

Phelps Dodge Corporation of Canada

DIAMOND DRILL LOG

PROPERTY: Mary March (294)

HOLE No.: MM294-4

Collar Eastings: -11400.00

Collar Northings: 500.00

Collar Elevation: 0.00

Collar Inclination: -45.00

Grid Bearing: 180.00

Final Depth: 395.00 metres

Logged by: J.G. Thurlow

Date: June 19, 1999

Down-hole Survey: Tropari

FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS					
						WIDTH	Au (ppb)	Ag (ppm)	Cu (%)	Pb (%)	Zn (%)
0	3.0	Overburden									
3.0	122.2	Relatively unaltered basalts with synvolcanic felsic sills/lava displaying incipient alteration									
3.0	44.3	Basaltic pillow lava, dark green to reddish and moderately hematitized. Generally aphyric though locally with epidotized plagioclase phenocrysts. Some good pillow selvages, some reddish interpillow material. Common calcite amygdules with variable distribution suggests pillows. Some hematitic amygdules. Minor volcanoclastic sections with reddish hematitized fragments in greenish chloritic, palagonitic matrix. Somewhat fractured/broken core. Quite magnetic at top (k = 1.0 to 2.2) but has some lesser magnetic sections farther down. No mineralization-related alteration, no sulphides. Minor late epidote veining. Diabase from 5.2 to 6.5 is greenish, f.g. Dominantly volcanoclastic from 28.5m - 44.3m. Basal contact is sharp, unshered, 80 degrees to core axis.									
44.3	77.5	Typical feldsparphyric intermediate-felsic flow or sill. Weak chill at upper contact. Medium greenish with abundant small leucocratic plagioclase phenocrysts. Locally glomeroporphyritic with interstitial amphibole. Mottled colours with incipient pseudofragmental textures caused									

HOLE No: MM294-4

Phelps Dodge Corporation of Canada

DIAMOND DRILL LOG

PROPERTY: Mary March (294)
HOLE No.: MM294-4

Page 2

FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS				
						WIDTH	Au (ppb)	Ag (ppm)	Cu (%)	Pb (%)
		by weak sericitic alteration. Heterogeneous, blotchy appearance locally but the underlying lithology is fairly massive. Local well developed perlitic cracks. Minor elongate silica-filled voids. Local weak epidote alteration. Non-magnetic (k = 0.01-0.02). Rare speck pyrite. Fairly solid core overall. Basal contact is not sheared; marked by weak chill and a few cm of hyaloclastic brecciation - intrusive into wet pillow lava.								
77.5	111.7	Basaltic flow and hyaloclastic breccia. Weakly to moderately hematitized. Common calcite veining and pink calcite amygdules. Minor hematite in amygdules and local minor pyrite. Core is somewhat more broken than unit above and with minor gouge zones (the hole would definitely cave without plastic lining). Local early epidotization is cut by late calcite veining. Essentially non magnetic (K = 0.01 - 0.04). Fairly significant shearing at 65 degrees to core from 96.2m to 98.6m. Bleached, leucocratic halos around some amygdules and in zones of breccia suggest post-hematite fluid movement through the basalts. No sulphides, except for local minor pyrite in amygdules. Unsheared basal contact.								
111.7	120.5	Light green intermediate-felsic sill or lava. Upper contact weakly chilled at 55 degrees to core. Some small elongate voids parallel to the contact. Massive, no phenocrysts, incipient sericite alteration. Medium hardness. Non magnetic (k=0.0). Basal contact is sharp, 50 degrees to core.								

HOLE No: MM294-4

Phelps Dodge Corporation of Canada

DIAMOND DRILL LOG

PROPERTY: Mary March (294)
HOLE No.: MM294-4

Page 3

FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS					
						WIDTH	Au (ppb)	Ag (ppm)	Cu (%)	Pb (%)	Zn (%)
	120.5	122.2	Moderate to strong shear zone within dominantly mafic(?) hosts. Protolith is bleached and contains anomalous disseminated pyrite. Shearing at 45 to 80 degrees to core.								
122.2	209.53	Felsic volcanic lithologies, flows and synvolcanic intrusive lithologies. Incipient to weak alteration.									
	122.2	128.2	Moderately hematitized, dull reddish, massive felsic lithology. Contains abundant small leucocratic specks/spots which resemble altered plagioclase phenocrysts but which also could be some sort of reduction spots. Greener at basal contact (this may be a sill intruding the unit below).								
	128.2	137.2	Oacitic rocks with locally well developed fragmental textures characterized by plagioclase-leucoxene-rich clasts in a lighter, siliceous matrix - (and resemble parts of MM-294-1). Fragmental sections contain some brownish-green clasts with darkened rims - esp Box 33. Abundant plagioclase phenocrysts, no quartz, dark specks after amphibole. Trace pyrite. Rare, small, elongate silica-filled voids. Moderately strong shear 137.0-137.2m at 45 degrees to core.								
	137.2	193.0	Dark brownish green flow, with minor autoclastic breccia. Local weak hematite. Composition looks not quite as felsic as normal; more intermediate. Locally								

HOLE No: MM294-4

Phelps Dodge Corporation of Canada

DIAMOND DRILL LOG

PROPERTY: Mary March (294)
HOLE No.: MM294-4

Page 4

FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS					
						WIDTH	Au (ppb)	Ag (ppm)	Cu (%)	Pb (%)	Zn (%)
		without plagioclase phenocrysts near the top of the unit but these become more abundant downward. Weak epidote locally only in fractures, weak sericitic alteration. No pyrite. Moderate broken core and several gouge zones (e.g., 143.2-143.3m). Local poorly-developed hard orange-brown alteration (e.g., from 150m-152m). Generally with only minor disseminated pyrite, though locally there is weak sericitic alteration with anomalous disseminated pyrite. Local incipient silica introduction and brecciation. Rare anomalous green sericite after plagioclase. Unit as a whole displays incipient hydrothermal alteration. Fracturing subparallel to core around 170m. Local holocrystalline cognate xenoliths. Minor broken core at basal contact.									
		193.0 209.53 Blotchy, heterogeneous intermediate-felsic flow. Incipient to weak silica-sericite alteration with locally anomalous disseminated pyrite. Local minor introduction of cherty silica. Some of the blotchy alteration begins around small elongate silica-filled voids. Badly broken core 204-207m with fracture zone subparallel to core. Basal contact is cored, no brittle faulting but next unit is substantially sheared.									
209.53	217.85	Strongly altered, mineralized felsic volcanic rocks (proximal stringer zone material).	294001	209.53	210.65	1.12	213	N.A.	0.38	1.05	2.01
			294002	210.65	211.76	1.11	208	N.A.	1.75	0.14	0.99
			294003	211.76	212.88	1.12	301	N.A.	0.33	0.97	1.82
		209.53 212.88 Sheared, friable, semi-massive sulphide impregnated rock. Foliation 55 to 60 degrees to core.	294004	212.88	214.01	1.13	165	N.A.	0.42	0.15	0.93
			294005	214.01	215.15	1.14	166	N.A.	0.73	0.39	1.76

HOLE No: MM294-4

Phelps Dodge Corporation of Canada

DIAMOND DRILL LOG

PROPERTY: Mary March (294)
HOLE No.: MM294-4

Page 5

FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	WIDTH	ASSAYS				
							Au (ppb)	Ag (ppm)	Cu (%)	Pb (%)	Zn (%)
		Host is sericitic. 20% sulphide average, fine grained. Pyrite-sphalerite-chalcopryrite, lesser galena and barite as disseminations and in deformed anastomosing bands/strings. Some sections of quite good grade. Some less mineralized lithons of perlitic-cracked, altered felsic volcanic suggest that this might be stringer material in more advanced stage of deformation than sections below. Deformation is dominantly ductile but with some sections of cohesive gouge. Ohmmeter shows weakly anomalous conductivity throughout.	294006	215.15	216.28	1.13	109	N.A.	1.18	0.84	1.39
			294007	216.28	217.85	1.57	34	N.A.	0.04	0.09	0.16
		212.88 217.85 Less deformed, less sulphidic felsic volcanic rock cut by numerous veinlets and stringers containing locally good grade Zn-Cu. Host rock is light to dark grey, strongly sericitized with silicification and is sheared and friable. Some weakly blueish sericite (or clay mineral?). Relict plagioclase phenocrysts (now sericite), local well developed pseudofragmental textures based upon perlitic cracks. Some cohesive gouge but overall is less friable than subunit above. Shearing dies out around 215.1m. Some stringers are quite high grade Zn, others good grade Cu. Percentage and size of stringers diminishes with depth. Ohmmeter shows very weak to nil conductivity between stringers but chalcopryrite-rich stringers have very high conductivity.									
		MINERALIZED ZONE: Core Angle: 90 True Width: 6.75	209.53	216.28	6.75	193	-0.0	0.80	0.59	1.48	
217.85	281.7	Altered, pyritized felsic volcanics.	294008	217.85	219.44	1.59	30	N.A.	0.01	0.07	0.08

HOLE No: MM294-4

Phelps Dodge Corporation of Canada

DIAMOND DRILL LOG

PROPERTY: Mary March (294)
HOLE No.: MM294-4

Page 6

FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS				
						WIDTH	Au (ppb)	Ag (ppm)	Cu (%)	Pb (%)
	217.85	226.7	Well developed perlitic cracks and pseudofragmental textures. Moderately strong silica-sericite alteration. Medium to dark grey. 1%-2% disseminated and thin veinlet pyrite, common minor specks of sphalerite and local specks chalcopryite (grades are comparable to or less than the last assay). Arbitrary gradational basal contact.							
	226.7	238.7	Dark grey, more massive and homogeneous felsic flow. Still strongly altered and with 2% disseminated pyrite and local Zn-Pb-Cu-barite in veinlets. Common tiny silica-sericite-filled voids. Medium hardness.							
	238.7	257.3	Distinctive grey felsic flow characterized by abundant tight packed leucocratic specks in dark grey matrix (an alteration phenomenon of perlitic cracks). Strong sericite-silica alteration with 1%-2% disseminated pyrite. Locally 5% very fine grained disseminated pyrite over sections of several metres. Rare pyrite (-sphalerite) veinlet. Sericite after plagioclase phenocrysts. Minor sections of true breccia with arenaceous, pyritic matrix. Arbitrary, gradational basal contact.							
	257.3	263.0	Heterogeneous, light to medium grey, altered and pyritized felsic flow. 1%-2% disseminated pyrite and local specks/streaks of sphalerite. Pseudofragmental textures. Strong sericite (-silica) alteration. Local bluish and greenish sericite.							

HOLE No: MM294-4

Phelps Dodge Corporation of Canada

DIAMOND DRILL LOG

PROPERTY: Mary March (294)
HOLE No.: MM294-4

Page 7

FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS					
						WIDTH	Au (ppb)	Ag (ppm)	Cu (%)	Pb (%)	Zn (%)
		263.0 275.8 Altered volcanics characterized by anomalous yellowish green phyllosilicate alteration. Protolith appears to be largely basaltic as evidenced by local amygdules (calcite and silica-filled). Strong sericite (silica-calcite) alteration with variable 1%-5% disseminated pyrite. Local trace sphalerite. Only minor pyrite veinlets. Weakly foliated (sheared) and with local fault gouge.									
		275.8 281.7 Massive, medium-dark grey altered felsic flow, moderately strong sericite (silica-pyrite) alteration. Local well developed perlitic cracks. 1% - 2% disseminated pyrite. Local weak shears. Rock near basal contact is bleached (chilled). Basal contact is sharp, unsheared, bleached and with abundant perlitic cracks; a chilled intrusive contact is suggested. Contact represents a change to somewhat weaker alteration and mineralization in the unit below.									
281.7	316.0	Basaltic pillow lava and related fragmental rocks. Alteration is patchy; generally Weak sericite-calcite alteration with anomalous (i.e., more than 1/4%) disseminated pyrite but narrow zones (1cm - 30cm)-of moderate alteration which contain trace veinlets of pyrite. More altered areas are bleached and have small sericite-filled vesicles and larger calcite-filled amygdules. Local specks chalcopryite -best section around 310m is assayed. Colour is more greyish than greenish. Areas of weakest alteration have weakly reddish fragments with incipient-weak hematite alteration in greenish palagonitic matrix. On the whole, the unit is definitely not	294018	309.88	310.77	0.89	5	0.6	0.02	NIL	0.01

HOLE No: MM294-4

Phelps Dodge Corporation of Canada

DIAMOND DRILL LOG

PROPERTY: Mary March (294)

HOLE No.: MM294-4

Page 8

FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS					
						WIDTH	Au (ppb)	Ag (ppm)	Cu (%)	Pb (%)	Zn (%)
		"dead."									
316.0	336.5	Composite zone of intrusives and some shearing.	294D09	317.10	318.50	1.40	26	2.3	0.05	0.26	0.88
316.0	317.1	Bleached, weakly altered and mineralized felsic sill, light greenish. Resembles sill in 294-3 at 181.3m-187.75m. Moderate sericite alteration and 1/2% disseminated pyrite. Minor sphalerite in calcite-pyrite veinlets. Contacts 35 degrees to core.									
317.1	321.1	Weakly-moderately sericitized basaltic rocks containing minor veinlets of calcite-pyrite-sphalerite and minor disseminated sphalerite. Local anomalous green phyllosilicate. May include some altered felsic sill lithology.									
321.1	323.4	Dark grey, hard, felsic (sill?) characterized by elongate parallel silica-filled voids. Broken core in part with some fault gouge. Siliceous veinlet has traces chalcopyrite and specks of a silvery metallic (arsenopyrite?).									
323.4	334.1	Bleached, chilled diabase. Upper contact is chilled against the felsic rock at approx. 45 degrees to core. Minor disseminated pyrite and pyrite in amygdules. Minor screens of sericitized-pyritized felsic host rock. Good solid core.									

HOLE No: MM294-4

Phelps Dodge Corporation of Canada

DIAMOND DRILL LOG

PROPERTY: Mary March (294)

HOLE No.: MM294-4

Page 9

FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS					
						WIDTH	Au (ppb)	Ag (ppm)	Cu (%)	Pb (%)	Zn (%)
		334.1 336.0 Dark grey-black fine grained diabase, late-looking. Chilled against the earlier diabase above. Moderately magnetic (K=1.0).									
		336.0 336.5 Sericitized, weakly pyritized felsic (sill?) similar to 316.0-317.1m. Shearing at basal contact.									
336.5	395.0	Medium-dark grey-green, mineralized, moderately strongly altered, amygdular mafic-intermediate rocks. Fine leucoxene dust throughout. Voids tend to be elongate/parallel - larger ones are irregular and silica-filled.). Common hyaloclastic brecciation with subsequent cloudy silica infill in matrix. Sericite-silica-(chlorite) alteration of fragments. Sphalerite-chalcopryrite- (galena) are dominantly within irregular, ptymatic, pyrite- silica-calcite-(barite) veinlets/stringers which post-date brecciation/infill. No additional alteration adjacent to these. Some specks base metal in silica-carbonate-filled voids. The best zones have been split for assay - intervening zones are less attractive but lesser sphalerite-bearing veinlets and disseminations can be found throughout. Some coarse pyrite aggregates. Overall 1% - 2% pyrite. No conductive sections. Good solid core with only a few minor gouge sections. Chilled early diabase from 380.8m - 382.3m contains calcite amygdules; contacts 30-45 degrees to core, no shear. Mineralization below the diabase is marginally less than in sections above.	294010	336.50	338.00	1.50	10	0.4	0.01	0.03	0.10
			294011	338.00	339.50	1.50	15	0.6	0.01	0.03	0.10
			294012	345.65	347.32	1.67	10	1.3	0.01	0.31	0.53
			294013	347.32	348.98	1.66	5	0.7	NIL	0.02	0.12
			294014	352.08	353.22	1.14	5	1.4	0.05	0.16	0.43
			294015	354.65	355.39	0.74	14	1.6	0.04	0.14	0.80
			294016	357.79	359.20	1.41	5	1.3	0.03	0.08	0.53
			294017	377.50	378.68	1.18	18	2.4	0.08	0.23	0.72

HOLE No: MM294-4

Phelps Dodge Corporation of Canada

DIAMOND DRILL LOG

PROPERTY: Mary March (294)
HOLE No.: MM294-4

Page 10

FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS				
						WIDTH	Au (ppb)	Ag (ppm)	Cu (%)	Pb (%)

395 metres EOH, 100 core trays

Tropari test at 325 metres 40 degrees dip at 143 true azimuth.

Tropari test at 395 metres 39 degrees dip at 148 true azimuth.

Assay Samples: 294001 to 294018

Lithogeochem samples: 238.0, 260.7, 308.9, 339.0 & 385.2 metres

DOWN-HOLE SURVEY DATA

DEPTH	INCLINATION	BEARING
325.00	-40.00	193.00
395.00	-39.00	198.00

HOLE No: MM294-4