

RIO ALGOM EXPLORATION INC.

DIAMOND DRILL LOG

PROPERTY: GULLBRIDGE

HOLE No.: GB-147

Collar Eastings: 525.00

Collar Northings: 6100.00

Collar Elevation: 0.00

Grid: MAIN

Core Size: BQ

Collar Inclination: -62.00

Grid Bearing: 85.00

Final Depth: 342.29 metres

Purpose: To test the bimodal sequence north of mie.

Logged by: MJT

Date: March 7, 1991

Down-hole Survey: tropari

FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS			
						WIDTH	Cu (ppm)	Pb (ppm)	Zn (ppm)
0.00	12.20	OVERBURDEN							
12.20	58.04	POLIATED RHYOLITE	27434	24.51	25.01	0.50	NIL	NIL	NIL

Light grey-green, light-medium grey, patchy salmon pink, f.g. though grainy, non-magnetic, generally well foliated @ 45°-50° CA, though flatter in upper 2m. Foliation also accompanied by a sort of colour banding - may be relict flow banding. Note crenulation cleavage @ 44.50m, 46m. Few massive zones (e.g. 32.80-35.20m) probably represent "rafts" of unfoliated rhyolite. Grainy nature gives a tuffaceous appearance to unit (note 23-25m); sporadic light grey to white Pp grains $\leq$ 1mm; also more diffuse lighter grey, siliceous frags (lithic frags?). Unit likely a flow foliated to massive rhyolite where secondary fabric formed parallel to flow banding and perhaps more massive rhyolite remained non-foliated. Lower contact brecciated and abrupt @ 25° CA. Core rubbly over 10-20cm intervals e.g. 37-38m, 39.50-40m, 45.50m, 57m, possibly associated with brittle faulting.

Weak-moderate sc $\pm$ chl alteration. Possibly silicified - very brittle and could be hornfelsed, note fractures easily across foliation. Numerous white qz $\pm$ carb $\pm$ sc veins/veinlets. Pink-orange carb veinlets/stringers and fracture fillings, also associated with qz veins. More rarely ep veins (e.g. 35.12m) as well as irregular crackle stringers sc-ep $\pm$ qz. Notable zones of veining: 12.20-13.70m, irreg qz veining possibly with sp (hematite) envelopes, minor ep and sc; 18.55m (30cm), qz veins up to 2cm wide with reddish sp/hematite alteration, cut by late sc stringers and veinlets; 23m (20cm), same as previous; 35.85-37.92m, salmon pink to reddish, weak qz stockwork with Fe-carb or hematitic envelopes, commonly staining interval, late ep or sc veinlets and stringers; 40.85-44.27m, same as previous though patchy and not as intense; 45-48.25m, few qz veins but softer, grey-greenish, perhaps stronger sc-chl alteration; 54.40-58.04m, crackle breccia zone bleached grey to medium grey to pinkish, abundant white to grey qz veins, irregular up to 2cm wide, numerous qz $\pm$ sc and carb veinlets and stringers, lower 40cm grades in and out of crackle zone to fault breccia, matrix light greenish and sericitic -

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FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	WIDTH	ASSAYS			
							Cu (ppm)	Pb (ppm)	Zn (ppm)	Ba (ppm)
		fault zone at 25' - 30' CA. Very minor finely disseminated sulphide.								
58.04	66.41	RHYOLITE DYKE Salmon-pink to orange, f.g., massive. Sub-round to oval, maroon blotches up to 0.5cm long possibly altered f.p. phenos or rhyolite frags. 10% spherulites up to 0.5cm diameter, commonly with light grey core and maroon rims, some contain cavities and are likely lithophytes (e.g. 62.50-63.50m. Non-magnetic. Near contacts more f.g. glassy appearance. About 60% of core very rubbly and broken. Lower contact brecciated but sharp @ 10' CA. Moderate sc-hem alteration. Numerous stringers/veinlets sc-carb-qz, calcite also occurs in irregular blotches. Bleached light grey-green 58.50-59.76m. Narrow crackle breccia zones between 65.40-65.75m. Few small irreg cavities. Very minor rusty disseminated sulphides (e.g. 66.30m).	27435	60.05	60.55	0.50	NIL	NIL	NIL	NIL
66.41	96.63	PELSIC METAVOLCANIC/METATOPF-METESOMINENT/MAPIC METAVOLCANIC Light grey to buff to dark green, mixed package. Very difficult to determine good contacts. Core generally rubbly and broken - lithologies are rubbly and hornfelsed. 66.41 71.13 PELSIC METAVOLCANIC Medium grey, f.g. though locally grainy almost tuffaceous in appearance (e.g. 69.40m). Massive though possibly autobrecciated. Non-magnetic. Gougy (fault) over 10-15cm @ 66.75m. Core very broken and blocky in middle of interval. Lower contact abrupt @ 40' CA. Moderate chl alteration, few irreg qz veins and patches up to 3cm wide. Late qz-sc-carb stringers/veinlets numerous. Blotchy pink-orange colour likely alteration of f.p. No visible sulphides. 71.13 77.33 PELSIC METATOPF Mottled light grey to greenish-grey, f.g. Commonly appears fragmental and tuffaceous, frags up to a few cm long parallel to foliation/banding and vary from light grey-white to buff. Appears to	27436 27437 27438	72.32 77.53 93.36	72.82 78.03 94.16	0.50 0.50 0.80	111 77 14	82 2 10	72 74 90	420 50 830

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FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS				
						WIDTH	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ba (ppm)
		be compositionally banded on mm to 1-2cm scale @ 25'-40' CA, but can be irreg. Strong foliation parallel to banding. Non-magnetic. Narrow, 10-15cm wide, v.f.g. weakly magnetic interbedded meta-sediment @ 72.15m. felsic metavolcanic (similar to 64.41-71.13m), possibly autobreccia @ 73.56-74.28m. Lower contact abrupt but irreg. Moderate chl ± sc alteration, few irreg to planar qz-carb patches and veins/veinlets, some with orange coloured (Fe-carb?) envelopes. Dissem, blebs, stringers (mainly parallel to foliation) py 0.5%.								
		77.33 88.11 MAPIC METAVOLCANIC/METASEDIMENT Medium-dark grey green, v.f.g. Interval appears massive but very subtle foliation 35'-60' CA. Upper 1-1.5m siliceous metasediment or possibly metavolcanic (?), may contain relict fp phenos or could be spherulites e.g. 78.50m. Moderately magnetic though upper 1-1.5m non-weakly magnetic. Core blocky and very broken/rubbly in lower 2.5m obscuring lower contact. Moderate chl alteration. Few carb ± qz ± ep veins, minor green-yellow veinlets/stringers, pink-orange Fe-carb-hematite veins/veinlets commonly associated with carb ± qz veins. Dissem, patches and stringers py to 1% in upper 1.5m then decreases to ≤ 0.5%.								
		88.11 96.33 METASEDIMENT/TOFF Mottled light-medium grey to buff to maroon, f.g. although tuffaceous zones more grainy. Weakly-moderately magnetic, particularly finer metasediment. Metasediment massive to weakly foliated but may be a function of grain size; tuffaceous zones exhibit strong foliation @ 30'-45' CA; deformation likely complex (e.g. 92.40-92.60m). Porphyroblast development over 10cm at *93m, appear to have overgrown foliation. Note roundish siliceous blebs(?) in fine biotitic metasediment *93.50-94m. Tuffaceous intervals: 88.11-88.93m; 88.50m (10cm); 91.62-93.20m, possibly lithic frags in this interval. Metasediment likely argillite and unit as a whole may correlate with cherty argillite - tuffaceous units observed in GB-145. Lower contact abrupt at 50' CA. Moderate chl alteration, also biotitic. Veining (3% of interval: early light grey irreg qz veins/patches; followed by carb-qz-ep veins/veinlets/patches; latent stringers and fracture fillings ep ± sc and orange Fe-carb or fp(?). Dissem, stringers and blebs py 1%.								
96.33	231.90	MAPIC METAVOLCANIC/ROBERT'S ARM DYKE	27439	116.69	117.19	0.50	78	2	64	250

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FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS			
						WIDTH	Cu (ppm)	Pb (ppm)	Zn (ppm)
									Ba (ppm)
			27440	159.12	159.62	0.50	83	4	90
			27441	194.80	195.30	0.50	64	2	74
									230
		Medium-dark green, f.g. though few grainy sections (e.g. 107.35 and 123m) where small sp laths visible. Weak-moderate magnetic. Massive, though possibly a very subtle foliation - note 105.50-107m where tiny white altered sp laths possibly aligned, also 193-195m though may be local shearing? Brittle and hard, hornfelsed. Upper part of unit does not appear like late dykes, likely pillow basalt or Robert's Arm feeder dyke - note possible pillow rim (chill?) @ 116.26m, more siliceous interpillow/interflow material @ 121.50m (20cm), 215.60m (10-15cm @ 40° CA), 220-220.70m (frag-mental, note 4cm light grey, f.g. tuffaceous zone @ 220.42m, 40° CA). From 156.15-163.29m possibly mafic dyke, n.g. almost porphyritic, very chloritic but amph-chl alteration pseudomorphs relict mafic (px?) grains up to 2-3mm diameter. Contacts very diffuse, and below 163.29m appears very massive and dyke-like (diabasic). Gougy, brecciated faults @: 165.90m (rubbly over 10-15cm, carb-ep veins, 25° CA), 172.50-173.70m (rubbly, some gouge remains, breccia with ep-scl(?) carb-qz matrix, 30°-35° CA), 195.80m (10cm @ 10°-15° CA). Lower 30-40cm foliated (sheared?) @ 35°-40° CA and possibly chilled. Moderate chl and silica (hornfels) alteration. Few carb-qz : ep veins at various orientations to CA; notable concentration of veins: 109.60-115.30m, 122.75-123.25m, 143-144.50m (also hematite associated with ep), 177.25-194m (3-4 veins/m), 201.90-202.60m, 213.50-216.50m (also good irreg and planar ep veins), 220.85m to end of interval 3-4 veins and patches/m. Patchy ep concentration: 100.50m (5cm wide, breccial), 118.93m, 128.20-130m, 206.30m. Very minor dissem py to 153.30m then trace dissem, stringers and blebs, commonly near veins (e.g. 169.72m).							
231.90	342.29	FAULT ZONE	27442	237.44	238.19	0.75	33	2	66
			27443	242.32	242.82	0.50	24	2	78
			27444	284.80	285.30	0.50	40	2	66
			27445	289.00	290.00	1.00	8	2	76
			27446	299.00	299.56	0.56	67	2	54
			27447	318.32	318.82	0.50	77	8	206
			27448	327.33	327.83	0.50	93	2	86
			27449	341.10	341.60	0.50	40	2	66
									10
									610
									10
									340
									1470
									100
									240
									10
		Dark grey-green, f.g. though commonly grainy. Very soft, strongly chloritic, almost talcose - note smooth waxy feel on fracture surfaces, able to scratch with finger nail. Moderately magnetic - though from 324.29-334.75m non-magnetic, sheared @ 40° CA, more grainy, possibly tuffaceous. Core very rubbly and broken throughout interval. Numerous chloritic, gougy, brecciated zones 10-20cm wide: 233.20m (40°-45° CA), 248.35m (most gouge washed away),							

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FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE NO.	FROM	TO	WIDTH	ANALYSIS			
							Cu (ppm)	Pb (ppm)	Zn (ppm)	Ba (ppm)
		250.75m (30°-35° CA), 253m (5cm), 256.60m (rubbly, gouge washed), 266m (rubbly, gouge washed), 276.46m (rubbly, gouge washed), bores 48 & 49 (269.10-276.71m) virtually all rubble, 280.15m (contains brecciated qz veins), 282m (gougy), becomes progressively more gougy/brecciated to 287.31m where strongly sheared @ 35° CA and 1cm clay gouge in contact with sc-chl brecciated tuff, box 61 (334.42-340.19m) very rubbly and likely 28-30% core loss. Py < 0.5% disse.								
		Most strongly chloritic material in fault zone likely mafic meta-volcanic though lower 2-3m could be strongly altered, brecciated felsic - very difficult to tell. Faulting likely late as very few veins cut this interval. At end of hole retained a sample bag of sand-size frags - gouge washed away.								
		241.53 244.97 ANDESITE DYKE Medium grey with pink tinge near lower contact (fp), f.g.-m.g. (grainy), weakly porphyritic with s 3t whitish fp laths up to 1mm long and possibly small roundish mafic phenos near upper contact and augh needles 1mm long near lower contact. Hard, likely of intermediate composition. Generally non-magnetic though locally magnetic near lower contact. possibly chill margins - note finer grain size and darker colour. Upper contact rubbly and obscured, lower contact @ 40° CA, possibly sheared. Minor carb : qz and ep veins/veinlets. Disse py < 0.5%.								
		287.31 294.52 FOLIATED METATUFF Light grey-green to buff, f.g., possibly contains elongate lithic frags (e.g. 289.90m). "Ash" generally a f.g. mass of qz-sc-chl. Possibly also qz and fp xl frags though could be small compositional variations in tuff due to deformation. Strongly foliated @ 35°-40° CA, also crenulated (e.g. 289). From upper contact to 288.40m strong brecciation (fault breccia) containing round to angular matrix supported, white (qz) and grey (rhyolitic), frags from 1mm to 4cm across; matrix consists of qz-sc : chl. Lower contact sharp @ 35° CA. Moderate - strong sc-chl alteration. Frequent irreg qz-sc:ep:chl veins/patches - commonly contorted. Oddly virtually no carb veins. Note what appears to be late yellow-green sc stringers. Very finely disse sulphides 0.5%.								
		294.52 315.26 MAFIC METAVOLCANIC Dark grey-green, f.g., foliated @ 30°-50° CA but can be as flat as 10°-15° CA. Note - though likely the same rock-type as between								

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FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS			
						WIDTH	Cu (ppm)	Pb (ppm)	Zn (ppm)
		231.90-287.31m not as strongly sheared or chloritized. Broken, rubbly zones are present, especially in upper 4m. Rubbly gouge at 304.20m. Sporadically non-moderately magnetic. Lower contact fairly sharp @ 25' CA. Moderate chl alteration. 3-5% carb-qz-ep veins/veinlets/stringers. Veins commonly irreg, though also may parallel foliation. Likely 2-3 generations veining. Dissem py trace - 0.5%, commonly dissem along foliation planes (e.g. 207.60m and 313m).							
		315.26 319.93 MAFIC METATUFF/METASEDIMENT Medium-dark grey-green, beige near upper contact, (e.g. Banded from 1-5mm @ 25'-40' CA. Foliation parallel to banding. Brittle and fractures across foliation - hornfelsed. Weakly-moderately magnetic. To 315.83m some bands very siliceous - perhaps mixing between fine mafic and felsic tuffs. Below 315.63m more mafic in appearance - likely a mafic tuff or immature metasediment. Lower contact sharp @ 40' CA. Local porphyroblasts (spots) up to 1cm diameter (e.g. 317.78m), possibly chloritized cordierite. Moderately chl altered. Few carb-qz:ep:sc veins/veinlets. 1cm wide brecciated vein at 315.45. Magnetite assoc with vein at 317.55m. Dissem and blebs py to 0.5%, commonly aligned parallel to fabric.							
		319.93 324.29 MAFIC DYKE Dark green, f.g., subtly porphyritic over middle part of dyke with 15% amph/chl altered mafic phenos and altered light grey fp laths. Non-very weakly magnetic, weakly-moderately magnetic near contacts. Chl margins may be evidenced by lack of phenos. Note fabric near lower contact (50' CA) which likely reflects shear on intrusion. Lower contact sheared @ 30' CA. Mod-strongly chl altered. Few carb-qz veins, notably at 320.30m (irreg, with ep), 323.88m (1-2cm, flat). Minor dissem py.							
		338.86 340.31 ANDESITE DYKE Grey-brown, f.g., weakly porphyritic with 5-10% white fp laths up to a few mm long. Also diffuse irreg 'frags' ≤ 5mm diameter, possibly phenos though uncertain. Massive, non-magnetic. Upper contact uncertain, lower contact sharp @ 50' CA. Few qz-carb stringers. No visible sulphides.							

EOB 342.29

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FROM	TO	LITHOLOGICAL DESCRIPTION	SAMPLE No.	FROM	TO	ASSAYS			
						WIDTH	Cu (ppm)	Pb (ppm)	Zn (ppm)

SUMMARY

GB-147 was drilled to a depth of 342.29m and consists of foliated rhyolite (12.20-58.04m), felsic metavolcanics, metasediments and mafic metavolcanics (66.41-342.29m) and a unit termed "fault zone" (231.90-342.92m) which contains various lithologies although mainly mafic metavolcanic. Numerous rhyolitic to mafic dykes intruded the sequence. The foliated rhyolite represents the hangingwall thrust panel, is dominantly well foliated and contains few massive sections. The bimodal sequence is represented between 66.41-96.63m and possibly extends to the bottom of the hole. Most lithologies within the fault zone are strongly chloritized and sheared and thus their original identities are obscured. However, a foliated metatuff (287.31-294.52m) and mafic metatuff/metasediment (315.26-319.93m) are similar to bimodal sequence lithologies.

Aside from the strong chloritization associated with the fault zone, no significant alteration/mineralization was encountered.

DOWN-HOLE SURVEY DATA

DEPTH	INCLINATION	BEARING
68.98	-60.00	82.00
240.80	-59.00	93.00
342.29	-59.00	93.00

HOLE No: GB-147

PROJECT: ROBERT'S ARM - GUN BRIDGE

SAMPLE NUMBER	SAMPLE INTERVAL			Cu ppm	Pb ppm	Zn ppm	Ba ppm	SULPHIDES	DESCRIPTION
	FROM	TO	LENGTH						
27434	24.51	25.01	0.50	7	14	24	760	none visible	Foliated rhyolite; minor qtz veins
27435	60.05	60.55	0.50	1	2	22	150	none visible	Solomon pink to orange rhyolite dyke
27436	72.32	72.82	0.50	111	82	72	120	0.5% py	Foliated/banded meta tuff; dissem. blebs stringers py
27437	77.53	78.03	0.50	77	2	74	50	1% dissem; stringer py	Siliceous meta sed? or mafic volcanic?; chloritic
27438	93.36	94.16	0.80	14	10	90	830	1% dissem; stringer py	Argillaceous meta sed; brownish tinge to veins
27439	116.69	117.19	0.50	78	42	64	250	none visible	Mafic metavolcanic; moderate chlorite
27440	159.12	159.62	0.50	83	4	90	80	tr py	Mafic metavolcanic; m.gr; possibly dyke
27441	194.80	195.30	0.50	64	42	74	230	none visible	Mafic metavolcanic; possibly foliated
27442	237.44	238.19	0.75	33	42	66	410	<0.5% py	Fault zone; strong chloritization
27443	242.32	242.82	0.50	24	42	78	610	none visible	Andesite dyke
27444	284.80	285.30	0.50	40	42	66	410	none visible	Fault zone; strong chloritization; fault gouge
27445	289.00	290.00	1.00	8	42	76	340	0.5% finely dissem. py	Foliated meta tuff; very few veinlets
27446	299.06	299.56	0.50	67	42	54	1470	minor py	Mafic metavolcanic; few ep + qtz veins
27447	318.32	318.82	0.50	77	8	206	100	0.5% py // to foliation	Felsic meta tuff/meta sed; thinly banded; minor py veinlets
27448	327.33	327.83	0.50	93	42	86	240	none visible	Fault zone - grainy looking - possibly tuff; strong chl.
27449	341.10	341.60	0.50	40	42	66	410	none visible	Fault zone - gouge, fragmental; chl; magnetite moderate