

(238)

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R.M.

AUSTRALIAN CONSOLIDATED INDUSTRIES LTD.

MINERAL RESOURCES DIVISION

TASMANIAN EXPLORATION E.L.16/68

17th December, 1970.

REPORT ON D.D.H.1. CLUMP PROSPECT

H. G. Davies.

SUMMARY

DDH.1 at the Clump Prospect, was abandoned in caving ground at a depth of 138.08m. Mineralised material was encountered at 54.18m and the drill hole continued in target zone to 138.08m. The main mineralised zone was between 54.18m and 76.46m, (165m true width) and assayed 0.25% Cu. and characterised by a high carbonate content. The true width of target zone is significantly wider in the drill hole than at the surface. Sulphide banding is present in parts of the core.

D.D.H.1. - CLUMP PROSPECT

Grid Reference 459,010yN, 310,442yE
Collar level c.168.5m.
Inclination 50°
Direction 043° magnetic
Date drilled 24/6/70 - 9/8/70

AMG

No core held

1. OPERATIONAL DETAILS:

D.D.H.1. was drilled by Associated Diamond Drillers using a E.1000 rig. The rig arrived on site on 18th June, 1970 and was set up for drilling on 24th June. Drilling commenced on 30th June, following repairs to the injection pump.

1.1 Progress

Drilling progress can be summarised as follows:

<u>Week ended:</u>	<u>Footage:</u>	
3/7/70	0-61'	
10/7/70	61'	42.1m
17/7/70	138-226'	42.10m - 68.9m
24/7/70	226-338'	68.9m - 103.0m
31/7/70	338-392'	103.0m - 119.4m
7/8/70	392-453'	119.4m - 138.08m

The drill hole was terminated at 138.08m. on 9/8/70. The drilling rate was poor due to the men employed being severely discouraged by the adverse weather conditions in the area. A second crew took over the rig on 3/8/70.

1.2 Drilling Conditions

NX casing was set at 1.22m. and BX casing at 12.35m. The remaining portion of the drill hole below 12.35m. was cored, using BX wireline equipment. Core recovery to 137.2m was excellent, but from 134.2m - 138.1m. the ground was soft, broken with small quartz fragments continually falling in the drill hole, cutting up diamond crowns badly. The drill hole was cemented twice, but due to porous ground conditions from 137.0m - 138.1m, some cement was lost. On drilling the cement out, the ground continued to cave badly and the drill hole was temporarily abandoned, the NX and BX casing being left in the hole for future re-entry.

1.3 Deviation

Simple acid tests were taken as follows:

0'	50°
15.25m	52.5°
30.5m	51°
61.0m	51.5°
91.5m	50.5°
122.0m	52.5°
137.25m	54.5°

The rapid deviation in the upper part of the drill hole was unexpected and may be due to drilling down dip of banded sediments of variable competence. The kick off around 137.25m reflects the soft graphitic formation at the base of the drill hole which caused caving and probably the development of a small cavity.

2. GEOLOGY:

The detailed core log is presented in Appendix A and may be briefly summarised as follows:

0 - 54.18m. Banded and laminated sediments with chlorite and pyrite becoming more common with depth. Chalcopyrite occurred in this band at 36.80m.

		<u>Intersection in metres.</u>	<u>% Cu.</u>
54.18m - 56.20m.	Quartz zone leached trace mineralisation.	2.02	0.005
56.20m - 61.60m.	Carbonates mineralised.	5.40	0.25
61.60m - 61.92m.	Slate - well mineralised.	0.32	0.78
61.92m - 63.84m.	Quartz - trace mineralisation.	1.92	0.029
63.84m - 69.18m.	Silica/dolomite mixture.	5.34	0.17
69.18m - 69.68m.	Slate - trace mineralisation.	0.50	0.087
69.68m - 71.21m.	Siliceous zone - moderate mineralisation.	1.53	1.00
71.21m - 73.38m.	Slate - trace mineralisation.	2.17	0.11
73.38m - 76.46m.	Siliceous material with slate bands.	3.08	0.22
76.46m - 138.08m.	Slaty altered sediments with bands of mineralised carbonate and quartzose material.		

The sequence from 54.18m to the base of the drill hole is considered to be all target zone, but contained only trace amounts of chalcopyrite.

3. ASSAYS.

The drill core was originally split in half and one half split in two. Initial sampling involved taking one quarter core over 5 foot intervals, irrespective of lithology. The drill hole was resampled by Dr. P. Solomon, taking half core samples over the mineralised zone. The sample intervals and Cu. assay results are shown in Appendix B. and meaned values.

4. DISCUSSION.

The geology of the drill hole and the overlying costeans are shown on the drill section and indicate a dip of the mineralised zone of 815° towards the drill hole. The drill hole angle through the zone was 51° and the true width of the intersection 54.18m - 76.46m is c16.5m.

The unit 56.20m - 76.46m has a mean assay of 0.25% Cu. over a true width of 14.90m.

The drill hole terminated in poorly mineralised ground and the total width of the target cannot be evaluated.

The drill hole also proved more mineralised material than is visible in the surface costean, a greater amount of carbonate and in parts of the core, the sulphides exhibited a distinct banding suggestive of a replacement origin rather than a hydrothermal mode of formation.

DDH. 1 - CLUMP PROSPECT.

Grid Reference: 459,010yN, 310,442yE.

Angle 50°

Direction: 035° Magnetic.

INTERVAL IN METRES		% Recovery	DESCRIPTION
From:	To:		
0.	1.22		No core recovered.
1.22	1.85	100	Banded and laminated sequence of weathered light grey, grey and dark grey carbonaceous siltstones. Individual bands vary from 1½ cms. to 0.1 cm. and the thicker ones show an upward change in colour from light to dark grey associated with an increase in carbon and argillite content. The bases of all light grey bands are sharp and show small load cast structures. Dip + 6°, assuming normal facing. The unit is well jointed with a porous quartz vein as a joint infilling at 1.60m and at 1.52m chlorite bands occur parallel to a joint in the adjacent sediments.
1.85	3.66	100	Dark grey weathered carbonaceous and argillaceous siltstone containing a few thin light grey siltstone bands (<0.2 cms). The core is broken with evidence of frequent joints. Dip 0°.
3.66	9.34	100	As 1.22-1.85 metres with frequent joints, locally ironstained. Microfaulting present at 4.90m. At 6.40m. two joints intersect at 90°. Dips. 3.66-4.80m. + 5 to 0°. Dip. 4.80m.-5.20m. Increase to + 15 and return to + 2°. Dip. at 7.11m. + 4°. Dip at 9.14m + 8°. Dip. at 7.50m + 6°. Dip. at 8.40m. + 8°. Thin continuous bands, lenses and patches of green chlorite are developed sporadically throughout and are aligned parallel to the bedding surfaces. They occur mainly in the darker more argillaceous sediments. The banding becomes finer towards the base of the sequence with local minor contortions. At 9.08m. several of the veins of chlorite, quartz and traces of carbonate are developed, cutting the bedding at 50°. A minor fold is developed at approximately 5.80m., the axial plane dipping at + 60° to the core long axis.
9.34	9.90	100	Dark green grey chloritic argillaceous siltstones, containing common thin lighter laminae exhibiting sharp bases, locally load cast; and gradational tops. The sequence is cut by several thin quartz and chlorite veins with small cavities and dip + 60°. Dip of sediments + 10°.
9.90	14.60	20 cms. loss core.	Dark grey carbonaceous siltstone with abundant thin light grey laminae up to 2 mm in thickness. Thicker 0.5 cm bands develop near base of the unit. Dips. + 10° at 10.10m. + 6° at 11.10m. - 30° at 11.70m. Axial plane at 11.43m dips + 50°. - 40° at 13.38m. - 12° at 12.65m. - 20° at c.13.50m. - 40° at 13.80m. - 14° at 14.10m. Axis dip change at 13.98m.

241

INTERVAL IN METRES		% Recovery	DESCRIPTION
From:	To:		
14.60	16.46		<p>The change in dip between 12.38m and 12.65m occurs rapidly at 12.55m associated with a minor fault filled with quartz, chlorite, minor pyrite and included grey siltstone fragments. The fault dips at c.40° and the dip change is also associated with a change in strike. (c.10°). Joints with chloritic surface and locally associated with quartz patches, are present throughout. Microfaults of 1-5 mm displacement become more common with depth.</p> <p>As 1.22-1.85m, but with bands up to 1 cm in thickness. Moderately well jointed with chlorite coating on some joint faces. Dips. + 15° at 14.96m. + 16° at 15.77m, Dip + 32° at 16.10m.</p> <p>The change in dip occurs at c.16.00m and is associated with a minor fault with crumpling of laminae and the development of disseminated chlorite. From 15.20m to 15.77m, several microfaults occur with a displacement of up to 1 cm. Chlorite and sporadic pyrite occur as joint infillings.</p>
16.46	28.35	c.60 cms core loss.	<p>Dark grey carbonaceous argillaceous siltstone with thin light grey silt laminae showing good basal load casts. The frequency of lamination is less than 9.90m-14.60m and rare grey bands (up to 1½ cms) are developed. Moderately well jointed with only rare chlorite films.</p> <p>Dips. + 13° at 16.79m, + 3° at 16.98m., + 4° at 18.00m. - 2° at 18.20m, -15° at 18.88m., - 2° at 19.46m, - 8° at 20.68m. -15° at 21.94m, +13° at 23.65m., - 4° at 24.85m., -10° at 25.79 (? core upside down).</p> <p>Change from - 15° to + 13° occurs at 23.45m.</p> <p>Rare microfaults are present with chlorite and quartz infillings.</p>
28.35	36.80	40 cms lost.	<p>Dark grey carbonaceous - sparingly calcareous, siltstone with the light grey laminae exhibiting good basal structures. The unit is chloritic, the chlorite content becomes marked below 33.50m and well visible in the light grey sediments - pyrite locally developed concordantly within the light grey chloritic siltstone laminae. The unit is moderately well jointed, chlorite occurs on joint surfaces together with traces of graphite towards the base. Microfaults are present with small displacements, but filled with a siliceous, chlorite rich material. Some fault zones contain pyrite and chalcopyrite is developed in a 1 cm leached siliceous band at 28.46m.</p> <p>Dips at - 13° at 28.89m, - 2° at 29.40m. - 11° at 31.63m, - 8° at 32.43m, - 5° at 33.16m. 0° at 33.86m, -10° at 34.41m.</p> <p>Folds are at 34.26, dips at + 40° - mono clinal flexure. - 2° at 35.36: 0° at 36.70.</p>

272

INTERVAL IN METRES		% Recovery	DESCRIPTION
From:	To:		
36.80	37.48	100	A 2 cm thick light grey chlorite siltstone underlain by dark grey carbonaceous and argillaceous siltstone with thin light grey laminae. The base of the thick band displays good load casts. The upper 6 inches of core consists of silicified material with carbonate containing chlorite blebs and patches associated with quartz veins and mineralised with pyrite and chalcopyrite. Total sulphides 5%. Dip at 37.45m. - 14°.
37.48	44.94	100	As 9.90 to 14.60m. With disseminated chlorite throughout. Well developed joints with chlorite coatings. Several microfaults are developed of irregular trend, filled with quartz. Disseminated pyrite develops in lower part of the unit. Dips: - 20° at 38.50m. - 4° at 39.32m. - 12° at 40.12m. Slight flexure at 39.24m axis dips + 70°. Dips: - 2° at c.41m, - 93° at 41.76m. - 34° at 42.52m, - 23° at 43.84m, 0° at 44.90m. At 44.54m, a 10 cm unit occurs comprising several discordant veins of chlorite, quartz and silicified sediments with traces of pyrite. The veins dip at + 60°. A 1 cm chlorite rich vein occurs at 43.92 dipping at + 55°.
44.94	45.16	100	Silicified and recrystallised siltstone unit with patches, stringers and fragments of intensely chloritic sediment and cut by white granular quartz veins. A few small cavities present with relicts of carbonate. Well mineralised with pyrite and traces of chalcopyrite. Total sulphides 10%. The base of the unit is marked by very chloritic siltstone, contact dipping + 50°.
45.16	45.91	100	Dark grey very carbonaceous, chloritic siltstone with thin (<1mm) light grey siltstone laminae. Two well developed joints present with chlorite on graphitic coating. Four siliceous and chloritic veins with pyrite, between 0.5 and 2.5 cms in thickness, are present in the centre of the unit dipping at + 63°. Dip + 3° to 0° at base.
45.91	51.21	100	Dark grey very carbonaceous and chloritic siltstone with frequent thin greeny-grey chloritic siltstone laminae. Sporadic sharp joints with traces of graphite on faces. Dips: - 12° at 46.65m, - 15° at 49.40m, - 14° at 50.50m. At 50.40m, a 5 cm siliceous and chlorite rich vein dips at + 50° and is mineralised with chalcopyrite and pyrite. A similar mineralised irregular vein occurs at 51.01m containing buff carbonate patches (ferro-dolomite ± ankerite). Approximate dip + 50°.

243

INTERVAL IN METRES		% Recovery	DESCRIPTION
From:	To:		
51.21	52.39	100 rec.	Dark grey, very carbonaceous sparingly chloritic siltstone, slightly silicified bearings thin light grey silt laminae (up to 2 mm) with load cast bases. Euhedral pyrite occurs along bedding surfaces and joint planes. Dip 0° at 51.25m, -15° at 52.00m, -18° at 52.30m.
52.39	54.18	90 +	As above, but cut by numerous veins varying from 0.5 cm to 5 cms in width. The sediments are moderately chloritic, contain disseminated pyrite and are silicified in the vicinity of the veins. Dip: -18° to -20° . A few microfaults are developed filled with dolomite. The veins consist of grey quartz with blebs, veinlets and irregular small patches of chlorite and disseminated pyrite throughout, often concentrated parallel to the contact. The adjacent sediments are chloritised, with local development of graphite aligned parallel to the contact. Dips of veins: $+40^{\circ}$, $+45^{\circ}$.
54.18	56.08	85 rec. approx.	White quartz with included fragments and bands of chloritised siltstone and common chlorite which occurs as small patches and discontinuous bands. The chlorite along many partings is schistose and in parts the boundaries of the included sediments show a definite orientation dipping at 35° - 45° . No mineralisation but a few leached cavities occur in the quartz and one vugh was noted.
56.08	56.20	100	Extensively chloritised and silicified siltstone with a few veins and blebs of white quartz. Total sulphide 2% consisting of chalcopyrite.
56.20	57.20	100	Light grey, talcose material containing fragments and broken bands of chloritised siltstone and blebs of chlorite. In parts, a schistosity is developed dipping at $+48^{\circ}$. The unit is mineralised with chalcopyrite and minor pyrite. Total sulphides c.1%.
57.20	57.80	100	Pale Brownish, micritic ferro-dolomite with veins of carbonate and quartz and containing blocks and small fragments of extensively, locally completely chloritised siltstone. Schistosity locally developed dipping $\pm 45^{\circ}$. Mineralised with chalcopyrite and pyrite Total sulphides c.2%, the carbonate containing only traces of mineralisation which is restricted to the altered included sediments.
57.80	57.98	100	Massive white quartz containing patches and irregular veins of ferro-dolomite containing chloritic wisps, blebs and fragments. Minor chalcopyrite and pyrite 0.5% max. (This unit is probably a quartz vein within enclosing units).

(24)

INTERVAL IN METRES		% Recovery	DESCRIPTION
From:	To:		
57.98	61.60	90	Light grey sparry ferrodolomite with subordinate amounts of micrite, weathering on core surface to a brownish colour. Sporadic inclusions of green chlorite and very chloritic and graphitic siltstone are present, abundant between 60.76m and 61.15m. A pronounced schistosity is shown within the inclusions and occasionally within the carbonates dipping 35° - 45° . Sporadic pyrite and chalcopyrite mineralisation mainly within and adjacent to argillaceous inclusions. Total sulphides $< 0.5\%$.
61.60	61.92	100	Black, disturbed graphitic slate with chlorite blebs and patches and with irregular quartz veins and patches which break up the slate into fragments. Subordinate ferrodolomite is present as veinlets and small patches. Well mineralised with chalcopyrite and pyrite. Total sulphides 5-8%. Schistosity and banding dip 38° - 45° .
61.92	63.84	100	Massive white quartz with irregular patches and veins of pale buff ferro-dolomite and small chlorite blebs. A 1 cm black graphitic siltstone band occurs at the top of the unit dipping at 60° . Sporadically mineralised with pyrite and trace chalcopyrite associated with carbonates. Below 63.14, irregular, broken bands (0.5 to 2.5 cms in width) of black graphitic and chloritic siltstone are developed sporadically, all dipping in the same direction and associated with pyrite and minor chalcopyrite mineralisation. Total sulphide c. 0.5% . Dips: 38° , 37° , 35° .
63.84	64.24	100 ?	Green grey silicified, chloritic sediment with broken bands of black silicified graphitic siltstone and irregular blebs and veins of white quartz. Irregular patches and veins of ferro-dolomite occur throughout. Dip of bands, 40° , 35° . Well mineralised, total sulphides 3% - 5% mainly chalcopyrite with minor pyrite. A finely granular carbonate vein 1 cm wide occurs near the base of the unit.
64.24	67.50	100 ?	Light grey recrystallised siliceous material with 10-15% interstitial ferro-dolomite. Locally the carbonate content reaches 40% over 3-5 cms widths. The unit is heavily mineralised (20-30% total sulphides) with pyrite and small amount of chalcopyrite which is most abundant in the carbonate rich zones. In some cases, the chalcopyrite is surrounding pyrite. The pyrite varies in colour from white to gold (arsenopyrite - copper bearing pyrite?). The basal 5 cms are very siliceous and abut sharply against altered sediments. Dip 47° .
67.50	67.64	100 ?	As above, but with 40% included fragments of green silicified chloritic siltstone and 20% ferro-carbonate heavily mineralised with pyrite and minor chalcopyrite. Total sulphides 30%.

245

INTERVAL IN METRES		% Recovery	DESCRIPTION
From:	To:		
67.64	67.94	100	Light grey, siliceous and sericitic material with 10-20% ferro-dolomite as patches and veinlets. Suggestion of schistosity. 15% sulphides - pyrite and trace chalcopyrite.
67.94	68.20	100	As above, with included green chloritised sediment fragments.
68.20	69.18	100	As 67.64 to 67.94. With common chlorite blebs and included chloritised sediments showing locally a crude banding (dip 45°). The basal 10 cms are soft, talc rich with a marked schistosity and moderately well mineralised. 10% total sulphide, mainly pyrite and arsenopyrite with traces of chalcopyrite.
69.18	69.68	100	Black graphitic slate, locally chloritic occurring as broken bands and fragments separated by bands and veins of mixed ferro-dolomite/silicified material and chlorite containing pyrite (5% total sulphides). Dip of banding 50° , 52° , 50° .
69.68	71.21	100	Light grey-white, siliceous material, with sporadic included fragments of black graphitic slate, common between 70.60m and 70.90m and ferro-dolomite veinlets and patches. Total sulphides 5% mainly disseminated chalcopyrite with subordinate pyrite. 71.57m band of dominantly pyritic sulphides.
71.21	73.00	100	Black, silicified, graphitic and carbonaceous siltstone, the graphite being developed mainly along joints and fracture planes. Bedding vague but dips visible around 71.90m at $\pm 30^{\circ}$ to 35° . The unit is cut by numerous thin quartz veins \pm chlorite and carbonate which often occur along microfaults. Local brecciation develops in zones of high vein density. The veins vary from 0.1 cm to 2 cm in width and carry pyrite and chalcopyrite, the latter being common in the basal 40 cm of core. Total sulphides $<1\%$. The major veins dip 40° - 50° and the very thin veinlets having random orientation.
73.00	73.38	100	Grey, siliceous material, with abundant included fragments and broken bands of black graphitic slate. Ferro-dolomite occurs as patches and veinlets. Heavily mineralised with chalcopyrite and pyrite occurring as blebs and irregular bands concordant with the sediment banding. 10-15% total sulphides. Dip of sediments: 40° - 50° . Dip of mineralisation: 45° .
73.38	74.58	100	White quartz with ferro-dolomite patches and veins and graphitic slate inclusions. Dipping 30° - 40° . Sporadically mineralised with pyrite and chalcopyrite mainly along and within included sediments. Total sulphides 3-5%.

INTERVAL IN METRES		% Recovery	DESCRIPTION
From:	To:		
74.58	74.83	100	Black graphitic slate, (approx. schistosity dip 37°), well jointed, cut by thin veins of silicified material and quartz with ferro-dolomite chlorite. The veins and adjacent sediments are mineralised with pyrite and chalcopyrite. Veins deep 40° . Total sulphide c.1%.
74.83	76.46	100	Siliceous material and quartz with ferro-dolomite and chlorite patches and veinlets containing two bands of chloritised, graphitic siltstones, (c.10 cms) heavily veined as above. Sporadic moderate pyrite and chalcopyrite mineralisation. Total sulphides 5%.
76.46	77.10	100	Black silicified, graphitic and carbonaceous siltstone cut by numerous thin siliceous veins and patches, containing chlorite and irregularly distributed ferro-dolomite. All veins are mineralised with pyrite and chalcopyrite. Total sulphide 3-5%. Dip of veins 30° - 40° .
77.10	79.66	100	Dark grey-black, carbonaceous siltstone bearing a few thin light grey laminae. Dips: - 12° at 78.80m, + 10° at 78.80m, at 78.60, change from 0° to + 12° . All other dips vary from 30° to 0° , but facing cannot be definitely proved. At 79.56m, minor fold axis dips at + 98° facing definite. Quartz porphyroblasts, hexagonal to irregular in shape, occur throughout the section locally associated with chlorite and carbonate. Mineralised siliceous veins (pyrite with chalcopyrite) up to 5 cms wide occur sporadically throughout, dipping at between 45° and 60° . Total sulphide content <0.5%. Irregular joints show graphite on the faces with rare slickensides.
79.66	80.06	100	Green grey, chloritic, siliceous vein complex containing bands of black carbonaceous siltstone which die out with depth. Ferro-dolomite is patchily developed throughout, forming 70% over 10 cms. in the central portion of the unit. Mineralised with pyrite and chalcopyrite. Total sulphides 10%.
80.06	83.32	100	As 77.10 to 79.66m. Dips: - 2° at 80.36m, + 5- 10° at 80.48m. Dip: + 2° increasing to $\pm 30^{\circ}$ at 81.38m, suggestion of near flat dip at base of core. Rare veins with only trace of mineralisation and graphite is developed on joint surfaces.
83.32	83.54	100	Steeply inclined vein of mixed siliceous material, ferro-dolomite and some chlorite, heavily mineralised with pyrite and minor chalcopyrite. Total sulphide 30%. Bedding/vein angle at base dips 118° .
83.54	84.74	100	As 77.10 to 79.66m, but with thin rare veins. Dips c.83.70m - 40° , 84.13m - 30° (facing difficult to interpret due to minor flexures).

247

INTERVAL IN METRES		% Recovery	DESCRIPTION
From:	To:		
84.74	95.81	95	<p>Black, carbonaceous, siltstone with thin light grey laminae, quartz porphyroblast - often hexagonal in outline, and cut by numerous thin chlorite, quartzose material and carbonate veins often mineralised with pyrite and trace of chalcopyrite. Thicker veins occur as follows:</p> <p>17 cms. complex vein at 85.30m. 20% sulphide, pyrite, chalcopyrite. 15 cms. complex vein at 85.71m. 25% - 30% sulphide, pyrite, chalcopyrite. 10 cms. vein at 87.20m. 5% sulphide, pyrite. 7 cms. vein at 90.72m. 20% sulphide, pyrite. 15 cms. vein complex at 94.27m. 2-9% sulphide, pyrite. (Very siliceous).</p> <p>The basal 20-30 cms. contain numerous irregular small veins, strongly graphitic joints and abundant chlorite. Dips of sediments: + 54°, 55.09; ± 57° and 85.32, + 65°, 85.85m. +120°, at 87.97; + 120° at 90.00; +55° at 91.30m.</p> <p>Facing is very difficult to establish as minute crumpling occurs throughout unit.</p>
95.81	97.03		<p>Light grey sparry ferro-dolomite with occasional patches of milky-white quartz. The unit is traversed by thin veins consisting of a mixture of quartz and dolomite, dipping + 45°. At 96.70m, a 5 cm thick massive quartz vein occurs, dipping at 45°. Total sulphides 7%. Chalcopyrite traces.</p>
97.03	97.69		<p>Chloritised mudstone containing irregular veins and patches of milky-white quartz and sparry dolomite. Fracture planes are graphite coated. Total sulphides 2%. Chalcopyrite traces.</p>
97.69	98.15		<p>Siliceous material with fine grained dolomite traversed by thin quartz veins up to 1 cm thick, dipping 45°. Total sulphides 5%. Chalcopyrite traces.</p>
98.15	101.53		<p>Dark grey to black graphitic mudstone with 5% light grey siltstone. The zone is very distorted and has the appearance of a breccia. Veins consisting of quartz and chlorite up to 1 cm thick traverse the bedding, but are too distorted to determine the dip. Quartz porphyroblasts are well developed. Dip of bedding at 98.90m, 0°; at 99.60m, 10°; at 101.40m, 15°. Total sulphides 0.1%.</p>
101.53	102.09		<p>Zone comprised of dolomite, siliceous material and a small amount of talc, with fragments of angular graphitic mudstone. Total sulphides 15%. Chalcopyrite 0.2%.</p>
102.09	103.35		<p>Fragmented chloritic mudstone including bands of pyrite mixed with dolomite and silica, dipping 20°. The middle part of this zone is more dolomitic grading into a finer grained mixed dolomite-silica material at the base. Total sulphide 5%. Chalcopyrite traces.</p>

248

INTERVAL IN METRES		% Recovery	DESCRIPTION
From:	To:		
103.35	103.75	90 approx.	Black, silicified graphitic and carbonaceous siltstone with sporadic thin veins (<2 cms) of quartz, ferro-dolomite and chlorite. Quartz porphyroblast occurs throughout. The veins are sparsely mineralised with pyrite and one joint face is covered with pyrite crystals. Strata dip c.70.80°.
103.75	104.93	100	Ferro-dolomite containing quartzose patches. Heavily mineralised with pyrite, total sulphides 30-40%.
104.93	111.05	Losses:104.93 to 107.29. 60% recovery.	Black silicified, carbonaceous somewhat graphitic siltstone with little evidence of bedding above 108.25. Thin siliceous, carbonate and chlorite veins occur sporadically with euhedral pyrite with pure chloritic veinlets. Quartz porphyroblasts occur throughout. Dip: 25° at 108.30m, 42°, 109.10m; 25° at 109.70m. 45° at 110.60m. The basal 10 cm are very graphitic, slickensided and contain extensive ferro-dolomite veining.
111.05	112.00	100	Light grey ferro-dolomite containing a few chloritised graphitic fragments at the top and passing down into intensely chloritic and talc rich carbonate, soft, porous with local schistosity (40% chlorite). Below 111.45m, the chlorite content reduces to about 5% and the carbonate becomes compact and hard. Sporadically mineralised with pyrite - 1% total sulphides.
112.00	112.32	100	Black graphitic mudstone, fragmented by numerous small veins consisting of quartz, chlorite and carbonate. Slickensides are developed on graphitic surfaces and at the base of the core, a well mineralised (pyrite) zone of carbonate shows a well developed schistosity dipping 45°. Elsewhere mineralisation is very sporadic - total sulphides 1 - 2%.
112.32	112.57		Milky white massive quartz - no mineralisation.
112.57	114.15	100	As 111.05 to 112.00, with minor chlorite and a graphitic slate band 28 cms wide at 113.11m. Pyrite mineralisation - total sulphides 3-5%.
114.15	118.32	100	Dark grey-black, partly silicified carbonaceous and graphitic siltstone with thin light grey laminae and quartz porphyroblasts. A 5 cm wide milky quartz with ferro-dolomite band occurs at 115.11m. The whole sequence is cut by numerous thin (<2 cms) veins comprising siliceous material, carbonate and chlorite. The veins are well mineralised with pyrite and scattered crystals of pyrite occur throughout. Chalcopyrite is present in veins around 118.27m.

249

INTERVAL IN METRES		% Recovery	DESCRIPTION
From:	To:		
118.32	119.36	100	<p>Dips: from 114.15 to 117.50m. The dips are between 40 and 55° where visible. At 117.50m, the dip changes to near parallel with the core, the axial plane dipping 48° cutting the bedding nearly at 90°; at 118.90m, the dip changes to 20°, but reverts to 50° at 118.25m. (Due to microfaulting and crumpling, the way up of beds cannot be determined. The split core also makes this more difficult). Dip at base 45°.</p> <p>Broken fragments of black silicified, graphitic and carbonaceous siltstone within a complex vein system of quartz, chlorite, silicified material and ferro-dolomite. Components form individual veins, or occur together in single veins. The thickest vein occurs at the base being 8 cms wide and consisting of milky quartz. Veins dip between 37° and 50°. The unit is well mineralised with pyrite and chalcopyrite. Total sulphide 10 - 12%.</p>
119.36	119.65		<p>Dark grey-black, very graphitic slate with numerous veins and blebs of quartzose material ferro-dolomite and chlorite aligned parallel to bedding. Thin cross cutting veinlets also occur and are of carbonate with minor white quartz. The veins are well mineralised with pyrite and trace of chalcopyrite. Total sulphide, 5%. Dip (bedding and vein) 52° - 55°. Thin cross cutting veins cut the bedding at c.90° and are displaced by microfaults.</p>
119.65	120.85		<p>Dark grey-black, graphitic, carbonaceous siltstone partly silicified with fine light laminations. Local incipient brecciation occurs. Thin concordant quartz carbonate veins occur sporadically throughout. Mineralised with pyrite tending to form bands parallel with the bedding. Total sulphides 2-3%.</p> <p>Dips + 45° at 120.62m, - 45° at 120.70m, (axial plane 90° to core). From 120.70 - 85m, anticline/syncline is present, the axial planes dipping + 60°.</p>
120.85	121.08		<p>As 119.36-119.65 with minor pyritic mineralisation.</p>
121.08	124.75		<p>Dark grey-black silicified graphitic slate/siltstone, bearing a few thin lighter laminae with abundant quartz porphyroblasts, often hexagonal and partly replaced by carbonate or pyrite. The unit is cut by veins from 0.2 cm to 3 cms wide, consisting of carbonate, quartz, and chlorite singly or together. Local microfaulting and crumpling of laminae occurs near veins.</p> <p>Dips (sediments): 52° at 121.05m, 30° at 121.35, 45° at 121.70. 45 - 50° to 123.40. (Minor fold between close to 2 cm vein dip 60°), 35° at 124.15; 55° at 124.65.</p> <p>Dip of veins: 50-52°.</p>

250

INTERVAL IN METRES		% Recovery	DESCRIPTION
From:	To:		
124.75	125.40		Irregular fragments of black graphitic, silicified siltstone up to 2 cm in size. Set in a fine grey siliceous matrix. Thin ferro-dolomite veinlets cut the unit at random and irregular patches of carbonate occur sporadically throughout. Mineralised with dominantly euhedral pyrite - 3% total sulphides. The top and base of this unit is gradational.
125.40	129.90	100% recovery except 126.95m - 128.30m, where 90 cm missing.	Dark grey-black, silicified, graphitic slate/siltstone with a vague thin lighter lamination. Dips: 29° at 125.65m, from 125.65 - 126.40, series of shallow folds axis dipping 50°. Quartz/carbonate veins occur along and parallel to the fold axis which are locally microfaults. 21° at 126.55m; 40° at 126.90m. From 126.95-127.50m, the unit is broken-veined and very contorted. Between 127.30-128.74m, a series of small folds, axial planes dipping at 50°, with microfaults and developed and veined with a mixture of silica, chlorite carbonate. 15° at 129.20. From 129.20 to the base sediments. Dip 10-20°, but core cut by many microfaults between which small scale folds and crumples occur. Dip and faults 50-60°. The whole unit is mineralised with disseminated pyrite, which occurs locally in bands parallel to the bedding.
129.90	136.55	100	As above, the sediments dipping between 10 and 20° with numerous microfaults and minor crumples and folds, the axial planes dipping at 50-55°. From 125.40 - 136.55, thin quartz, carbonate and chlorite veins occur throughout, comprising one or all components. Dips 45° - 50°. Minor pyrite mineralisation.
131.55	138.08	20% recovery.	Black-dark grey graphitic silicified siltstone, very contorted with quartz vein up to 9 cm. in width containing fragments of sediment and mineralised with chalcopyrite. Losses reflect soft graphite bands. Total depth 138.08m, the drill hole being abandoned due to caving of the graphite bands.

APPENDIX B.

SAMPLE INTERVALS AND ASSAY RESULTS

SAMPLE NO.	INTERVAL		LENGTH IN METRES.	% Cu.
	From	To		
BAL. 0084	51.21m	54.18m	2.97	.007
0085	54.18m	56.20m	2.02	.006
0086	56.20m	57.20m	1.00	.33
0087	57.20m	57.98m	0.78	.40
0088	57.98m	61.60m	3.62	.21
0089	61.60m	61.92m	0.32	.78
0090	61.92m	63.84m	1.92	.029
0091	63.84m	67.50m	3.66	.22
0092	67.50m	69.18m	1.68	.066
0093	69.18m	69.68m	0.50	.087
0094	69.68m	71.21m	1.53	1.00
0095	71.21m	73.38m	2.17	.11
0096	73.38m	74.58m	1.20	.41
0097	74.58m	74.83m	0.25	.048
0098	74.83m	76.46m	1.63	.10
0099	76.46m	79.25m	2.79	.043
0100	79.25m	84.79m	5.54	.025
0101	84.79m	95.90m	11.11	.012
0102	95.90m	96.95m	1.05	.028
0103	96.95m	97.15m	0.20	.004
0104	97.15m	101.53m	4.38	.002
0105	101.53m	103.33m	1.80	.098
0106	103.33m	111.05m	7.72	.017
0107	111.05m	112.57m	1.52	.069
0108	112.57m	114.15m	1.58	.038
0109	114.15m	118.24m	4.09	.006
0110	118.24m	119.28m	1.04	.13
0111	119.28m	129.84m	10.56	.011
0112	136.58m	138.05m	1.47	.082
0113	138	to end.	(All sludge)	.023

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0106	103.33m	111.05m	7.72	.017
0107	111.05m	112.57m	1.52	.069
0108	112.57m	114.15m	1.58	.038
0109	114.15m	118.24m	4.09	.006
0110	118.24m	119.28m	1.04	.13
0111	119.28m	129.84m	10.56	.011
0112	136.58m	138.05m	1.47	.082
0113	138	to end.	(All sludge)	.023