Cominco

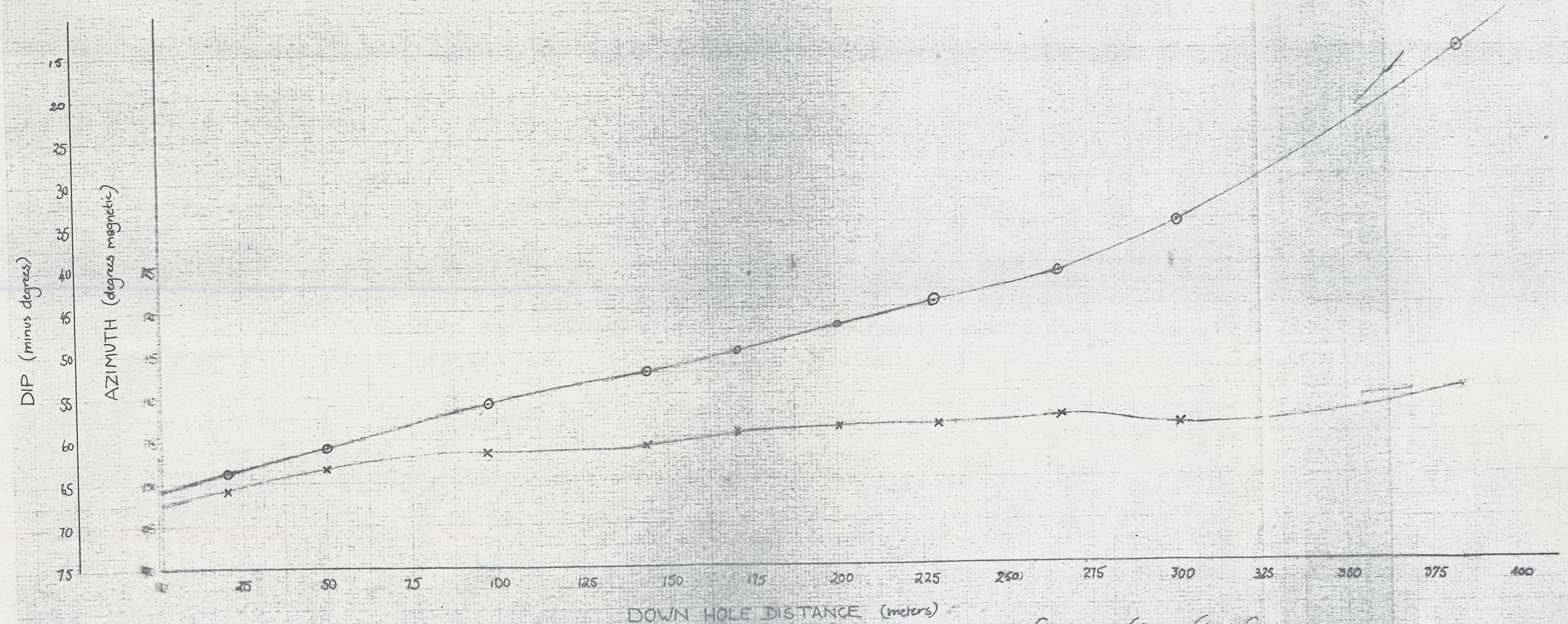
DRILL HOLE RECORD

Location Que River Area
Property Mackintosh EL 2/70
District Tasmania, Australia
Alt./R.L. 686.9
Hole No QR 22
Commenced 21.2.1975
Completed 2.3.1975
Core size NQ to 278.15 BQ to 384.66 EOH.
Co-ordinate 7801.1N 5019.7E
Date 3.3.1975
Bearing (M) 97.5
Logged R. BIRRELL
% Recovery 95%
Grid bearing (M) 8.68°
Dip 65°
Objective To test intersections beneath QR 15 and west lens position.

SURVEY DATA			
DEPTH	DIP	BEARING(M)	INSTRUMENT TYPE
0	65	97.5	Compass and Clinometer
20.7	64	99	Eastman
50	61	101.5	Single Shot
99	56	103.5	Camera
143	52.5	104	" "
171	50	105.5	" "
201.5	47	106	" "
229.35	44.5	106	" "
266	41	107	" "
301	35	106	" "
384	15	110	" "

GRAPH DERIVED DATA						REMARKS
DEPTH	DIP	BEARING(M)	NORTHING	EASTING	ALTITUDE	
0	66	97.5	7801.1	5019.7	686.9	
25	63.5	99.5	7801.13	5030.36	664.29	
50	61	101.5	7800.76	5042.00	642.16	
75	58	103	7799.97	5054.66	620.62	
100	56	103.5	7798.89	5068.24	599.66	
125	53.5	103.5	7797.68	5082.61	579.24	
150	52	104.5	7796.27	5097.68	559.34	
175	49.5	105.5	7794.53	5113.40	539.98	
200	47	106	7792.48	5129.92	521.33	
225	45	106	7790.27	5147.15	503.35	
258.7	42	106.5	7787.05	5171.38	480.15	258.7 - 273 m Bands and stringers of
273	40	107	7785.53	5182.07	470.77	massive base metal sulphides.
300	35	106	7782.62	5203.29	454.33	
325	30	106.5	7779.84	5224.19	440.90	
335	27.5	106.5	7778.65	5232.88	436.09	334.7 - 338.2 m Possible west lens position
350	24	107.5	7776.69	5246.24	429.58	
375	17.5	109.5	7772.71	5269.28	420.72	
384.66	15	110	7770.93	5278.38	418.01	

QR. 22.



Eastman Single Shot Camera.

○ DIP

× AZIMUTH

DIAMOND DRILL LOG

Hole N°. QR 22 | Page N°. 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
		No Core.			
1.66	5	Down to 20.1 m, weathered and broken core. Fault pug common with secondary pyrite along fractures and in pug. Iron staining and kaolinisation? common in the first 7 m.			Secondary pyrite 1% as fine aggregates of euhedral to subhedral crystals.
1.5					
1.7	10	Grey, weakly sericitised <u>lithic feldspar crystal agglomerate</u>. This rock is similar to QR 11 33.7 - 115 m and QR 12 26.85 - 75 m (re petrology QR 12, 46.75 m).			
2.15					
1.9	15	The unit may be genetically related to the buff coloured carbonated feldspar tuff lava recognised in previous holes.			
2.4	20				
1.25	20.1	20.10 - 27.4 m. Light grey, the unit is lightly weathered but competant. Brecciated and with prominant faults, intersticial pyrite is common. Grey alteration fringes and oxidised pyrite are common along irregular fractures.		20.1	Pyrite 5% as aggregates veins and intersticial dust.
2.1					
3.05	25				

DIAMOND DRILL LOG

Hole N°. QR 22 | Page N°. 2.

Feature : Bedding, Foliation, Fragment – size & shape (Og) | 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
3.05	30	Below 27.4 m, the unit becomes locally brecciated, with remaining kernels of partially altered grey-buff dacitic-lava? (to 15 cm) that have diffuse corroded margins. Euhedral aggregates of pale green sericite and carbonate patches (to 15 cm) are possibly indicative of relic feldspar in these fragments.		27.4	Pyrite 2% as veins and aggregates usually along fractures, and as disseminations throughout the groundmass.
3.05					
3.05	35				
3.05					
3.05	40	41.6 – 43.6 m <u>Hornblende crystal tuff</u>. Fine "ashy" appearance, with green chlorite flecks replacing relic hornblende? crystals.			
3.05	45	Occasional lithic bands have angular to sub-angular fragments (to 2 cm) of dacitic lava, feldspar crystal tuff lava (to 4 cm), grey chert (to 1 cm) with carbonated tension fractures, and pumice fragments(to 3 cm). The groundmass is grey, sericitised, carbonated and locally siliceous.			Secondary sphalerite has been noted associated with carbonate veins.
	50				

DIAMOND DRILL LOG

Hole N°. QR 22 | Page N°. 3.

Feature : Bedding, Foliation, Fragment – size & shape (Og)

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
3.05	55	Fractures usually 60° to the core axis but can be nearly perpendicular. Local speckled appearance is due to carbonate aggregates replacing feldspar? in fragments and in the groundmass.							Pyrite as above.
3.05									
3.05	60	Occasional bands of disrupted (slumped) bedding? can be found, and are characterised by brecciation, sericitisation and fragments of siliceous fine grey tuff.							
3.05	65	The unit becomes increasingly siliceous below 64 m.							
3.05									
3.05	70	Illite-hydromuscovite has been noted.							
3.05	75								

DIAMOND DRILL LOG

Hole N°. QR 22 | Page N°. 4.

Feature : Bedding, Foliation, Fragment – size & shape (Og); 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	DEPTH m	MINERALIZATION
3.05		As above.			Pyrite 1% as veins and aggregates of euhedral to subhedral crystals along fractures and disseminated through the matrix.
3.05	80	Minor chloritisation imparts a grey-green colour with a higher proportion of lithic fragments (to 2 cm).			
3.05					
3.05	85	Small carbonate stringers occur and fractures are ragged and usually at 60° to core axis.			
3.05					
3.05	90				
	91.5	Grey tuff agglomerate. The unit becomes finer and obviously lithic toward 95 m and has an "ashy" grey matrix.			
3.05	95	Grey lithic vitric? tuff agglomerate. The unit appears to consist of large grey siliceous fragments with numerous pale green sericite (chlorite) aggregates possibly replacing feldspars.			
3.05					
	100				

VISUAL LOG columns: TRACE, COMMON, ABUNDANT, MASSIVE; BROKEN CORE

DIAMOND DRILL LOG

Hole N°. QR 22 | Page N°. 5.

Feature : Bedding, Foliation, Fragment – size & shape (fg) | 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	DEPTH m	MINERALIZATION
3.05		The unit may be an autobrecciated vitric tuff.			Pyrite as above.
3.05	105	Below 105 m, the unit becomes disrupted, siliceous and locally chloritised with numerous irregular quartz carbonate veins.	F		
3.05			F		
3.05	110	Fractures become ragged and are usually 30° - 40° to the core axis.	F c		
3.05			c		
	115		F		
3.05	116.7	Sericitised, sheared pumice vitric tuff. Steel grey in colour with alternating dark and light bands (bedded pumice?) with pale green sericite aggregates replacing devitrified shards.		116.7	Pyrite 1% as fine disseminated euhedral-subhedral crystals, usually associated with sericitisation.
3.05	119.7				
	120	Fault zone sheared and broken core.	F		
	120.2	Lithic tuff agglomerate. Disrupted and sheared, with chloritisation, sericitisation common, and irregular abundant carbonate aggregates and veinlets.	F	120.2	Pyrite 5%, 50% where indicated, occurs as above.
3.05		Fine grey siliceous tuff bands and fragments also occur.			
	125				

DIAMOND DRILL LOG

Hole N° QR 22 Page N° 6.

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
3.05		Below 124.7 m, the unit has a mottled grey appearance due to its pyroclastic nature. It is no longer disrupted and can be correlated with QR 15 2.3 – 21.7 m.			
	128.2			128.2	Pyrite 2% as aggregates and fine disseminations of euhedral to subhedral crystals.
2.95		Pumice vitric tuff. Similar to unit above between 120 – 116.7 m. Locally disrupted (slumped?) with fine charcoal grey siliceous tuff bands (to 1 cm) showing drag folds. Sericitised relic glass shards and bands have abundant pyrite disseminated throughout.	F		
	130				
3.05					
2.15					
	135	Quartz and carbonate are common as irregular bands, veins and aggregates.			
1.2			2c		
	137	Fault zone 50% sheared and broken core. Localised fault pug with quartz and carbonate veins common.	F		Trace galena and sphalerite noted.
3.05					
	140	Vitric tuff. Light grey with characteristic pale green sericite aggregates (to 3 mm) replacing relic glass shards.	F	140	Pyrite 5% as fine disseminations and as aggregates along fractures and shears.
3.05		Sugary quartz crystals (<1 mm) occur throughout the unit and local bands of sericitisation give the unit a darker colour.			
	145	Carbonate alteration is common around brecciated areas and as random aggregates and veins.			
3.05					
	150				

DIAMOND DRILL LOG

Hole N°. QR 22 | Page N°. 7.

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
		The matrix is light grey ashy usually sericitised and occasionally carbonated.							Pyrite as above.
3.05									
	155								
3.05			qc						
3.05									
	160	Some large fractures are "healed" with grey chert containing carbonated tension fractures.	qc						
3.05									
3.05	165	Fractures are ragged and can vary between perpendicular and 20° to the core axis. Foliation is usually between 30° and 40° and is emphasised by rough allignment of sericite aggregates.							
3.05									
	170	Illite-hydromuscovite has been noted.							Galena and sphalerite has been noted.
1.55									
1.5									
3.05									
	175								

DIAMOND DRILL LOG

Hole N°. QR 22 | Page N°. 8.

Feature: Bedding; Foliation; Fragment – size & shape (Og); 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	DEPTH m	MINERALIZATION
					Pyrite as above.
3.05					
3.05	180	Below 179 m, the unit is disrupted sericitised and has chert fragments and bands. Quartz veins (to 3 cm) are common.			
3.05					
	184.7			184.7	Pyrite 15%, 70% where indicated, as veins and aggregates of euhedral to subhedral crystals, and as a fine dust associated with sericitisation.
	185	Disrupted and thoroughly sericitised <u>fine tuff</u>. Grey to green-grey with random lithic fragments of filamentus pumice and grey chert. Some siliceous grey tuff fragments (to 5 cm) have carbonate aggregates rimmed with pyrite.			
3.05					
3.05	190				
3.05					
3.05	195	Below 195 m, carbonate veins and aggregates are common and thoroughly sericitised bands (to 2 m) of fine pumice tuff, with abundant dusty pyrite have a cyclic occurrence.			
3.05					
	200				

DIAMOND DRILL LOG

Hole N°. QR 22 | Page N°. 9.

Feature : Bedding, Foliation, Fragment – size & shape Og; 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
3.05	205	200.5 – 203.5 m Lithic tuff. Sericitised filamentus pumice with fine dusty pyrite, and sub-angular fragments (to 2 cm) of vitric tuff containing sericitised glass shards are common. Aggregates of yellow-brown carbonate and quartz veins have random occurrence while the matrix is grey, "ashy" and locally silicified.			Pyrite as above.
3.05		The finer unit appears to be bedded? at 60° to the core axis while fractures vary between 80° and 30° to the core axis. Below 206 m, the unit becomes very disrupted.			
	207.5			207.5	Pyrite 3% as fine disseminations through the matrix and as aggregates along fractures and shears. Commonly associated with carbonate veins.
3.05	208	Fault zone sheared and broken core. Light grey vitric tuff. Similar to the unit above between 140 – 170 m. Local sericitised bands appear dark green-grey. Patches of carbonate alteration have a pale yellow-brown hue.			
3.05	210				
1.95		Pale green sericite aggregates (to 2 mm) replacing devitrified shards? allign to the foliation at 30° – 40° to the core axis.			
1.2	215	Occasionally the unit appears to be bedded at 30° to the core axis.			
3.05		The matrix is light grey, "ashy" and often has fine sugary quartz crystals.			
3.05	220				
	221.7			221.7	Pyrite 5% as above.
3.05		Charcoal grey, sericitised, pumice tuff Agglomerate. Large (to 6 cm) angular to sub-angular fragments of vitric tuff, thoroughly sericitised with associated fine pyrite. Filamentus pumice is also common, and has "sheared?" sericite aggregates			
	225				

Feature : Bedding, Foliation, Fragment – size & shape Og; 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	DEPTH m	MINERALIZATION
3.05		(to 2 mm) (relic vitric shards).			Pyrite as above.
3.05	230	Locally disrupted, the matrix is light grey, "ashy" and has sugary quartz crystals (<1 mm), together with carbonate aggregates (<1 mm). Foliation is at 30° to core axis while fractures are at 30° - 50° to the core axis.			
3.05					
	234.5		F		
	235	Fault zone			
3.05		Thoroughly broken, sheared and disrupted with abundant fault pug. Sericitisation and carbonate veins common.			
3.05					
	240		c		
3.05					
2.75	244.7		F		
	245	The unit is dark grey-green and thoroughly sericitised.			
3.05			c		
	250				

TRACE COMMON ABUNDANT MASSIVE

DIAMOND DRILL LOG

Hole N°. QR 22 | Page N°. 11.

Feature: Bedding; Foliation; Fragment – size & shape (Og); 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	DEPTH m	MINERALIZATION
3.05		As above.			
3.05	253.9			253.9	Rare pyrite as fine discrete crystals.
3.05	255	Pale green to buff carbonated lithic tuff agglomerate. Fragments of feldspar hornblende crystal tuff, chert, carbonate aggregates and pyrite fragments (to 2 cm) occur in a fine green-grey matrix. Illite-hydromuscovite common. 256.7 – 257.4 m. Band of fragmental sulphides, genetically related to the sulphides described below.	F, F, C	256.9 257.4	Pyrite 30% as aggregates and fragments sphalerite 7% galena 3%. Rare pyrite as above 256.9 m.
3.05	258.7	Lithic pumice tuff (host rock). Intermittant massive sulphide bands. Fragmental sulphides occur below 260.5 m, and fragments of the host can be found at the bottom of the preceeding unit.		258.7 259.1 259.6 260.9 262.1 263.2 263.5	Pyrite 30% sphalerite 25% galena 15%. Pyrite 7% detrital fragments of galena, sphalerite bearing host. Pyrite 15% trace galena and sphalerite. Pyrite 7% as fine anhedral to euhedral crystals as disseminations and aggregates. Pyrite 60% as above. Weakly banded at 45° to core axis. Framboidal aggregates noted.
0.3	260				
3.05					
3.05	265			265.25	Pyrite 40%. Pyrite as above. Trace galena and sphalerite.
3.05				267.2 267.45	Pyrite 35% dark grey sphalerite 5%, galena 3% occasionally fragmental. Massive sulphides, galena 15% sphalerite 20%.
3.05	270		C, F	268.85	Pyrite 15%. Trace galena and sphalerite.
3.05					Pyrite 7% except where indicated. Pyrite 90%.
	273	Grey Pumice lithic tuff agglomerate. Fragments of grey, possibly altered carbonated feldspar crystal tuff (to 15 cm) are common.		273	Pyrite 3% as aggregates veins and dissemination throughout the matrix.
	275				

DIAMOND DRILL LOG

Hole N°. QR 22 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
3.05		Large fragments (to 10 cm) of pumice have white sericite, carbonate, pale plagioclase feldspars? and pink albitised? feldspars.							Pyrite as above.
1.55		Pyrite aggregates are also associated with sericite aggregates.							
1.50		Chert fragments (to 1 cm), and angular fragments (to 1 cm) of fine charcoal-grey siliceous tuff have common occurrence, along with carbonate aggregates (to 2 cm) and irregular bands and veins.							
	280								
3.05		The matrix is grey, tuffaceous, occasionally siliceous and the unit is locally disrupted.							
		Fractures are usually 60° to the core axis and foliation is 40° to core axis.							
3.05									
	285								
3.05		Below 287 m the unit has bands with a green hue. Possibly due to random chloritisation and small sericitised bands.							
		The above unit may be similar to QR 15 210.4 – 224 m and QR 20 72.5 – 85 m.							
3.05	290								
	292.9							292.9	Rare pyrite as discrete euhedral crystals.
3.05		Green-grey <u>lithic vitric tuff lava</u>. The unit is chloritised and locally sericitised and green colouration is a consequence to the occurrence of chloritised angular – sub-angular lava clasts (to 3 cm) with white carbonate aggregates (to 2 cm) and sericite aggregates (<1 mm).							
	295								
3.05		These fragments occur in a green-grey mottled matrix, possibly a vitric tuff lava, with chloritised devitrified shards that allign roughly with the foliation at 40° to the core axis.							
	300								

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
3.05	305	Minor sericitised filamentus pumice bands to 1 cm have been noted. Fractures are irregular and carbonate veins and rounded aggregates are common.							
3.05									
3.05	310	Between 308 - 322 m <u>vitric tuff lava</u>. Occasionally pumiceous, lithic fragments are less common and abundant pale green sericite lens shaped aggregates allign to the foliation of 40° to the core axis.							
3.05									
3.05	315								
3.05									
3.05	320								
3.05		Below 322 m the unit is the same as above 308 m but becomes disrupted, thoroughly chloritised and is usually broken and sheared.							
3.05	325								

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
3.05		Some lava clasts? have pinkish aggregates (to 5 mm) possibly albitised? feldspar.			
3.05	330	Bleached areas have been completly carbonated, with some minute sugary quartz crystals remaining.			
3.05	332.6	Fault zone 80% sheared and broken core.	F		
3.05	334.7 335	Thoroughly sericitised, disrupted pumice lithic tuff. Possible west lens position.	F	334.7	Pyrite 3% except where indicated as veins, disseminations and aggregates of euhedral to subhedral crystals.
3.05	338.2 340	Grey pumice lithic tuff agglomerate. Locally sericitised with pale grey angular to rounded fragments (to 10 cm) of pumice, sometimes vitric, with pale green sericite and carbonate, replacing feldspar? and glass.	F	241 242	Pyrite 20%.
3.05	345		F		
3.05		Sericitised filamentus pumice and angular to rounded charcoal grey lithic fragments (chert?) are common.			
3.05	350				

DIAMOND DRILL LOG

Hole N°. QR 22 | Page N°. 15.

Feature: Bedding, Foliation, Fragment – size & shape (fg); 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
3.05		The matrix is fine grained, grey and has disseminated pyrite throughout.							
		Foliation is about 40° - 50° to the core axis.							
3.05	355	Fractures are usually 50° to the core axis.	c						
3.05									
	360								
3.05			c						
3.05	365	Some sections of the unit have a bleached appearence because of extensive carbonate replacement.							
3.05									
	370	Irregular carbonate veins and aggregates are abundant.	c						
3.05									
	375								

DIAMOND DRILL LOG

Hole N°. QR 22 | Page N°. 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	TRACE	COMMON	ABUNDANT	MASSIVE	DEPTH m	MINERALIZATION
3.05		As above.							Pyrite as above.
3.05	380								
3.05									
1.11	384.66 E.O.H.								
	385								