PLANET METALS LIMITED

Geochemical Survey of the Petermann Ranges South-West Northern Territory

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GEOCHEMICAL SURVEY OF THE PETERMANN RANGES SOUTH-WEST NORTHERN TERRITORY

1. INTRODUCTION

1.1 Preliminary rock geochemical studies of the Pinyinna beds in the Butler Dome area of the Petermann Ranges Prospecting Authority 1435 gave significant results which led to the pursuit of a rotary drilling programme that failed to intersect significant base metal concentrations.

1.2 All anomalous metal values were contained in ferruginous cap rocks derived by weathering from iron-rich sediments. A report covering the assessment of this previous programme has already been submitted to Planet Metals Limited.

1.3 The Butler Dome area represents only a few percent of the total Pinyinna bed exposure. Accordingly, the present geochemical programme was undertaken to locate all other anomalous metal horizons that could not be explained by the surface enrichment of iron sediments.

1.4 Although the facies types recognised at Butler Dome are basically of a machanical origin, it was proposed that elsewhere in the unit there could be a facies change to give abundant interbedded tuffs and carbonates within which conformable sulphide deposits might occur.

1.5 A programme was initiated to cover both a geological and geochemical reconnaissance of the Pinyinna beds over a total strike length of 150 miles. At the same time, while helicopter and camp facilities were available it was deemed advisable to study other interesting rock units in the area. Two such units were the Bloods Range Beds and the Mount Harris Basalts. The former is made up of interbedded sediments and basalts, while the latter is dominantly a basaltic sequence.

It was hoped that a search of these units would yield copper concentrations of economic significance.

2. OBJECT

2.1 To determine the economic base metal potential of the Pinyinna Beds in Prospecting Authority 1435 over the Petermann Ranges, using rock geochemistry.

2.2 To examine the Bloods Range Beds and Mt. Harris Basalts to determine their potential for base metal concentrations.

3. SCOPE

3.1 A field programme was established, with the aid of helicopter transportation, to cover approximately 150 miles along the strike of the Pinyinna Beds in the Petermann Ranges.

3.2 With the aid of the 1-63,360 maps prepared by Geophoto Resources Consultants an aerial reconnaissance was made of all mapped exposures of the Pinyinna Beds. Where favourable outcrop was located, mapping and sampling was carried out along traverses spaced at approximately one mile, depending on rock exposure.

3.3 A total of 83 traverses was completed. Along each, where possible, at 50 ft. intervals or at significant changes in lithology, samples were taken.

3.4 Traverse locations are shown on Figures 1-4 as follows:-

Figure 1 - Pinyinna Beds	Traverse Nos.	1 - 13, 18 - 20, 28 -31
Figure 2 - Pinyinna Beds	Traverse Nos.	21 - 23, 68 - 81
Figure 3 - Pinyinna Beds	Traverse Nos.	14 - 17, 24 - 27, 32 - 65, 82 - 83
Figure 4 - Pinyinna Beds	Traverse Nos.	66 - 67

These figures are reductions of the Geophoto Resources Consultants geology maps.

3.5 The sample localities along each traverse were plotted on grid sheets together with the pertinent geology.

3.6 All geochemical rock samples were identified and assayed for copper, lead and zinc by Geomin. Laboratories, using Atomic Absorption Spectrometry. The results are given in Appendix I.

3.7 The coverage of the Bloods Range Beds and Mount Harris Basalts was of a general reconnaissance nature, wherein traverses were made across the beds at selected locations.

3.8 At each location, rocks were collected for detailed petrological study in addition to being submitted for geochemical analysis.

3.9 Major areas of the Bloods Range Beds and Mount Harris Basalts were flown by helicopter, and the follow-up ground traverses were made across the better exposed outcrops.

3.10 All traverse locations are shown on Figures 1 and 2 as follows:-

Figure 1 - Traverse Nos. B:6A and 8, 13 - 16.
Figure 2 - Traverse Nos. B:2 - 5, 7, 9 - 12.

4. SUMMARY

4.1 Pinyinna Beds

4.1.1 The Pinyinna Beds are represented by a sequence of fine grained calcic and graphitic sediments whose metamorphic equivalents consist of phyllites, schists, and recrystallized siltstones with localised, but usually thick, limestone beds.

4.1.2 Sericite and quartz are ubiquitous in the schistose rocks, while hematite and graphite dominate in certain layers.

4.1.3 Bands of welded and carbonaceous tuff occur intermittently throughout the unit, verifying the original concept that explosive phases of vulcanism were active at the time of sedimentation.

4.1.4 Pinyinna exposures in many localities were poor, as these lime-rich and fine grained rocks weather easily in comparison to the highly resistant basal quartzite. Also, screes of quartzite and sand dunes cover much of the Pinyinna horizon. Sampling, although representative, was restricted by the lack of outcrop.

4.1.5 The Pinyinna Beds contain no significant base metal concentrations (anomalies). All "high" metal values are confined either to the cap rocks over the iron-rich sediments, or areas of the tuff beds. Furthermore, there is little visible evidence of pyrite or other sulphides which might indicate that metal sulphides were present in the depositional environment. As at Butler Dome, the metal enrichment is a secondary phenomenon, due to the immobility of these elements in the iron-rich alkaline weathering environment. Anomalous lead values characterize the tuffaceous members.

4.2 Mount Harris Basalts and Bloods Range Beds

4.2.1 The Mount Harris Basalts and Bloods Range Beds exhibit a low potential for base metal concentration.

4.2.2 The lava sequences show little evidence of explosive volcanism. Volcanic agglomerates and tuff rocks are noticeable scarce.

4.2.3 The Mount Harris Basalts consist predominently of a sequence of epidotized amygdaloidal and massive basalts indicative of a phase of quiet lava outpouring with an almost complete absence of rocks representing the explosive phases of volcanism with which the deposition of copper mineralisation is usually associated. Sulphides are in fact noticeably scarce, even in the favourable amygdules where quartz is the major amygdule fill.

4.2.4 Few sediments were found within the Mount Harris Basalts although sediments dominate lava flows within the Bloods Range Beds. Geochemical reconnaissance gave no anomalous metal values within the sediments.

4.2.5 The small showing of copper mineralization within the Bloods Range Beds in the vicinity of Docker Creek, has no potential. Mineralization is confined to a small shear within the lava sequence.

4.3 The Younger Granite

4.3.1 The Younger Granite is thought to be the top-most level of a regionally metamorphosed feldspathic sediment. Its mineralogy suggests a hybrid parentage.

4.3.2 Copper-lead-zinc showings reported by the Bureau of Mineral Resources are evidently small pockets of sulphides confined within the quartz veins emanating from this complex. An attempt to locate these showings during the present survey was not successful.

5. CONCLUSIONS

5.1 Anomalous values of copper, lead, and zinc, detected in the Pinyinna Beds result principally from weathering or oxidation phenomena, and do not indicate the presence of significant anomalies at depth.

5.2 The Pinyinna Beds, which outcrop within Petermann Range Prospecting Authority 1435, possess little or no potential for base metal concentrations.

5.3 The Bloods Range Beds and Mount Harris Basalts possess a low potential for base metal concentration.

6. RECOMMENDATIONS

As a result of the programme of investigation within Prospecting Authority 1435, it is recommended that the Pinyinna Beds, Mount Harris Basalts, and Bloods Range Beds no longer be considered as potential hosts for the location of base metal deposits.

7. DISCUSSION

7.1 Pinyinna Beds. The Pinyinna Beds are of Lower Proterozoic Age and conformably overlay the Dean Quartzite. The regional structure is open to discussion, but is though by most to be a series of overturned synclines with Dean Quartzite limbs enclosing the Pinyinna Beds. During folding the relatively mobile calcareous Pinyinna Beds have been pinched out in some places. Pinyinna outcrop is poor or absent as these highly calcareous and fine grained beds weather relatively rapidly. Also, large areas of prospective Pinyinna outcrop, as mapped from air photos, have been covered by wind blown sand and Dean Quartzite scree. Thus large areas could not be sampled. All airborne magnetic anomalies occurred under sand dunes.

The Pinyinna Beds were found to consist of five basic units. These, in ascending stratigraphic order are:-

(i) Quartz Sericite Schist
(ii) Hematite-Goethite Schits
(iii) Black Graphitic Slate-Phyllite-Schist.
(iv) Grey-Green Siltstones
(v) Yellow to Grey Limestones

N.B. Interbedded tuffs occur within several of these units.

The lateral relationships of these units are shown schematically in Figure 5. Geochemical data across these units are presented in Table 1. Thin section descriptions for several samples are given in Appendix II. Following, there are brief descriptions of the above rock units and their significance.

(i) Quartz Sericite Schist: A recrystallized medium grained impure quartz sandstone. This unit represents the contact between the Dean Quartzite and Pinyinna Beds. The graduation into the Pinyinna Beds is probably marked by an increase in sericite and iron content. (This then indicates the change in the environment of deposition, i.e. a change from rapid weathering and deposition to a quiet deposition.)

(ii) Hematite-Goethite Schist: A recrystallized ferroan quartz mica siltstone. This unit probably was deposited over a large area of the base of the "Pinyinna Basin". Where these iron rich schists are exposed they generally underlie the iron cappings that were once thought to be gossanous. These represent the result of an arid leaching process by which all the base metal ions have been concentrated to give anomalous values. The type-outcrop for this unit is in the Butler Dome Area which has been studied in detail.

(iii) Black Graphitic Slate - Phyllite and Schist: This unit appears to have only a limited distribution for it is found mainly in the Southern part of the Prospecting Authority. The rock is characteristically blue black in colour with a well developed schistosity. A fairly massive outcrop occurs at Tornpakura Hill. The rock is essentially a graphitic sericite quartz schist derived from muds and siltstones. There are also tuff members interbedded within this unit. The environment of deposition would thus appear to be one of quiet and deep water with reducing conditions; ideal for the formation of conformable sulphide deposits. Unfortunately, as Table I shows, the supply of base metals and sulphide has been very low.

(iv) Grey-Green Siltstones: This unit also has a restricted outcrop, having widespread exposures only in the Pinyinna and McNicol Ranges. The unit is characterised by a green to grey sericitic siltstone, with varying amounts of calcite. This rock shows local enrichments of iron and forms red bands on weathering. In outcrop, 3 directions of cleavage at right angles have been observed. Original bedding is obscured by the cleavage. The unit represents a rather shallow, quiet, oxidising environment. These siltstones grade into a more calcic rich member, forming the base to the limestones.

(v) Limestones: This unit has a fairly even distribution over the whole Pinyinna outcrop, with the largest outcrop located in the Kay Valley area. These limestones were found to vary from fine grained manganese stained, grey-cream rocks, to a coarse grained, recrystallised variety, having pink calcite in the joint fillings. They represent times of quiet chemical deposition, in an overall shallow basin.

(vi) Tuffs: The tuffs are found as inch to a few feet thick beds that occur sporadically and have weathered to a mottled iron-stained clay rock.

7.2 Geochemistry of the Pinyinna Beds: All the rock types from the 83 Traverses have been listed, along with the assay results for each, in Appendix I. Table 1 shows the range and average geochemical results for the six basic rock units discussed above.

Table 1: Rock Geochemical Data - Pinyinna Beds

Rock Type	Range of Values			Average Value		
	Cu ppm	Pb ppm	Zn ppm	Cu ppm	Pb ppm	Zn ppm
(i) Quartz Sericite Schist Unit	1-10	2-36	3-24	3	9	8
(ii) Hematite-Goethite Schist Unit	47-400	34-900	12-1020	205	370	215
(iii) Black Graphitic Slate-Schist Unit	4-128	7-320	7-58	24	32	13
(iv) Grey-Green Siltstone Unit	8-68	8-44	7-24	22	24	12
(v) Limestone Unit	24-3	17-49	10-38	9	36	21
(vi) Tuffaceous Members	12-238	7-4800	7-1480	225	1500	50

In general it was found that iron rich rocks show a corresponding increase in copper, lead and zinc. The Butler Dome report discusses this phenomenan and shows that such results are not significant. Also, the few tuffaceous members which were found did show rather high values. Tuffs invariable carry high metal values.

7.3 Stratigraphic Reconstruction: In summary a large basin-type depositional environment is envisaged for the formation of the Pinyinna Beds. Several basement changes have been responsible for the variation in lithologies and facies. The stratigraphic column is illustrated in Figure 5, which is a schervatic representation only of the areas covered during the present programme.

The goethite-hematite schist forms the true base of Pinyinna Bed deposition. These hematite beds are followed by the Black Graphitic Unit, which in places attains a thickness varying up to ten inches. This reducing-tuffaceous environment was probably the most suitable for sulphide deposition, but because of base metal and sulphur scarcity, the sulphides have not been precipitated. Also, these sediments are believed to be mechanical and not chemical in nature, thus reflecting a physical environment not so suited to base metal precipitation.

The grey-green siltstones probably represent a much shallower environment with mechanical deposition being more dominant than in the Black Graphitic Schists. The final stage of deposition has operated within a shallowing basin, with creation of an environment suited to limestone deposition.

7.4 BLOODS RANGE BEDS

The Bloods Range Beds are composed of three distinct rock units:-

(i) Arenaceous sediments
(ii) Volcanic sediments and basalt flows
(iii) Lutites and calcic sediments with graphite rich equivalents.

(i) The Arenaceous sediments are represented principally by quartz sandstones containing various proportions of sericite and k-feldspar, and consequently show varied resistance to weathering. These arenaceous rocks form the base of the Bloods Range Beds.

(ii) Volcanic sediments and basalt flows: The volcanic sediments are represented by greywackes, epidote rich arkoses and sandstones. Fewer finer-grained equivalent rocks of siltstone to mudstone size occur throughout, while tuffs and volcanic agglomerates occur sporadically. Both amygdaloidal and massive basalt flows are represented, though they only constitute a few percent of the total unit.

(iii) Lutites and calcic sediments: A twenty foot band of graphitic slate with calcic-chlorite-sericite-quartz schists is interbedded with the volcanic sediments. This was the only horizon that could be considered of interest for possible metal deposition. These rocks gave no anomalous geochemical values as seen in Table 2.

Table 2

Bloods Range Beds Geochemical Results				
Sample No.	Rock Description	Cu	Pb	Zn
B49	Graphite slates	17	58	55
B51	Graphite slates	8	220	62
B53	Graphite slates	80	5170	39
B55	Calcic sericite quartz schist	17	340	148
B58	Travertine	20	107	57

7.5 MOUNT HARRIS BASALTS

The Mount Harris Basalt is essentially a series of lava flows each approximately 40 feet thick and made up of a 15-20' base of massive basalt capped by 20-25' of amygdaloidal lava. The massive basalt is now a chlorite rich epidote rock and is more susceptible to weathering than the harder epidotized and silicified amygdaloidal tops.

Equivalent volcanic agglomerates and tuffs are noticably scarce. Epidote quartz sandstones occur sporadically but can be up to six feet thick.

A noticeable feature of the basalts is their relative lack of sulphide for such rocks of this age. Pyrite and chalcopyrite were observed in several rocks, but are scarce in the favourable amygdaloidal basalts. The amygdule fill is principally quartz and not calcite which favours a sulphide retention.

The lavas have suffered little shearing deformation and possess a well crystallised texture. Mineralized carbonatite bodies have therefore not formed as little or no mineral has been lost from these lavas.

The only instance where shearing has produced mineralization is at the Docker Creek copper prospect. The basalt has been sheared to an actinolite-chlorite schist with copper carbonates and oxides filling the shear at the surface. The lode is approximately 10 feet in width and 30 feet in length and averages 2-3% copper. The short stratigraphical width suggests that the body has a very limited depth and hence it is of no further interest.

APPENDIX I

A. A. S. ASSAYS - PINYINNA BEDROCK

Traverse No.	Rock No.	Rock Type	Assays Cu	Pb	Zn
1	HP 1	Thin bedded Buff Slate	20	9	5
	2	As Above	12	11	8
	3	Qtz rich Pale Grey Phyllite	4	4	7
	4	Dark Grey Carb Phyllite	4	6	4
	5	Thin bedded Pale Brown Slate	3	6	3
	6	Fe. stained Sandstone	10	6	3
	7	As Above	3	4	3
	8	Light Grey Phyllite	6	20	3
	9	As Above	8	11	4
	10	Grey Phyllite	16	6	9
2	HP 11	Pale Grey Phyllite	10	24	36
	12	Pale Grey Phyllite	4	11	33
	13	White Sericite Schist	6	27	30
	14	Qtz veins in Weathered Slates	4	22	27
	15	Pale Grey Slate	6	34	29
	16	Pale Buff Sericite Schist	10	32	30
	17	Pale Grey Phyllite	6	46	29
	18	Blue Black Phyllite	6	11	25
	19	Pale Grey Phyllite	10	86	30
	20	Cream Limestone	3	42	33
	21	Black Phyllite	3	42	38
	22	Grey and Pink impure Lst.	8	40	38
	23	As Above	10	40	33
	24	Lst. in Travertine	18	58	45
	25	Cream Lst.	14	49	38
	26	Brown Recryst Lst. (Mn. Stained)	8	44	33
	27	Thin bedded Limestone	10	60	45
	28	Grey and Black Limestone	30	78	38
	29	Banded Limestone	4	44	51
	30	Green Sericite Schist	12	78	49
	31	Grey and Fawn Lst.	10	32	35
	32	Sample of Gneiss	3	4	33
3	HP 33	Dark Grey cryst Lst.	6	40	38
	34	As Above	4	40	42
	35	Lt. Brown Qtzite	26	20	49
	36	Fawn-Brown Lst.	22	69	48
	37	Calc. Shale and Schist	36	36	63
	38	Coarse Qtz Micaceous Peg.	6	46	49
	39	Red Micaceous Phyllite	20	32	83
	40	Pelitic Schist	18	24	42
	41	As Above	20	34	42
	42	Banded Lst.	3	32	13
	43	Black Cryst. Lst.	38	34	13
	44	Pale Cream Lst.	4	29	9
	45	Massive Cream Lst.	3	32	20
	46	Calc Micaceous Phyllite	3	29	13
	47	Thin bedded Dk. Grey Lst.	8	29	19
	48	Fe rich Ironstone Nodules	18	36	180
	49	Massive Cream Lst.	4	34	25
	50	Calc. Grey Phyllite	28	42	23
	51	Calc Sericite Phyllite	20	60	16
	52	Black Calc Schist	20	87	21

Traverse No.	Rock No.	Rock Type	Assays		
			Cu	Pb	Zn
3	HP 53	Fe-rich Brown Phyllite and Nodules	570	598	305
	54	Fine grained Flaggy Qtzite.	3	4	9
	55	Green Epidote Basalt	47	42	18
	56	Epidotised Vesicular Basalt	88	42	14
	57	As Above	71	40	18
	58	Pelitic Schist	4	4	8
	59	As Above	1	4	7
4	HP 60	Thin bedded Sericite Qtz. Schist	12	32	51
	61	Recryst Orange-Buff Lst.	6	34	14
	62	Shale and Lst.	20	36	19
	63	As Above	18	36	12
	64	Grey Mic. Marl.	3	34	17
	65	Massive Grey Lst.	3	30	17
	66	White Grey Lst. (and pseudo pyrite)	3	34	14
	67	Thin bedded Cream Lst.	3	36	23
	68	Thin bedded Black Lst.	26	103	57
	69	Thin bedded Sericite Qtzite	4	6	11
	70	As Above	4	9	6
	71	As Above	4	17	8
5	HP 72	Massive Pink Lst.	14	36	26
	73	Thin bedded Orange-Black Lst.	4	34	11
	74	Cream Massive Lst.	20	40	17
	75	Massive White Qtzite	3	2	6
	76	Fe stained Sericite Qtzite	1	2	6
6A	HP 77	Dark Blue Chert	3	4	6
6B	78	Weathered Calc. Marl.	6	17	11
	79	As Above	6	17	11
	80	As Above	6	20	13
7	HP 81	Yellow Calc. Sandstone (Fresh)	1	4	7
	82	As Above (weathered)	1	9	7
10	HP 83	Black Qtz Schist	3	6	8
	84	Fe-rich Purple Phyllite	120	55	76
8A	HP 85	Purple-black Qtz. Schist	3	4	8
	86	Pale Purple Sericite Schist	3	4	7
	87	As Above	3	2	8
	88	As Above	14	2	7
	89	Interbedded Qtzite & Schist	36	6	9
	90	Sericite Qtzite	3	4	5
9	HP 91	Pelitic Schist	3	4	7
	92	Black Pelitic Schist	3	4	6
	93	Breccia of Black Lst.	6	17	9
	94	Breccia or Tuff (Grey)	12	27	18
	95	Red Fine Grained Mudstone	6	29	7
	96	Pale Grey Phyllite	4	9	11
8B	HP 97	Grey Phyllite	6	17	9
	98	Qtze. Vein material in 97	94	34	48

Traverse No.	Rock No.	Rock Type	Assays Cu	Pb	Zn
11	HP 99	Sericite Qtzite	1	2	7
	100	As Above	1	x	5
	101	As Above	1	2	7
	102	Thin bedded Grey Phyllite	1	2	6
12	HP 103	Massive Qtzite	1	x	7
	104	Dark Grey Mica Phyllite	4	4	9
	105	Thin bedded Qtzite	3	2	7
	106	Bands of Phyllite and Qtzite	1	4	7
13	HP 107	Fe-rich Qtzite	10	17	40
	108	Micaceous Qtzite	1	4	3
	109	As Above	3	6	6
	110	As Above	1	6	5
	111	As Above	1	4	4
	112	Massive Qtzite	1	2	3
14	HP 113	Thin bedded Qtzite	3	4	6
	114	Pink Sericite Sst.	3	2	5
	115	Massive Qtzite	3	2	7
	116	As Above	4	4	6
	117	As Above	3	4	5
	118	As Above	4	2	6
	119	Sericite Qtzite	3	4	10
	120	As Above	3	6	7
15	HP 121	Thin bedded Sericite Qtzite	3	14	7
	122	As Above	4	66	7
	123	Cream Schist (weathered)	8	44	8
	124	Dk. Grey Phyllite	6	27	9
	125	Banded Dk. Purple Phyllite	8	220	14
	126	As Above	8	24	19
	127	Blue Grey Phyllite	12	113	14
	128	As Above	12	46	13
16	HP 129	Fe-stained Schist	40	53	280
	130	White Sericite Schist	10	9	19
	131	Qtz-vein and Brecciated Slate	85	32	17
	132	Grey Phyllite	80	27	13
	133	Dark Blue Phyllite	16	42	15
17	HP 134	Pale Grey Phyllite	8	4	13
18	HP 135	Thin bed White Qtzite	10	6	12
	136	Thin bedded Pink Sst.	6	4	11
	137	Sericite Schist	6	6	14
	138	As Above	8	6	12
	139	White Massive Qtzite	8	4	13
	140	As Above	6	6	12
	141	Impure fine grain Lst.	14	24	22
	142	Dk. Brown-Blue Cryst. Lst.	16	34	20
	143	As Above	10	36	18
	144	Pale Brown Cryst Lst.	12	36	19
	145	Cream and Brown Lst.	22	34	22
	146	Sandy Cryst. Lst.	14	42	20
	147	Pale Grey Lst.	20	40	19

Traverse No.	Rock No.	Rock Type	Assays Cu	Assays Pb	Assays Zn
18	HP 148	Calc Phyllites and Ironstone Bands	32	152	32
	149	Pale Grey Cryst Lst.	10	36	18
	150	As Above	10	46	18
	151	Red and Grey Lst.	16	44	24
	152	Dark Grey Lst.	12	40	23
	153	Dark Grey (Fine) Lst.	20	40	20
	154	Thin bedded Lsts.	14	32	19
	155	Calc Shales	16	40	20
	156	Lst (Orange)	28	42	23
	157	Purple Phyllite	12	14	13
	158	Pale Grey Phyllite	8	9	12
	159	Sericite Schist	10	60	19
19	HP 160	As Above	12	17	14
	161	Recryst Lst. (Mn stained)	18	36	23
	162	Thin bedded Lst.	10	34	16
	163	Brown Calc. Phyllite	8	20	26
	164	Green Pink Lst.	6	29	18
	165	As Above	10	34	21
	166	Red Recryst. Lst.	10	32	18
	167	Pale Grey Schist	8	27	20
	168	Purple - White Qtzite	10	32	16
	169	As Above	10	4	12
	170	Massive Sericite Schist	No Sample Assayed		
20	HP 171	Sericite Schist	12	6	12
	172	Massive Qtzite (White)	8	4	12
	173	Purplish Qtzite	8	4	13
	174	Dark Grey Recryst Lst.	8	32	18
	175	Black Lst.	10	29	20
	176	Black Calc. Schist	16	20	19
	177	Massive Recryst Lst.	32	42	35
	178	Blue Black Chert	10	9	12
	179	Thin bedded Lst.	10	32	19
	180	As Above	8	29	20
	181	Sericite Schist	8	6	14
	182	White Qtzite	8	6	14
21	HP 183	Qtz. Sericite Schist	12	17	17
	184	Travertine	16	22	30
	185	Schist (weathered)	10	32	42
	186	Iron Cap	8	36	24
	187	Marl	22	55	55
	188	Dark Green (Chlorite) Schist	28	32	330
	189	Travertine	22	29	42
	190	Calc Schist (weathered)	16	34	29
	191	Iron Cap	12	40	18
22	HP 192	Qtzite and Sericite Schist	6	4	14
	193	As Above	8	4	12
	194	Sericite Schist	8	9	24
	195	Grey Carb. Schist	4	14	11
	196	As Above - more Fe present	8	9	12
	197	Sericite Schist (Pui)	3	14	4

Traverse No.	Rock No.	Rock Type	Assays		
			Cu	Pb	Zn
22	HP 198	As Above	3	6	7
	199	Qtzite of Pud.	1	4	5
23	HP 200	Fe stained Sericite Schist	1	4	3
	201	As Above	4	4	3
	202	Massive Qtzite	1	14	3
24	HP 203	Fe stained Sericite Schist	3	4	6
	204	Iron Cap Rock	10	20	11
	205	White Chert	6	32	9
28	HP 206	Fe stained Qtzite (Pud)	6	6	7
	207	Grey Phyllite	3	14	7
	208	Massive Grey-Yellow Lst.	6	36	29
	209	Massive Yellow Lst.	10	36	17
	210	Black Siliceous Lst.	6	40	11
	211	Qtz-Sericite Schist	5	51	16
	212	Thin bedded Brown Lst.	4	36	12
	213	White-Pink Lst.	4	40	10
	214	Fe stained Qtz. Sericite Schist	3	36	13
	215	Thin bedded Grey-Orange Lst.	6	32	10
	216	Iron Cap Rock	44	34	990
	217	As Above - more limonitic	51	27	1400
	218	Lst. with limonite present	44	42	206
	219	Soil Sampes over Phyllite	10	42	11
	220	As Above	8	89	9
	221	Grey Phyllite	4	14	7
	222	Red Mat. in Core Minor Folds	10	20	12
	223	White Shale with Qtz. fragments	6	24	14
29	HP 224	Qtz Sericite Schist	3	4	7
	225	As Above	6	9	11
	226	As Above	3	6	10
	227	As Above	3	9	7
30	HP 228	Qtz. Sericite Schist	1	6	4
	229	As Above	4	9	4
31	HP 230	Qtzite and Schist	8	17	3
	231	Qtz Sericite Schist	6	9	3
	232	Fe Stained Sericite Schist	6	11	10
32	HP 233	Qtz Sericite Schist (Pui?)	4	11	5
	234	Qtz Sericite Schist	3	4	6
	235	As Above	3	22	5
	236	Qtz Sericite Schist	1	4	4
	237	As Above	10	49	6
33	HP 238	Micaceous White Phyllite	6	6	7
	239	Micaceous Grey Schist	6	40	7
	240	Grey-Black Micaceous Schist	4	17	7
	241	Green Micaceous Phyllite	3	9	7
	242	Black Micaceous Schist	4	17	6
	243	White-Green Phyllite	3	9	7
	244	Black Phyllite	3	14	7
	245	Micaceous Schist (Tuffaceous)	10	20	10

Traverse No.	Rock No.	Rock Type	Assays		
			Cu	Pb	Zn
34	HP 246	Qtz Sericite Schist (Pud)	3	4	7
35	HP 247	Qtz Sericite Schist	3	6	7
	248	As Above	6	4	4
	249	As Above	3	6	5
25	HP 250	Massive Qtzite and Sericite Schist	3	9	7
	251	Thin bedded Sericite Schist	3	17	4
	252	As Above	3	6	7
	253	As Above	3	9	5
	254	White Massive Qtzite	3	4	10
26	HP 255	Thin bedded Qtzite	3	4	5
	256	Thin bedded Micaceous Schist	24	6	14
	257	Qtze-Sericite Schist	6	17	9
	258	Pale Grey semi-pelitic Schist	4	17	7
	259	Weathered Schist	12	32	9
	260	Tertiary Sst. or Grit.	6	4	6
	261	Flaggy Qtzite	4	6	4
	262	As Above	3	4	4
	263	As Above	4	6	5
	264	Qtz. rich Phyllite	3	14	9
	265	Qtzite and Schist	3	4	6
	266	Massive Qtzite	3	6	7
	267	As Above	3	6	6
35 (cont)	HP 268	Qtz Sericite Schist	8	11	16
	269	As Above	3	4	9
	270	Mica Schist - with red and yellow bands	61	34	38
	271	Massive Banded Limonite	230	62	49
	272	Hematite Slate	14	22	11
	273	Green Talc Slate	59	111	25
36	HP 274	Grey Chert	14	14	19
	275	Travertine	22	44	13
	276	Recryst Lst.	6	40	14
37	HP 277	Black Slate	91	29	58
	278	White Qtz Mica Schist	16	49	13
	279	Grey Black Phyllite	8	11	11
	280	Black Sericite Schist	8	17	22
	281	Yellow Limonitic Slate	73	140	100
	252	Black Sericite Schist	26	22	10
38	HP 283	Iron Cap Rock	186	64	385
	284	Green Spotted Phyllite	20	69	14
	285	Yellow Limonitic Rock (Tuff?)	238	176	233
39	HP 286	Micaceous Hematite Schist	400	1230	705
	287	Calcareous Schist	36	78	180
	288	Red Chert (Derived from Tuff)	224	4800	1400
	289	Grey Slate	38	115	38

Traverse No.	Rock No.	Rock Type	Assays		
			Cu	Pb	Zn
40	HP 290	As Above	38	87	19
	291	Calc. Micaceous Schist	42	53	51
	292	Lst. and Shale Mixture	30	22	9
52	HP 293	Weathered Tuff	10	6	12
	294	Micaceous Lst.	8	34	17
	295	Micaceous Schist	80	40	30
53	HP 296	Yellow Recryst Lst.	14	42	16
	297	Yellow Red Recryst Lst.	8	44	16
	298	Qtz-Mica Lst (with Mn)	10	29	22
	299	Black Silica Lst.	10	11	11
	300	Fe-Recryst Lst.	12	46	17
	301	Orange Recryst Lst.	14	71	33
	302	Black Phyllite	36	32	23
	303	Qtz Limestone (with Mn)	10	34	19
54	HP 304	Weathered Lst.	14	36	16
	305	Travertine	18	51	30
	306	As Above	18	44	76
	307	Weathered Lst.	24	42	33
	308	Fe stained Grey Phyllite	36	24	33
	309	Blue Lst.	10	49	26
	310	Blue Travertine	20	42	62
	311	Blue Lst.	12	32	23
55	HP 312	Pink-Grey Lst.	10	36	17
	313	Orange-Pink Lst.	10	49	21
	314	Pink Limestone	10	40	14
	315	Orange Limestone	8	36	17
	316	Fe rich Limestone	6	34	14
56	HP 317	Pink Limestone	10	42	18
	318	Blue Limestone	8	36	27
	319	Orange-Pink Lst.	6	40	14
	320	Weathered Lst.	16	40	21
57	HP 321	Black Slate	18	44	11
	322	White Clay - Tuffaceous	230	236	13
	323	Black Graphitic Schist	100	120	11
	324	As Above	16	73	11
	325	Qtz-Black Phyllite	30	236	14
	326	Red-Yellow Iron Schist	320	740	35
	327	Iron capping on Schists	400	2900	55
	328	Calc Travertine	171	140	20
	329	White Slate	61	78	16
	330	Weathered Qtzite	59	42	85
58	HP 331	Black Iron Concretion	10	24	20
	332	Black Iron Capping	24	22	535
	333	Travertine	10	20	17
	334	Weathered Calc Slate	20	34	35
	335	Blue Chert	12	93	16
	336	Grey Slate	22	85	13
	337	Orange-Sst. (weathered)	24	160	16

Traverse No.	Rock No.	Rock Type	Assays		
			Cu	Pb	Zn
58	HP 338	Qtz Grey Phyllite (crenulated)	36	53	11
	339	Grey Phyllite	18	22	11
59	HP 340	Grey Phyllite	8	20	10
	341	Fe stained Grey Slate	12	9	9
	342	Black Graphitic Schist (crenulated)	32	220	13
	343	Qtz veined Black Phyllite	18	109	11
	344	Hard Black Phyllite	16	22	11
	345	White-Grey Slate	42	71	13
	346	Red-Hematite Schist	94	467	16
	347	Iron Cap Rock	12	80	13
	348	Tuff-weathered	14	80	16
60	HP 349	Tuff Band (White-Grey)	12	98	11
	350	Fe stained Clay Band	244	1630	28
	351	Grey Slate	10	49	10
	352	White-Grey Phyllite	10	85	13
	353	Grey-Slate	12	69	11
	354	Black Slate	12	17	11
	355	Fe stained Sst.	40	160	18
	356	Travertine	22	40	18
61	HP 357	Calc. Mica Schist	14	36	17
	358	Grey Slate	20	24	36
	359	Orange Brown Lst.	10	42	58
	360	Travertine	12	500	25
	361	Fe-stained Lst.	6	49	15
	362	Fe-stained Grey Slate	73	638	13
	363	Grey-blue Lst.	4	71	14
	364	Black-Iron Capped Orange Lst.	16	140	35
	365	Fe stained Lst.	12	460	72
	366	Yellow Lst.	3	40	16
	367	As Above	4	71	19
	368	Fe stained Lst.	12	113	76
	369	Yellow Lst. (Brown Capping)	4	46	31
	370	Blue Grey Qtz Lst.	3	44	22
	371	Blue-Grey Lst.	4	34	19
62	HP 372	Black Qtzite	12	51	11
	373	Grey Slate	14	14	33
	374	Grey-Calc Mica Schist	4	27	65
	375	Yellow Lst.	38	44	26
	376	Weathered Slate	34	80	23
	377	Black Sericite Schist	24	22	13
	378	White-Grey Clay Band	32	24	9
	379	Grey Slate	4	11	9
62A	HP 380	Blue Lst (weathered)	8	75	48
	381	Cream Lst (weathered)	4	42	15
	382	Massive Yellow Lst.	4	32	16
	383	Blue-Qtz Lst.	4	34	14
	384	Thin bedded Blue Lst.	4	40	17
	385	Yellow Lst.	4	42	16

Traverse No.	Rock No.	Rock Type	Assays		
			Cu	Pb	Zn
68	HP 386	Lst. with Qtz veins	245	100	17
	387	Calc Slate	17	25	28
	388	Limestone	28	28	10
	389	Green-red Slate	8	28	15
	390	Fe stained Slate (Red)	8	22	19
	391	Pink Lst.	15	34	13
	392	Black Lst.	121	31	10
69	HP 393	Blue Qtzite	31	13	8
	394	Blue-Green Siltstone	10	8	7
	395	Fe-red Siltstone	535	44	42
	396	As Above	192	25	38
70	HP 397	Qtz Clay Slate	5	19	7
	398	Blue-red Qtz Siltstone	22	8	4
	399	Weathered Material on Surface	8	16	9
71	HP 400	Fe rich Black Qtzite	8	13	7
	401	Green Qtz Siltstone	8	16	7
	402	Red (Fe) Siltstone	15	13	9
	403	As Above	10	13	9
72	HP 404	Red Siltstone	20	25	10
	405	Green Siltstone	28	25	11
	406	Mixture Red and Green Siltstone	65	16	9
	407	As Above	20	31	10
	408	White Calc. Siltstone	3	10	7
73	HP 409	Tertiary Travertine (Grit.)	20	13	13
	410	Soft Travertine	8	34	6
	411	(No Sample)	-	-	-
74	HP 412	Green Calc. Siltstone	13	13	7
	413	As Above	13	25	9
	414	Red (Fe) Siltstone	15	28	9
	415	Green Calc. Siltstone	17	19	8
	416	As Above	20	19	9
	417	Mixture Red and Green Siltstone	15	22	8
	418	White-Yellow Calc. Siltstone	33	19	9
	419	Red (Fe) Siltstone	20	31	14
	420	As Above	17	40	10
	421	As Above	63	31	32
	422	Green Siltstone	36	31	16
	423	Blue-Grey Chert	24	22	14
	424	As Above	33	19	9
	425	Travertine over Red Siltstone	36	22	15
	426	Green Siltstone	24	19	12
	427	Grey-Green Calc Siltstone	31	22	22
	428	Red Siltstone	47	19	83
	429	Pink Siltstone	24	16	23
75	HP 430	Weathered Banded Dolomite	17	47	-
	431	Pink Iron Dolomite	22	34	14
	432	Banded Limonitic Dolomite	10	22	34

Traverse No.	Rock No.	Rock Type	Assays		
			Cu	Pb	Zn
75	HP 433	Blue Dolomite	5	31	35
	434	Dark Blue Dolomite	5	28	11
	435	Blue Breccia Dolomite	20	74	12
	436	Pink Ferruginous Dolomite	13	31	19
	437	As Above	17	34	19
	438	Bedded Ferruginous Dolomite	24	47	14
	439	As Above	20	107	10
	440	Red Ferruginous Dolomite	13	37	10
	441	Dark Red Dolomite	8	22	9
	442	Pink Dolomite	8	40	14
76	HP 443	Clay Material - Tertiary			
77	HP 444	Hard Fe Stained Calcrete	17	22	28
	445	Soft (powdery) Fe Calcrete	13	25	22
	446	As Above	17	22	28
	447	As Above	17	28	25
78	HP 448	Green Calc. Siltstone	20	31	24
	449	Qtz Vein Material	137	34	8
	450	White-Pink Calc Siltstone	22	44	9
	451	As Above	47	55	7
	452	Green-Brown Siltstone	68	55	5
	453	Mauve Siltstone	44	44	4
	454	White-Pink banded Siltstone	183	58	31
	455	As Above	44	67	8
	456	Red and Green Silicified Siltstone	44	40	21
	457	Mauve Siltstone	75	31	11
	458	Red and Olive Jasper	42	25	27
	459	Mauve Siltstone	87	47	11
79	HP 460	Qtz rich Talc Shale	44	19	3
	461	Grey-Green Sericite Phyllite	173	19	11
	462	Pink-Orange Sericite Phyllite	84	19	13
	463	Mauve Sericite Phyllite	77	19	13
	464	Green Sericite Phyllite	103	19	6
	465	Light Green Siltstone	13	22	7
	466	Red Ferruginous Siltstone	40	22	13
	467	Recryst. Sericite Siltstone	26	44	72
	468	White Argillaceous Siltstone	137	61	11
	469	As Above	590	40	11
	470	Fe - Calc Siltstone	80	28	13
	471	Weathered Fe Siltstone	348	52	25
	472	As Above	87	47	23
	473	Mauve Siltstone	97	37	18
	474	Green-Grey Siltstone	10	16	19
	475	White-Mauve Siltstone	31	25	14
	476	White-Grey Sericitic Siltstone	22	22	19
	477	Mixture of Siltstones	65	28	15
	478	Mauve Band - Tuffaceous (?)	13	22	17
	479	Pink Ferruginous Siltstone	15	26	19
	480	Green-Grey Siltstone	26	16	23
	481	Mix Sample Siltstone and Tuff	65	16	34
	482	Red-White Tuff	68	31	30
	483	Red-Green Siltstone	15	14	14

Traverse No.	Rock No.	Rock Type	Assays		
			Cu	Pb.	Ag
80	HP 484	Calcrete	5	77	x
	485	Green Siltstone	10	28	x
	486	Light Green Siltstone	17	31	x
	487	As Above	10	34	x
	488	Qtz Vein Siltstone from Shear	47	19	x
	489	Purple Slate	33	52	2
	490	Calc Dolomitic Siltstone	10	31	x
	491	Green and Mauve Dolomitic Siltstone	13	25	x
	492	Fe-Siltstone	77	64	2
	493	Grey Siltstone	15	55	x
	494	Channel Sample from Leached Zone	348	165	2
	495	White Dol. Siltstone	57	74	2
	496	Channel Sample of 495	141	25	1
	497	Green Siltstone	8	22	x
	498	As Above	8	22	x
	499	Green Talc Siltstone	5	25	x
					Zn
42	HP 500	Banded Goethite Cap Rock	370	2900	745
	501	Massive Goethite Cap Rock	244	332	1020
	502	As Above	100	520	600
	503	Sericite'Calcite' Qtz Schist	10	44	14
	504	Graphitic Sericite Qtz Schist	18	60	20
	505	Hematite Schist	47	236	255
	506	Hematite Goethite Schist	136	430	12
	507	Graphitic Sericite Qtz Schist	20	27	9
	508	As Above	16	140	47
43	HP 509	As Above	3	9	7
	510	As Above	54	24	5
45	HP 511	Graphitic Sericite Qtz Schist	6	11	7
	512	As Above	6	27	17
46	HP 513	Qtz Sericite Schist (Pud)	6	6	3
47	HP 514	As Above	6	46	12
48	HP 515	Silicified Calcrete	6	32	14
	HP 516	(Petrological Sample)	(No Assay)		
	517	Recryst Dolomitic Sst.	12	34	11
	518	As Above	12	40	14
	519	Recryst Dolomitic Qtz Sst.	6	40	22
	520	As Above	8	71	140
	521	As Above	4	36	14
	522	As Above	8	44	18
49	HP 523	Siliceous Calcrete	22	66	14
	524	Marble (Dolomite ?)	6	40	12
	525	Recryst Lst.	8	42	14
	526	As Above	10	46	14

Traverse No.	Rock No.	Rock Type	Assays		
			Cu	Pb	Zn
50	HP 527	Carbon Schist frags. in Caprock	10	20	23
	528	Ferroan Calc. Sst.	10	20	11
51	HP 529	Blue Carbon Schist	10	11	5
	530	Dolomite	8	44	13
	531	Ferroan Dolomite	40	40	40
	532	Dolomite	8	42	15
63	HP 533	Graphitic Sericite Qtz Schist	4	17	7
	534	As Above	4	24	7
64	HP 535	As Above	4	27	7
	536	As Above	4	27	8
	537	Graphitic Sericite Qtz Schist	8	17	8
	538	As Above	128	320	17
	539	As Above	28	107	25
	540	Weathered Calc Siltstone	14	11	14
	541	As Above - Travertine increases	6	17	11
	542	As Above	14	24	13
	543	As Above	8	24	12
	544	As Above	16	71	47
65	HP 545	Travertine	18	40	17
	546	White Banded type - Hard	14	36	15
	547	Conglomerat type - Hard	10	32	14
	548	As Above	28	80	15
	549	Powdery Conglomerate type - soft	14	34	14
	550	Conglomerate type - Hard	14	32	11
	551	Grit type - very hard (silicified)	20	32	14
	552	Dolomite	14	34	11
	553	Travertine top and dolomite remains	12	27	11
	554	Dolomite - Limestone (?)	8	29	9
	555	As Above	8	51	20
	556	Mass Dolomite	8	44	16
	557	Dolomite and Dolomitic Siltstones	83	36	13
	558	Ferroan Dolomite	6	36	14
	559	Massive Dolomite	10	34	12
	560	Recryst. Dolomitic Siltstone	4	34	16
	561	Dolomite	2	34	23
	562	Travertine	17	31	20
	563	Fissile Dolomite	5	31	17
	564	Massive Dolomite	5	44	16
	565	As Above and Fe bands	5	52	23
	566	Dolomitic Siltstone	40	31	10
	567	Grey Dolomite	13	31	18
66	HP 568	Calc. sericite Qtz Schist	8	10	7
	569	As Above	2	8	7
	570	Calc. Sericite Qtz Schist	2	8	7
	571	Calc. Qtz Sericite Schist	2	13	8
	572	(Graphitic) Sericite Qtz Schist	2	5	6
	573	(Graphitic) Sericite Qtz Schist	8	10	7
	574	Graphitic Schist	8	10	7
	575	As Above	5	16	10

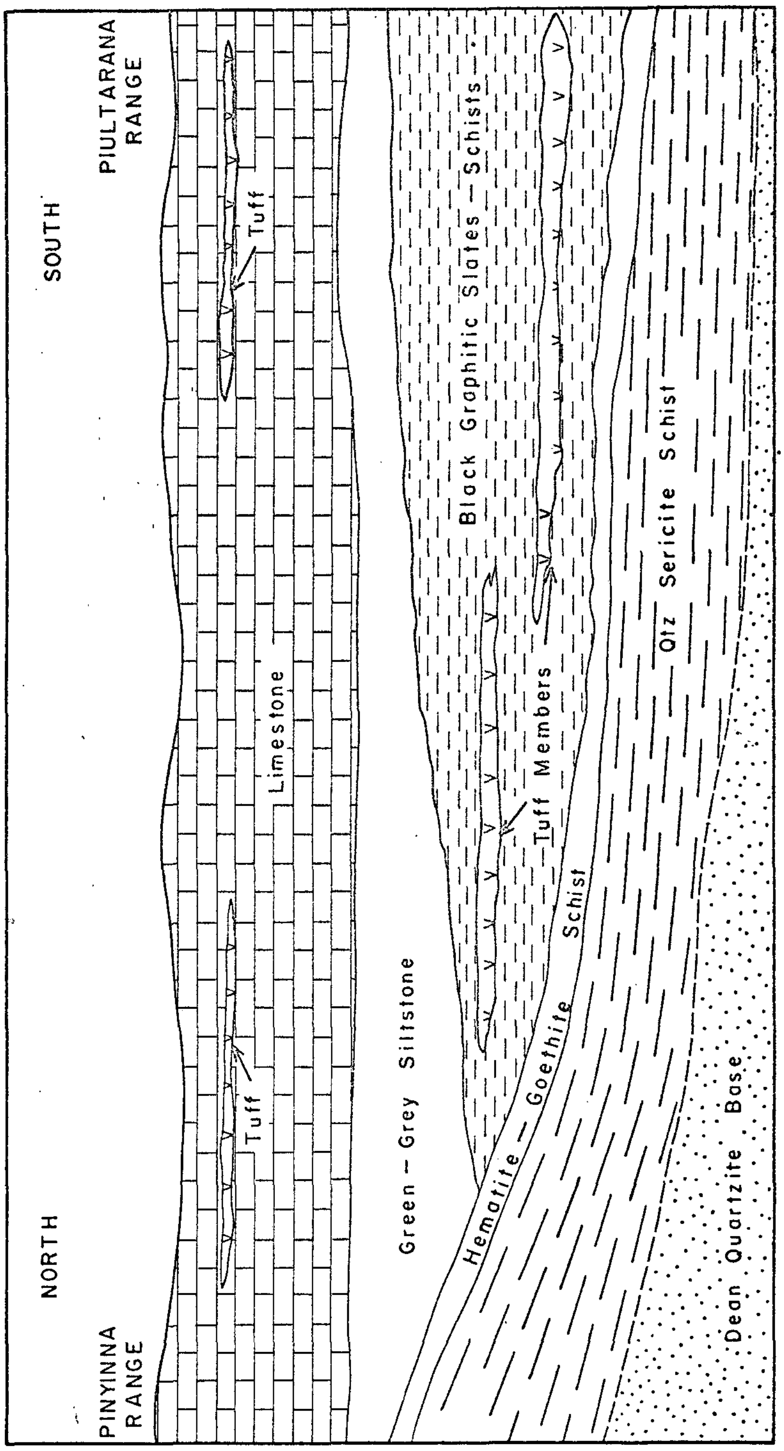
Traverse No.	Rock No.	Rock Type	Assays		
			Cu	Pb	Zn
66	HP 576	Porphyrablastic Graphite Chert Schist	15	28	14
	577	Graphite Schist	2	22	8
	578	Qtz veins in Blue Graphite Schist	5	8	5
67	HP 579	Blue Graphite Schist	2	13	9
	580	Black Graphite Schist	5	8	7
					Ag
80 (cont)	HP 581	Weathered Fe rich Siltstone	5	64	x
	582	White Chert (weathered)	10	240	1
	583	Highly weathered Green-Grey Siltstone	106	300	x
	584	Fe stain Qtz Vein Material	13	13	x
	585	Green Chert	10	10	x
	586	Goethite Sap Rock	13	105	2
					Zn
	587	Goethite Schist	348	83	18
	588	Hematite - Goethite Schist	125	74	12
	589	Red Hematite Schist	200	14	200
	590	As Above	97	61	19
81	HP 591	Pebbly Sst.	13	16	4
	592	Grey-Green Coarse Siltstone	42	28	7
	593	Mauve Siltstone - Tuffaceous	118	40	7
	594	Thin bedded Fe-banded Siltstone	5	116	8
	595	Red Hematite Schist	5	44	9
	596	Grey-Green Dolomitic Siltstone	2	13	49
	597	As Above	2	25	30
	598	Grey-Green Siltstone	5	25	19
	599	As Above and Qtz veins	8	58	76
	600	Hematite Schist	63	200	100
	601	As Above	63	300	120
	602	As Above	36	112	100
	603	Dolomitic Siltstone	47	34	9
	604	Hard Dol. Green Siltstone	26	37	10
	605	Weathered Sample of 604 (c.f.)	168	116	14
	606	Grey-Green Siltstone	15	112	10
	607	Weathered Sample of 606 (c.f.)	26	67	14
	608	Weathered Dolomitic Siltstone	75	67	14
	609	As Above	118	44	19
	610	Weathered Fe-Dolomitic Siltstone	10	183	36
	611	Grey-Green Siltstone	15	28	8
	612	Red Fe Stained Zone in 610	80	25	12
	613	Fe Stained Siltstone	15	34	33
	614	Green and Red Siltstone	28	44	8
	615	Qtz-Chlorite Schist	87	13	4
	616	Hematite Phyllite	94	25	7
82	HP 617	Black Phyllite	5	13	6
	618	Grey-Black Phyllite	1	16	3

Traverse No.	Rock No.	Rock Type	Assays		
			Cu	Pb	Zn
82	HP 619	Grey-Green Qtz Phyllite	8	10	6
	620	Grey-Black Qtz Phyllite	x	8	5
83	HP 621	Fe-stained and Grey Phyllite	2	19	7
	622	Red-Brown Hematite Phyllite	8	28	14
	623	Banded Hematite Phyllite	5	19	9
	624	Grey-White (Talc) Phyllite	2	10	9
	625	As Above	8	16	28

APPENDIX II

Thin Section Descriptions: Pinyinna Bed Rock Geochemistry Samples

Sample No.	Thin Section Description
11P	Quartz sericite schist
14P	Calcic (muscovite, quartz, chlorite) schist
18P	Sericite quartz schist (recrystallized siltstone)
20P	Dolomite (medium sandstone)
22P	Dolomite (fine to medium sandstone) + 5% goethite
45P	Dolomite (medium sandstone)
56P	Epidote-antinolite quartz rock, a recrystallized amygdaloidal basalt
85P	Medium granied recrystallized quartz sandstone + 5% muscovite
93P	Banded quartz-sericite schist + goethite bands
116P	Quartz (muscovite) schist
125P	Banded quartz-goethite, muscovite sandstone (highly sheared, fine grained)
139P	Recrystallized medium grained sandstone - 2% muscovite
148P	Recrystallized goethite, calcite-quartz-chlorite sericite siltstone with chlorite sericite segregations
167P	Coarse grained calcite-quartz-chlorite sericite sandstone
170P	Quartzite. Coarse grained sandstone
213P	Coarse grained calcic sandstone - 3% chlorite and muscovite
259P	Sericite chlorite quartz phyllite + sphene epidote masses
260P	Argillaceous quartz sandstone (medium grained). Possible greywacke or tuff.
249P	Quartz sericite chlorite phyllite + goethite bands
277P	Argillitic sericite phyllite, moderately graphitic
278P	Recrystallised quartz, greywacke
502P	Possible acid tuff or quartz greywacke. Possible embayed quartz. Goethite, muscovite matrix
503P	Hematite quartz mica phyllite; mica is sericite and muscovite - 3% rutile
504P	Fine grained quartz - sericite sandstone. Recrystallized.
507P	Quartz (sericite) schist - 2% tourmaline. Graphitic
516P	Calcite - quartz sandstone (coarse grained) or siliceous limestone



PINYINNA BED STRATIGRAPHY
SCHEMATIC DIAGRAM

FIGURE 5

PLANET METALS LIMITED

PETERMANN RANGES
PINYINNA BEDROCK GEOCHEMICAL
PROGRAMME 1968

KENNETH Mc MAHON AND PARTNERS PTY. LTD.

FIGURE 4 TRAVERSE LOCATIONS – PINYINNA BED ROCK GEOCHEMICAL PROGRAMME 1968