PASMINCO EXPLORATION
DIAMOND DRILL CORE RECORD

HOLE No. TF1

754056

Page 1 of

LOCATION	TULLAH
PROJECT	EL 22/90
PROSPECT	FARRELL
DESIGNED BY	J.G. PURVIS
LOGGED BY	J.G. PURVIS
RELOGGED	
COMMENCED	25.5.95
COMPLETED	11.7.95
DRILLED BY	L. LORRIGAN
DRILL RIG	LONGYEAR 44

OBJECTIVE

TO TEST HENTY FAULT, FARRELL LODE POSITION, AND FARRELL SLATES/MURCHISON VOLCANICS CONTACT IN POORLY-KNOWN AREA EAST OF FARRELL MINES.

RESULT

NO SIGNIFICANT MINERALIZATION INTERSECTED. FARRELL SLATES/MURCHISON VOLCANICS CONTACT CONFORMABLE AND COMPLETE, ALTHOUGH SHEARED.

LOCATION/SURVEY DATA (AMG)

Grid	AMG		RL Collar m 284.8
Northing m	5378507.2		Bearing Collar 090°
Easting m	385562.3		Dip Collar −62.5°
DH Survey Type	EASTMAN CAMERA		Length Hole m 813.1

Depth m	Bearing	Dip	Depth m	Bearing	Dip
30	092.8°	−61.4°	750	112.5°	−30.5°
60	094.5°	−61°	780	114°	−29.3°
90	092.5°	−60.3°	800	115°	−28.8°
126	099.5°	−59°			
150	096°	−58.3°			
180	095.5°	−57.4°			
210	095.5°	−56.3°			
240	095°	−55.3°			
270	091.5°	−54°			
300	091.5°	−53°			
330	092°	−51.8°			
360	095°	−50°			
390	094.8°	−48.5°			
420	097°	−47°			
450	098.3°	−45.6°			
480	100.5°	−44°			
510	102°	−42.8°			
540	104°	−41°			
600	106°	−38°			
630	107°	−37°			
660	108.5°	−35.3°			
690	110°	−33.8°			
714	111°	−32.3°			

SIGNIFICANT INTERSECTIONS

From m	To m	Interval m	Cu	Pb	Zn	Ag		Comments
127	129	2			0.17%			HENTY FAULT - Crushed Zone
255	257	2		0.1%	0.33%			Black shale ± carb-sp veinlets
666.95	668	1.05		2.23%		50 g/t		Qtz-siderite-gn lode (Farrell Slates)
798	801	3			0.21%			Disseminated sp in epiclastics of Murchison Volcanics

SIGNIFICANT CORE LOSS

From m	To m	% Lost
NO SIGNIFICANT CORE LOSS		

POOR GROUND CONDITION ZONES

From m	To m	Condition
125.25	128.7	Broken, with pug zones (HENTY FAULT).
226.3	227.5	Fault with bx + pug (FARRELL LODE POSITION)
733	750	Fissile + broken along foliation (shale).

HOLE SIZE

Size	Depth m
HQ	119.9
NQ	813.1

HOLE CONDITIONS AFTER COMPLETION

Collar	STEEL CAP PUT ON HW CASING, COLLAR CEMENTED.
Steel Casing	6m HW CASING LEFT IN TOP OF HOLE
PVC Casing	40mm ID PVC PLACED TO BASE
Ground Water	
Wedge	
Drill Pad	

Project : TULLAH
Logged by: J.G. PURVIS
Date : JULY 1995

PASMINCO EXPLORATION DIAMOND DRILL LOG

HOLE No. TF1

754057

m	VEINING and ALTERATION (1 = weak, 4 = intense)	STRUCTURE (b = bedding, c = cleavage, f = fault, Angles to LCA)	GRAPHIC LOG (0.06 mud, 0.5, 2, 8, 32, max mm)	LITHOLOGY	MINERALISATION
0			Tricone	MT BLACK VOLCANICS	Rare py, gen assoc with chl veinlets
	↑ minor ox on fracts	Mod fract + broken ↕		MASSIVE FELDSPAR-PORPHYRITIC DACITE WITH MINOR MAFIC DYKES	
	sil-alb>ser (2-3) chl-co (1)	Gen hard & unbroken		Pinkish-fawn, pale red to reddish-brown. (Mafics green)	
10	Abund co ± chl veinlets Lesser qtz>co±chl veins (often comb-struct)	70mm mafic dyke 45°	Irreg pods mafic dyke material		
	Leucoxenisation of opaques	Weakly foliated	Mafic Dyke (sub-ophitic) 35°	Common feld laths (white or pink) to 4mm, av 2-3mm. In fi gr felsic groundmass.	
	chl-co (2-3)		Mafic dyke (amygdaloidal) 50° 45°		
20		C: 40°			
		Small fault 40° (// fol)			V minor py disseme in co-chl veinlets
					← minor mag in co-chl vein
30		C: 43° (Dips 27° to 062° AMG)			Rare py
40	co veinlets highly abund	C: 45°	Andesitic dyke 45°		
		Strongly Foliated f 60° (30mm cataclasite)	Andesitic dyke 45° (chl) 300mm chl mafic dyke 50°		← minor py in & around dykes
50					

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m	VEINING and ALTERATION (1 = weak, 4 = intense)	STRUCTURE (b = bedding, c = cleavage, f = fault, Angles to LCA)	GRAPHIC LOG (0.06 mud, 0.5, 2, 8, 32, max mm)	LITHOLOGY	MINERALISATION
50	sil-alb > ser (3-4) Almost no chl	Strong foliation ↓ Strong F: 50° F: 45° Mod foliated C: 45°	10mm fvg with black shale material.	DACITE As before.	Rare py ↓
60	sil-alb>ser (4)	fract & bx Strong F 60°			← sp-gn in co-qtz veinlet
70	sil-alb-ser (3) chl (1) (chl in abund veinlets ± co) Common leucoxene after opaques; pink calcite veins	Weakly foliated C: 45°			
	chl-co (3)	All // fol 30° 20° 25°	Basalt dykes (non-mag)		
	sil-alb>chl (3-4)	irreg Not foliated ↕ 25° // fol 25°	Blotchy texture due to 2° feld overgrowths on feld phenos		
	chl-co (3)		Basalt Dyke weakly sub-ophitic, non mag		
80	sil-alb>chl (3) ↑ Leucoxene ↓ qtz-chl veins (sil-alb, 4)	Shear 50° C: 35°			← py stringers Minor py
					Rare py ↓
90	co>chl (3) Abund calcite veinlets. Leucoxene. sil-alb (1)	C: 47° (Dips 41° to 157° AMG) 55° (// fol)		90.3m MAFIC DYKE Green, med gr, massive. Weakly sub-ophitic. Non mag. Some pink felds to 1-2mm (2°?)	

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PASMINCO EXPLORATION DIAMOND DRILL LOG

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m	VEINING and ALTERATION (1 = weak, 4 = intense)	STRUCTURE b = bedding c = cleavage f = fault Angles to LCA	GRAPHIC LOG (0.06 mud, 0.5, 2, 8, 32 max mm)	LITHOLOGY	MINERALISATION
100	co>chl (3)			Mafic Dyke	Rare py
		50°		102.4m	
	sil-alb>>ser (3) chl (1) Numerous co>chl veinlets	Hard, largely unbroken. Weakly foliated C: 40°		DACITE As before. Feld phenos v indistinct due to alteration	
110					
		Foliation Increasing C: 50°		100mm sheared mafic dyke material in foliation.	
120		(Dips 83° to 274° Mag) C: 40° C: 33°			
	ser>sil-alb-ble (2-3)	Strongly foliated + sheared	qtz veinlets		Minor to 1% py, dissem + stringers. Rare sp-gn.
		45° Broken + sheared + pug 55°	45-55°	125.25m HENTY FAULT Crushed qtz, minor black shale + mafic material (ser>fuc) 125.7m	
	CO (2-3) Dispersed + in abund veinlets. sil (1)	FAULT ZONE Cataclasite zones, brecciated + broken, 60°	sst/sh Foliated Dacite sst/sh	HENTY FAULT 128.7m FARRELL SLATES	1-2% py, dissem Rare gn.
130	Minor patchy sil assoc with thin qtz veins	Mod-Strongly Foliated Bk: 65° Faulted 55° (// fol)	shale	MAINLY FINE CALCAREOUS SANDSTONE/SILTSTONE Qtz-feldspathic. Carbonaceous. Minor interbeds of grey siltstone and black shale	1% dissem py
		C: 70°			
140		Soft-sed disruption Weakly foliated B: 71°		90% sst 10% black shale	Minor py
150					

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m	VEINING and ALTERATION (1 = weak, 4 = intense)	STRUCTURE (b = bedding, c = cleavage, f = fault, Angles to LCA)	GRAPHIC LOG (0.06 mud, 0.5, 2, 8, 32, max mm)	LITHOLOGY	MINERALISATION
150	co (2-3) Patchy sil(1) assoc/c qtz veinlets. ↑ Abund co ± qtz veinlets throughout ↓	↑ Weakly foliated ↓ soft-sed disruption. B: 73° (Dip: 10° to 268° AMG)	sericitic siltstone	MAINLY SANDSTONE AS BEFORE Minor thin black shale interbeds. Minor detrital mica in sst.	Minor dissem py ↓
160	carbonate increasingly & Mn-type	B: 71°	siltstone/shale		
		small f: 60° (//b) Stronger fol Minor kinks //LCA			
	0.4m broken qtz vein	Vuggy cataclasite ///// on vein margins	60–70°//fol	168.7m QUARTZ LODE (FAULT) 169.3m	Minor to 1% py
170	↑ Abund irreg co (siderite?) veinlets ± qtz (some pre-date fol) ↑ Minor chl veinlets ↓	Strongly foliated ↓ B: 55° ↑		STRONGLY FOLIATED BLACK SHALE Partly graphitic. Carbonate-veined.	2% py dissem & veinlet. Trace sp-gn in shale & co veinlets.
					3% py. Trace sp-gn.
					2% py. Trace sp-gn.
180		C: 65° f: 65° Strong f: 47° (Dips 79° to 275° AMG) Contact: irreg	B: 55° (Dips 2° to 107° AMG)	183.0m	1% py. Trace sp-gn.
	co veinlets (some sid) less than above	B: 75° ↑↑ Weak-mod foliation ↓	sericitic shale	TURBIDITIC QUARTZ-CRYSTAL-LITHIC SANDSTONE MASS FLOW Below 184.3m appears to be single up-hole fining mass-flow. Grey. Massive & uniform. Qtz xtl grains & common black shale frags, in sl vitric matrix.	Minor to 1% py. Trace sp-gn. - dissem & in siderite veinlets
190	Qtz veinlets	C: 70°			
		Fold kink //LCA			
	co (1-2) pervasive Also co veinlets as above	C: 72° f: 65° (//b)			
200					

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200	co (1-2) as above	C: 68°		↓ Increasing black shale frags	Minor dissem py. Rare sp-gn.
		↓ Moderate foliation		AS ABOVE ← stretched black shale frags to 5mm long	
210		C: 70° (Dips 18° to 034° AMG) (questionable measurement)		↓ Lithic component increasing (black shale + fi gr tuffaceous seds) some feld xyl grains also (1-2mm) ← 70 x 25mm black shale clast ↓ stretched lithics av 10mm, to 30mm vólc qtz xyls to 2-3mm (abraded) (abundant)	
		Contact B/c: 75° small f: 80° (// fol)		Black shale rip-ups 218.65m	
220	Abund spidery siderite (± qtz ± chl) veinlets Common qtz-co ± chl veins, commonly brecciated & disrupted	// fol ↑ [strong f: 75° f: 60°		BLACK SHALE Carbonaceous Strongly graphitic in places, esp around faults + on foliation planes. FARRELL LODE POSITION? Highly graphitic shale disrupted & brecciated	← 1mm aspy veinlet 1-2% py (conc in co veinlets)
		Strongly foliated contorted in places f: 60°	Puggy cataclasite		2-3% py Dissem + veinlet
230		major fault 65°			1-2% py. Rare aspy.
		v strong f: 70°	cataclasite		
	co (Fe/Mn type) ± qtz ± chl veinlets in fol. dispersed co (1) around co veinlets.	Moderately foliated C: 55° ↓			2-3% py Dissem + veinlet. common 1mm py veinlets in fol
		f: 20°?	Pug		
240		B/C: 70° (Dips 58° to 292° AMG)			
	co (1-2) - dispersed + co (Fe/Mn type) (± qtz) veinlets.	B/c: 62° Folds		↓ small co-rich laminae	↓ py conc in co-rich lam in co veinlets
250					

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PASMINCO EXPLORATION DIAMOND DRILL LOG

HOLE No. TF1

RC4062

m	VEINING and ALTERATION (1 = weak, 4 = intense)	STRUCTURE (b = bedding, c = cleavage, f = fault, Angles to LCA)	GRAPHIC LOG (0.06 mud, 0.5, 2, 8, 32, max mm)	LITHOLOGY	MINERALISATION
250	As before co (1-2) dispersed, co ± qtz veinlets ↓ occasional qtz veins to 100mm.	Fold noses f: 65° (// Fol)	Thin co-rich laminae	BLACK SHALE	← 70 x 8 mm broken massive py bed in fol co-sp veinlets to 10mm 2-3% py disseminated veinlets. Rare as py ± sp
260		B/C : 50° Mod foliated f: 60° f: 25° (// Fol)	sulph vein (70mm) in fault.		← 70mm qtz-py vein
270		B/C: 52° (Dips 33° to 145° AMG) (Questionable measurement)			← minor sp in co > chl veinlets
	↓ Trace chl in co-qtz veinlets Common qtz > co veins to 100mm	Lode 45° // Fol B: 43°	0.55m qtz vein with black shale frags qtz-xyl sst beds		1% py. Rare sp assoc c ← qtz lode barren. co-chl veinlets.
280	Much less veining. Patchy co (1)				2-3% dissem py
	co (2) - Fe/Mn type. Sev (1-2) Some chl veinlets	Contact 50° (// Fol) Mod foliated	283.2m qtz vein to 300mm (barren) sericitic shale	THINLY-INTERBEDDED TURBIDITIC SANDSTONE/ SILTSTONE + SHALE Grey. Downhole - fining sst beds (calcareous) 30-200mm thick, with dark grey siltstone + shale. All rocks sl carbonaceous. Sst = qtz-feld-lithic (incl small flecks of black shale) Unit comes more shaley with depth.	V minor sp-qn veinlets Minor to 1% py Dissem.
290	co (2) (calcite, not Fe/Mn type as above). Persistent veinlets of calcite ± qtz	↑ V weakly foliated B: 55° (c: 15° off sense)	sst 0.1-0.2m thick shale		← py veinlets in shale Trace po ↓
300					2-3% po >> py Dissem.

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PASMINCO EXPLORATION DIAMOND DRILL LOG

HOLE No. TF1

TF1063

m	VEINING and ALTERATION (1 = weak, 4 = intense)	STRUCTURE b = bedding c = cleavage f = fault Angles to LCA	GRAPHIC LOG 0.06 mud, 0.5, 2, 8, 32 max mm	LITHOLOGY	MINERALISATION
300	As before	⇓ ⇓ ⇓	qtz vein	SANDSTONE SILTSTONE & SHALE As above	2–3% po >> py, dissem + veinlets. Rare sp + cp in co veinlets ↓
	co(2) Calcite ± qtz veinlets more common. Minor qtz > co-chl veins to 120mm. 200mm qtz > co-chl vein, chl (1) around vein	More silt/shale and more thinly-bedded. B: 53°			
310		V regular bedding B: 58°. C: 15° (same sense)			
		B: 57°. C: 27° (same sense)			
320	co(2) Calcite ± qtz veinlets less common. No qtz veins	B: 48° ↓ Moderately foliated		⇐ Thin limestone beds	
		Contact: B 55° Conformable. B/c: 60° (Dips 60° to 282°)		sandstone with shaley matrix. Vol qtz to 5mm, felds to 3mm. Qtz commonly deformed to augen by foliation of matrix. 329.0m	
330	ser > chl-sil-co (1-2) ↓ qtz > co ± chl veins to 400mm, gen irreg ↓	Moderately foliated ↓ C: 57°	shaley bands	± qtz-porphyry frags (± cp + sp). PUMICEOUS QUARTZ–CRYSTAL SANDSTONE Greenish-grey. Massive, lineated. Abundant abraded (sub-rounded to rounded) + fractured qtz xtls to 7mm, av 2–3mm. In sericitic finely pumiceous matrix (av < 5mm). Abund small angular qtz xtl frags.	Minor to 1% dissem py. ∨ minor dissem py
340			qtz qtz qtz qtz		
		Contact B: 50° Conformable		342.45m	
	co ± qtz veinlets ↓ qtz-co ± chl veins to 250mm ↗ qtz vein	⇓ ⇓ Weakly foliated (bedding // B: 57° Regular bedding from 1mm to 1m (sst)	lst beds	MONOTONOUS INTERBEDDED TURBIDITIC SANDSTONE SILTSTONE + SHALE Grey to dark grey. Strongly calcareous – some beds are impure limestone	Minor to 2% po > py. Dissem ← 100m qtz vein ± po + trace cp.
360					

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350	Minor chl veinlets (± co)	V weakly foliated B: 55° C: 45° (opp sense)	(core lost) siltstone turbidites 50-100mm fine sst turbidite	AS BEFORE: MONOTONOUS CALCAREOUS SANDSTONE, SILTSTONE + SHALE Rocks are "dirty" ie: strong lithic component. Sst composed of lithics > qtz-feld + mica. Sl carbonaceous. Lithics in sst include cherty frags and black shale	V minor po > py Dissem + leaser veinlets
360	Minor co±qtz veinlets	B: 41°, C: 62° (B dips 88° to 325° AMG, C dips 65° " ")	strongly fol black shale ungraded sst/siltst		
		B: 65°	unsorted sst	Rocks much more micaceous	
370		Fold	sst turbidites 50±150mm		
	chl (2-3) assoc ± zone of qtz-chl-co veining		qtz vein qtz		
380		B: 41°	qtz sst turbidites 50-200mm		← po veinlets
	chl (1) assoc with irreg qtz > chl-co veins	Strongly foliated qtz with some brecciation	qtz		1% po > py Dissem + stringers. ← Trace cp in qtz veins
390		Weakly foliated B: 48°, C: 75° (B dips 7° to 062° AMG, C dips 32° to 242° AMG)	some thin impure sst beds sst turbidites 100-300mm		Po conc in siltst/shale as v fi gr dissem.
		B: 27°, C: 60° (same sense)	Limey siltstone		
400					

RS4064

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400	Minor qz veinlets Lesser qtz > cc ± chl veins to 200mm	V weakly foliated Thinly bedded B : 75°	Fold some lst limey sst 50–400mm Fold sst 100–200mm	MONOTONOUS SANDSTONE, SILTSTONE & SHALE As before. Locks strongly calcareous (except shale) Lithic & micaceous. Minor carbonaceous material Visible volc qtz grains in base of sst turbidites -Otherwise, rocks not very siliceous. Common creamy, finely-laminated limey siltstone and impure limestone (av <30mm).	Minor to 2% po > py Po mainly as v fi gr dissem in shaley beds Minor veinlets (rare cp in these)
410					
420		B : 45° C : 70° (B dips 75° to 327° AMG, C dips 59° to 327° AMG)	sst 100–200mm impure lst beds		
430		Deformed Zone: - common small-scale folding esp of limey beds ? Fold axis - B gen almost // LCA. Much intra-formational folding of limey siltstone	qtz some lst v limey v limey	More shale, less sst.	
440	chl veinlet → (+ po)	More thinly bedded	Ungraded sst some limey siltstone beds lst interbeds		
450					

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m	VEINING and ALTERATION (1 = weak, 4 = intense)	STRUCTURE (b = bedding, c = cleavage, f = fault, Angles to LCA)	GRAPHIC LOG (0.06 mud, 0.5, 2, 8, 32 max mm)	LITHOLOGY	MINERALISATION
450	V minor cot qtz veinlets	B/c: 54° (Dips 80° to 306° AMG) Fold; Weakly foliated; Thin regular bedding. Fine intraformational slumping B: 50° folding of limey beds.	impure lst beds	SANDSTONE, SILTSTONE SHALE AS BEFORE Less calcareous because more shaley. Thin creamy impure limestone and limey siltstone beds, v common.	Minor to 2% po > py as before
460					Minor po > py Mainly dissem.
470		b: 50° c: 70° (same sense); Weak-mod foliated	sst has lithic-rich bases; sst turbidite 200–300mm; some lst beds < 20mm		
480	130mm qtz-co vein (minor chl veinlets around vein)	Fold; B: 54°, C: 68° (B dips 82° to 300° AMG; C dips 64° to 300° AMG). Zone of mod-strong foliation f: 70° (11 RL)	siltstone/shale beds av < 50mm; Limey siltstone beds common.		Minor to 2% po > py Mainly dissem.
490	carbonate becomes Fe-type	B: 62°	sandy lst < 20mm; common beds of limey siltstone.		↓ py > po
500		B: 65°	siltst/sh av < 50mm.		

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m	VEINING and ALTERATION (1 = weak, 4 = intense)	STRUCTURE b = bedding c = cleavage f = fault Angles to LCA	GRAPHIC LOG (0.06 mud, 0.5, 2, 8, 32, max mm)	LITHOLOGY	MINERALISATION
500	Scattered co-qtz±chl veinlets	Beds av <30mm B : 60° Contact: irreg	numerous (irreg silty) beds	AS BEFORE 504.45m frags in qtz	Minor to 1% py>>po. 1-2% py, dissem & veinlet. Rare cp.
	Massive white dog-tooth qtz veins & minor co(fe type). co-chl(1) of host rock	Lithological change bx-cong frags dominate Contact: 35°(sub//B)	Black shale	ZONE OF QUARTZ VEINING Containing lumps & bands of host lithic breccio-conglomerate (frags/clasts av 5-10mm of qtz-phyric volc, tuff, sds, black shale), also lithic sst. 509.75m	Qtz barren except: dist py>sp-gn in qtz. Minor dissem py in host rocks.
510	co (1-2) Rare spots of fuc. zone of qtz veins	Moderately foliated B/c: 60° (Dips 78° to 307° AMG) Contact: 60°(//B/c)	qtz qtz	BRECCIO-CONGLOMERATE + SANDSTONE WITH QUARTZ VEINS Sub-angular to sub-rounded stretched clasts of tuff-seds, black shale, qtz, "chert," 514.5m qtz-phyric volcs, rare pumice + magn.	Minor dissem py. Rare sp.
520	co (1) V minor qtz-co veins 10-100mm	B : 72° Moderately Foliated Thick regular bedding (av 0.5-1m)	Ungraded	FINE LITHIC SANDSTONE + SILTSTONE Grey. V minor thin beds of grey-black shale. Rocks are micaceous and sl carbonaceous. Only v sl calcareous.	Trace dissem py
		B : 68° fold			
530	V minor co veinlets		Ungraded		
540		Fold? (Disrupted bedding //LCA) B/c : 82° (Dips 58° to 310° AMG)			
		B : 69°	lithic-rich base & qtz-xyl grains. minor shale interbeds		
550					

PB4067

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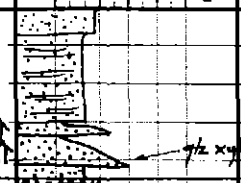
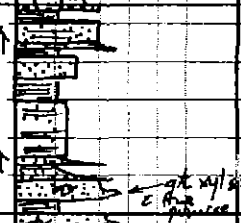
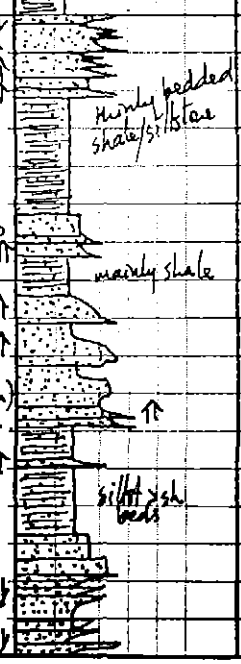
m	VEINING and ALTERATION (1 = weak, 4 = intense)	STRUCTURE (b = bedding, c = cleavage, f = fault, Angles to LCA)	GRAPHIC LOG (0.06 mud, 0.5, 2, 8, 32, max mm)	LITHOLOGY	MINERALISATION
550	As before	Moderate foliation Contact: B: 87°		As Before qtz xyl grains > lithics 554.45m	Trace dissem py.
	co (2) (sl fe type) → co augen	Mod foliation (// to B) B: 84° Contact: B: 84°		INTERBEDDED GREY-BLACK SHALE, SILTSTONE + SANDSTONE Sandstone becoming cleaner and more ghose. qtz xyl sst 560.0m	Minor dissem py
560	ser-sil (1-2) irreg qtz > co veins	Contact: irreg & qtz veined		PUMICEOUS QTZ-FELD XYL SST 561.05m	Minor py
	Minor qtz-co veins 10-200mm	Weakly Foliated Thin regular rhythmic bedding (av 5-15mm max 150mm) crenulation cleavage visible B/C: 82° Dips 43° to 299° Mag Fold	 sericitic siltstone	THINLY BEDDED GREY-BLACK SHALE Lesser calcareous siltstone	Minor dissem py (rare veinlets) some py bedded (locally 1%) py veins in vitric siltst
580		Contact: B: 75°		583.0m	
	V minor co ± qtz veinlets	Weak-Mod Foliation B: 77° Bedding fine + regular (av < 100mm) sst up to 1m B: 73° current bedding	 thinly bedded shale/siltstone mainly shale silty ash beds	MONOTONOUS INTERBEDDED SANDSTONE, SILTSTONE + GREY-BLACK SHALE Rocks weak-mod calcareous (strongest in siltst). Rocks sl carbonaceous, micaceous, qtz-feldspathic, + lithic rich. Sst "dirty", turbiditic, uniform.	V minor dissem py.
600					

RS4068

Project : TULLAH
Logged by: J.G. PURVIS
Date : AUGUST 1995

PASMINCO EXPLORATION DIAMOND DRILL LOG

HOLE No. TF1

m	VEINING and ALTERATION (1 = weak, 4 = intense)	STRUCTURE (b = bedding, c = cleavage, f = fault, Angles to LCA)	GRAPHIC LOG (0.06 mud, 0.5, 2, 8, 32, max mm)	LITHOLOGY	MINERALISATION
600	V minor qtz-co (dol?) veins to 100mm. ↓	B: 73°, C: 82° (B dips 70° to 310° AMG, C dips 61° to 310° AMG). ↑ Weak-mod foliation ↓ B: 80°	Fold in shale; Thin-bedded siltstone + shale; Fold	As before. SANDSTONE, SILTSTONE + GREY-BLACK SHALE Siltstone/shale beds av < 30mm Sandstone 30-300mm, av 100-200mm.	V minor dissem py
610			ungraded		sp in qtz veinlet
		Weakly foliated ↓	Mainly black shale		Minor to 1% py, mainly dissem. Trace dissem cp. ↓
620		B: 75°	sericitic siltst (1% py, trace cp, sp, gn)		
		f: 40° (same sense as B)	Black shale; sst (100-200mm) turbidite; sst (30-300mm) turbidite.		
		No sign of fold			
630	Trace chl around qtz-co veinlets	f: 70° (/B) Fold; B/C: 76° (Dips 71° to 287° AMG)	sst 50-300mm		Trace dissem py. Rare cp in co-qtz veinlets.
640			Thinly bedded shale > siltstone av 5-10mm		← Rare cp-sp-gn in co-qtz veinlets ← Rare sp-gn in tiny qtz veinlets
	Ser (1-2) Trace chl		sericitic (vitric) shale bed.		
		B: 77°	Mainly siltstone beds 50-200mm.		
650					

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PASMINCO EXPLORATION DIAMOND DRILL LOG

HOLE No. TF1

m	VEINING and ALTERATION (1 = weak, 4 = intense)	STRUCTURE (b = bedding, c = cleavage, f = fault, Angles to LCA)	GRAPHIC LOG (0.06 mud, 0.5, 2, 8, 32 max mm)	LITHOLOGY	MINERALISATION
650	Minor qtz-co veinlets	Contact: B: 74°	Beds 10–100mm; Thinly bedded (< 50mm)	As before. Rocks micaceous. 654.75m	Trace py (mainly in co-qtz veinlets)
	co (1) - in bands up to 250mm gen assoc c co>qtz veinlets; ser (2-3) chl-sil (1)	Mod-strong foliation; C: 74° (Dips 72° to 288° AMG)	vole lithics; black shale x bp-sp; carbonaceous shale matrix	VITRIC QUARTZ-CRYSTAL SANDSTONE (the Murchison Mine Host Rock). Light grey. Massive. Uniform. Coarsens downhole from sericitic siltstone at top to v coarse xyl sst at base, with rounded vole qtz to 8mm, av 2-3mm. Rock composed of larger rounded + fract qtz xyls and smaller angular xyl frags, in vitric, partly pumiceous, matrix. Altered grains (< 1mm) of devitrified biotite. Minor clasts, av 5mm, of qtz-phyric volcs.	Rare dissem py
660					Trace dissem py + rare cp-sp-gn
	qtz-co (siderite)-sulph veinlet swarm // LCA + bx fill	Strongly foliated	bx zone; Calcareous shale		5% gn>py-cp>sp
	co (1-2) ser-chl>>sil (2-3)	C: 65°	very pumiceous		Minor dissem py, rare cp
670		Contact, B: 78°	shale matrix; calc shale xlpwidgets	673.3m	
	Common tiny qtz-co gash veinlets gen at low angle to LCA	Weakly foliated; Kinks 70° (opp sense to B); shale-rich zones are fissile	some qtz xyls	INTERBEDDED CALCAREOUS SANDSTONE, SILTSTONE + SHALE. Grey to black. Zones of thinly rhythmically bedded (av < 15mm) siltstone and shale, + thicker-bedded (av 100–300mm, to 800mm max) turbiditic lithic-rich sst. Rocks are calcareous, esp siltstone. Some beds of impure limestone. Rocks also micaceous and sl carbonaceous.	Minor dissem + veinlet py
680	Minor qtz-co veins + chl	B: 75° f: 75° (to fol)	Some impure lst beds		Persistent trace cp>sp dissem + in qtz-co gash veinlets
		current bedding in siltst			decreasing
690	qtz-co veins to 200mm + chl veinlets	B: 69° (Dips 77° to 307° AMG)	shale; sst 50–200mm non-graded		Rare
		current bedding at top of turbidite			
700		B: 70° c: 67° (opp sense)			

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Project : TULLAH
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PASMINCO EXPLORATION DIAMOND DRILL LOG

HOLE No. TF1

CR 4071

m	VEINING and ALTERATION (1 = weak, 4 = intense)	STRUCTURE (b = bedding, c = cleavage, f = fault, Angles to LCA)	GRAPHIC LOG (0.06 mud, 0.5, 2, 8, 32, max mm)	LITHOLOGY	MINERALISATION
700	Minor qtz-co veins + veinlets (± chl)	Moderately foliated	Mainly shale. Beds 3-30mm.	AS BEFORE: SANDSTONE, SILTSTONE + SHALE	Rare py > cp. Dissem + veinlet (cp in qtz-co ± chl veinlets).
	Minor chl veinlets	Disruption of bedding by fol, esp in calc siltstone	← strong fol shale		
710		B: 81° Fold	Mainly shale		1% py Dissem + veinlet. Rare cp.
	massive 0.95m qtz > co vein // b/c: 60-70°		qtz	Sandy section, increasingly micaceous	
		B: 77°	← lithic-rich + qtz-xyl sst.		Trace py. Rare cp-sp (in qtz-co ± chl veinlets).
720	Trace chl alteration.			sst tending to become double-graded or ungraded. Also increasingly qtz-xyl rich!	
		current bedding B/C: 87° (Dips 64° to 292° MAG)	← lithic qtz xyl rich sst + black shale rip-ups		
730	minor chl veinlets	fissile + broken along fol B/C: 70°	impure sst beds	Thinly-bedded silty-shaley section with shale increasing with depth. Beds av 5-50mm. Siltstones very micaceous + calcareous (some impure limestone).	
740	chl (1) in sst →				
		Zone of strong foliation with some boudinaging of siltstone beds B/C: 85° f: 25°	Beds 5-10mm		1-2% dissem + veinlet py. Rare cp-gn. Minor py dissem. ← cp-gn in co veinlets
750	minor chl + ser	strong f: 75° (// fol) Contact: 70° (B/C). Conformable, abrupt.	← 100mm sericitic Hunchison Vbles under fault	750.0m.	1% py. Dissem.

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PASMINCO EXPLORATION DIAMOND DRILL LOG

HOLE No. TF1

m	VEINING and ALTERATION (1 = weak, 4 = intense)	STRUCTURE (b = bedding, c = cleavage, f = fault, Angles to LCA)	GRAPHIC LOG (0.06 mud, 0.5, 2, 8, 32, max mm)	LITHOLOGY	MINERALISATION
750	ser > chl-co (2-3) co augen →	√ strong fol - some qtz + co augen; layering; B/c : 78°	black shale slivers; Absent fine pumice + qtz xyl grains	MURCHISON VOLCANICS PUMICEOUS QUARTZ CRYSTAL-LITHIC EPICLASTICS Grey-green. Wispy-textured. Massive, granular, uniform. Siliceous, sericitic, hard.	1% dissem py, often conc in sooty py bands
	ser-chl > sil (2-3) co (1) Minor qtz-co veins + veinlets	Strongly foliated	qtz xyls to 3mm	Up-hole fining mass flow, composed of abund pumice, volc qtz xyl grains, lesser feldspar grains, and sub-angular lithics of tuffaceous sediments, qtz-phyric volcs, + occasional black shale + limestone.	Minor dissem py-po, some veinlets in fol. Rare sp-gn + cp.
760			lithics 5-10mm, qtz xyls to 5mm		
	sil increasing	C : 75°			
770			inc lithics (to 25mm); black shale rip-up	Sandy top and lithic clast-rich base. Minor leucoxene (prob after biotite).	↓ minor dissem sp ← sp in qtz vein
		C : 78°		↓ pumice increasing (packed) Black shale rip-ups to +50mm x 15mm.	1% po >> py-sp Dissem, clots + small stringers in fol
780		C : 77°		↓ lithic-rich section (to +50mm) incl minor lst	2% po >> py. Po in slugs to 40 x 5mm, in fol Trace cp.
		Contact: Bk. 80°		786.95m	1% po > py as above
	ser > chl (1-2) (-chl in tiny veinlets)	↑ Weakly foliated ↑ Thinly Bedded	Bedding disrupted in places	VITRIC TUFFACEOUS SHALE/ SILTSTONE Dk grey ↓ Pale grey Uniform. Finely comminuted volc. glass + minor small grains of qtz.	1% po-py-sp-gn Dissem + veinlet. (sp in chl veinlets).
790	ser > co (1-2) Tiny co veinlets	↓ B/c : 83° ↓		794.25m	Minor py-po-sp (sp in co veinlets) ↓ Rare
		Contact abrupt, broken 55° (sub // fol)			
	sil > ser (2-3) Minor chl. Co veinlets.	↑ Mod foliated ↑ C : 80°	sp ↑ siltstone	disrupted, much included black shale. MASS FLOW: QUARTZ-FELDSPAR SANDSTONE Dark grey. Hard. Massive. Uniform. Siliceous. (see P17) ↓	2-3% py-sp > po (sp assoc ± black shale)
800			Black-shale rip-ups to 20mm thick		1-2% sp > py-po Dissem + veinlets (mostly assoc ± zones of sil)

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800	sil > ser (3) Minor chl. qtz > co veins to 200mm. Tiny co veinlets. qtz > chl veins to 200mm.	Moderately foliated C: 75° (Dips 82° to 301° AMS)	qtz. Texture indistinct due to alteration.	AS ABOVE: SANDSTONE. Composed of qtz xtls to 2-3mm (some euhedral), commonly with silica overgrowths, and minor pumice (3-5mm), in silica-sericite matrix. Some feldspars (2-3mm), visible in stylitic ser-chl patches.	2% sp >> py Minor to 1% sp > py-gn Trace py-sp Rare
810			minor rip	black shale 813.1m. EOH	