(20)

AUSTRALIAN CONSOLIDATED INDUSTRIES LTD. 3688

MINERAL RESOURCES DIVISION Rep. No.

TASMANIAN EXPLORATION EL.16/68. 3rd December, 1970.

REPORT ON DDH.3 - CLUMP PROSPECT. H. G. DAVIES.

SUMMARY:

DDH.3. at the Clump Prospect was terminated at a depth of 125.89m having penetrated mineralised material over the interval 61.97m - 84.43m. Core recovery in parts of the mineralised zone was poor especially above 71.47m, due to extensive leaching of carbonates. Individual assays were as high as 2.27%, the interval 71.47m - 84.43m assaying 0.45% cu. for a true width of 9.2m.

DDH.3 - CLUMP PROSPECT:

Grid Reference:	459,828N, 310,000E. AMG.
Collar Level:	c.151.m.
Inclination:	- 60°
Direction:	220° magnetic.
Date Drilled:	8/9/70 - 9/10/70.

No core held

1. OPERATIONAL DETAILS.

The rig was set up on site on 8/9/70 and drilling commenced on 11/9/70.

Drilling progress, together with engineering details, are shown on Figure 1. NX casing was set at 3.04m and BX casing at 9.15m, the remainder of the hole being cored with BX wireline equipment.

1.1 Drilling Conditions:

Appendix A shows the drill runs and core recovery. From the surface to 35.7m, progress was slow due to badly jointed ground and all drilling fluids were immediately lost to the formation. The formation became less jointed between 35.7m and 58.0m when core loss became pronounced, due to soft graphite rich bands. The hole was cemented at 65.00m and at 69.3m, due to caving ground and poor core recovery. On drilling out the cement plug, full circulation was regained and the drill hole flowed water at 190 litres/hr. No sludge samples were taken between 69.3m and 72.6m for reasons unknown. Below this depth, full sludge samples were taken, although the sampling interval was 3 metres in parts of the mineralised zone, due to an error by the site geologist. At 76.2m, the water flow increased to 950 litres/hr, and caving occurred in areas of low core recovery where the carbonate minerals had been leached out from mineralised zones.

Some water was lost at 78.4m, but regained after drilling a further 1 m. The drill hole was continued to a depth of 125.89m, the mineralisation terminating at 84.5m.

On completion, the drill hole was left open as an emergency source of water and the flow was approximately 1,200 litres/hr.

1. OPERATIONAL DETAILS (Continued).

1.2 Deviation:

The deviation, measured by the acid tube method, was as follows :

0.0m.	60.0°
15.25m.	61.5°
30.5m.	61.0°
45.7m.	57.5°
61.0m.	61.0°
76.2m.	57.5°
91.5m.	56.5°
106.75m.	55.0°
122.0m.	53.0°

The drill hole maintained good angle into the mineralised zone, but rapidly shallowed between 61.0m. and 122.0m.

2. GEOLOGY.

The detailed log is given in Appendix B, and may be summarised as follows :

		Inter-Section in metres.	% Cu.
0 - c.61.97m.	Flysch type sediments with sporadic veins.		
61.97m - 71.47m.	Poor core recovery; zones of leached quartz/carbonate material and graphitic siltstone, minor mineralisation.	9.50	0.1
71.47m - 73.98m.	Quartz/quartzose zone.	2.51	0.86
73.98m - 74.97m.	Leached zone, quartzose remnants, trace mineralisation.	0.99	0.38
74.97m - 75.78m.	Graphitic Slate.	0.81	0.021
75.78m - 77.99m	Leached zone-quartzose remnants (sludge assay).	2.21	0.41
77.99m - 79.19m.	Graphitic slate, moderate mineralisation.	1.20	0.33
79.19m - c80.38m.	Massive sulphides and carbonate (core loss).	1.19	0.47
80.38m - 84.43m.	Carbonates-moderate mineralisation (core loss at base).	4.05	0.35
84.43m - 125.89m.	Flysch type sediments.		

Mineralised Zone.

3. ASSAYS.

The core was split in half and lithological units sent for assay. The full assay results are presented in Appendix C. and summarised above against the mineralised unit log. Due to high core loss, the assay results in the leached section of the mineralised zone must be considered only as a guide.

Assay for the interval 75.78m - 77.98m was based on sludge samples only.

4. DISCUSSION.

The geology of the drill hole and the overlying costean are shown in the drill section, indicating that the mineralised zone dips at 77° towards the drill hole.

The drill hole angle through the mineralised zone was approximately 58°. Thus the true width can be calculated by multiplying the core length by 0.71.

In DDH.3., the total intersection of mineralisation is 22.46m, or 16.95m. true width. The average grade between 71.47m - 84.43m was 0.45% Cu. over a true width of 9.2m. This zone excludes extensively leached material where no sludge samples were obtained.

Portions of well mineralised core material showed a distinct banding of the mineralisation, adding weight to the conclusion reached from DDH.1. that the mineralisation is of replacement origin.

APPENDIX A.

DDH.3 - CLUMP PROSPECT

DRILL RUN WITH CORE RECOVERY

MEASURED FOOTAGE		METRIC EQUIVALENTS		CORE RECOVERY	
From	To	From	To	Metres	Percentages
0.00	6.00	0.00	1.83	0.36	19.7
6.00	8.00	1.83	2.44	0.58	95.1
8.00	20.00	2.44	6.10	1.88	51.4
20.00	24.00	6.10	7.32	1.13	92.6
24.00	25.92	7.32	7.90	0.58	100.0
25.92	28.00	7.90	8.53	0.63	100.0
28.00	30.50	8.53	9.30	0.32	41.6
30.50	34.42	9.30	10.49	1.13	95.0
34.42	35.58	10.49	10.84	0.35	100.0
35.58	36.83	10.84	11.23	0.39	100.0
36.83	38.92	11.23	11.86	0.63	100.0
38.92	40.92	11.86	12.47	0.61	100.0
40.92	42.83	12.47	13.05	0.58	100.0
42.83	45.92	13.05	14.00	0.95	100.0
45.92	47.92	14.00	14.61	0.61	100.0
47.92	51.50	14.61	15.70	0.60	55.0
51.50	52.75	15.70	16.08	0.29	76.3
52.75	53.42	16.08	16.28	0.05	25.0
53.42	54.25	16.28	16.54	0.08	30.8
54.25	55.34	16.54	16.87	0.33	100.0
55.34	56.83	16.87	17.32	0.45	100.0
56.83	61.17	17.32	18.64	0.35	26.5
61.17	62.50	18.64	19.05	0.41	100.0
62.50	65.00	19.05	19.81	0.48	63.2
65.00	66.58	19.81	20.29	0.48	100.0
66.58	68.00	20.29	20.73	0.44	100.0
68.00	69.42	20.73	21.16	0.43	100.0
69.42	70.08	21.16	21.36	0.20	100.0
70.08	71.00	21.36	21.64	0.12	42.9
71.00	71.92	21.64	21.92	0.28	100.0
71.92	72.83	21.92	22.20	0.28	100.0
72.83	74.58	22.20	22.73	0.53	100.0
74.58	75.34	22.73	22.96	0.23	100.0
75.34	76.75	22.96	23.39	0.30	69.8
76.75	78.34	23.39	23.88	0.49	100.0
78.34	80.50	23.88	24.54	0.66	100.0
80.50	82.58	24.54	25.17	0.57	90.5
82.58	84.58	25.17	25.78	0.61	100.0
84.58	86.34	25.78	26.32	0.54	100.0
86.34	87.00	26.32	26.52	0.20	100.0
87.00	89.34	26.52	27.23	0.65	91.5
89.34	90.83	27.23	27.68	0.41	91.1
90.83	92.42	27.68	28.17	0.44	89.8
92.42	95.75	28.17	29.18	0.95	94.1
95.75	97.00	29.18	29.57	0.39	100.0
97.00	98.50	29.57	30.02	0.45	100.0
98.50	100.00	30.02	30.48	0.46	100.0
100.00	102.58	30.48	31.27	0.79	100.0
102.58	105.25	31.27	32.08	0.81	100.0
105.25	109.67	32.08	33.43	1.35	100.0
109.67	112.83	33.43	34.39	0.86	89.6
112.83	117.00	34.39	35.66	1.27	100.0
117.00	123.08	35.66	37.51	1.85	100.0
123.08	127.75	37.51	38.94	1.43	100.0
127.75	132.34	38.94	40.34	1.15	82.1
132.34	132.83	40.34	40.49	0.15	100.0
132.83	136.17	40.49	41.50	1.01	100.0
136.17	140.42	41.50	42.80	1.30	100.0

MEASURED FOOTAGE		METRIC EQUIVALENTS		CORE RECOVERY	
From	To	From	To	Metres	Percentages
140.42	144.25	42.80	43.97	1.17	100.0
144.25	147.00	43.97	44.81	0.84	100.0
147.00	152.67	44.81	46.53	1.72	100.0
152.67	155.17	46.53	47.30	0.72	93.5
155.17	157.00	47.30	47.85	0.55	100.0
157.00	158.92	47.85	48.44	0.59	100.0
158.92	160.92	48.44	49.05	0.61	100.0
160.92	164.42	49.05	50.12	1.07	100.0
164.42	167.00	50.12	50.90	0.46	39.0
167.00	171.17	50.90	52.17	1.27	100.0
171.17	181.00	52.17	55.17	3.00	100.0
181.00	183.00	55.17	55.78	0.26	42.5
183.00	184.42	55.78	56.21	0.40	93.0
184.42	186.83	56.21	56.95	0.76	100.0
186.83	188.50	56.95	57.46	0.49	98.0
188.50	191.25	57.46	58.26	0.60	75.0
191.25	196.92	58.26	59.98	0.64	37.0
196.92	202.16	59.98	61.59	0.16	26.0
202.16	203.42	61.59	61.97	0.12	32.0
203.42	207.00	61.97	63.06	0.34	31.0
207.00	213.00	63.06	64.90	0.18	10.0
213.00	227.00	64.90	69.19	0.84	20.0
227.00	229.00	69.19	69.80	0.44	72.0
229.00	229.92	69.80	70.08	0.30	100.0
229.92	230.08	70.08	70.13	0.05	100.0
230.08	234.50	70.13	71.47	0.50	37.0
234.50	235.92	71.47	71.90	0.47	100.0
235.92	238.25	71.90	72.61	0.68	95.0
238.25	241.92	72.61	73.73	1.10	100.0
241.92	242.75	73.73	73.98	0.23	91.0
242.75	246.00	73.98	74.97	0.20	20.0
246.00	247.42	74.97	75.40	0.46	100.0
247.42	248.67	75.40	75.78	0.31	100.0
248.67	249.42	75.78	76.00	0.15	68.0
249.42	251.00	76.00	76.49	0.12	24.0
251.00	255.92	76.49	77.99	0.25	17.0
255.92	257.00	77.99	78.33	0.33	97.0
257.00	259.16	78.33	78.99	0.64	100.0
259.16	267.00	78.99	81.48	1.46	61.0
267.00	277.00	81.48	84.43	2.59	87.0
277.00	285.08	84.43	86.87	2.46	100.0
285.08	287.08	86.87	87.48	0.63	100.0
287.08	289.16	87.48	88.11	0.57	90.0
289.16	297.00	88.11	90.53	2.38	99.0
297.00	303.16	90.53	92.41	1.66	91.0
303.16	307.00	92.41	93.58	1.17	100.0
307.00	312.67	93.58	95.30	1.60	94.0
312.67	317.00	95.30	96.62	0.96	73.0
317.00	323.00	96.62	98.35	1.83	100.0
323.00	327.00	98.35	99.67	1.32	100.0
327.00	332.16	99.67	101.25	1.58	100.0
332.16	334.50	101.25	101.96	0.68	95.0
334.50	337.50	101.96	102.87	0.91	100.0
337.50	347.00	102.87	105.77	2.90	100.0
347.00	354.00	105.77	107.90	2.23	100.0
354.00	357.00	107.90	108.82	0.51	71.0
357.00	358.75	108.82	109.35	0.40	76.0
358.75	360.33	109.35	109.84	0.49	100.0
360.33	364.83	109.84	111.21	1.32	98.0
364.83	370.83	111.21	113.04	1.83	100.0
370.83	375.25	113.04	114.38	1.34	100.0
375.25	379.33	114.38	115.57	1.26	100.0
379.33	387.00	115.57	117.96	2.41	100.0
387.00	397.00	117.96	121.01	3.05	100.0
397.00	407.00	121.01	124.06	3.05	100.0
407.00	413.00	124.06	125.89	1.83	100.0

DDH.3 - CLUMP PROSPECT. GRID REFERENCE: 459,828N 310,000E COLLAR REFERENCE: c.151m. Direction: 048° true. Inclination: 60°

STRATIGRAPHIC INTERVAL IN METRES		DIP OF BEDDING		DESCRIPTION.
From	To	Depth	Dip.	
0	c.1.50	0.0m c.0.6m c.0.8m	+ 39° + 39° + 36°	Finely banded and laminated sequence of light grey siltstone and grey very carbonaceous silty mudstone (25% siltstone). The light grey siltstone bands and laminae show sharp bases, are locally load cast, and grade upwards into more argillaceous material. The sequence is well jointed, joint surfaces being commonly iron-stained and weathered. Locally a cleavage is developed in the argillaceous units, inclined at 12° to the bedding. A bedding plane lineation is locally developed. Disseminated cavities after pyrite, containing limonite and haematite, occur within the siltstones (95% sulphides oxidised; Total original sulphide <0.1%)
c.1.50	c.3.65	c.1.8m c.1.88m c.1.94m c.1.97m c.2.10m c.2.25m c.2.39m c.2.55m c.3.50m c.3.55m	+ 39° + 47° + 52° + 50° + 51° + 45° + 47° + 45° + 45° + 43°	Grey-dark grey carbonaceous, very argillaceous siltstone with occasional thin (2mm-2cms) light grey siltstone bands (esp. at c.1.88m and at c.3.55m) showing erosional bases, and upward grading (5% siltstone). The siltstone bands contain small iron-stained cavities and thin iron-stained fractures. The argillaceous sediments are massive, with suggestions of a rough banding. At c.1.93m, a fine (<½ mm) quartz vein dips at + 30° and at c.1.96m, another fine (<< ½ mm) quartz-chlorite vein intersects the bedding at 65°. The sequence contains frequent iron-stained joints and at c.2.00m, an irregular band of chlorite blebs and patches is developed, dipping + 47°. The chlorite band shows minor flexures and occasional small limonite stained fibrous cavities. Leucoxene is present in abundance as small flecks aligned with bedding. A cleavage is developed locally in the very argillaceous units, inclined at 25° to the bedding. Total original sulphides <<0.05%. Sulphides 100% oxidised.
c.3.65	6.10	c.4.86 c.5.47	+ 47° + 51°	Grey-dark grey, carbonaceous, very argillaceous siltstone, with occasional thin (2mm) light grey siltstone bands showing erosional bases and upward grading. At c.3.70m, the siltstone bands are tightly micro folded and micro faulted (10% siltstone). The unit is well jointed, joint and bedding planes locally coated with patches of limonite and chlorite. A cleavage is developed locally in the more argillaceous units, inclined at 22° to the bedding. Numerous thin (1 mm- 7 mm) quartz veins transect the units in all directions. The veins, locally micro folded, are cavernous, and contain substantial amounts of chlorite and pyrite. Chalcopyrite is a minor constituent. Total original sulphides c.1%. Sulphides 50% oxidised.

(21)

STRATIGRAPHIC INTERVAL IN METRES		DIP OF BEDDING		DESCRIPTION.
From	To	Depth	Dip.	
0.10	c.9.55	c.7.50 c.7.90 c.8.20	+ 47° + 53° + 47°	Dark grey carbonaceous, very argillaceous silty mudstone, with occasional thinner units of siltstone/mudstone bands and laminae. (10% siltstone). The sequence is well jointed. Joint surfaces have a limonitic coating. Numerous very thin quartz veins traverse the sequence. Mineralisation is poor. Total original sulphides <0.05%. Pyrite is associated with thin quartz-chlorite veins. The veins show leached cavities with little sign of oxidation. At c.8.53m, a 1 cm wide mineralised argillaceous unit occurs, containing 20% granular pyrite. White specks of leucoxene are present in abundance throughout the sequence.
c.9.55	c.11.88	c. 9.74 c.10.95	+ 45° + 45°	Finely banded and laminated sequence of light grey siltstone and dark grey carbonaceous and argillaceous siltstone (30% siltstone). The siltstone/mudstone units vary from 1 mm to 10 cms. in width. The bases of the siltstone bands are sharp and show local erosion and load cast structures. The siltstone layers contain subhedral pyrite and numerous cubic cavities. Total original sulphides <0.1%. Sulphides 1% oxidised. Abundant leucoxene is present within the argillaceous sediments.
c.11.88	c.12.33	c.12.20	+ 46°	As c.9.55m - c.11.88m, with a siltstone content of 50%. Thicknesses of the units vary from 0.5 mm to 3 mm. The sequence is well jointed in places and local minor fracturing is present. Occasional thin quartz veins (<0.55 mm), cut the bedding at 45°. Mineralisation is poor. Small amounts of quartz, chlorite and pyrite occur in micro gashes and fractures. Total original sulphides <<0.05%. Leucoxene is abundant in the more argillaceous units.
c.12.33	c.13.08	c.13.08	+ 38°	As c.9.55m - c.11.88m, with a siltstone content is 20%. Mineralisation is restricted to the light grey siltstone bands, where finely divided pyrite occurs occasionally in semi-spherical, diffuse edged pockets (esp. at c.12.60) Cavities after pyrite are common. Total sulphide<0.1%.
c.13.08	c.14.86	c.13.91	+ 48°	Grey-dark grey, carbonaceous, very argillaceous, massive, siltstone. Fine white elongated flecks (leucoxene ?) and small micas identify the bedding. Bedding surfaces have a sub-pearly lustre due to aligned micas, and a faint lineation. The sequence is well jointed and fine (<1 mm) quartz veins follow joint planes. The quartz veins contain finely disseminated pyrite and abundant chlorite. At c.13.20 m, an irregular-quartz-chlorite vein is developed,(c.1 cm)cutting the bedding obliquely at 27° and at a shallow angle to the core. The vein is locally microfolded and the chlorite tends to occur in patches around a series of aligned quartz stringers.

STRATIGRAPHIC INTERVAL IN METRES		DIP OF BEDDING		DESCRIPTION.
From	To	Depth	Dip.	
				The quartz is cavernous and contains pyrite. Mineralisation in the sequence is confined to the fine quartz-chlorite veins. Total original sulphides <0.1% Sulphides not oxidised, but numerous cavities after pyrite are present.
c.14.86	c.16.82	c.14.94 c.15.84 c.16.77	+ 49° + 45° + 45°	As for interval c.9.55m - c.11.88m, with a light grey siltstone content of c.40%, and units vary <1 mm to 2 mm in thickness. Jointing is moderately well developed, and small kink folds are common at c.15.90m, where bedding planes have a sub-pearly lustre (micas) and a lineation is developed, approx. perpendicular to strike. Occasionally, very fine quartz veins (<0.5mm) at the bedding. Between c.15.00m and c.15.70m, the sediments are silicified and cut by quartz veins (1-2mm). Mineralisation is poor, restricted to the basal part of the light-grey bands and laminae where very finely divided pyrite occurs in micro fractures and cavities. Limonite stains are only very occasionally present on bedding and joint surfaces. Total original sulphides <0.05%. Sulphides are not oxidised, but a few pinpoint cavities are present
c.16.82	m.20.12	c.18.59 c.19.19 c.20.10	+ 39° + 52° + 48°	Broadly banded and laminated sequence of light grey siltstone and dark grey carbonaceous and argillaceous siltstone (40% siltstone). Individual units vary in thickness from <0.05 mm to 10 cm. The light grey siltstone bands have sharp erosional bases and grade upwards into dark grey argillaceous material. The sequence is well jointed. Bedding surfaces have a sub-pearly lustre due to mica and at 18.67m, c.19.35m, and c.19.93 m bedding surfaces are semi-lustrous, have a soft soapy feel, due to a coating of graphite, and are heavily striated. Most bedding planes have a lineation developed approx. perpendicular to strike. At c.19.00m quartz veining is well developed along joints, the veins containing numerous cavities. Finely disseminated pyrite occurs in the light grey silty layers and a 1 mm vein consisting entirely of pyrite, occurs at c.18.87m. Total sulphides <0.1%. Chlorite is associated with quartz veins, and finely disseminated leucoxene is present in the more argillaceous units.
c.20.12	c.21.66	c.20.19 c.20.38 c.20.96 c.21.20 c.21.60	+ 46° + 47° + 48° + 47° + 47°	As for c.9.55m - c.11.88m with light grey siltstone content of 50%. The sequence is moderately well jointed and is occasionally cut by fine (<1 mm) quartz and quartz-carbonate veins.

STRATIGRAPHIC INTERVAL IN METRES		DIP OF BEDDING		DESCRIPTION.
From	To	Depth	Dip.	
				Micro folding and faulting are all well developed at c.20.13m, c.20.37m and c.20.97m. Micro gashes are developed at the base of the siltstone bands at m.20.58m, and are partially filled with decomposed carbonate. A green grey chloritic siltstone band occurs between c.20.50m and c.20.65m. Mineralisation is present at the base of this band, in the form of granular pyrite. Leached cavities are numerous. Total sulphides < 0.1%.
c.21.66	c.22.65	c.22.10	+ 42°	Light grey-dark grey massive, carbonaceous argillaceous siltstone, with a single zone of light grey siltstone bands and laminae. (5% siltstone). The sequence is well jointed, and is transected by occasional fine quartz veins (< 1 mm). Bedding planes either exhibit a sub-pearly lustre and are striated (esp. close to the silty zone), or are micaceous with a vague lineation. Mineralisation absent.
c.22.65	c.24.18	c.22.70 c.22.90 c.23.00 c.23.90 c.24.10	+ 50° + 45° + 48° + 53° + 48°	Finely banded and laminated sequence of dark grey carbonaceous argillaceous siltstone and light grey siltstone. (40% siltstone). The light grey siltstone bands and laminae show sharp erosional bases, locally loadcast, and grade upwards into finer carbonaceous material. A 10 cm massive argillaceous siltstone unit occurs at c.23.50m. The sequence is well jointed, joints commonly being filled with a quartz-carbonate-chlorite mixture. Bedding planes are soft, sub-pearly and semi-graphitic, with a lineation almost perpendicular to strike. Mineralisation is restricted to the quartz-carbonate veins. Very finely disseminated pyrite infills, and often is the only vein constituent remaining after leaching of the carbonate. Total sulphides < 0.05%.
c.24.18	c.26.27	c.24.68 c.25.17 c.25.75	+ 53° + 47° + 41°	Light-grey - grey, massive, carbonaceous and argillaceous siltstone with occasional lightgrey siltstone bands and laminae. The siltstone bands have sharp erosional bases, locally truncated, and grade into finer carbonaceous material. Light grey siltstone content 15%. The sequence is well jointed, and quartz-carbonate-chlorite veins follow joints at c.24.22m, c.24.51m, c.24.67m, c.26.00m, and 26.20m. Bedding surfaces have a sub-pearly lustre and are semi-graphitic, exhibiting a lineation perpendicular to strike. The siltstone units over the interval c.25.35m - c.25.70m, have undergone a high degree of silicification. Pyrite occurs in the quartz-carbonate-chlorite veins at c.24.83m, c.25.70m, and c.26.10m. Total original sulphides < 0.1%

STRATIGRAPHIC INTERVAL IN METRES		DIP OF BEDDING		DESCRIPTION.
From	To	Depth	Dip.	
c.26.27	c.26.74	c.26.55	+ 41°	As for intervals c.22.65m - c.24.18m, light grey siltstone content 50%. Micro fracturing and faulting is well developed at c.26.40m, the sequence is well jointed, and quartz infillings along joints are common.
c.26.74	c.27.90	c.27.00 c.27.40	+ 40° + 37°	As for intervals c.24.18m - c.26.27m, light grey siltstone content 20%. The sequence is well jointed with quartz-carbonate-chlorite infilling the joints. Pyrite occurs in quartz-carbonate veins. Total sulphides < 0.1%.
c.27.90	c.28.84	c.27.95 c.28.40	+ 39° + 45°	As for interval c.22.65m - c.24.18m, very finely laminated. Between c.27.90m and c.28.20m, light grey siltstone content 30%. The sequence is moderately well jointed with quartz and carbonate infillings; some siltstone bands are microfolded and faulted. Mineralisation is poor, restricted to joint infillings. Very finely divided pyrite. Total original sulphides < 0.05%.
c.28.84	c.29.70	c.29.25	+ 46°	Grey massive carbonaceous and argillaceous siltstone with leucoxene aligned along bedding planes. Fine (<1 mm) quartz veins cut the sequence. The sequence is well jointed and 2 sets of lineation are developed on joint surfaces intersecting at 55°. Silicification is marked at c.28.91m. Finely divided granular pyrite occurs on joint planes. Total sulphides < 0.05%.
c.29.70	c.35.45	c.29.85 c.30.35 c.30.90 c.31.25 c.31.40 c.32.00 c.32.35 c.32.45 c.33.00 c.33.30 c.33.75 c.34.28 c.34.55 c.34.90 c.35.32	+ 40° + 40° + 48° + 41° + 42° + 44° + 39° + 38° + 49° + 40° + 35° + 42° + 43° + 46° + 50°	Finely and broadly banded, and laminated sequence of grey carbonaceous and argillaceous siltstone and light grey siltstone (25%). The sequence contains thin zones of very fine lamination (c.30.35m, c.30.70m, c.31.15m, c.32.00m, c.33.45m, and c.35.00m), and zones of massive argillaceous siltstone (c.30.05m - c.30.25m, c.33.87m - c.34.18m). Elsewhere banding is fine or broad. The sequence is well jointed and joint planes exhibit a distinct lineation (c.55° to core). At c.33.60m, a small but extensively fractured zone occurs mineralised with quartz-carbonate-chlorite veins infilling the fractures. Mineralised veins of quartz-carbonate-chlorite occur along cleaved bedding planes and joints at c.31.91m and c.32.12m. Quartz porphyroblasts appear at c.31.80m and tend to prefer the finer, more argillaceous layers. Chlorite occurs on semi-graphitic bedding planes as blebs and patches at c.31.35m. A wide chloritic band occurs over the interval c.33.08m - c.33.30m, with large irregularly shaped patches of very finely divided pyrite. This band is cut by fine quartz veins and fractures. Pyrite mineralisation occurs within the light grey siltstone (c.30.85m and c.34.44m), as finely disseminated particles along joints (c.32.00m) and fractures (c.33.60m) and as large crystals in small quartz veins. Total sulphides < 0.1%.

(214)

STRATIGRAPHIC INTERVAL IN METRES		DIP OF BEDDING		DESCRIPTION.
From	To	Depth	Dip.	
c.35.45	c.39.77	c.35.60 c.35.90 c.36.35 c.36.70 c.37.26 c.37.72 c.38.05 c.38.50 c.38.92 c.39.25	+ 42° + 43° + 40° + 40° + 48° + 45° + 44° + 40° + 44° + 45°	As for the interval c.22.65m - c.24.18m with 30% siltstone. This sequence is well jointed and quartz-carbonate veins commonly follow the jointing pattern. Zones of <u>very</u> finely laminated sediments occur between c.37.00m - c.37.16m; c.38.60m - c.38.71m, c.39.46m - c.39.56m; c.37.66m - c.37.78m. Quartz porphyroblasts occur intermittently in the argillaceous units. Fine (< 1 mm) quartz-carbonate-chlorite veins traverse the beds. Pyrite mineralisation occurs as extremely finely divided grains accumulated thickly on joint surfaces (c.35.62m) or thinly as encrustations on bedding surfaces (c.38.40m). Pyrite also occurs as large crystals and pockets of finely divided grains at the bases of the siltstone bands, and in well developed quartz-carbonate veins which follow joints and cross the bedding obliquely. Total sulphides < 0.1%
c.39.77	c.41.50	c.40.14 c.40.90 c.41.50	+ 53° + 47° + 42°	As c.22.65m - c.24.18m; siltstone content 20%. The sequence is moderately well jointed, and the entire interval is traversed by numerous, locally highly folded and fractured, mineralised quartz-carbonate-chlorite veins (< 1mm-1.5cms). Micro fracturing and folding is associated with the extensive veining. Quartz porphyroblasts are developed in the more argillaceous units. From c.40.00m to c.40.35m, the sediments are very chloritic and chlorite forms a border around the quartz-carbonate veins. The carbonate is partially leached. Pyrite mineralisation is restricted to the quartz-carbonate-chlorite veins. Total sulphides 0.1%.
c.41.50	c.42.11	c.42.00	+ 43°	Grey, massive, carbonaceous and argillaceous siltstone with isolated light grey siltstone blebs and laminae and fine leucoxene. The sequence is well jointed and joint planes exhibit a distinct lineation. Extremely fine quartz stringer veins cut the beds along the length of the core. No mineralisation.
c.42.11	c.42.68	c.42.27 c.42.65	+ 42° + 44°	As for interval c.22.65m - c.24.18m; siltstone content 25%. Cross stratification is developed in a siltstone layer at c.43.00m. The sequence is well jointed and traversed by a few mineralised, but highly leached quartz-carbonate veins. The majority of veins are locally microfolded and cut the bedding obliquely, but a few follow joints and bedding planes. Local microfaulting is present and quartz porphyroblasts are common in the more argillaceous layers.

(215)

STRATIGRAPHIC INTERVAL IN METRES		DIP OF BEDDING		DESCRIPTION.
From	To	Depth	Dip.	
c.				Pyrite occurs in the quartz-carbonate-chlorite veins, and in the basal layers of a chloritic siltstone band at c.43.00m. Cavities are common in this unit Total sulphides 0.05%. Sulphides not oxidised, majority removed.
c.42.68	c.45.44	c.43.15	+ 43°	Grey-green massive, carbonaceous, argillaceous, chloritic siltstone with occasional light grey siltstone bands and laminae (10% siltstone). Otherwise similar to c.24.18 - c.26.27. Siltstone content 10%.
		c.43.50	+ 45°	
		c.44.15	+ 43°	
		c.44.58	+ 46°	
		c.44.98	+ 51°	
c.45.44	c.45.54	c.45.51	+ 43°	Dark grey carbonaceous mudstone with light grey siltstone bands. Siltstone content 30% Thickness of the units varies from 1 mm to 5 cm. The base of the siltstone is sharp and has load cast structure developed. The zone is well jointed and contains disseminated pyrite mainly contained within the siltstone. Total sulphide less than 0.1%.
		c.46.05	+ 42°	
		c.46.85	+ 43°	
		c.47.58	+ 47°	
		c.47.96	+ 43°	
		c.48.00	+ 44°	
		c.48.95	+ 41°	
		c.49.45	+ 45°	
		c.49.87	+ 43°	
		c.50.29	+ 43°	
		c.51.15	+ 44°	
		c.51.45	+ 41°	
		c.51.81	+ 40°	
		c.52.11	+ 43°	
c.45.54	c.55.17			As above but/ units become more massive and more graphitic. Thickness of units vary from 3 cm to 20 cm. The zone is traversed by occasional thin quartz veins. Tota sulphides less than 0.1%.

STRATIGRAPHIC INTERVAL IN METRES		DIP OF BEDDING		DESCRIPTION.
From	To	Depth	Dip	
c.55.17	c.56.21		45°-60°	Dark grey, carbonaceous and graphitic blocky argillaceous siltstone with common quartz or cordierite porphyroblast rarely replaced by a pyrite/carbonate mixture. Bedding is indistinct but leucoxenes show good parallelisation. Between 55.17m - 55.78m, the sequence is microfaulted and folds are present with abundant graphite or slip surfaces. Thin unmineralised quartz veinlets are also present in this sub-unit. The remainder of the unit has sporadic joints (or bedding surfaces) with graphite rich surfaces. Core loss is likely to be associated with the soft microfaulted graphitic zone.
c.56.21	c.56.95		+ 50°	Dark grey-black carbonaceous and graphitic argillaceous siltstone with thin lighter green-grey chloritic bands and laminae 1mm - 2 cms wide. (20% total). These show good upward grading, minor load casts/scours. Many of the bedding surfaces are very graphitic with evidence of movement parallel to the bedding. Small porphyroblast occasionally near hexagonal in shape are very common (quartz or cordierite). Very thin irregular quartz veinlets are common, a 1 cm wide vein at 56.67 m cuts the bedding at 10-20° is microfaulted and consists of quartz, chlorite patches near the margin and minor fine disseminated chlorite.
c.56.95	c.57.00			Quartzose band comprising irregular patches is of milky quartz in a grey siliceous matrix containing silicified fragments of black sediment. Small amounts of chloritic material are also present and blebs usually associated with the sediment inclusions. Mineralised with fine euhedral pyrite and euhedral chalcopyrite. Total sulphides c.1%.
c.57.00	c.57.64		55°	Dark grey carbonaceous siltstone with thin light grey bands and laminae (<0.5cm) having upward grading and minor compactional structures, which decrease in abundance with depth. (Total light grey content 20%). Quartz or cordierite porphyroblasts occur in a few more argillaceous bands. At the upper contact, graphite is well developed and the core is fragmented. The basal 10 cms contain thin quartz veinlets and graphite becomes common on bedding surfaces. The unit is well jointed, the joint/bedding angle being 70° with similar strikes. No mineralisation.

STRATIGRAPHIC INTERVAL IN METRES		DIP OF BEDDING		DESCRIPTION.
From	To	Depth	Dip.	
c.57.04	c.58.26		35°	Dark grey-black brecciated very graphitic argillaceous siltstone with lighter silty bands which have been broken into fragments. Chlorite bands and patches are common, the bands marking the boundaries of the main disturbed zones. Quartz-cordierite, pseudohexagonal porphyroblasts are abundant throughout, locally replaced by buff carbonate. A few quartzose blebs and thin milky quartz veinlets are present and one soft carbonate/chlorite/quartz veinlet was noted. (1-2 mm). The carbonate is very leached. Core losses occur in the very graphitic units.
c.58.26	c.58.51			As 57.00m- 57.04m, but severely microfaulted with abundant chlorite as disseminations in the sediments, veins and patches. A few light grey quartzose blebs and veinlets are present.
c.58.51	c.61.97			Very poor recovery in this zone. Recovered core comprises dark grey very argillaceous graphitic siltstone with abundant quartz-cordierite pseudohexagonal porphyroblast. A few slightly lighter laminae are present (<10% total). Bedding where visible varies from 50° to parallel to the core, indicating folding in this section. Graphite is common on bedding surfaces and also on the numerous joint faces. A few ferro-carbonate patches are present in the upper portion of the unit and quartzose patches and veins with associated chlorite are present in the basal few centimetres of recovered core. No mineralisation visible.
c.61.97	c.63.00		50°	Poor core recovery. The upper 3 cms. comprises milky quartz containing irregular wisps and laminae of very graphitic sediment. A few small patches of chlorite and decomposed carbonate occur. No mineralisation. A few small soft fragments of quartz/chlorite/leached carbonate with inclusions and wispy laminae of graphite were recovered beneath the quartz vein. Majority of core loss probably occurs in this type of lithology. The remaining core recovered comprises dark grey carbonaceous argillaceous siltstone with a few lighter laminae containing common quartz/cordierite porphyroblasts, frequently pseudohexagonal. Thin chlorite veinlets are sporadically developed. The unit is well jointed.

(218)

STRATIGRAPHIC INTERVAL IN METRES		DIP OF BEDDING		DESCRIPTION.
From	To	Depth	Dip.	
c.63.06	c.64.90			Recovery 10%. Fragments recovered comprise (in approx. equal amounts) dark grey, carbonaceous and argillaceous siltstone with porphyroblasts. White vein quartz with cavities lined with patchy chlorite (carbonate leached) locally containing graphite coatings. Finely intermixed quartz and buff carbonate with stringers of graphite. Mineralised with fine pyrite and traces of chalcopyrite (1-3%).
c.64.90	c.69.19		30°	20% recovery. Upper 5 cms. Dark grey very graphitic argillaceous siltstone with siliceous patches and abundant chlorite veins. 25 cms. Dark grey carbonaceous and graphitic, argillaceous siltstone with quartz/cordierite porphyroblasts and disseminated pyrite in basal 3 cms. Bedding indistinct. A few thin quartz veins are present. 6 cms. The core of this unit is continuous with unit above. Milky quartz with thin irregular graphitic wispy laminae tending to produce a pseudonodular texture. Mineralised with pyrite and chalcopyrite. Total sulphides 6-7%, 1% chalcopyrite. 20 cms. Intermixed white quartz and chlorite/graphite siliceous sediments. Mineralised with pyrite and subordinate chalcopyrite. Total sulphides 2-3%. This unit is very broken and most of core loss occurs in this type of lithology. 20 cms. As 25 cms. unit.
c.69.19	c.69.90		50°	Dark grey-black carbonaceous/graphitic very argillaceous siltstone with thin lighter laminae < 2 mm (<10% total). Quartz veins up to 1 cm wide with a few quartz blebs occur and are mineralised with chalcopyrite and pyrite. The bedding/vein intersection is approximately 20°.
c.69.90	c.70.13			Milky white quartz and light grey siliceous material containing numerous wispy bands and irregular fragments of graphite and graphitic sediment. Chlorite patches are sporadic throughout. Total sulphides 1-2% comprising chalcopyrite and pyrite in approximately equal proportions.
c.70.13	c.71.47			Core recovery 37%- no sludge collected. Upper half of core comprises milky quartz with veins of graphite. Trace of pyrite. Lower half; grey siliceous material with irregular cavities, clay lined showing a banding through chlorite and graphitic rich laminae. Mineralised with pyrite and trace chalcopyrite. Total sulphides 1%.

(219)

STRATIGRAPHIC INTERVAL IN METRES		DIP OF BEDDING		DESCRIPTION.
From	To	Depth	Dip.	
c.71.47	c.71.80		50° - 45°	Milky quartz and greyish quartzose material containing wispy laminae and irregular fragments of black graphitic sediment. Small cavities rarely with quartz crystals occur throughout (carbonate removed). Well mineralised with pyrite and chalcopyrite occurring in bands and disseminated patches. Total sulphides 12%.
c.71.80	c.72.00			Milky white quartz with rare fragments of chloritised sediment, black graphite and rose chlorite veinlets. <0.5% pyrite.
c.72.00	c.72.90			Mottled milky white quartz and greyish quartzose material with included fragments and wispy laminae of graphite rich sediments producing pseudonodular texture. Bands of milky quartz are also present. The milky quartz is mineralised with traces of pyrite and the quartzose material carried pyrite and chalcopyrite. Total sulphide ≤ 1%.
c.72.90	c.73.50		45° - 50°	Light grey quartzose material with sporadic angular inclusions of dark grey graphitic siltstone and a few wispy irregular laminae. The unit is very well mineralised with chalcopyrite. Total sulphides 8%. Locally the chalcopyrite shows a crude banding parallel to the orientation of the included sediment fragments. Small cavities are locally present - solutionof carbonate.
c.73.50	c.73.73			As above but angular sediment fragments increase to a true breccia. Total sulphides 3%, 2% chalcopyrite.
c.73.73	c.74.97			Poor core recovery below 73.98m. Light grey quartzose material with bands, laminae and included fragments of green chloritic material and dark grey graphite rich sediment. Cavities up to 1 cm in diameter are common lined with quartz crystals and/or chlorite (cavities due to solution of carbonate). During drilling the string was falling under its own weight and core loss is probably due to extensive cavities. Minor pyrite (<1%) with trace of chalcopyrite in core. Sludge sample shows more sulphide.

220

STRATIGRAPHIC INTERVAL IN METRES		DIP OF BEDDING		DESCRIPTION.
From	To	Depth	Dip.	
c.74.97	c.75.78		45° - 50°	Dark grey, carbonaceous, graphitic, argillaceous siltstone, with common quartz/cordierite porphyroblasts - bedding indistinct and distorted. The unit is severely jointed with strong development of graphite on joint surfaces. Between 74.15 m and 74.45 m, veins up to 3 cmsin width are common comprising siliceous material with common small cavities, chlorite coating along boundaries, included chlorite patches. These veins are poorly mineralised with pyrite and chalcopyrite.
c.75.78	c.76.00			c.70% recovery. Interbanded light grey siliceous material with included angular dark grey sediment fragments, small cavities are present throughout. Mineralised with pyrite and chalcopyrite. Total sulphides 8%, 3% chalcopyrite minimum.
c.76.00	c.77.99			Core recovery very poor, many core fragments rounded and rolled. Recovered core comprises grey siliceous material with bands of included angular chloritised sediment fragments, graphitic rich wispy laminae and bands. Cavities are present throughout (carbonate ?). The core is variably mineralised in bands of between 3% and 40% sulphide. Overall estimated mean 10%, 3% chalcopyrite and 7% pyrite. Some of the chalcopyrite is amorphous and friable.
c.77.99	c.78.33		45°	The sequence comprises two veins 3 cms and 15 cms wide respectively separated by 7 cms of green grey intensely chloritised carbonaceous sediment with numerous quartz/cordierite porphyroblasts, cavities and blebs or patches of soft buff carbonate. The veins comprise grey quartzose material with included bands and wispy laminae, of black argillaceous material and approx. 20% irregular patches of soft weathered buff carbonate concentrated mainly in the centre of the thicker vein. The veins are heavily mineralised with 30-40° sulphide comprising large (5 mm) pale pyritohedrons and traces of chalcopyrite.
c.78.33	c79.19		30° - 50°	Severely disturbed very graphitic sediment with numerous irregular veinlets, blebs and patches of chloritic material. The overall internal structure indicates severe brecciation. Quartz/cordierite porphyroblast are common in the dark argillite. From 78.33-78.76m. Sporadic pyrite mineralisation with trace chalcopyrite. Total sulphides 2%. From 78.76m. Blebs and bands of chalcopyrite locally with covellite staining and possible chalcocite. Total sulphides 10%, 4% chalcopyrite. From 78.99-79.19m. Silicified in upper 10 cms, 20% sulphides mainly cubes of pyrite and trace of chalcopyrite.

STRATIGRAPHIC INTERVAL IN METRES		DIP OF BEDDING		DESCRIPTION.
From	To	Depth	Dip.	
c.79.19	c.80.38			15 cms. of core recovered from this unit comprising 5 cm band of massive pyrite dodecohedrons and cubes (≤5 mm) granular texture, no chalcopyrite visible. 5 cms as 78.33m-79.19m mineralised 15% pyrite with traces of chalcopyrite. 5 cms deep green dendritic chlorite/buff ferrocarbonate admixture. No visible mineralisation.
c.80.38	c.81.30			Light grey and buff micritic ferro-dolomite with possible minor amounts of quartzose material with a few chloritic patches and pale chloritised sediment fragments. Locally the carbonate is soft and friable and very porous. The unit is mineralised with very fine grained pyrite and chalcopyrite, the mineralisation being patchy and disseminated. Total sulphides 2%, chalcopyrite c1%.
c.81.30	c.81.40			Greeny-black, chloritised graphitic argillite disrupted by numerous veins and lenses of both micritic and sparry ferro-dolomite producing a brecciated appearance. Trace only of pyrite and chalcopyrite.
c.81.40	c.82.06		50°	Light grey finely brecciated talcose ferro-dolomite and fragments of green-grey chloritised sediment. (< 3 mm). Between 81.56 m and 81.62 m, a sheared zone of interbanded greeny serpentine and white talc is developed with blebs and patches of ferrodolomite. Sporadically mineralised with fine (<2 mm) pyrite and chalcopyrite. Total sulphides c.1%, chalcopyrite c.0.5%.
c.82.06	c.82.24			Light grey fine grained, locally talcose, ferro-dolomite with a few radiating acicular crystals (? wollastonite) and a patch of sparry carbonate.)(1 cm). Mineralised with 1% chalcopyrite with some pyrite. Total sulphides 2%.
c.82.24	c.82.82		50°	As 81.40m - 82.06m, with a 2 cm lineated talc zone at 82.30 m. Included fragments up to 1 cm in width. Mineralisation 1% total sulphide, 0.3% chalcopyrite.
c.82.82	c.83.38			As 81.40m - 82.06m. Total sulphides 15%, chalcopyrite 0.5-010%. The pyrite occurs as dodecohedron up to 0.5 cm wide and as very fine cubes. (<1 mm)
c.83.38	c.84.43			As 82.06m - 82.24 m, with one 2 cm wide zone of included greeny grey chloritic graphitic sediment at 83.46. No core recovered below 84.00m. (All core fits about this level). The basal part of recovered core is soft and friable and the lost core is likely to be very weathered carbonate material. Base of mineralisation taken at 84.43 m. Total sulphides 5% pyrite with 0.5% chalcopyrite. The sulphides are fine grained and disseminated through the carbonate.

(2222)

STRATIGRAPHIC INTERVAL IN METRES		DIP OF BEDDING		DESCRIPTION.
From	To	Depth	Dip.	
c.84.43	c.86.87	84.90m 85.80m 86.80m 86.87m Veins dip 30° - 60°	74° 75° 75° 90°	Dark grey finely banded and laminated carbonaceous argillaceous siltstone. The bands comprise lighter, less argillaceous material and vary in thickness from <1m to 1 cm, the thicker bands showing an upward grading and minor scour features. (Total light sediment 15%). Quartz/cordierite porphyroblasts are common throughout, occurring mainly in the more argillaceous units. The unit is cut by sporadic veins and irregular veinlets of quartz/chlorite and carbonate ± pyrite and chalcopyrite, up to 2 cms wide. Some veins are associated with microfaults. Veins intersecting bedding at an acute angle.
c.86.87	c.87.17			Breccia comprising angular fragment of black sediment up to 4 cms wide in a finely granular matrix of siliceous material, carbonate and chlorite with traces of pyrite.
c.87.17	c.87.36			3 cm vein of finely granular siliceous material, buff ferrocarbonate and chlorite no mineralisation underlain by 6 cm of carbonaceous argillaceous siltstone as 84.43 - 86.87. A 7 cm dominantly micritic carbonate vein with siliceous material and disseminated chlorite forms the base of the unit. Mineralised with pyrite and minor chalcopyrite. Total sulphide for unit <0.5%.
c.87.36	c.88.85	87.50m 88.30m 88.80m	60° 60° 65°	Dark grey argillaceous and carbonaceous siltstone with lighter more silty bands and laminae. (1mm- 5 cm. Total lighter content 30%. The lighter bands show an upward grading and repetitive nature, the upper more argillaceous zones of each graded unit containing porphyroblasts (quartz/cordierite). Sporadic veins and veinlets cut the sequence and are composed of a quartz/chlorite/carbonate mixture with traces of pyrite. At 87.48, 5 cms of vein fragments occur comprising siliceous material, chlorite and included sediment fragments with 15% sulphides; 1-2% chalcopyrite.
c.88.85	c.94.90	89.25m 90.00m 90.75m 91.55m 92.30m 93.00m 93.90m 94.75m	60° 60° 65° 70° 60° 65° 55° 60°	Dark grey-black carbonaceous very argillaceous siltstone with 15% of lighter siltstone occurring as very thin laminae (c.1mm) and occasional sporadic thin bands showing minor basal structures and fine upward grading. The unit becomes increasingly more silty with depth over the basal 1.60m. Quartz/cordierite porphyroblasts occur abundantly in the more argillaceous units. Fine pyrite occurs sporadically in the light grey silty bands. The sequence is cut by a few irregular veins of quartz/carbonate/chlorite up to 1 cm in width often associated with small microfaults, and are most common in the basal 1.5% metres. The veins show small leached cavities and minor pyrite. The walls of the veins are very chloritic over 1-2 mms. The unit is patchily jointed. Graphite occurs on some bedding and joint surfaces.

(22)

STRATIGRAPHIC INTERVAL IN METRES		DIP OF BEDDING		DESCRIPTION.
From	To	Depth	Dip.	
c.94.90	c.96.30 (approx)			Basal boundary uncertain due to core loss. Major veins zone comprising intermixed grey quartzose material, buff carbonate and chlorite blebs and patches with numerous included angular fragments of finely laminated dark grey argillaceous siltstone in the upper 60 cms. The lower portion of the core contains only a few small chloritised fragments. The unit contains cavities from 1 m - 1 cm in size, due to removal of ferro-dolomite patches. Mineralised with pyrite, total sulphide 3%.
c.96.30	c.96.62		60° - 65°	Interbanded and laminated light grey siltstone and dark grey carbonaceous and argillaceous siltstone. (50% light grey siltstone) porphyroblasts present in argillaceous sediments. The unit is cut by numerous thin quartz/chlorite veinlets.
c.96.62	c.97.06			Brecciated zone comprising angular fragments of dark grey carbonaceous and argillaceous siltstone with abundant porphyroblasts in a matrix of finely granular siliceous material, chlorite and carbonate, the latter being leached out in parts leaving small cavities. Sporadically mineralised with pyrite; total sulphide c.1%.
c.97.06	c.97.20		65°	As 96.30-96.62m.
c.97.20	c.97.88			Dark grey carbonaceous and argillaceous siltstone with 20% light grey laminae and a few thin bands (1 cm) severely intrudedd by finely granular siliceous material/carbonate/chlorite veins which tend to brecciate the sediment and in some instances, fragments of sediment are included in the veins. The veins contain about 0.5% pyrite.
c.97.88	c.100.92	99.67m 100.85m	65° 65°	Dark grey and argillaceous siltstone becoming more siliceous with depth, with quartz-cordierite porphyroblasts containing 15% of light grey siltstone, locally pyritic, as very thin laminae and bands up to 1.5 cms. wide. The bands show upward grading, irregular bases (load cast and/or scours). The unit contains sporadic, non-oriented, thin veinlets and irregular patches of quartz with chlorite. At 100.17m, a 2 cm wide vein of white quartz with chlorite blebs and small cavities (after carbonate) contains brecciated angular fragments of sediment associated with microfaulting. No visible mineralisation.

(422)

STRATIGRAPHIC INTERVAL IN METRES		DIP OF BEDDING		DESCRIPTION.
From	To	Depth	Dip.	
c.100.92	c.101.96			Zone comprising mainly siliceous 20%/carbonate 20%/chlorite 60%, vein material with thin interbeds of argillaceous siltstone. The vein material contains included angular fragments of dark grey sediment, green chloritised sediments up to 2 cms in width. Some small cavities present due to carbonate removal. Quartz/cordierite porphyroblasts abundant in the sediment bands and fragment. The vein material is mineralised with pyrite and chalcopyrite. Total sulphides 1-2% with 0.5% chalcopyrite.
c.101.96	c.103.53		60°	Dark grey carbonaceous siltstone with 20% lighter siltstone bands with scattered porphyroblasts averaging 3 mm in diameter in the dark grey sediment. The sequence is cut by common small microfaults with local crumpling of lamination adjacent to the fault planes. At 102.10m, a fold occurs, the axis dipping at 60° The unit is cut by common irregular quartzose/carbonate/chlorite veins and veinlets (up to 2 cms wide) totalling 20% of the unit. The veins occur along microfaults and graphite is developed on slickensides adjacent to the veins. The veins are randomly oriented and contain locally included fragments of sediment. The veins are mineralised with traces of pyrite.
c.103.53	c.108.35	104.26m 105.15m 105.72m 106.22m 107.00m 107.75m 108.25m	55° 55° 60° 53° 60° 67° 58°	Dark grey argillaceous and carbonaceous siltstone with 20%-30% of light grey siltstone as thin laminae (c.1m) and bands (up to 1 cm wide). The bands show upward grading and minor basal irregularities. Quartz/cordierite porphyroblast occurs throughout being restricted mainly to the darker lithology. Quartz/chlorite/carbonate veins occur as follows: 6 cms vein at 104.21m - chloritised and dark grey sediment fragments included in the vein. Minor pyrite mineralisation. 8 cms vein at 105.25m - included fragments as above. 1 cm vein at 105.77m - runs parallel to core over 30 cms. with local small offshoots, rare included sediment fragments. 3 cm vein at 107.67m 30° to core - few chloritised sediment fragments trace 2 cm vein at 107.90m - milky white quartz withchlorite blebs. pyrite.
c.108.35	c.109.84			Some core lost in this zone which consists sediments as above intruded by many quartz/chlorite/carbonate (partly leached veins with included chloritised sediment and dark grey sediment fragments. Total vein material 50% with only traces of pyrite. Veins occur along joints and microfaults and graphite occurs along vein boundaries.

STRATIGRAPHIC INTERVAL IN METRES		DIP OF BEDDING		DESCRIPTION.
From	To	Depth	Dip.	
c.109.84	c.110.77	110.14m 110.65m	65° 67°	As 103.53m-108.35m, with no major veins but sporadic numerous thin veinlets of quartz/carbonate/chlorite.
c.110.77	c.111.05			Quartz/carbonate/chlorite vein system with numerous cavities after carbonate with included angular fragments chloritised sediments. Mineralised with 5% sulphides - pyrite and traces of chalcopyrite.
c.111.05	c.111.20			Dark grey disturbed carbonaceous siltstone cut by microfaults and thin quartz veinlets.
c.111.20	c.111.54			Breccia zone comprising angular fragments of dark grey carbonaceous siltstone, partly chloritised, up to 3 cms in width in a matrix of finely granular quartz/chlorite/carbonate vein material. Trace pyrite.
c.111.54	c.111.96		57°	Major veins rich in chlorite with quartz and carbonate containing a few large (3-4 cm) included fragments of dark grey and green grey chloritised siltstone. Heavily mineralised with pyrite and minor chalcopyrite (0.5%). Total sulphide 8-10%.
c.111.96	c.113.90		80°	Dark grey argillaceous and carbonaceous siltstone with 40% light grey siltstone occurring as thin laminae and band vary between o.5 cm and 5 cm in thickness. The siltstone bands shows small-scale cross-stratification, minor scours, load casts, fine upward grading and small-scale slumping. Generally cycles can be recognised consisting of light grey siltstone; sharp base ± cross stratificating passing upwards into finer laminted sediment and finally to a dark grey argillaceous unit with porphyroblasts. The cycles vary in thickness from about 1 cm to 5/7 cms. A few microfaults are present filled with thin quartz veins and patchy mineralised with pyrite.
c.113.90	c.114.38			Dark grey carbonaceous and argillaceous siltstone with a few light bands and laminae (≤.1 cm), severely disturbed and cut by numerous thin quartz veins and quartz/chlorite patches, mineralised with traces of pyrite. Graphite present on vein contacts.
c.114.38	c.114.48		47° - 50°	Quartzose vein with common disseminated chlorite and thin dark grey wispy sediment inclusions. Mineralised with pyrite and chalcopyrite. Total sulphide 3%, 2% chalcopyrite.

226

STRATIGRAPHIC INTERVAL IN METRES		DIP OF BEDDING		DESCRIPTION.
From	To	Depth	Dip	
c.114.48	c.116.22		80° ± 5°	As 111.96m- 113.90m. Very well developed cycles and sedimentary features as before with sporadic worm tubes in argillaceous sediment filled with light grey silty material derived from the overlying siltstone layer.
c.116.22	c.116.40			Greeny grey, extensively chloritised and silicified siltstone containing sub-rounded fragments of more chloritic material (primary sedimentary features) Heavily mineralised with pyrite and minor chalcopyrite. Total sulphide 15%.
c.116.40	c.117.05		90°	Massive unit of grey carbonaceous siltstone with 10% light grey silty laminae and some complex sedimentary disturbance feature. A 1 cm quartz vein with bands of chlorite of each wall occurs concordant with the bedding at 116.75m. Gradational base.
c.117.05	c.117.57			Light grey chloritic siltstone showing an erosive base and an upward progression from planar lamination to cross-stratification to planar lamination with argillaceous laminae. Cut by several closed joints with pyrite infillings. The above two units form one graded bed.
c.117.57	c.123.53		80° - 90°	Banded sequence of dark grey carbonaceous and argillaceous siltstone with 40-50% light grey siltstone. The sequence comprises series of graded units from 2 cms to 27 cms in thickness consisting of light grey siltstone resting sharply or erosively on argillaceous material with well developed load casts in parts passing upwards into darker finer sediment becoming dark grey at the top. Small-scale cross-stratification occurs in the lower parts of some of these units. A 2 cm quartz vein with sediment fragments concordant with the bedding occurs at 123.23 m.
c.123.53	c.124.41			Massive dark grey argillaceous fine sandstone with abundant leucoxear and very disturbed bedding (sedimentary process - organic, worms ?) Disseminated pyrite.
c.124.41	c.125.89		80° - 90°	Broadly banded (10 cm + each band) grey laminated quartzite and dark grey chloritic argillaceous sandstone with common leucoxene. The quartzites shows of cross-stratification and the laminae are formed of carbonaceous material. A thin penecontemporaneous conglomeration occurs at 125.42m. A few thin quartz veinlets are present.

227

APPENDIX C

CLUMP PROSPECT D.D.H.3

SAMPLE IDENTIFICATION AND ASSAY RESULTS

Sample No.	Interval in Metres	Length in Metres	% Copper
0058	64.90-69.19 upper 30 cms of low recovered core		.010
0059	64.90-69.19 central 28 cms of recovered core		.38
0060	64.90-69.19 basal 26 cms of recovered core		.007
0061	69.19-69.90	0.71	.023
0062	69.90-70.13	0.23	.033
0063	70.13-71.47	1.34	.018
0064	71.47-71.80	0.33	.54
0065	71.80-72.90	1.10	.035
0066	72.90-73.58	0.68	2.27
0067	73.58-73.98	0.40	.012
0068	Sludge 73.98-74.97	0.99	.38
0069	74.97-75.78	0.81	.021
0070	75.78-76.00	0.22	.88
0071	Sludge 76.00-76.49	0.49	.25
0072	Sludge 76.49-77.99	1.50	.40
0073	77.99-78.33	0.34	.12
0074	78.33-78.99	0.66	.51
0075	78.99-79.19	0.20	.13
0076	79.19-80.38	1.19	.47
0077	80.38-81.38	1.00	.54

Sample No.	Interval in Metres	Length in Metres	% Copper
0078	Sludge 78.99-81.38	2.39	.93
0079	81.38-82.06	0.68	.61
0080	82.06-82.82	0.76	.12
0081	82.82-83.38	0.56	.26
0082	83.38-84.43	1.05	.26
0083	Sludge 81.38-84.43	3.05	.55
0145	52.35-57.65	5.30	.005
0146	57.65-64.92	7.27	.002
0147	84.43-87.29	2.86	.004
0148	87.29-90.01	2.72	.010
0149	90.01-95.10	5.09	.001
0150	95.10-99.06	3.96	.013
0151	99.06-100.91	1.85	.006
0152	100.91-102.91	2.00	.038
0153	102.91-107.59	4.68	.002
0154	107.59-112.01	4.42	.012
0155	112.01-114.43	2.42	.004