sample No.	Co-ordinate position	Cu	Pb	Zn	Co	Ni	Radio-activity (mR/Hr)	Sample depth (feet)
67124726	312N 8E	20	30	100	20	10	007	23
7	4E	10	25	60	55	25	010	23
8	00EW	55	30	40	10	25	008	23
9	4W	35	30	30	10	25	008	23
30	8W	75	35	50	20	50	007	23
1	336N 00EW	30	30	30	10	25	003	6
2	4E	20	25	10	10	15	005	11
3	8E	15	15	40	10	10	010	23
4	12E	35	30	15	10	15	007	10
5	16E	35	15	45	10	30	007	23
6	20E	45	30	140	15	90	007	23
7	24E	50	45	45	35	50	007	17
8	28E	15	30	20	10	10	006	23
9	32E	40	30	80	15	35	006	23
40	36E	60	25	85	25	60	008	23
1	40E	25	25	102	20	35	004	23
2	44E	15	30	80	20	19	004	16
3	48E	140	25	130	55	60	003	23
4	52E	10	25	110	50	20	004	23
5	56E	15	30	100	50	15	004	23
6	60E	110	30	75	50	60	004	23
7	64E	155	30	85	50	65	004	23
8	68E	70	55	45	15	60	006	23
9	72E	55	35	30	10	30	007	23
50	76E	80	30	65	35	50	003	23
1	80E	100	30	75	35	35	003	19
2	84E	130	35	160	110	90	003	23
3	88E	85	30	65	55	50	003	23
4	92E	100	30	55	35	30	003	23
5	96E	75	30	75	55	50	004	23
6	100E	65	35	90	50	60	003	17
7	104E	70	55	85	10	20	004	23
8	108E	105	30	280	90	75	003	23
9	112E	55	30	70	35	25	003	23
60	116E	170	35	120	70	35	004	23
1	120E	145	30	100	60	50	004	23
2	124E	100	20	110	55	50	004	23
3	128E	75	25	75	30	50	004	23
4	132E	120	25	100	55	40	003	17
5	136E	230	30	140	65	35	003	23
6	140E	40	30	30	20	15	002	6
7	144E	50	440	1000	30	50	005	23
8	148E	160	100	35	240	80	004	4
9	152E	200	30	120	60	35	005	23
70	156E	75	25	70	40	90	004	23
1	160E	140	70	25	55	50	003	12
2	164E	160	40	80	50	40	003	23
3	168E	65	40	40	35	35	004	23
4	172E	155	35	145	55	40	003	23
5	176E	40	40	70	25	40	Mattock sample	


PLATE 1
LOCALITY MAP
GEOPHYSICAL & GEOCHEMICAL SURVEYS
1967
RUM JUNGLE AREA
Geochemical Surveys 1967.
Geophysical Surveys 1967.
Scale: 1 mile to an inch.
1 0 1 2 miles
Plo Coomalie Dolomite boundary
Slingram anomaly axis
Self-potential anomaly
Self-potential axis
Surface radiometric anomaly
L2 Axis of geochemical anomaly
L1 Area of geochemical anomaly
Gravity traverse
ACACIA AREA
Acacia Creek
Manton River
Manton Dam
Adelaide River
Darwin
Darwin River
North Australian Railway
RUM JUNGLE COMPLEX
Giants reef fault
Rum Jungle
Finniss River
Batchelor
Airfield
WOODCUTTERS AREA
AREA 44 EXTENDED
COOMALIE GAP WEST
GOULD AREA
Gould Airfield
MT. MINZA AREA
WATERHOUSE No.2 PROSPECT
WATERHOUSE GRANITE
A/River
12°50'
13°01'
131°01'
131°10'
Pine Creek
Reference to Australian Standard 4m Map Series
B.M.R. Darwin Oct. 1967.
To Accompany Record No. 1967/141
D52/B7-360

GEOLOGICAL MAP - ACACIA AREA N.T.

Sandstone. Sandstone. Vein Qtz. Purple and Brown. Schist. Sil. slate. Brown. Schist. Blatk sil slate. Bl. Sil. slate. Bl. Sil slate. Bl. slate. Sandstone. Sink. Hole. Qtz. Sandstone. Qtz. Sandstone. Qtz sandstone. Brown. Sil. sh. Schist. Brown. Sil. Sh. Qzte. Qtz Fest Breccia. Bwn. Qtz Sil Shaft. Acacia Creek. Amphibolite. Frazer Prospect. Fest Breccia. Purple and Brown. schist. calcilutite. Bwn. sil SH. Brown. schist. Army Road. Purple brown. Shale. Purple & Brown schist. Bwn. sil sh. Qtz cgl. Billabongs (sink holes.) Army Road. Qtz. pebble congl. Billabong (sink hole) Billabong. Stock yard. Wilsons' Gate H.S. Gate. Highway. Brown. shale. Chert. Qzt. Gidnis Reef. Fault. Omphibolite. Vein Qtz.

Plo Pld Plo/Pld Plr Czs

REFERENCE:

CAINOZOIC

Czs undifferentiated Ferruginous sands, laterite

LOWER PROTEROZOIC

Golden Dyke Formation **Pld.**
Brown & black siliceous shale & slate;
Purple & brown schist: amphibolite, minor sandstone.
Acacia Gap Tongue **Pla**
Quartz Sandstone
Transition Bed **Plo/Pld**
calcilutite
Coomalie Dolomite **Plo**
Quartzite
Crater Formation **Plr**
Quartz conglomerate

GEOLOGICAL BOUNDARIES

Formation boundary, position approximate
Outcrop boundary
Non-outcropping boundary
Strike & dip of strata { Inclined / Inclined, showing prevailing dip.

FOLDS

Established anticlinal crest-position. approximate
Established synclinal trough. - position. approximate

FAULT, ETC.

Established fault, position accurate
Established fault, position. approximate
Probable fault, concealed.
Quartz vein
H.S. Homestead
Highway.
Vehicle track
Fence
C Costean.
X Limits of auger drilling.

scale 1" : 1.000 Feet

To accompany Record 1968/8

Plate 2
D52/A8/256

GEOCHEMICAL CONTOURS AND RADIOMETRIC HIGHS
ACACIA AREA, N.T.

1000 500 0 1000 2000 3000 FEET

- 150, 300 ppm Copper
- 100, 200, 400, 800 ppm. Lead
- 200, 400, 800 ppm. Zinc
- 100, 200 ppm. Nickel
- 100, 200, 400 ppm. Cobalt
- ·017mR/Hr — Radioactivity above 0·015 mR/Hr
- Formation boundaries
- Established fault, position accurate
- Established fault, position approximate
- Probable fault, concealed
- Anticlinal crest
- Synclinal trough
- X Limits of auger drilling

To accompany Record 1968/8

PLATE 3

D52/A8/257

CUMULATIVE FREQUENCY PLOTS OF BASE METALS.

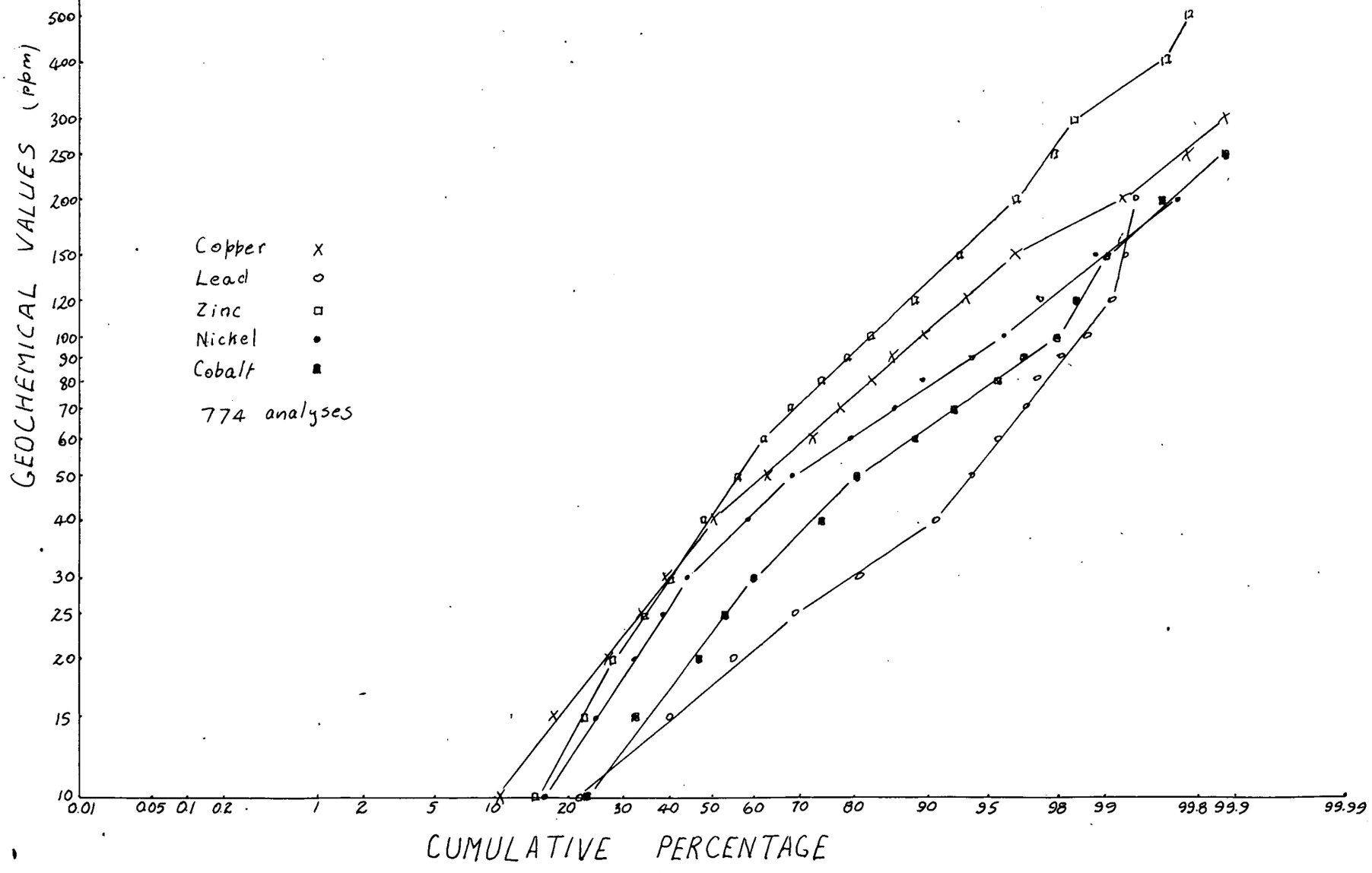

PLATE 4

To accompany Record 1968/8

M(G) 89