ABMINCO N.L.
CLEVELAND MINE

CATEGORY: Surf Ex

HOLE No.: C1290 REF No 18551

GENERAL DATA

Objective: Halls Formation 500 North.

Area of Operation: W. PROSPECT 2 500 Sect. Location: ,

Collar R.L.: 476.35m Co-ordinates: 15856.585 N, 11837.839 E.

Bearing of Hole: 316° 22' 32" (320°) Angle of Hole: -54° 48' 33" (-54°) Final Depth: 582.5 m.

Drilling Commenced: 12/5/78 Completed: 6-6-78 Logged by: A. Eadie

DRILLING DATA

Drilled by: Longyear Non Coring: 0 - 10 m

Drilling Rig: 44. Coring: 10 - 582.5m.

Driller(s): P. Lefebvre, G Abbitt

Core Recovery:

HOLE SURVEYS

HOLE No.: C1290

24164

HOLE No.: 129c

SAMPLE DATA

SHEET No.: .....

LENS	SAMPLE No.	ROCK TYPE	Σ	INTERVAL From	INTERVAL To	Length (L)	Assays (A) % Snt	% Sns	% Cu	S	Product (A×L) ~~P. Snt DRY~~	~~P. Sns WET~~	~~P. Cu~~	S.G.
	222419	Limestone (m.g. chloritic)		514.83	516.25	1.42	0.01	<0.01	0.01	0.68	1986	1256		2.72
	420	Py limestone		522.30	523.74	1.44	0.01	<0.01	0.01	1.46	1989½	1262		2.73
	421	" "		527.63	529.42	1.79	0.01	<0.01	0.01	1.62	2445	1571½		2.80
	422	Shale/Calc. Shale (Fe chlts)		534.90	535.68	0.78	0.01	<0.01	0.01	0.58	966	623		2.82
	222423	Min'd Limestone		541.78	542.43	1.70	0.04	<0.01	0.02	0.32	2008	1285		2.79

N.W.P.B.

SUBTRACT 4°
FROM MAGNETIC BEARING
TO GIVE GRID BEARING

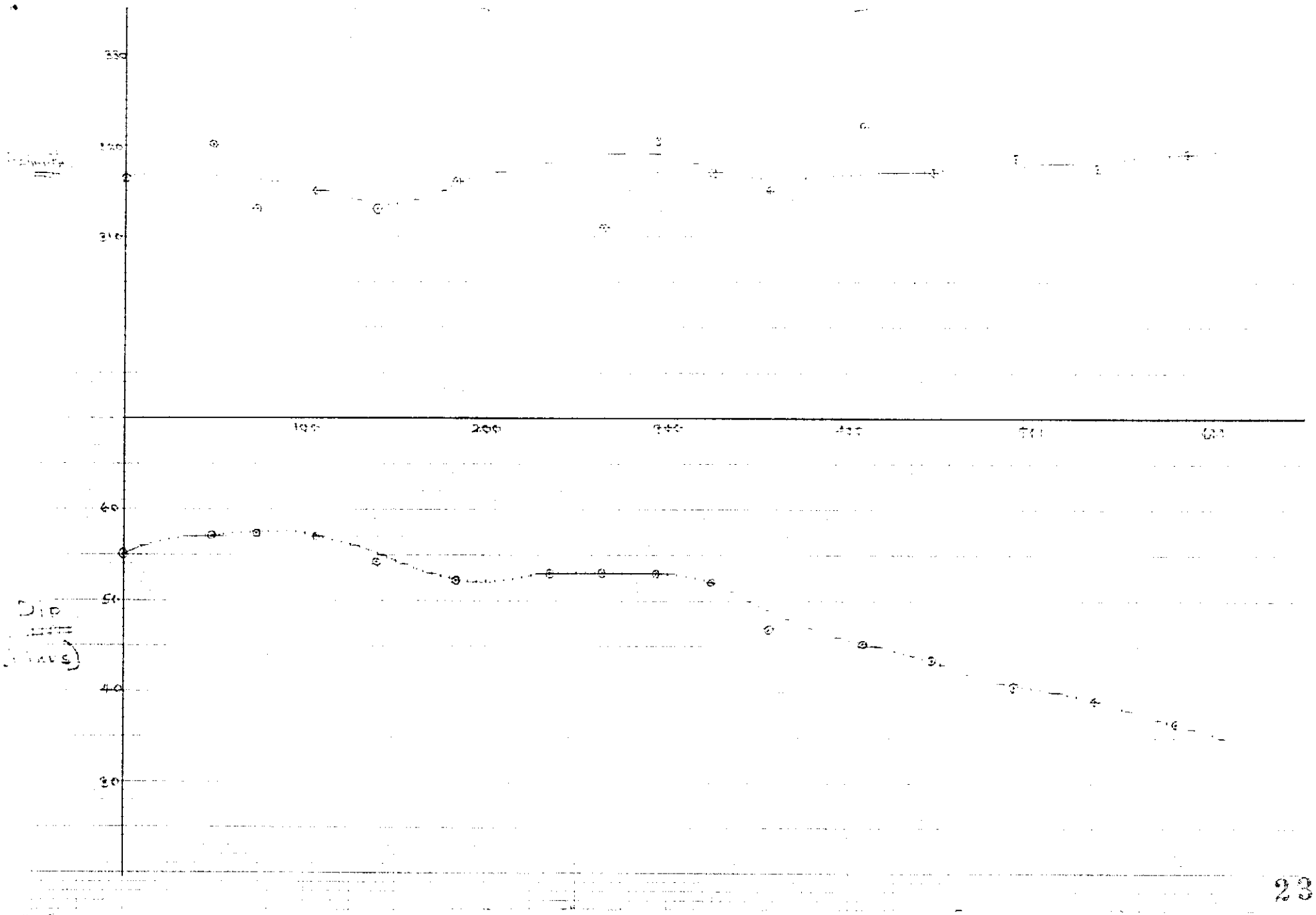
ABMINCO N.L. - Cleveland Mine

Hole No. C 1290

Sheet No.

DIAMOND DRILL HOLE DATA

PROGRAM DATA				SURVEY DATA				INTERPOLATED DATA		
				Instrument Type	Depth	Dip	Azimuth	Depth	Dip	Azimuth
1	Attitude	—	(+) (-)	Survey	0	54·8	316 3/4	12½	56	316 3/4
				Camera.	0	55¼	—	37½	57	316 3/4
2	Hole No.	1290			48·7	57	324 (326)	62½	57½	316½
					73	57⅓	317 (313)	87½	57½	315¾
3	Down Hole Interval	25			105·6	57	319 (315)	112½	56¾	314¾
					139	54¼	317 (313)	137½	55½	313½
4	Collar	15856·57	N		183	52¼	320 (316)	162½	53½	314¼
					235	53	—	187½	52¼	316
5	Co-ords.	11837·84	E		264	53	311 (307)	212½	52½	317¼
					294	53	324½ (320½)	237½	53	318
6	Collar R.L.	476·35			324	52	321 (317)	262½	53	318¾
					355	46¾	319 (315)	287½	53	319¼
7	Halls Sect. Z 500	16198·87	N		407	45¼	326 (322)	312½	52½	318¼
					445	43½	321 (317)	337½	50¾	316¾
8	Intersect Point	11458·41	E		490	40½	322½ (318½)	362½	48¼	316¼
					535	39	321½ (317½)	387½	46½	316½
9	Battery Sect. FA	15409·21	N		580	36½	323 (319)	412½	45	317
								437½	43¾	317
10	Intersect. Point	10838·12	E					462½	42¼	317½
								487½	40¾	317¾
11	Start Plot (Depth)	0	ϕ = Collar					512½	40	318
								537½	39	318½
								562½	37½	318¾
								~~587½~~	~~36~~	~~319~~



DOWN HOLE PLOT

Hole No: C129

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	LONG SECTION Sect. Z 500	LONG SECTION Dist from Batt.	LONG SECTION Sect. FA
0	15856·57	11837·84	476·35	511·01	782·36	1·94		766·47	
25	15866·67	11828·17	455·62	497·07	769·78	2·92		772·59	
50	15876·59	11818·84	434·66	483·49	757·60	3·98		778·65	
75	15886·33	11809·60	413·57	470·09	745·55	4·97		784·58	
100	15895·95	11800·22	392·49	456·69	733·42	5·79		790·35	
125	15905·60	11790·49	371·58	442·99	720·94	6·38		796·03	
150	15915·35	11780·22	350·98	428·84	707·92	6·68		801·60	
75	15925·73	11769·57	330·88	413·97	694·33	7·19		807·64	
200	15936·74	11758·93	311·11	398·70	680·54	8·19		814·28	
225	15947·91	11748·60	291·28	383·54	666·97	9·51		821·17	
250	15959·09	11738·54	271·31	368·57	653·65	11·01		828·16	
275	15970·40	11728·62	251·35	353·62	640·42	12·71		835·33	
300	15981·80	11718·79	231·38	338·69	627·26	14·54		842·61	
325	15993·16	11708·66	211·55	323·55	613·81	16·12		849·75	
350	16004·68	11697·82	192·19	307·78	599·65	17·35		856·79	
375	16016·70	11686·31	173·54	291·17	584·68	18·51		864·07	
400	16029·18	11674·47	155·40	274·01	569·24	19·78		871·67	
425	16042·11	11662·41	137·73	256·39	553·45	21·23		879·61	
450	16055·32	11650·09	120·44	238·40	537·31	22·72		887·72	
475	16068·96	11637·59	103·63	219·97	520·85	24·41		896·18	
500	16082·98	11624·86	87·31	201·11	504·05	26·21		904·91	
525	16097·22	11612·04	71·24	182·06	487·09	28·13		913·81	
550	16111·77	11599·17	55·51	162·74	469·97	30·23		922·99	
575	16126·68	11586·09	40·29	143·04	452·53	32·47		932·44	

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	LONG SECTION Sect. 8 500	LONG SECTION Dist from Batt
600	16141·94	11572·82	25·59	122·95	434·78	34·84		942·

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DIAMOND DRILL LOG

Hole N° 1290 Page N° 1

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	DEPTH m	MINERALIZATION
		NO CORE RECOVERY			
0.36	10	BASALT (Vb) - From 10.00 m - 27.00 m The Vb is generally weathered, core recovery is poor and most of the core is broken up. Iron staining (goethite) is quite common. Vb textures are poorly preserved.			
0.42	20	From 27 m. recovery is better and the Vb is a massive dark olive green chlorite veined. Fine carbonate spotting common.			
change of scale. 1.07	30	Bleached zone at 34.05 - fine, calcite vein - FAULT - 30° to C.A. Shearing along chlorite veins common in vicinity of fault.	F		
	35	The Vb is massive olive green variably chlorite veined, - rare carbonate veinlets and segregations.			
	40	Shearing common parallel to chlorite veining Rare calcite veining.			
	50	FAULT 48.70 - calcite vein & slickensides - 25° to C.A. From 50.80 - 53.63 The Vb is very fine grained with rare chlorite veins becoming quite regular towards base Lower contact 45° to C.A.	F F		
	53.63	[illegible] Vb - 45° to C.A. FAULT at 53.72	F		
change of scale	53.89	Irregular Vb breccia & chloritized zone.		54.20	
	55	BASALT (Vb) - massive, initially fine grained with thin chlorite filled fractures grading into typical Vb with abundant chlorite veins. Rare irregular calcite veins & some epidote alteration. Dark olive green in colour.			
	60				

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DIAMOND DRILL LOG

Hole N° 1290 Page N° 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
		Vb as above, abundantly veined by chlorite - rare calcite veining. Dark olive green, massive.							
change of scale	70	Lower contact sharp, slight bleaching of Vb - 35° to C.A.							
	70.40	Well bedded tuff shale - 45° to C.A.							
	71.05	TUFF SST. - partly laminated pale grey/green 45° to C.A.						70.53	
	72.80	TUFF SHALE (Vt) - Fine grained finely bedded brown to grey shale - well bedded 45° to C.A. Rare calcite veining and re-x'ed calcite. Lower contact sharp. 40° to C.A.							
		BASALT (Vb) As previous units - massive fine to medium grained, olive green in colour - common chlorite veining. Rare irregular calcite veins and segregations.							
	75	Chlorite spotting as infill in amygdules is common towards base.							
	80	Calcite veining becomes more prominent - generally irregular and subparallel to C.A. - segregations also common. Lower 30 cm is slightly bleached as a result of proximity to calcite vein. Lower contact not well defined							
	84.75								
	85	FX - calcite veined, buff, Vb							
		TUFFACEOUS SHALE (Vt) - Fine grained greyish green, generally well bedded 55° to C.A. Lower contact sharp.						85.00	calcite vein at 85.12, core broken - possible fault. F.g. syngenetic, bedded py.
	86.34	CHLOR. SHALE							
		Massive, fissile, fine grained chocolate brown coloured shale. Calcite veining variable, generally as thin stringers cross cutting core rarely as discontinuous blebs. More abundant 91.00 - 91.90.							
	90								

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DIAMOND DRILL LOG

Hole NO 1290 Page NO 3

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
		Rounded greenish alteration blebs common generally less than ½ cm in diameter rarely to 2cm.			
		Lower 22cm sees a gradual change to greenish brown to greenish shales, quite likely with more tuffaceous content. Contact with unit below appears to be PLANAR.			
	94.50	65° to c.A. — Bed'g. 45°			
	95	GREY - GREY GREEN TUFFACEOUS SHALE (VT). F			
		Fine grained pale greyish green to grey tuff shales - well bedded 35° to CA. Rare calcite veins - gradual change to grey black shales below.			
	97.00				
		GREY - BLACK SHALES (Shg)			Rounded patches of fine grained aggregates of Py. with some Py layers ll'l to bedding. Total content less than 1%.
		Mid grey to black fine grained shales, generally well bedded with rare erratic sections, fracturing common - Bed'g. 45° to c.A.			
	100	Calcite veining irregular and clotty. Lower contact not seen but likely to be gradational as above.			
2.04	101.40				
		GREY TUFFACEOUS (?) SHALE (VT).			
		Fine grained pale grey to grey well bedded shales, with probably a high tuffaceous content.			
2.48		Calcite veining is sporadic in occurrence, being limited to the lighter grey shales - Bed'g is generally uniform - about 45° but can vary to 55°			
1.51	105	Silicified shale or chert 107.00 - 107.23			syngenetic (?) Py disseminated through lighter coloured shales.
		Base of sequence shows a gradual colour change to greyish brown thin bedded choc. shales, contact.		108.23	calcite veins containing 20% Py, 2cm wide, 60° to c.A.
		45° to c.A.			
	108.83				
		CHOC. SHALES.			
	110	Fine grained generally well bedded choc. brown coloured shales.			
		Bed'g quite uniform. 35° to c.A.			
		Some sandier sections. 112.50 - 112.62, 113.10 - 113.38. Graded bedding well developed, shows younging up the hole.			
		Erratic calcite veins, and segregations are common.			
		M - crystallized calcite occurs within the tuff ash units.			
4.19	115				

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DIAMOND DRILL LOG

Hole N° 1290 Page N° 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
	116.40	Alteration and irregular foliations developed towards base of sequence with last 5 centimetres resulting in a gradational hard variation							
	117.65	TUFFACEOUS SHALE (VE) - generally well bedded, slightly sheared, stringers of q. buffs, fracturing common. bed'g. 30° to C.A.							
	118.25	CHLOC. SHALES - Massive moderately well bedded - 45° to C.A.							
		TUFF SHALES - moderately to poorly bedded green							
	118.75	CHLOC SHALES - massive moderately bedded 45°							
	119.20	TUFF SHALES Massive poorly bedded generally fractured - silicified, pyramid to fault @ 120.19, 2 sm. vnds, calcite veining, 35° to C.A.			F				
	120								
	120.69								
		CHLOC. SHALES Moderately well bedded chocolate coloured fine grained shales - generally uniform in composition calcite veining is variable, appears to be concentrated over the last three metres, where they are thin and erratic in orientation.							
	125	Tuff sandstone units or layers are often interbedded, being brown in colour.							
		Bedding overall is quite uniform varying from 30° - 50° to C.A.							
		Purply brown shales from 132.63 - 133.26 - carbonate segregation common in this interval.							
	130	Finely laminated towards the base of the sequence, with a gradational hard variation towards lower contact. Lower contact 45° to C.A, but not too well defined.							
	135								
	135.35	TUFFACEOUS SHALE (VE) - pale green f.g. well bedded buffs. Calcite veining with stilpnids pyramid to lower contact			F				
	136.66								
		BASALT (VB) Massive olive green f.g. VB - Initially fractured appearance with no chlorite veins. From 137.94 - 142.60 - abundant erratic chlorite veins.				F			
	140	lower sequence moderate development of chlorite				F			

DIAMOND DRILL LOG

Hole No 1290 Page No 5

Feature : Bedding, Foliation, Fragment - size & shape 0%; 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
		Calcite veining is generally restricted to fault(?) zones & otherwise as thin cross-cutting veinlets. FAULT - calcite vein with slickensides 3cm wide at 138.12, 30° to C.A. Section of calcite veins 139.88 - 140.00 includes slickensides - FAULTS. Sand variation towards base. Contact 45° to C.A.							
	145							145.42	
2.21	146.23	TUFFACEOUS SHALE (VC) - f.g. well bedded tuffs, greenish grey in colour 45°							Rare calcite veining Calcite vein 1cm wide 50° to C.A. no movement 145.66
3.11	149.19	CHOC SHALES. Finely bedded chocolate coloured fine grained shales. Initially sand content is high. Calcite veining is common generally cross cutting, occasionally erratic. Rare green alteration patches. Contact sharp 50° to C.A.							
1.32	150.55	PURPLE/BROWN TUFF SHALES (VC) Finely bedded, purple, brown, green tuffs. - bed'g 45° to CA							
	152.27	CHOC. SHALES. Moderately well bedded f.g. shales with minor purple shales Calcite veining erratic. Possible Fault at 152.07			F				
2.55	157.24	TUFFACEOUS SHALE (VC) greenish grey f.g. well bedded shales minor calcite veining.							
3.00	155	CHOC. SHALES. Fine grained massive to moderately well bedded and jointed chocolate coloured shale. Irregular blebby light green alteration patches common Thin carbonate veinlets rare. Initially massive, grading into well bedded then chaotic, irregularly jointed. Bed'g. 46° to C.A. Lower contact sharp 45° to C.A.			a				
1.51	158.42								
1.58	160	PURPLE/BROWN SHALES. Initially erratically jointed and laminated purple/brownish coloured f.g. shales - generally chaotic, with rare 10cm well bedded sections. From 165.08 to base of sequence the shales are less chaotic, more massive, grading into well bedded shale - bed'g. 48° to C.A. Carbonate present in thin fractures and as micro veinlets. Blebby chlorite common in more disrupted sections. Finely bedded over final 30cm.							
2.19									
1.65	165								

DIAMOND DRILL LOG

Hole No 1298 Page No 6

Feature : Bedding, Foliation, Fragment - size & shape 0% | 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
		Contact veins form ∥ to 45° to c.a.			
1.61	165.25	BASALT (Vb) Massive f.g. olive green Vb. Initially 165.25 - 164.50 the Vb is amygdular, with chlorite filling the 1mm diameter amygdules. Fine scale chlorite veining is common. Irregular carbonate veinlets occur generally to 1mm in width rarely to 1cm. Carbonate segregations occur. The Vb is generally highly magnetic (dacem may be From 164.50 - 173.02 - amygdules are rare, carbonate is finely distributed and occurs also as irregular veinlets Epidote occurs in bands at 171.30 & 171.48			Disseminated fg. less 1%.
2.34					
2.97	170				
	173.02	Contact very sharp 55° to c.a.			
3.02		GREYWACKE/ARGILLITE. Well bedded f.g. greyish green & chloritic coloured shales probable bifurcation - bed.g. 60° to c.a.			
	174.11				
2.91	175	PORPHYRITIC BASALT (Vb) Highly porphyritic fine grained grey groundmass Vb. The feldspars (?) are generally to 1mm in length and vary from irregular to euhedral, usually angular. The Vb has a very variable transition from grey green to olive green, usually as rounded continuous zones (alt?) Irregular carbonate veinlets and segregations are common. Disseminated carbonate present, magnetite (?) Epidote alteration around some carbonate veins. Chlorite veining rarely seen. Lower contact not seen.		175.26	Vuggy carbonate texture.
				176.33	2cm wk. qtz vein & abundant epidote alteration - slumps in Vb altered to a pinkish clay
3.00	180				
3.02				183.32	5cm qtz, carb, chlorite vein & stringers - FAULT 45° to c.a
2.98				185.21	10cm. carbonate qtz vein, open cavities, chlorite/epidote FAULT (?). 45° to c.a.
	187.20	Vb - fine grained, amygdular, olive green.			
3.01	188.01	BASALT (Vb) Fine grained, mottled irregularly patchy grey green to olive green colored Vb. Carbonate veining sporadic. Minor development of phenocrysts. Irregular carbonate veining at 193.40 - 193.70. Chlorite veining non-existent Contact 45°		187.92	
	190				
3.08					
2.94	195.09				
2.96		PORPHYRITIC BASALT (Vb) Fine grained olive green Vb - alteration gives a mottled, pseudo fragmental appearance with grey green & olive green patches. The Vb is highly porphyritic with phenos ranging from fine to ½ cm in length.			Irregular carbonate veining quite common throughout the sequence. Epidote commonly associated
	200				

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DIAMOND DRILL LOG

Hole No 1290 Page No 8

Feature : Bedding, Foliation, Fragment - size & shape 0%; 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
9.98		Pyrrhotite around 242.35, 242.50 FAULT(?). or 243 pyrrhotite to chlorite veins. From 243.00 - 251.20 the Vb is massive, chlorite not developed. Carbonate veining common. Possible fault 244.9, 45° to c.a. chlorite/talc slickensides.							
9.98		Contact with unit below unclear, with some Vb fragments found in tuffs.							
	250								
	251.20	TUFF SHALES - f.g. green -							
5.00	251.61	BASALT (Vb). Variable massive f.g. olive green Vb. Moderately chlorite veined to 255.36						255.36	Py, chlpy overprint (?) in carb veins
		Calcite vein & slickensides at 254.96 The Vb's disrupted - series of calcite veins 255.26 - 255.36 and silicious tuffs. Possible fault but not visible slickensides						256.36	qtz, carb, epidote vein
5.05								256.96	qtz, carb vein 15° to c.a & slickensides.
	260	Porphyritic Vb from 255.36 - 259.22. Finely spotted Vb (carbonate) from 259.22 - 260.30.							
4.57		The basalt then becomes porphyritic with phenocrysts up to 0.5cm in length. Crumbly core 262.33 - 262.45 - FAULT(?). Variability in distribution of phenocrysts.						262.63	carb calcite vein & open cavities.
4.84									
	270	Decrease in porphyritic texture from 267.7 until at 270.20 No phenocrysts are seen.						270.64	qtz, chl, carb vein 15° to c.a.
								270.84	qtz, carb vein 20° to c.a.
3.59								271.94	qtz, carb vein 75° to c.a.
		Irregular chlorite veins become common, generally alteration around fractures and providing carbonate veinlets.						272.61	qtz, carb vein 80° to c.a.
4.92								273.53	vein qtz, carb, chl, epidote network of veins Possible FAULT 15 - 20° to c.a.
		No shear of calcite veins at base of sequence.							
	280	Lower contact very sharp, 55° to c.a.							
3.08									
	293.2								
4.88.	294.09	TUFF SILT Fine to m.g. brownish green well bedded tuff/silt, bed @ 55° to c.a.							
		TUFF SHALE TUFF SHALE & interbedded brownish green tuff/silt and chocolate coloured							
	295								

3346
3346

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DIAMOND DRILL LOG

Hole N° 129c Page N° 4

Feature : Bedding, Foliation, Fragment - size & shape (D%), 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
	285.74	buff shales - bed'g. regular, 55° to c.a. Minor calcite veining.							
	286.35	TUFF-SST - fine to m. g. well bedded greenish brown							buff - bed'g. 55°
		LITHIC TUFF - brown grained buff, green in colour c 1mm. lithic fragments.							calcite veining with minor epidote alteration.
	287.14	TUFFISSTONE / SIL. BX. TUFF - f. g. clastic buff							+ brecciated silicified buff.
	287.44	BASALT (Vb)							
4.04		Massive fine grained basic volcanic, olive green in colour, homogeneous in texture -							
	290	Irregular carbonate veining. Chlorite filled fractures and veins and aggregates are common.							
4.98		Slippage along chlorite veins fairly common.							
		FAULT at 290.40 - 5cm wide - gouge, carbonate filled with some open cavities and slickensides. @ 70° to c.a.							
4.02									
	300	The Vb becomes fine grained with little chlorite and carbonate veining towards base - slight silicification.							
4.89		Contact sharp - 75° to c.a.							
	305								
4.87									
	307.98	LITHIC TUFF - grey green - fragments to 2 mm.							
	308.21	TUFF SILT - grey green finely bedded - 75° to c.a							
	308.61	TUFF SST. - greyish green - medium to fine grained - bed'g moderately well defined. 60° to c.a. minor lithic fragments							
	309.76	TUFFSST / TUFFSILT - as above with chlorite brown buff, shale interbeds - bed'g. variable 60 - 70° to c.a.							
	310								
	310.61	TUFFSILT - dark brown coloured bed'd shale 60° to c.a.							
2.70	311.07	TUFFSST - finely bedded greenish brown sst						311.45	
		TUFFSILT - well bedded - grey to grey shale - bed'g. 70 - 80°						311.90	
	311.35	CHLORITE - massive fine grained green shale						312.05	
		BASALT (Vb)							
		Massive homogeneous olive green fine grained basic volcanic. Finely disseminated carbonate and magnetite (not visible). Carbonate veinlets are common - generally							
	315								

Commco

DIAMOND DRILL LOG

Hole N° 125c Page N° 10

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
4.89		erratic in distribution - Albite is present within fracture and as veinlets and aggregates. Decrease in abundance below 317.00 Ub is very fine grained to aphanitic brn - siliceous(?) - fractured up. proximal to contact below.						315.6	carbonate vein 40° to C.A
2.85	320								
	320.74	TUFF SST - M.g. fgy speckled grey laminated huff - iron lithic fragments generally disrupted with silicified lapilli.							FAULT boundary 45° to C.A.
	322.30								
1.64		TUFFISHALE - Fine grained dull greenish grey well bedded huff. Generally siliceous throughout. Bed'g - uniform at 50°. Lower contact moderately sharp.						321.8	2cm. qtz, carb filled FAULT fractures. 65° to C.A.
	323.54								
2.55	325	CHLOR. SHALES Fine grained chloritic brown colored shales - Initially siliceous, massive to moderately well bedded finely disseminated carbonate occurs through the sequence. Carbonate veinlets common Iron alteration zones and pockets are frequent, proximal to carbonate veins & within shales. Lower contact is predominantly with shales changing to a brown grey then to grey.							
3.46									
	329.51								
0.71	330	MARLY CARB - CARB GREEN SHALE - Core missing floor in this section - Shales grade from l.g. purple grey - green grey - to brown grey							2cm vein forms at 330.45 FAULT(?) contacts not generally seen.
	330.72								
1.86		CHLOR. SHALES Massive structureless chlor. colored fine grained shales to 333.80 From 333.80 - 337.20 the shales are irregularly foliated with pale green chlorite alteration common around the carbonate veins and as blebs and patches. Secondary carbonate is common, as'x'ing as rounded clusters and fine grained disseminations. From 337.20 to 347.75 the shales are massive, bedding is not well developed. Alteration is still common resulting in irregular patches.							
	335								
4.79									
0.91	340								

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DIAMOND DRILL LOG

Hole N° 129C Page N° 12

Feature : Bedding, Foliation, Fragment - size & shape (0%), 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
2.36		and bands of lithic giving an impression of banding, although in several cases the alteration bands cross cut bedding. Bed'g loc A at 342.5. Carbonate veining is rarely seen from 343.50 the shales are more massive, alteration virtually non-existent. Lower contact gradational and the unit below is banded between chlor. shales & tuffs.							
3.70	345								
	347.75	PURPLE BROWN SHALE - foliated dark shale							
4.81	350	TUFFACEOUS SHALE Massive, occasionally foliated dark greenish grey tuff shales and grey tuffs. Carbonate veining generally minimal, with rare 2 greater inches of veining and carbonate aggregates from 351.48 to 352.75 Lower contact not seen as core is broken up.							
	352.75	TUFF SST. m-g. grey green sst & lithic frags							
1.97	353.10	TUFF SHALE - often green shale, foliated							minor disseminated Py.
		CHLOR SHALE - massive finely bedded shale						353.60	
0.78		TUFF SHALE - massive grey green f.g.						353.90	
0.50		Shale - minor tuff sst clasts up to 3cm wide.							
0.63	355	CHLOR SHALE						354.80	
0.89		Massive fine grained chlor coloured shale. Thin irregular calcite veins, minor alteration. Bed'g not well defined.							
1.77	357.96	CARBON TUFF.							
	358.20	CHLOR SHALE Clastic, foliated chlor coloured shale. Thin carbonate veinlets common as are irregular segregations.							
1.18								359.38	
0.79	360	CARBON TUFF SHALE - foliated.							
		CHLOR SHALE - minor foliated zones.						360.19	
0.65	360.76	TUFF SHALE.							Disseminated syngenetic Py.
0.85		Massive greyish green, weakly foliated fine grained tuff.							
0.96		Lower contact gradational.							
	362.15								
1.71		CHLOR SHALE massive fine grained poorly bedded chlor. coloured shale. Contact 40° to C.A. - carbonate veins.							
	363.86								
		LITHIC TUFF / TUFF SST / TUFF SHALE (VB)							
	365	Interbedded m-g. lithic tuffs green in							

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DIAMOND DRILL LOG

Hole N° 1290 Page N° 12

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
		Colour 30cm (rare to 1cm in length - e.g. lithic lapilli sst, and f.g. dark brown shales (buffs?) Lower contact sharp 60° to c.a							
4.96	374.75	Tuffaceous sst Medium grained generally massive greenish brown to green coloured buff/brown sst. The brownish coloured buffs are more carbonate rich. A fine layering is often seen generally low angle to core axis 10-20°. Minor brown shaley lithic fragment occur Contact with basalt is foliated sheared green shale and quite irregular							
4.93	379.68								
	379.68	Basalt (Vb) Massive fine grained olive green Vb - carbonate veining rare, and occur as thin irregular cross cutting veins. Chlorite filled micro fractures common.							Py aggregates and veinlets common - < 1%.
4.99	379								
4.98		Minor patchy epidote alteration proximal to carbonate veins and within fractures.						380.26	1cm qtz, carb vein 35° to c.a.
0.88	384	From 379 carbonate veining becomes more common - and from 381						384.05	2cm carb, qtz vein - 20° to c.a.
		Intense carbonate veining, closely associated with qtz veins and qtz, carb. veins. From 384.45 incidence of veining decreases						385.2	carbonate Vb Brx (?).
4.98		Most veinlets are upto 1cm in width - generally smoke and criss crossing. Chlorite veining rare. Lower contact sharp 65° to c.a						385.1	2cm qtz/carb vein - 30° to c.a. Patchy and veiny Py occurs sporadically.
	390								
	390.48								
		Chloritic Shales Massive, fine grained, generally finely bedded dark/dark coloured shale. Irregular carbonate segregations occur along with thin carbonate veinlets - Cross cutting chloritic alteration (?) - uncommon - Bed's 45° to c.a From 395m rounded carbonate							
3.19									
0.75	393.5								
0.55	395								

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DIAMOND DRILL LOG

Hole N° 1290 Page N° 13

Feature : Bedding, Foliation, Fragment - size & shape (0%), 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
		aggregates and segregations become more frequent the shale becomes more disrupted - Lower contact is gradational with gradual color change to green tuffs.							
1.30									
	397.13	TUFF-BRECCIA & SHALE (VC).							Fine grained syngenetic fg aggregates and crystals occur - Total less 1%.
5.66		Fine grained greyish green to grey well bedded tuffs - Thin irregular black shales occur. Carbonate veining minimal. Bed's uniform 50° to C.A. Lower contact sharp. 37° to C.A.							
	402.70								
		CHLORITE SHALE / TUFF SST. Interbedded chl shale, f.g. massive and medium grained tuff sst and shales - minor lithic fragments occur within sst's. Lower contact sharp. 65° to C.A.							
3.38	405.73								
	405	BASALT (Vb) - schistose, porphyritic Vb. phenos to 3 mm in length.						404.56	Fract. fg carbonate & chlorite
	405.22	TUFF SHALE - f.g. tuffaceous shale							
3.08		BASALT (Vb) Fine grained massive olive green basalt. chlorite filled amygdules common from 407.0 - 407.20 - in the same segment many erratic carbonate veins 1/2 to 1 cm wide. Vb becomes fine grained siliceous proximal to contact 35°.							
	408.25	CHLOR. SHALE f.g. grades to chloritic chert							
	408.30	TUFF SST - recent grey fg m.b.							
4.90	408.34	CHLOR SHALE Moderately well bedded fine grained shale - Bed's 45° to C.A.							
	410								
	410.25	TUFF SST. M.g. light brown grey green sst. minor thin shaly partings							
	410.88	TUFF SHALE - f.g. grained, grading to brownish							
	411.65	CHLOR SHALE							
3.48		Massive to chaotic fine grained olive brown shale - bedding not well developed. From 418 - 421.5 the shales are irregular and chaotic, at times with a pseudo fragmental texture (i.e. 419.50 - 419.90) Fine scale calcite veining generally sporadic in occurrence. Purple brown shale unit. 416.10 - 416.60. (with finely interbed carbonate). Alteration proximal to veins and fractures. Lower contact not seen core is ground slightly.							
1.51									
3.05	424								
3.35									
0.13	424.	TUFF SHALE Pale greenish grey fine g. well bedded tuffs. Bed's 30-40° to C.A.							
1.23	425	Varying to a brownish grey.							

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DIAMOND DRILL LOG

Hole N° 1290 Page N° 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
		Lower contact not visible.							
0.40	425.45	BASALT (Vb) The basalt is initially massive olive green with numerous wide carbonate veins and lesser thin micro veins. Minor chlorite filled amygdules. Core generally broken over initial 2 m.							qtz, carb veins // to c.a 425.72 - 426.00 qtz, carb vein // to c.a 426.90 - 427.40 - quartzy in places. 5cm qtz carb vein 10° to c.a from 428.00 - 428.50 Fault at 429.15, carb, chl. filled, slickensides 40° to c.a. Minor fine grained epidote in fractures and within veinlets.
3.15		Scattered phenocrysts from 429.44 - 433 and rounded chlorite filled amygdules.							
4.93	435	The basalt becomes highly amygdaloidal from 433.00 - 435.40. The lower amygdules - finally almost free of amygdules - contact is gradational with phenocrysts increasing slightly.							
	436.73								
		PORPHYRITIC BASALT (Vb).							
4.55		Massive olive green fine grained basalt with abundant pale white green feldspar (?) phenocrysts generally upto ½ cm in width - chlorite filled amygdules are common. Carbonate veining erratic with fine scale crisscrossing veins common. Lower 35 cm siliceous fine grained and devoid of phenocrysts - abundant carbonate veinlets and segregations						440.05	50 cm long qtz, chlorite carbonate vein parallel to c.a & slickensides - FAULT
5.02	445								
	446.49								
		TUFF SILTSTONE (TUFF SST).							
4.24		Predominantly fine grained dark reddy brown Hematitic shales interbedded with greenish brown medium grained tuff sst. Bedding is variable from 40° at 446.50 to 25° at 451.55. Thin carbonate veinlets common. Rare lithic tuff units - 10 cm wide. Fault - 448.00, 15° to c.a - carb chlorite with slickensides. Lower contact sharp - 45° to c.a.							
4.92	455								
4.01	457.16								
		LITHIC TUFFS. Greenish grey lithic tuffs with minor tuff sst and tuff shales. Fragments comprised of Vb, shales, chert shales range from 0.25 mm to 1 cm. Fine carbonate veining. Radiating calcite clots are common. Contact erratic with clasts in sst.							
	460								
	460.58								
	460.72	TUFF SST - grained brown [illegible] 40° to c.a							
4.22		TUFF SILTSTONE / TUFF SST							
		Fine grained massive dark brownish red shales - no bedding except in thin 2 cm wide tuff sst beds - 35° to c.a. Carbonate filled fractures.							
	462.75								
		LITHIC TUFF Medium grained green-black coloured tuffs - fragments range from 0.1 mm to 2 cm, comprise Vb in the main, green tuffs, chert shales.							
	464.40								
		TUFF SST - m.g. greenish brown very [illegible] shales - 45°							Faulted contact 35° to c.a.
	465								
4.70		BASALT (Vb)						466.86	

Dominco

DIAMOND DRILL LOG

Hole No 1296 Page No 16

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	DEPTH m	MINERALIZATION
3.18		green to greyish grey and grey. Bedding is variable with the better bedded units probably represent the silicified shales (cherts) and the more massive, microfractured rocks being the more cherts. Carbonate veining rare. Bed'g uniform 30-40°.			
0.20 0.28 0.83 0.55 0.83 0.46	514.0	From 513 the chert/shales are very well bedded, and therefore most likely highly silicified buff coarse shales - resemble some of the previously logged buff shales. Lower contact sharp 40° to c.a.			
1.20				511.8	2mm vein with 80% galena
0.17					
2.78				512.43	1cm wide calcite vein + qtz and minor galena 30° to c.a.
	514.22				
PGT 514.30	514.60	LIMESTONE - mid grey, m.g. well bedded, medium			of fine sand grains & fragments.
		GREY GREEN SHALE & SILT - well bedded			
3.03	515	LIMESTONE - Medium grained clastic limestone made up of fine carbonate chert. well bedded - 40° to c.a. - some thin non calcareous partings. Minor carbonate veining			
	516.79				
		BUFF/GREEN SHALES. grey/grn to grey well bedded shale (buff coarse?) bed'g 45° to c.a.			Minor carbonate veining.
	517.1				
2.40		LIMESTONE/SHALE Predominantly clastic fine and medium grained fragmented limestone and dark associated pale grey fine grained shale - pale broken up by carbonate.			Fine grained syngenetic bedded py and patchy py aggregates. <1%.
	519.5				
2.99	520	LIMESTONE. Massive fine grained grey to grey black limestone. Fine wispy black shaly(?) chert are common. Bed'g. weakly developed - generally a bimodal variation - 45° to c.a. Carbonate aggregates occur Minor carbonate and qtz carbonate veining. The unit is well bedded from 519.5 - base of sequence. Thin interbedded shale units common towards base. Lower contact sharp. 35° to c.a.			Upto 1% py developed generally fine grained aggregates of grains. Some vein oriented, patchy irregular to rounded aggregates. 1cm wide veins parallel to bedding (syngenetic). 520.92 - 0.5cm qtz, carb vein c py, assoc py. 25° to c.a. 525.14 qtz, carb vein c minor po 525.83 qtz, carb vein c ga assoc py.
	X520.06 PGT.				
2.97	523				
2.89					
	529.45				
	530	GRAYWACKE - f.g. sandstone well bedded LIMESTONE/SHALE			

Commeo

DIAMOND DRILL LOG

Hole N° 1296 Page N° 17

23354

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
3.02		Regularly interbedded pale grey fine grained siliceous shale and limestone. The limestones vary from m.g. well bedded clastic lst to massive fine grained lst (calcareous shale?). Fine scale carbonate veining common generally parallel to bedding - 30-45° to C.A.							Syngenetic (parallel to bedding) fine grained py and aggregates of py occur in trace amounts. The veins or layers vary from 1mm to 1cm in width. Total sulphide upto 1%.
2.97									
	535	SHALE (tuff) fine grained well bedded siliceous grey shale, host to m cm carbonate rich Beds 35°						534.35	Limited fg. bands or patches with random mms.
	535.67								
3.13	536.71	LIMESTONE. Dark grey black fine grained - massive, poorly bedded. Minor shaly beds towards base.							Finely disseminated py.
	537.91	SHALE - siliceous fine grained chalky shale moderately well bedded, pale grey to dark grey with dark bands. Bed's 30° to C.A.							
		LIMESTONE - dark grey black fine grained.							f.g. patchy disseminated py.
	538.41	SHALE / LIMESTONE Interbedded mid to light grey fine grained shale and grey to black fine grained limestone. Erratic carbonate veining is very common predominantly in the shale. The shales are well bedded. 60° - 35° to C.A.							Finely disseminated py less 1% in limestone?
3.03	540								
	541.56	Contact 45° to C.A.							
3.08		LIMESTONE - Massive dark grey black f.g. patchy bedded limestone - minor fractures and carbonate veining							Patchy py and po., total sulphide 2%
	544.49								
	544.92	CHERT - Highly silicified shale and chert, mid grey in colour. Lower contact jointing and brecciated 60° to C.A.							
2.97	545	LIMESTONE (Minor Shale). Predominantly limestone, m.g. and fine grained varieties - with f.g. mid grey clastic shale interbeds. Erratic carbonate veining and segregations are common. Lower contact erratic and gradational.							Fine grained patchy py less than 1%.
3.01	548.57	CARBONATE SHALE - greenish grey chaotic and disturbed fine grained shale. Contact 35° to C.A.						549.86	
	550	MASSIVE SHALE dark grey foliated massive shale.							Minor py.
	550.47	CHERT (chalky shale). f.g. fractured and crazed massive cherts, mid grey in colour, together with fine grained highly silicified shales (chalky shales) generally dark grey-black in colour.							Pyrite on joint planes minor chlorite on cleavage and joint planes.
3.00									
0.57									
	554.48	Lower contact fractured normal to C.A.							
	555	SHALE / SANDSTONE Interbedded f.g. shale upto 10cm							

Comunco

DIAMOND DRILL LOG

Hole No 1290 Page No 18

Feature : Bedding, Foliation, Fragment - size & shape 0%; 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
		with sst clasts, then becoming sst, mid grey medium to coarse grained with lesser shale interbeds and irregular wispy partings. Minor carbonate veining in sst. Contact fairly arbitrary.						556.62	py, carb vein 35° to c.a, cross cutting py veinlet.
								557.17	py, carb vein 10° to c.a + galena
								559.30	py, carb vein 20 to c.a.
								559.70	py, carb + py 559.70-80 galena
	560	SANDSTONE - Massive medium to coarse grained mid grey sst. Bedding not defined, minor carbonate veining. 1cm shear at 561.6. 15cm shale band 563.65. Lower contact sharp 35° to c.a.			F			562.23	3cm py, carb vein 15° to c.a + sph, py, assemply (?).
								563.32	chl, carb vein + blackened fault (minor).
	565.15	SHALE - mid grey - smooth to foliated							new sst clasts
	566.15	SANDSTONE / SHALE.							
	570	Massive sandstone, mid grey in colour, medium grained - erratic carbonate veins and rounded to sub rounded carbonate segregations. Wispy erratic shale interbeds pulsing/undulating around 570.						570.00	bleached py, carb vein.
		SANDSTONE - Massive medium grained mid grey sst - minor carbonate veining poorly bedded - rounded to irregular 4"x1" carbonate clasts. Contact sharp - 45° to c.a.						571	1.5cm wide py, carbonate vein sub parallel to c.a = 10°. minor secondary shale.
	573.43	CARBONATIC SANDSTONE / SHALE Massive mid grey m.g. sst with interbedded shales, ranging from 10cm units to irregular contorted wispy flakes and partings. Very minor carbonate veining.							
	592.5	E.O.H.							

Alex Eastie. 3/7/78.