ABMINCO N.L.
CLEVELAND MINE

CATEGORY: U/G Expl.

HOLE No.: C1301 REF No 18552

GENERAL DATA

Objective: 13 level R.L. B South AF – AG Section

Area of Operation: 11 Khaki Location: 2m South of AD Section

Collar R.L.: 276.95 Co-ordinates: 15294.55 N, 10606.77 E.

Bearing of Hole: 144.5° (150) Angle of Hole: −21.75° (23½) Final Depth: 151m

Drilling Commenced: 7/7/78 Completed: 16/7/78 Logged by:

DRILLING DATA

Drilled by: A.D.D. Non Coring:

Drilling Rig: F30 air Coring: AQ 151m

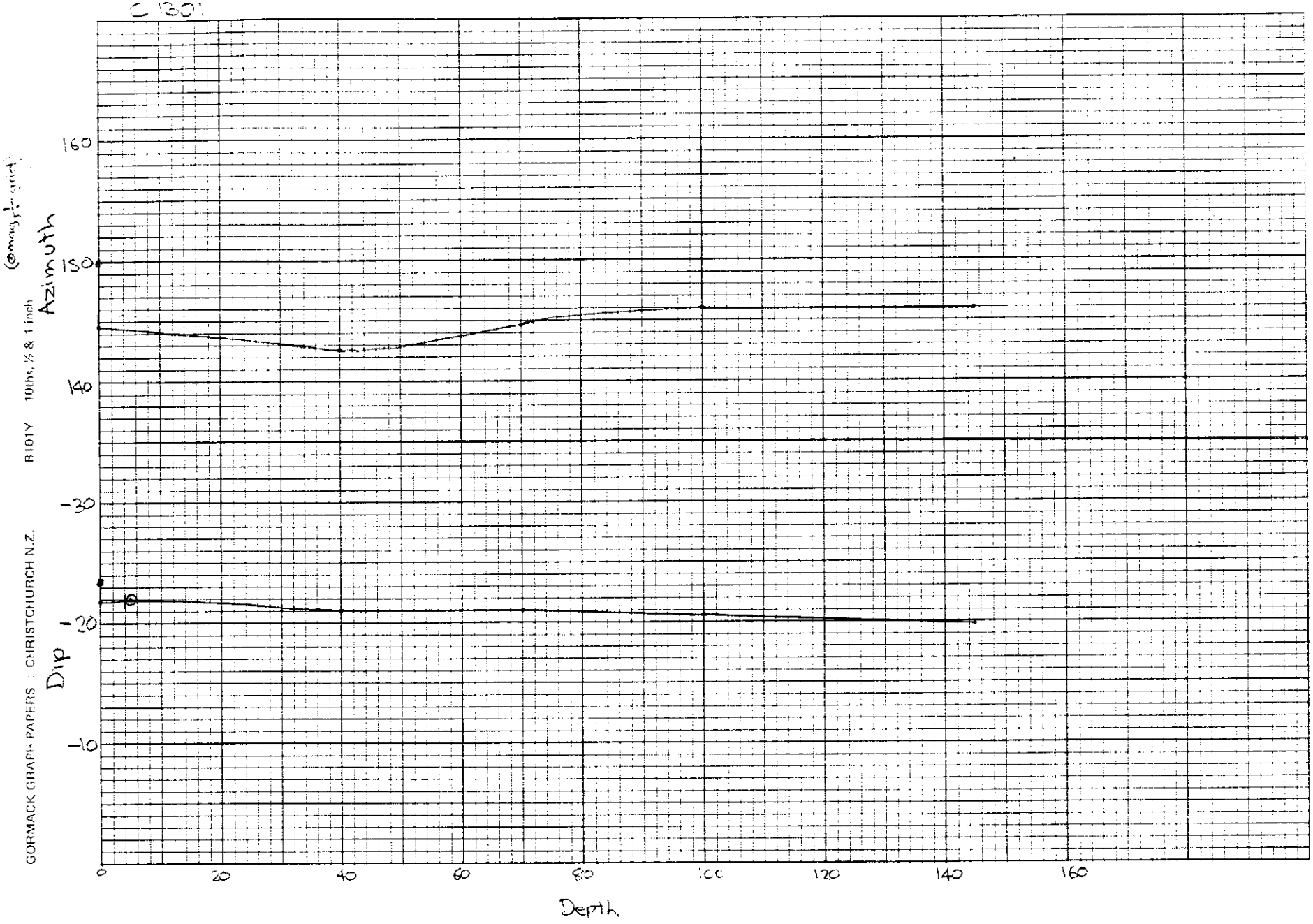
Driller(s): R. Kennard, R Lawson

Core Recovery:

HOLE SURVEYS

HOLE No.: 1301

NWPS 24164


C 130'
160
150
140
-30
-20
-10
Azimuth
Dip
0
20
40
60
80
100
120
140
160
Depth.
(magnetic card)
B101Y 10ths, ½ & 1 inch
GORMACK GRAPH PAPERS : CHRISTCHURCH N.Z.

-4° for grid

ABMINCO N.L. - Cleveland Mine

Hole No. 1301

Sheet No.

DIAMOND DRILL HOLE DATA

PROGRAM DATA				SURVEY DATA				INTERPOLATED DATA		
				Instrument Type	Depth	Dip	Azimuth	Depth	Dip	Azimuth
1	Attitude	—	(+) (-)	Survey	ø	-21 3/4	144 1/2	12 1/2	21 3/4	149
				Camera	5m	-22	(150 1/2) 146 1/2	37 1/2	21 1/4	142 3/4
2	Hole No.	1301			40	-21	142 1/2 (146 1/2)	62 1/2	21	149
					70	-21	(144 1/2 (148 1/2)	87 1/2	21 3/4	145 1/2
3	Down Hole Interval	25			100	-20 1/2	146 (150)	112 1/2	20 1/4	146
					145	-19 3/4	146 (150)	137 1/2	20	146
4	Collar Co-ords.	15294·55	N					162 1/2		
5		10606·77	E							
6	Collar R.L.	276·95								
7	Halls Sect. ~~Ef~~ Gh	15336·841	N							
8	Intersect Point	10674·751	E							
9	Battery Sect. ~~Ef~~ Af	15174·748	N							
10	Intersect. Point	10751·365	E							
11	Start Plot (Depth)	ø	ø = Collar							

DOWN HOLE PLOT

Hole No: 1301

Sheet No:

DEPTH	PLAN N	PLAN E	PLAN RL	CROSS SECTION Dist.from H.R.P.	CROSS SECTION Dist.from B.R.P.	LONG SECTION Dist. from Halls	Sect. GH	LONG SECTION Dist from Batt.	Sect. AF	Depth
0	15294·55	10606·77	276·95	−21·85	−177·18	−77·02		62·18		
25	15275·76	10620·42	267·69	0·88	−157·86	−81·74		49·30		
50	15257·22	10634·52	258·63	23·8	−138·2	−85·98		36·80		AB
75	15238·34	10648·24	249·67	46·65	−118·78	−90·72		23·85		AE
100	15219·16	10661·34	240·40	69·24	−99·85	−96·10		10·41		AF
125	15199·72	10674·45	231·75	92·02	−80·80	−101·66		−3·27		AG
150	15180·24	10687·59	223·20	114·84	−61·72	−107·24		−16·98		

PLAN N	PLAN E	PLAN RL	CROSS SECTION Dist.from H.R.P.	CROSS SECTION Dist. from B.R.P.	LONG SECTION Dist from Halls	Sect.	LONG SECTION Dist from Batt	S
	1:500 batt	✓						
	1:500 Long	✓						

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DIAMOND DRILL LOG

Hole Nº 1301 Page Nº 1

Feature: Bedding / Foliation / Fragment - size & shape / Shearing / Fault (F) / Vein (c carbonate, q quartz)

Mineralization: Trace 1-5% / Common 5-15% / Abundant 15-60% / Massive <60%

CORE REC'D	DEPTH m	GEOLOGY	VISUAL LOG	TRACE	COMMON	ABUNDANT	MASSIVE	DEPTH m	MINERALIZATION
	0.30	LODE - Chaotic, carb, siderite, qtz gangue, 5% sulphides		■					patchy - vuggy py, 98% 2% cass. (?)
	0.55	CHERT - brown coloured, white veined chert							
	1.10	LODE - irregular banding/sulphide blebs and 30% patches in a qtz, carbonate (siderite) gangue				■			vuggy patchy sulphides - 98% py 2% chpy, [illegible]
	1.66	CHERT - chaotic - foliated, siderite seamed and altered brown coloured cherty shale -							
	1.77	SST - bleached, slightly altered - g. pale mid grey							
4.30		CHERTY SHALE / CHERT. Fine grained erratic and foliated altered silicified shale and chert brown to tan in colour. Abundant patchy and finely veined siderite. Lower contact sharp - 45° to C.A.							
	4.66								
	5.20	SST - M.g. altered siderite orangy grey sst.							
0.97		CHERTY SHALE - brown to tan silicified cherty shale f.g.						7.77	Minor vuggy chpy, cavities.
	8.78	SANDSTONE f.g. siderite / mid grey altered sst. Thin vuggy veins. Contact 60°							
1.90	[illegible]	SHALE - f.g. tan massive to chaotic shale with tonal transition to pale grey, minor silic.							
0.38	8.30								
	9.01	SST - m.g. altered, siderite sst. contact erratic							
	9.73	SHALE/SST - chaotic interbedded slumped sst/sh.							
2.38		SST (Minor Sh). Predominantly m.g. pale brown to mid grey altered sst. Siderite patches and veinlets common.						11.66	2cm qtz carb vein c chl.
3.17		Irregular f.g. shaly partings, interbeds to 30cm, generally mid grey in colour. Local tourmalinization of sst. Several thin carb, qtz veinlets						14.00	5cm qtz, carb vein c chpy.
1.00	15.00		F					15.50	1cm healed fault. 45° to C.A.
1.30								15.83	brx zone 15.83 - 15.99.
0.42	17.31	Contact. sharp 60° to C.A.							
1.27		SHALE - f.g. mid grey to tan coloured erratic to chaotic shale - irregular siderite veinlets and aggregates common.							
0.38									
1.20	19.92	Contact sharp 60° to C.A.							
1.15		CHERT. - Dark grey black f.g. massive chert. Very minor fine scale siderite veining. Generally quite structureless							
0.43									
0.37		Contact not defined.							
	23.75								
0.59	24.50	SST - orangy pink grey m.g. altered (minor siderite)							Contact 40° to C.A.
	25.00	CHERTY SHALE.							
0.84		Chaotic grey black to mid grey silicified shale and chert - irregular sst clasts and carbonate alteration							
0.90	26.70	patches. Local tourmalinization.							
		LODE 15% sulphides in a qtz, carbonate tourmaline gangue. 85%, 60%, 10% respectively the [illegible] closely associated as irregular veins			■				Patchy, veining and vuggy sulphides. 80% py (after po?) and 20% chpy - minor disseminated cass. upto 1%.
1.45	28.15	and patchy aggregates.							
		CHERT. Fine grained greyish white to pinky grey to tan coloured chert - fractured							
0.22		and veined by siderite. Minor silicified							
	29.76	shale - lower contact sharp 70° to C.A.							
1.65	30	SANDSTONE. Massive medium grained bleached to a tan colour. Irregular siderite							
0.25		veinlets common. Shale interbeds and							
0.78	31.60	cherty clasts towards base c tourmalinization.							
0.33		LODE - Pale yellowy tan carbonate rich minor qtz.		■					2-5% chpy, [illegible] c tourm. patches
	31.95	SANDSTONE.							
1.08		From 31.95 - 36.20 the sst is slightly bleached tan to mid grey in colour and medium grained. Rare and minor vuggy tourmaline clots. Siderite							
4.42	35	veinlets occur sporadically. Tourmaline alteration from 36.70 - 36.80							

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DIAMOND DRILL LOG

Hole No 1301 Page No 2

Feature: Bedding, Foliation, Fragment - size & shape, Shearing, Fault, Vein (c carbonate, q quartz)

Mineralization: Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive <60%

CORE REC'D	DEPTH m	GEOLOGY	VISUAL LOG	TRACE	COMMON	ABUNDANT	MASSIVE	DEPTH m	MINERALIZATION
0.70 1.10	39.70	Core loss in this section - maybe fault zone. From 36.90 to 39.20 the sst is once again massive and slightly bleached with rare tourmaline alteration. Core broken at contact.							
0.97	41.40	SHALE - fine grained grey massive to crenulated shale with minor thin sst.							
0.81	43.25	SANDSTONE - massive mid grey feldspathic sst - m.g. with minor thin shaly partings.							
2.27 0.60	45	SST / SHALE - Interbedded chaotic shale and sst. - the shale is light grey and the sst is m.g. mid grey. Contact 45° to C.A.							
1.90 54 0.48 2.48 0.97	45.25 53.63	SHALE. Massive to chaotic fine grained grey shale. Minor crenulated sst clasts and laminae. Siderite veining common as thin irregular veinlets. Lower contact sharp - 88° to C.A.							
0.63 0.58 0.44 0.63 0.26 0.70 0.56 0.50 0.56 2.70 0.85	55 63.24	SANDSTONE. Massive bleached and altered m.g. sideritic sandstone - siderite disseminated and as irregular veinlets - tan coloured. Local tourmalinization 55.90 - 56.10. Lower contact not well defined. Core broken and some core loss.						56.80 62.66	Minor patchy segregations of sphalerite. qtz vein with chpy, py. 1 cm siderite vein with sph, chpy, qtz.
		CHAOTIC SHALE - f.g. irregular chaotic shale.							
.25 0.15 0.50	65 68.50	Clay zone with fine rounded shaly and qtz fragments in a grey clayey matrix. Lower contact sharp - 75° to C.A.							
	68.12	SST - bleached m.g. tan coloured sst.							Minor siderite veining.
1.00 1.02 0.93 2.22 0.97 2.25 3.00	75 79.75	SHALE. Predominantly massive to irregular fine grained tan to pale grey shale with lesser sst interbeds. Minor faulting is common and fine scale siderite filled fractures and veinlets. Rare chaotic clasts. Lower contact sharp 85° to C.A.						70.05 73.75 73.77	10 cm qtz, tourmaline vein with chpy, sph. qtz, carb vein with chpy 40° to C.A. qtz vein 7 cm wide with sph, chpy. 85° to C.A.
		SANDSTONE - slightly altered massive m.g. tan sst.							Contact sharp 85° to C.A.
3.09 2.41	85	SHALE. Predominantly fine grained tan to light grey massive to chaotic shale fine grained. Minor thin sst beds 81.80 - 81.93, 85.55 - 85.62 - generally m.g. slightly bleached - mid grey.							Minor irregular sphalerite in carbonate vein.

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DIAMOND DRILL LOG

Hole No 1301 Page No 3

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Feature: Bedding, Foliation, Fragment - size & shape, Shearing, Fault, Vein (c carbonate, q quartz)

Mineralization: Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive <60%

CORE REC'D	DEPTH m	GEOLOGY	DEPTH m	MINERALIZATION
3.06	86.51	86.21 – 86.51. – Lower contact erratic		
	86.81	SST. – m.g. mid grey feldspathic sst.	86.81 – 87.03	3cm qtz vein c spl, po, cpy. 2cm qtz, carbonate c py.
0.80 0.40 1.66 0.80 1.47		SHALE (Minor sst.) Fine grained massive to chaotic usually finely spotted by carbonate tan to light grey shale. Rare carbonate veining. SST. 88.86 – 89.00. – m.g. mid grey. Lower contact not well defined.	87.40 87.90	qtz carb vein. wispy chl qtz carb, fluorite vein c sph, cpy.
	94.15	SST. – m.g. pale grey to mid grey feldspathic.	94.37 – 94.65	Irreg. qtz carb vein network c spl.
0.79 1.81 2.00 1.90 1.45 2.15 1.45	95	SHALE Fine grained massive to chaotic shale. Tonal variation common from tan to mid grey to brown. Fine carbonate spotting common. Locally syngenetic euhedral py. developed. The shales become a darker grey tan from 101.4 and then over last 3m is predominantly dark purple grey to grey brown green, syngenetic py is common. Lower contact 70° to C.A.	100.00	qtz carb, chl vein c py possible fault (?).
	105 105.52	SST. m.g. mid grey sst. Rare carbonate veining. Lower contact not well defined	104.80	
1.49 0.22 0.60 0.70	108.48	SHALE Fine grained massive tan to light grey shale. Fine scale spotting after carbonate is very common. Minor criss cross siderite veinlets generally ≤1mm. Contact sharp 70° to C.A.	106.11	Fuzzy, dark filled vein c minor py. FAULT (?). 70° to C.A. Several thin fuzzy parts down to 107.3.
1.46 1.56 1.52 2.42	110 114.54	LODE. From 108.48 – 111.91 the lode is qtz/carbonate rich occurring as blotchy and irregular zones with sulphide rich areas and lens. The carbonate is predominant [illegible]% with qtz 5%. Rare up to 10cm barren chert units usually veined and fractured. Thin tourmaline/chlorite rich lode. 111.91 – 114.54 consists of tourmaline chlorite rich lode with accessory patchy and rounded carbonate. Tourmaline is fine grained and is closely associated with chlorite comprise up to 30%. carbonate up to 10%. Minor carbonate rich zones and irregular carbonate stringers.		25% sulphides. total sparsely distributed in carbonate rich lode consisting of patchy & veining po up to 30% and 70% vuggy, patchy py. In the tourmaline/chlorite lode po, 90% occurs as subrounded aggregates and fine disseminations 5% veining py and up to 5% cpy finely disseminated. Trace visible cass? Rarely seen.
	114.77	CHERT – f.g. grey black chert.		
	115	LODE – carbonate, qtz rich lode	114.77	Py/po sulphides. The carbonate veinlets.
0.57	115.35	CHERT – f.g. grey black to white grey.		
2.45 0.55 3.07	120	LODE From 115.35 – 118.42 The gangue mineralogy is carbonate/qtz with minor tourmaline and fluorite. The carbonate & qtz are erratic, wavy, fractured and veined with rare layered areas. Cherty zones occur. Tourmaline occurs as fine veinlets. From 118.42 – 119.42 the lode mineralogy is chlorite, tourmaline carbonate forming an irregular spotty to blotchy host. Rare banding due to concentration of sulphides and carbonate. From 119.42 to 120.09 the lode is as first section	115.35	20% sulphides occurring as patchy aggregates, veins and fine grained disseminations, vuggy cavities. Py is predominant in qtz section 95% with minor up to 5% po. In the chloritic section po 90%, cpy 10%, generally finely disseminated. No visible cass kit.

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DIAMOND DRILL LOG

Hole No 1301 Page No 4

Feature: Bedding · Foliation · Fragment - size & shape · Shearing · Fault · Vein (c carbonate, q quartz)

Mineralization: Trace 1-5% · Common 5-15% · Abundant 15-60% · Massive <60%

CORE REC'D	DEPTH m	GEOLOGY	VISUAL LOG	TRACE	COMMON	ABUNDANT	MASSIVE	DEPTH m	MINERALIZATION
		SHALE - f.g. grey brown shale, fine scale carb veins.						120.09	5cm qtz, carb vein c spt.
	121.81	LODE. Predominantly qtz, carbonate gangue with minor chl/tourmaline/albite red brown rock? and 15cm fine qtz carbonate host.				■		120.35	30% sulphides as previously. py predominates in carbonate lode po in lower ... [illegible] as disseminations & veinlets ... [illegible]
2.99		CHERT Fine grained pinky/tan chert with minor up to 5cm spotted shale bands. Chert becomes mottled pinky brown grey towards lower section. Fine carbonate spotting common (parts may represent cherty shale). Lower contact gradational with cherts/cherty shale becoming softer						122.31	2cm qtz, carb vein c sid. & minor py. Disseminated euhedral py in shalier unit
0.39	125								
1.31		SHALE Initially massive pale grey to tan coloured shale - becomes a darker purple grey from 126.80, once again quite massive. From 130.5 the shales are a mottled greenish grey to purple grey with bedding becoming better developed (probable tuffaceous content). From 132.20 to base the shale are massive finely carbonate spotted khaki coloured. Lower contact not defined							Minor erratic fine scale carbonate veins. Fine scale fracturing common.
0.73									
3.12									
1.46									
1.05									
2.70	135								
	136.2								
0.90		SANDSTONE. Medium grained massive greyish green feldspathic sandstone. Generally coarser grained down to 140.00. Local bleaching around thin carbonate veins. Contact irregular						136.14	qtz, carb vein 35° to C.A.
2.21								137.32	qtz, carb vein 45° to C.A. Thin veinlets containing spt.
								139.55	spt. in chl, carb vein.
3.15	141.50								
		SHALE Massive and locally chaotic fine grained tan coloured shale. Fine carbonate spotting common. Thin veinlets common. Rare sst unit 5cm wide 145.10-145.15. Contact 65°							core loss 1.50 metres.
1.03	145								
0.52									
1.27	145.31	SANDSTONE Predominantly m.g. massive mid grey sst. with rare chaotic shale. Porous vuggy section FAULT(?). 8cm wide from 145.54 - 145.62, 70° to C.A. (spt) Contact 75° to C.A.		F(?)				146.63	Vuggy carbonate vein c spt.
2.75									
	149.20							148.85	qtz, carb vein c spt, fluorite.
1.32	150.00	SHALE/SST - Tan shale c minor tan sst.		F				149.88	Healed fault 2cm wide 65° to C.A.
0.35		SANDSTONE - M.g. massive mid grey to tan grey sst. poorly bedded							
0.80									
0.40									
	151.5	E.O.H. Logged. A.Eadie. 27/7/78							
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HOLE No.: 1301

SAMPLE DATA

SHEET No.: .....

LENS	SAMPLE No.	ROCK TYPE	Σ	INTERVAL From	INTERVAL To	Length (L)	Assays (A) % Snt	Assays (A) % Sns	Assays (A) % Cu	SPECIFIC GRAVITY P. Snt DRY	P. Sns WET	~~P. Cu~~	S.G.
	222563	LODE (CARBONATE)		0.0	1.10	1.10	1.09	0.03	0.12	861	583½		3.10
	4	LODE (CARBONATE)		26.70	28.15	1.45	1.87	0.07	0.20	1234	857		3.27
	5	LODE (CARBONATE)		31.60	31.95	0.35	2.40	0.07	0.22	304	209		3.20
	6	LODE (carbonate)		108.48	109.78	1.30	0.99	0.02	0.05	969	665		3.19
	7	LODE "		109.78	110.89	1.11	0.84	0.03	0.03	893	614		3.20
	8	LODE "		110.89	111.96	1.07	0.73	0.02	0.08	848	572½		3.08
	9	LODE (TOUR CHL)		111.96	113.01	1.05	0.68	0.02	0.04	932	643½		3.23
	70	LODE (TOUR CHL)		113.01	114.42	1.41	0.57	0.02	0.05	1084	754		3.28
	1	LODE (MINOR CHLORIT)		114.42	115.50	1.08	0.75	0.02	0.07	798	540		3.09
	2	LODE (carbonate)		115.50	116.97	1.47	0.85	0.03	0.06	1325½	909		3.18
	3	LODE "		116.97	118.38	1.41	0.66	0.02	0.04	1158	799½		3.23
	4	LODE (TOUR CHL)		118.38	119.47	1.09	0.92	0.02	0.09	948	658		3.27
	5	LODE (CHLOR.)		119.47	120.64	1.17	1.58	0.03	0.08	1002½	694		3.25
	6	LODE (MINOR STRING)		120.64	121.81	1.17	1.28	0.04	0.07	1130	787		3.29
			Σ	108.48	121.81	13.33	0.89	0.03	0.06				

N.W.P.S.