ZINIFEX
ROSEBERY MINE

Hole No: 354R **Location:** Chamberlain CP354
Objective: Test Chamberlain ground EM target
Result:

Planned Direction: 95°
Planned Dip: -75°
Planned Depth: 1070.0 m
Planned Northing: 5371331 m N
Planned Easting: 377162 m E
Planned Collar R.L.: 250 m RL

Drilling Commenced: 27/07/2006
Drilling Completed: 23/10/2006
Actual Depth: 1070.4 m
Surveyed Northing: 5371331.00 m N
Surveyed Easting: 377162.00 m E
Surveyed Collar R.L.: 250.00 m RL

Date Logged: 18-Nov-2006
Logged By: Andrew McNeill
Hole Size: HQ/NQ/BQ
Hole Category: Surface Exploration
Grouted: No
Grout Comment:
Date Log Verified:
Verified By:

Summary Log:

Depth	Direct	Dip
0.0	95.0	-75.0
44.0	98.0	-75.0
71.0	97.0	-75.5
101.0	97.5	-75.0
131.0	98.0	-75.0
161.0	97.5	-75.0
191.0	97.5	-74.5
221.0	97.0	-74.0
251.0	97.0	-74.0
281.0	95.0	-73.0
311.0	93.0	-72.5
341.0	93.5	-72.0
371.0	94.0	-71.7
401.0	93.0	-71.3
431.0	94.0	-71.3
461.0	96.5	-70.8
491.0	95.5	-69.5
521.0	93.5	-68.5
551.0	95.0	-67.3
580.0	95.0	-66.5
611.0	99.0	-66.0
641.0	96.0	-66.0
671.0	97.0	-65.0
701.0	97.0	-64.5
731.0	100.0	-63.0
761.0	95.5	-61.3
791.0	99.5	-59.5
821.0	101.0	-58.0
851.0	102.7	-56.1
881.0	103.4	-55.7
911.0	98.0	-55.0
941.0	98.0	-54.0
968.0	99.0	-54.0
1004.0	103.0	-53.5
1034.0	99.0	-53.0
1070.0	101.0	-52.5

From (m)	To (m)	Model Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
0.0	**27.0**	**FG**				**FLUVIO-GLACIALS**				54.6	23
0.0	27.0		BR	cy	t	Light brown to light purple-grey unconsolidated polymict glacial overburden. Comprises a variety of rounded lithic and volcanic clasts to 0.25m in a clay rich groundmass. Core is very incompetent, and significant core loss has occurred during drilling.				137.8	90
										218.3	95
										285.1	93
										314.7	96
										398.0	95
										528.0	98
										634.6	99
										641.4	82
										670.0	95
27.0	**680.9**	**WSF**				**WHITESPUR FORMATION**					
27.0	57.0		ST MD SS	se	t	Medium brown over olive grey, laminated to well bedded, weakly foliated siltstone, mudstone and sandstone. Comprises repeatedly interbedded (1mm to 10cm, typically 1-3cm) units of well bedded siltstone and mudstone, and lesser, slightly coarser sandstone beds. Silstone/mudstone dominates sandstone beds 80:20. Bedding is generally sub-parallel to c.a., showing weak open folding on an approx 5m wavelength. Maximum bedding to c.a. angles approach 40 degrees. Oxidation decreases from quite high levels at 27m, is weaker past ~42.3m to base of oxidation at end of interval. Minor carbonate (Fe-rich) veinlets occur both parallel to bedding and to foliation, appearing to follow the foliation plane after intruding the bedding plane. Rare fresh pyrite was observed along fracturs and in bedding planes as disseminated bands to 2mm. Core is moderately competent, increasing as oxidation decreases (e.g. completely broken above 32.5m, 6-8 bpm down to 57m. Lower contact marked by end of oxidation.					

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $

Hole No: 354R

From (m)	To (m)	Model Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
57.0	212.5		ST MD SS	se	t	Fresh, medium olive-grey laminated to well bedded weakly foliated volcaniclastic siltstone and mudstone. Comprises olive green grey siltstone beds interbedded with less common darker grey (carbonaceous?) mudstone beds and minor thin sandstone beds. The sandstone beds (to 2cm) commonly grade into thicker siltstone beds (to 10cm), while the mudstone bands appear more homogeneous. Overall cycle is quite consistently SS to ST to MD on a 1-20cm scale. Sandstone beds are less abundant with depth through interval. Folding on a 5-10m wavelength is apparent until approx 168m, with graded bedding indicating common overturned beds (eg. fold axis @ 132.2m has normal facing above this depth, reverse facing below. Structural complexity decreases with depth through the interval, with more consistent, planar bedding apparent below 168m Pyrite occurs as rare, thin 1-2mm stratabound bands (usually in the coarser, more porous sandstone units, more common below 194m) showing weak alignment to foliation (fold cleavage?), rare fracture faces (also on fold cleavage) and as minor disseminated grains (also more common in the coarser sandstone beds). Carbonate veining occurs as minor veinlets in the foliation, occassionally bedding parallel, with rare thicker veins (eg. 143.3m) hosting minor c. gr. pyrite-chalcopyrite-galena-sphalerite mineralisation to 5% over 10cm. The core is reasonably competent (3-5 bpm), with no preference to fracture along bedding planes. The lower contact is conformable over approx 0.5m, at approximately 50 degrees to c.a.															
212.5	240.8		VC CG	cl	c	Medium grey-green massive, unfoliated polymict mass flow volcaniclastic conglomerate. Comprises very weakly aligned rounded to angular clasts of mudstone and siltstsone, quartz vein, qtz-phyric volcanics and other lithic clasts to 2cm, grains of qtz and feldspar to 3-4mm (dominant clast types). Generally well sorted. Within this interval there are several beds of siltstone/mudstone, similar to that described for 57-212.5m above, altered the same as the mass flow unit (e.g at.221.3m, 221.6-222m, 222.5-223.5m, 224.3-225.2m, 234.6-235m, and 239.6-240). They can be distinguished from clasts of this material (some observed, note) by the settling of larger mass flow clasts into the bedding planes at the tops of each fine grained sediment. The mass flow exhibits a weak grading from base to top, with basal units uniformly 5-10mm through to 1-2mm at the top. The mass flow unit is weakly to locally moderately carbonate-chlorite-sericite altered, with most carbonate (calcite) as irregular veins to 3cm thick, but also common replacement of feldspar crystals. Alteration appears to decrease with depth through this unit. Pyrite is ubiquitous but low grade through this unit, both as interstitial thin ?veinlets, and disseminated blebs to 5mm. Some lithic and volcanic fragments also have fine disseminated pyrite, although this may be post-depositional. The unit is competent, with less than 3 bpm. The lower contact is abrupt, marked by conformable ?bedded contact into another turbidite unit as per 57 - 212.5m															

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From (m)	To (m)	Model Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
240.8	321.2		ST MD	bs bs	c	Medium olive-grey to dark grey laminated to well bedded weakly foliated volcaniclastic siltstone and mudstone. Comprises olive green grey siltstone beds interbedded with common darker grey (weakly carbonaceous?) mudstone beds (dominant lithology below ~290m). Volcaniclastic (tuffaceous) sandstone beds of varying thicknesses occur in the following intervals: 249.6- 251.1m, 253.1-254.5m, 261.9-262.9m, 266.4-267.6m, 279.2-285.9m and 301.6-305.7m . There is reverse grading (overturned beds) evident for the remainder of the interval beneath a series of small tight fold hinges between 268-270m. Structural complexity decreases with depth here also, but includes a fault zone from 260 to 261.8m . Pyrite occurs as rare, thin 1-2mm stratabound bands, also showing weak alignment to foliation, rare fracture faces (spaced cleavage) and as minor disseminated grains. Carbonate veining occurs as minor veinlets in the foliation, occassionally bedding parallel, with rare thicker veins (eg. 253.1m hosting minor c. gr. pyrite-sphalerite mineralisation to 1% over 10cm. The core is similarly competent as previous intervals (3-5 bpm), except between 255.5 - 265.5m (>10 bpm), with a more obvious preference to fracture along bedding planes. The lower contact is sudden but conformable, into a thick mass flow unit again.																
321.2	357.1		SS VC	qs qs	c	Medium grey-olive weakly bedded unfoliated, fine to medium grained volcaniclastic lithic sandstone, with rare larger clasts. Comprises very faintly bedded quartz+/-feldspar volcaniclastic sandstone, with a general coarsening with depth through the interval (silty/ tuffaceous near top, coarser, quartz grain/phenocryst rich, rare polymict clasts to 50mm at base). Alteration increases past 336.7m, where the change into a quartz dominant, coarser grained lithic unit occurs. Numerous thin carbonate veinlets occur irregularly through the unit, with occassional coarser grained veins to 5cm (no preferred orientation). Sulphide content is negligible, with rare disseminations and occassional carbonate vein associations. The core is consistently competent, with ~3 bpm. The lower contact occurs across a 5cm qtz-carbonate vein almost perpendiculat to c.a.																
357.1	368.5		SS VC	qs	c	Light green-grey, massive, unfoliated coarse-grained volcaniclastic monomict ?lithic sandstone. Comprises similar composition to coarser grained beds of the above interval, but stronger matrix alteration (sericite-silica+/-carbonate) obscurs clast edges and definition. Alteration is mostly weak to moderate silica-sericite, with lesser carbonate. Numerous thin carbonate-quartz veins occur irregularly through the unit, occassionally to 5cm (no preferred orientation). Sulphide content is negligible, with rare disseminations and occassional carbonate vein associations. The core is consistently competent, with 3-4 bpm. The lower contact is abrupt, bedded? at 25 degrees to c.a.																

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From (m)	To (m)	Model Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
368.5	376.0		ST MD	se	t	Medium olive-grey to dark grey laminated to well bedded weakly foliated volcaniclastic siltstone and mudstone. Comprises olive green grey siltstone beds interbedded with more common darker grey (weakly carbonaceous?) mudstone beds. Very minor volcaniclastic (tuffaceous) sandstone beds of 5-20mm thickness occur scattered through this unit. Bedding is disrupted throughtout by veining, irregular spaced foliation and folding on a sub-metre scale. Pyrite occurs as uncommon, thin 1-2mm stratabound bands and as minor disseminated grains. Carbonate veining occurs as minor veinlets in the foliation, occassionally bedding parallel and as coarser, thicker irregular swarms. The core is relatively competent (3 bpm) with no afinity to fracture along bedding planes. The lower contact is abrupt and conformable, at 45 degrees to c.a.															
376.0	395.1		SS VC	si sq	c	Light green-grey, massive, unfoliated coarse-grained volcaniclastic monomict ?lithic sandstone to breccia. Comprises mostly quartz grains and irregular clasts to 10mm in a weakly to moderately silicified volcaniclastic matrix. Alteration is mostly weak to moderate silica-sericite, with lesser carbonate. A much finer grained (tuffaceous?) unit between 389-394.1m has stronger sericite-silica alteration. A 0.5m bed of the previous unit above starts at 389.4m. Numerous thin carbonate-quartz veins occur irregularly through the unit, occassionally to 5cm (no preferred orientation). Sulphide content is negligible, with rare disseminations and occassional carbonate vein associations (nice arsenopyrite-chalcopyrite-pyrite-carbonate vein at 393.7m. The core is consistently competent, with 2-3 bpm. The lower contact is an sharp, irregularly bedded? unconformable mark at varying degrees to c.a.															
395.1	398.7		ST MD	se	t	Medium olive-grey to dark grey laminated weakly foliated volcaniclastic siltstone and mudstone. Comprises olive green grey siltstone beds interbedded with more common darker grey (weakly carbonaceous?) mudstone beds. Very minor volcaniclastic (tuffaceous) sandstone beds. Bedding is disrupted throughtout by veining, irregular spaced foliation and folding on a 1-10cm scale. Pyrite occurs as uncommon disseminated grains. Carbonate veining occurs as minor veinlets in the foliation, occassionally bedding parallel and thicker irregular swarms. The core is relatively competent (3 bpm) with no afinity to fracture along bedding planes. The lower contact occurs across a 5cm c gr carbonate vein.															

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From (m)	To (m)	Model Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
398.7	450.0		SS CG VC	si sb	c	Light to medium grey-green massive, unfoliated coarse-grained volcaniclastic polymict lithic sandstone to breccia. Comprises mostly quartz grains/phenocrysts and minor irregular clasts (becoming polymict below 409.6m) in a weakly to moderately silicified volcaniclastic matrix. Probable mass-flow unit. Alteration is mostly weak to moderate silica-sericite-carbonate, both of matrix and ?feldspar phenocrysts. Stronger silica alteration decreases past 409.8m. Trace amounts of pyrite occurs as disseminations throughout, with a 30cm band of ?vein pyrite-arsenopyrite-hematite-chlorite mineralisation. At least 2 generations of carbonate and silica-carbonate veins are evident, usually 1-3mm thick with no preferred orientation. The core is consistently competent, with 2-3 bpm, except for a small shear zone at 437.3 to 438m The lower contact is sharp, irregular and unconformable at 25 degrees to c.a.															
450.0	463.6		MD SS VC	cb cb	c	Dark to light grey, moderately bedded (irregular and disrupted) to weakly foliated c.gr. volcaniclastic sandstone to carbonaceous shale/mudstone (probable conformable grading, with a second shale unit at the base of the unit). Comprises very irregular dark fine grained sediments with up to 50% silica-sericite veining at various orientations and thicknesses within the shaley unit. Some polymict (including dark shale) coarser grained beds show alignment of clasts along foliation planes. The interval exhibits weak carbonate+/-silica alteration. There is common pyrite in carbonate veins in the darker, carbonaceous shale, less so in the coarser pale volcaniclastic sandstone unit (rare blebs of sphalerite in carbonate-chlorite-silica veins). The interval is surprisingly competent, with 2-3 bpm. The lower contact is marked by a sudden conformable change into coarser volcaniclastic ?mass flow.															
463.6	478.4		CG VC	sb si	c	Light grey-green weakly foliated polymict mass flow volcaniclastic conglomerate. Comprises flattened to rounded clasts of sandstone and siltstsone, quartz vein, qtz-phyric volcanics and other lithic clasts to 2cm, grains of qtz and feldspar to 3-4mm, and occassional larger clasts of qtz vein to 5cm. There is no apparent grading through the interval, although alteration intensity increases downhole from weak sericite-carbonate to moderate silica-sericite-carbonate. Very minor sulphide observed, usually associated with veining. Silica-carbonate veining has 2 distinct forms - typical thin wispy veinlets and much thicker (to 25cm) more massive veins dominated by silica. The rock is broken in places (along foliation) but quite competent (~2 bpm) where silica alteration is stronger. The lower contact is abrupt but probably conformably bedded on top of a thick mudstone unit.															

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From (m)	To (m)	Model Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
478.4	559.4		MD ST VC	cb cb	c	Dark to medium grey laminated to well bedded weakly foliated volcaniclastic siltstone and mudstone. Comprises olive green grey siltstone beds interbedded with more common darker grey (carbonaceous) mudstone beds. Minor volcaniclastic (tuffaceous) sandstone beds of 1-20cm thickness occur scattered through this unit. These coarser beds are more porous, and exhibit stronger carbonate alteration and increased sulphide content relative to the mudstone/shale units. Pyrite is mostly associated with the thin carbonate veinlets (occassionally with pyrrhotite, scarcer thin 1-2mm stratabound bands and as minor disseminated grains. Carbonate veining occurs as minor veinlets in the foliation, occassionally bedding parallel and as coarser, thicker irregular swarms. The core is quite incompetent in places (20-30 bpm) with afinity to fracture along bedding planes, but elsewhere (weakly silicified?) more typical 3-5 bpm. The lower contact is abrupt and conformable, at 45 degrees to c.a.															
559.4	628.6		BR VC	qb cc	c	Medium grey to grey-green ?bedded, very weakly foliated polymict coarse grained to cobble sized, matrix supported mass flow volcaniclastic breccia. Comprises a series of mass flows showing both normal and reverse (overturned?) grading from very coarse (+20cm) to sand sized fragments (comprising quartz vein, 3+ varieties of lithic mudstone/siltstone, rare feldspar-phyric volcanic fragments, crystals of quartz and feldspar, and dark ?shale). The alteration is inconsistent through the interval: siliceous alteration is pervasive, but strongest at the start of the interval; carbonate alteration tends to be vein style and replacement of feldspar phenocrysts (where not silicified) as well as selectively altering lithic clasts; sericite is a minor matrix alteration feature which becomes stronger in the finer grained portions past 600m, and trace patches of ?fuchsite are seen (eg. 590-596m). The interval is almost absent of disseminated sulphide as seen higher in the hole, but minor carbonate-pyrite-pyrrhotite-sphalerite veins occur at 572.2-572.6m and 609-609.9m. Carbonate veining decreases downhole, with thicker autobrecciated carbonate-silica veins to 10cm common down to 595m. Thinner veinlets occur sporadically throught the interval generally oblique to c.a., possibly along bedding/ compaction foliation. No major structures are evident, and the core is quite competent with 2-3 bpm. The lower contact is abrupt and ?disconformable into a dark mudstone.															

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From (m)	To (m)	Model Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
628.6	657.7		SS VC	qt cb	b	Mottled grey/white, moderately sorted, coarse grained massive quartz-feldspar crystal-rich volcaniclastic sandstone mass flow unit. Comprises equigranular quartz and feldspar crystals and detrital grains in a finer matrix (25% of rock), with rare larger (to 5cm) lithic and volcanic clasts, and ?quartz vein rounded fragments. Rare disrupted mudstone bands (eg. at top of interval). Alteration is dominated by moderate to strong quartz-tourmaline-carbonate down to 640.6m, then weak sericite-carbonate+/-silica alteration for the remainder of the interval (a second, lesser tourmaline alteration zone occurs from 644.4-645.9m). The tourmaline is coarse, acicular crystals to 5mm where most concentrated, disseminated subhedral grains elsewhere. Minor pyrite and arsenopyrite occur in quartz-carbonate-tourmaline veins, with rare sphalerite blebs the only other sulphide noted. Apart from the carbonate-tourmaline-quartz veining, there are scarce irregular silica carbonate veins and veinlets. The rock is quite competent (2-4 bpm) except for where tourmaline alteration veining is strongest (8-10 bpm). The lower contact is abrupt, marked by a change into a much coarser polymict unit.																
657.7	680.9		BR VC	bs si	c	Spectacular mottled brown-grey-olive weakly foliated polymict quartz-feldspar volcaniclastic mass-flow breccia. Comprises poorly sorted angular to rounded clasts of +10 lithologies (lithic, volcanic and volcaniclastic) to 25cm (average = 2-5cm) as well as lesser quartz and feldspar fragments/grains in a dark matrix. There is a weak orientation of clasts which may be a bedding or compaction foliation. There is a small interval of volcaniclastic sandstone (as per 628.6-657.7m above) from 675.7-678.2m. Alteration is weak silica-sericite-carbonate, with the carbonate often selectively alteration lithic clasts or feldspar grains. A quartz-carbonate-pyrrhotite vein at the very start of the interval is the only notable mineralisation, although one ?detrital clast of sphalerite 3cm long occurs at 666.2m. Minor carbonate-silica veinlets are relatively common throughout, showing both cross-cutting and clast specific geometries. The rock is moderately competent with 2-4 bpm. The lower contact is marked by a disconformable abrupt change into fine grained volcaniclastic siltstone and carbonaceous mudstone.																
680.9	**684.6**	**F**				**FAULT**																
680.9	684.6		ST MD	bs si	b	Variable dark grey to white strongly broken fault gouged well foliated Fault Zone in ?volcaniclastic siltstone and mudstone. Comprises a short section of broken core, the strongest deformation (682.5-683.5m) coinciding with strongest carbonate-sericite-silica alteration (including silica-sericite bleaching) and best development of fault gouge. Lithology is typical dark siltstone and mudstone as per previous intervals, intensely disrupted in places but only weakly veined (carbonate). There is no apparent mineralisation, but weak disseminated ?pyrrhotite can be seen in the bleached fault gouge material. Irregular carbonate+/-silica veinlets cut the core throughout. The core has very low competency where shearing is strongest, grading back to moderate competency at the start and end of interval (4-5 bpm). The lower contact is disconformable and abrupt into a coarse mass-flow breccia.																

From (m)	To (m)	Model Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
684.6	**1070.4**	**WSF**				**WHITESPUR FORMATION**																
684.6	715.7		CG VC	cb qs	c	Medium grey to olive-grey massive to weakly foliated graded, clast-supported mass-flow feldspar-quartz phyric volcaniclastic conglomerate. Comprises very weakly aligned rounded to sub-angular clasts of mudstone and siltstone, quartz vein, qtz-feldspar phyric volcanics and other lithic clasts to 10cm, and grains of qtz and feldspar to 3-4mm (dominant clast types). There is well defined grading from coarse ploymict clasts at the top to to finer grains of just quartz and ?replaced feldspar down the hole. Weak carbonate (clast specific at top of interval) and trace silica-sericite alteration of the groundmass. Trace disseminated pyrrhotite and pyrite can be seen throughout. The usual carbonate-silica veins and veinlets show no preferred orientation. There is a hint of tourmaline in carbonate veining at 690.5m and 703.4m. The core is quite competent, with 2-3 bpm. The lower contact is gradational and interbedded over 0.5m with a fine dark siltstone unit.															
715.7	784.8		ST MD	cb	c	Dark grey to olive-grey laminated to well bedded, unfoliated volcaniclastic siltstone and mudstone. Comprises dark olive grey siltstone beds interbedded with less common darker grey (weakly carbonaceous?) mudstone beds. Very minor pale volcaniclastic (tuffaceous) sandstone beds of 1-5cm thickness occur scattered through this unit. Bedding is mildly disrupted in places by veining and folding on a sub-metre scale. Carbonate alteration is weak, selectively replacing more porous beds. Pyrite and pyrrhotite occur as uncommon, thin 1-2mm stratabound bands usually parallel to bedding, ocassionally replacing ?boudinaged beds, and as minor disseminated grains. Carbonate veining occurs as minor veinlets in the foliation, occassionally bedding parallel and as coarser, thicker irregular swarms, rarely with sphalerite (eg. 721.5m) or chalcopyrite (eg. 758.5m). The core is variably competent with 3-7 bpm, with some afinity to fracture along bedding planes. The lower contact is abrupt and conformable, stoped out by a very thick quartz-carbonate vein.															
784.8	802.8		CG VC	cb si	b	Medium to dark grey to olive-grey massive to foliated graded, clast-supported mass-flow feldspar-quartz phyric volcaniclastic conglomerate. Comprises weakly aligned rounded to sub-angular clasts of mudstone and siltstone, quartz vein, qtz-feldspar phyric volcanics and other lithic clasts to 6cm, and grains of qtz and feldspar to 3-4mm (dominant clast types). There is well defined grading from coarse ploymict clasts at the base to to finer grains of just quartz and ?replaced feldspar at the top of the interval. Weak carbonate (clast specific at top of interval) and trace silica-sericite alteration of the groundmass occurs throughout. There is a zone of strong silicification in the top 3m of the interval, with strong irregular silica-carbonate-pyrrhotite veining at irregular angles to c.a.. Trace disseminated pyrrhotite and pyrite can be seen in parts. The usual carbonate-silica veins and veinlets show no preferred orientation. There is a coarse sericite-muscovite vein at 794.9m. The core is quite competent, with 2-4 bpm. The lower contact is gradational and interbedded over 1.0m with a fine dark siltstone unit.															

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802.8	848.7		ST MD SS	cb	c	Dark grey to olive-grey laminated to well bedded, unfoliated volcaniclastic siltstone and mudstone. Comprises dark olive grey siltstone beds interbedded with less common darker grey (weakly carbonaceous?) mudstone beds. Rare pale medium grained volcaniclastic (tuffaceous) sandstone beds of 5-40cm thickness occur scattered through this unit (eg. 821.2-822.7m). Bedding is mildly disrupted in places by veining, fracturing and folding on a sub-metre scale. Carbonate alteration is weak, selectively replacing more porous beds. Pyrrhotite (and lesser pyrite) occur as disconformable, thin 1-2mm stratabound bands usually parallel to bedding, ocassionally in higher concentrations and thicknesses (ie. 813.4-814.2m = +5% pyrrhotite, 831.8-833m 2.5% pyrrhotite and trace chalcopyrite), and as rare disseminated grains. Carbonate veining occurs as minor veinlets in the foliation, occassionally bedding parallel and as coarser, thicker irregular swarms. The core is variably competent with 3-7 bpm, with some afinity to fracture along bedding planes. The lower contact is abrupt and conformable to slightly disconformable, at 80 degrees to c.a., parallel to 5 degrees off bedding planes.															
848.7	857.1		VC CG	cb	c	Medium to dark grey to olive-grey foliated, poorly graded, matrix-supported mass-flow volcaniclastic conglomerate. Comprises weakly aligned, compacted, rounded to sub-angular clasts of mudstone and siltstone, quartz vein, ?qtz-feldspar phyric volcanics and other lithic clasts to 15cm, and lesser grains of qtz and feldspar to 3-4mm. There is no apparent grading, and several irregular interavls of interbedded siltstone and volcaniclastic sandstone as per previous interval.. Weak carbonate (clast specific) and silica-sericite alteration of the groundmass occurs throughout. There is stronger sericite alteration in this interval compared to other mass flows in the hole. Trace to minor disseminated pyrrhotite and pyrite can be seen, with more concentrated pyrrhotite ?veining at 851.4m. Minor carbonate-silica veins and veinlets show no preferred orientation. The core is quite competent, with 3-4 bpm. The lower contact is abrupt and ?conformable with a thick sequence of fine dark siltstone.															
857.1	888.6		ST SS MD	cb	c	Dark grey to olive-grey laminated to well bedded, unfoliated volcaniclastic siltstone and mudstone. Comprises dark olive grey volcaniclastic siltstone beds interbedded with less common darker grey (weakly carbonaceous?) mudstone beds. Rare pale medium to ocassionally coarse grained ploymict volcaniclastic sandstone beds occur scattered through this unit (eg. 881.6-882.4m). Bedding is mildly disrupted in places by veining, fracturing and folding on a sub-metre scale. Carbonate alteration is weak, selectively replacing more porous beds. Pyrrhotite (and lesser pyrite) occurs as disconformable, thin 1-2mm stratabound bands usually parallel to bedding, ocassionally in higher concentrations and thicknesses (entire interval running +1% pyrrhotite), and as common disseminated grains. Carbonate veining occurs as minor veinlets in the foliation, swarms of bedding parallel veins, and as coarser, thicker irregular veins. The core is moderately competent with 3-6 bpm, with some afinity to fracture along bedding planes. The lower contact is abrupt and conformable at 70 degrees to c.a.															

Hole No: 354R

From (m)	To (m)	Model Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
888.6	904.6		VC CG	cb se	b	Medium green-grey to dark olive-grey foliated, poorly graded, matrix-supported mass-flow volcaniclastic conglomerate. Comprises up to 6 repeated units of weakly aligned, compacted, rounded to sub-angular clasts of mudstone and siltstone, quartz vein, ?qtz-feldspar phyric volcanics and other lithic clasts to 10cm, and lesser grains of qtz and feldspar to 3-4mm. There is weak apparent grading, and several irregular interavls of interbedded dark siltstone and volcaniclastic sandstone (eg.894-896m). Moderate carbonate (clast and porous bed specific) and silica-sericite alteration of the groundmass occurs throughout. There is stronger carbonate alteration in a white band of ?carbonate rock at 900.1-900.4m. Minor disseminated pyrrhotite can be seen throughout, with more concentrated pyrrhotite ?veining following carbonate veinlets. Minor carbonate-silica veins and veinlets show weakly preferred orientation along bedding. The core is quite competent, with 3-5 bpm. The lower contact is a gradual and conformable interbedded change over 0.3m into a thick sequence of fine dark siltstone.																
904.6	1070.4		ST SS MD	sb si	a	Variable dark olive-grey to green-grey to bleached cream, bedded to foliated ?volcaniclastic siltstone, mudstone and lesser quartz-feldspar sandstone. Comprises an interval of ultimately the same lithology - a volcaniclastic siltstone with interbedded mudstone and sandstone beds - with an extremely variable overprinting alteration. Textures are destroyed where alteration intensity increases (past approx 937m), leaving simply altered rock for much of the interval. Weakly carbonate altered banded siltstone similar to previous intervals occurs from 904.6 to 920m, followed by moderately altered (carbonate-sericite-silica) coarser monomict volcaniclastic sandstone to 931m, weakly altered banded siltstone to 937m, then strongly sericite+/-silica altered and bleached siltstone to eoh. This sericite-silica bleaching is prevasive and strong to 1025.3m, where less texturally destructive alteration of the same siltstone+/-sandstone unit continues to 1045m, past which strong sericite-silica bleaching continues to end of hole. There may be coarser polymict volcaniclastic sandstone beds past 1019 metres, but such is the intensity of alteration, most textural evidence is destroyed. Sulphide concentration varies across the interval, with typical fine disseminated pyrrhotite and stringers in the weakly altered siltstone to 937m. No disseminated or stringer sulphide can be seen, except for minor stringers of carbonate-pyrrhotite from 960-970m until 1018.5m, where up to 5% pyrrhotite and pyrite disseminations and lesser stringers occur. Levels of sulphides decrease again in the last 50 metres of core. Very minor carbonate-silica veins and veinlets cut the core, more concentrated where siltstone units are less altered. Some very minor tourmaline is observed in carbonate-pyrite veins between 939-953m. No major veins observed. The core is variably competent, poorly so in weakly altered silt units (>10 bpm), more so in strongly silica-sericite altered zones below 937m (3-6 bpm). The lower contact is unknown - end of hole																