

GEOLOGICAL C-111-116				DIAMOND DRILL LOG			HOLE No. DDH 87-A1			Page 1 of 12					
Property MIDNIGHT GULCH				NTS 105 D/2		Claim JL		Elevation 4200'		Azimuth 227°		Length 387'		Dip - S1°	
Coordinates S125N 1125E				Dip Tests		Advance 243.5'		Depth 300.8'		Date Collared JULY 1, 1987		Date Completed JULY 6			
Purposes TESTING RHYOLITE DYKE AT ADIT (4125N, 0190E)						Drilled by CARON				Assays by ACME			Logged by A. NOBLE/MLY		
Interval		Rec'y %	RQD	DESCRIPTION	Sample No.	Interval		Core Width	% PY	MUCH MACHINING					
From	To (m)					From	To			Cu	PB	ZN	AG	AS	AU
0	25.9			CASING											
5.28	16.15	40%	0.03	OVERBURDEN(?)	8366	14.63	16.15	1.52	0%						
				MIXED ROCK FRAGMENTS, PEBBLES & SOIL; ROCK FRAGMENTS IDENTIFIED INCL'D: SILICIFIED ANDESITIC LAPILLI TUFF, FE ALTERED & SHEARED LAPILLI TUFF, FLOW BANNED TUFF BRECCIA, MILKY QTZ-Fe Carb VEIN FRAGMENTS OR(?) FE ALTERED RHYOLITE; MINOR GLOSSANOUS CLAY RICH GRITTY SOIL (CARBONACEOUS)											
				- MINOR QTZ/CALCITE VEIN W/ 1% SUBEQUENTIAL PY (FRAGMENT) @ 13.65m											
				- FeCO <sub>3</sub> ALTH COMMON IN ROCKS											
16.15	19.2	45%	0	GLOSSANOUS SOIL/MNR TUFF? FRAGMENTS	8367	16.15	18.35	2.20	TRC	40% REC'D	26	12	92	.1	2 5
				YELLOW-BROWN CLAY RICH SOIL W/ ANGULAR ROCK FRAGMENTS - MAINLY FeCO <sub>3</sub> /SERICITE ALTERED, FOLIATED TUFF?; SOIL FREEZES IN DILUTE HCL.											
				18.35-18.65: SIMILAR TO ABOVE W/ ~ 30% QTZ-CALCITE VEIN FRAGMENTS W/ RUSTY LIMONITIC FRACTURES THROUGHOUT; VUGGY (APPEARS TO BE IN PLACE)	8368	18.35	18.65	0.30			5	6	64	.1	5 3
				FRAGMENTS OF FeCO <sub>3</sub> ALTH RHYOLITE? AT 16.15 - POSSIBLE DYKE CONTACT?	8369	18.65	19.2	0.55			23	10	83	.1	4 1
19.20	29.90	60%	0	ALTERNATING BLOCKY BROKEN ALT'D TUFF/GRITTY-CLAY RICH SOIL					TRC						
				COMMONLY LIES GLOSSANOUS GRITTY SOIL W/ ANGULAR RUSTY BROWN FeCO <sub>3</sub> ALT'D TUFF FRAGMENTS, ALTERNATING W/ VARIABLY ALT'D (FeCO <sub>3</sub> SERICITE), FOLIATED (50°-70° TO C.A.) TUFF, CARBONACEOUS LIMONITIC FRACTURES; FeCO <sub>3</sub> MNR QTZ FRACTURE FILLINGS. ← BLOCKY & BROKEN	8370	19.20	21.00	1.80			4	5	59	.1	2 3
					8371	21.00	23.00	2.00			11	6	65	.1	4 1
					8372	23.00	25.00	2.00	(23.77-26.21)		11	9	63	.1	3 1
					8373	25.00	27.00	2.00	-25% REC'D		68	29	81	.1	2 1
					8374	27.00	29.00	2.00	(25% REC'D)		18	13	70	.1	2 2

Property		NTS		Claim		Elevation		Azimuth		Length		Dip			
Coordinates		Dip Tests		Advance		Depth		Date Collared		Date Completed					
Purposes						Drilled by			Assays by			Logged by			
Interval		Rec'y %	RQD	DESCRIPTION	Sample No.	Interval		Core Width							
From	To					From	To		Cu	Pb	Zn	Ag	As	Au	
				- 22.5 TO 22.8: MINOR DULL GREEN (SOLITIC?) QZ VEIN FRAGMENTS; LOCALLY VUCCH W/ RUSTY HAIR LINE FRACTURES.											
				29.-29.5: MINOR QZ VEIN FRAGMENTS W/ RUSTY LINONITIC FRACTURES; SIMILAR IN APPEARANCE TO QZ @ 18.25-18.65. * NOTE - 28.35 - 29.87 ~ 30% RECOVERY	837S	29.00	29.90	0.90	(30% rec'y)	30	11	79	.2	6	3
				26.5-26.8: 2% subhedral py + possible sph in fractures + altered tuff contact fairly sharp $\perp$ to 80° to CA.											
29.90	30.33	88	.35	ALTERED TUFF	839B	29.90	30.33	0.43		57	10	53	.4	9	2
				Yellowish to reddish buff brown; fine grained, strongly limonitized <sup>Fe carbonatized</sup> & weakly chloritized. Moderate foliation @ 75° to CA, with 20% - 1mm chloritized plag (?) x'tals, @ 1% - 1mm py x'tals. Cloudy white gl' veins up to 8mm, often discontinuous & $\perp$ by foliation. Largest vein varies from 11 to 35° to CA, dominant fracture 20° to CA; weak carb.											
				Gradational											
30.33	31.85	98	.31	FRACTURED + ALTERED LITHIC LAPILLI TUFF											
				Brownish green to dark green; grades from moderate limonitization into strong silicification, with weak carb along fractures. May be partially brecciated; moderate pervasive chloritization throughout. Lapilli fragments of heterolithic volcanics. Several gl' - chl bands (2.65° to CA) one of which is 55% sil <sup>N</sup> 1cm by a fracture. Lim prchl along most fractures. Trace py											

Property		NTS		Claim		Elevation		Azimuth		Length		Dip		
Coordinates		Dip Tests		Advance		Depth		Date Collared		Date Completed				
Purposes				Drilled by				Assays by				Logged by		
Interval		Rec'y %	RQD	DESCRIPTION	Sample No.	Interval		Core Width						
From	To					From	To		Cu	Pb	Zn	Ag	As	Au
				- 30.33 to 30.67 : Up to 1cm white qtz veins, X cutting veins, probably 2 generations. Lim halos around fractures.	8399	30.33	30.67	0.34	28	6	74	.2	4	1
				- 30.67 to 30.98 : Strong sil with qtz-carb veinlets & irregular fracture filling	8400	30.67	30.98	0.31	45	7	65	.6	7	1
				- 31.48 to 31.78 : Chl-qtz-carb ± py bands. Gradational - - -	8401	31.48	31.78	0.30	51	8	62	.4	5	1
31.85	44.86			LITHIC LAPILLI ANDESITIC TUFF										
31.85	33.6	90	.34	Dark green to grey green; heterolithic fragments - fine grained flows, & tuffs; porphyritic flows, & zoned bombs (up to 65mm). Occasional qtz & carb vein, up to 6mm wide, commonly 20-30° to C.A. Carb & qtz tension fracture filling. Minor lim &/or wax along fractures. Weak to moderate pervasive chloritization, occasional silicified or strongly chloritized band.										
33.6	36.2	82	.49											
36.2	36.8	90	.60											
36.8	41.8	90	.64											
41.8	44.86	85	.47											
				- 33.6- 33.75 : Blacky sand grading into limonitized & chloritized clayey fracture										
				- 35.3 - 35.81 : Siliceous band, with qtz-chl. fractures (?) 80-85° to C.A. Upper contact @ 85° to C.A.										
				- 40.4 - 40.97 : Several 5cm felsic porphyritic to massive flows interbedded with lapilli tuff & a fine grained andesitic flow. Weak foliation & contact @ 45-50° to C.A.										

Property		NTS		Claim		Elevation		Azimuth		Length		Dip		
Coordinates		Dip Tests		Advance		Depth		Date Collared		Date Completed				
Purposes						Drilled by			Assays by			Logged by <i>BM</i>		
Interval		Rec'y %	RQD	DESCRIPTION	Sample No.	Interval		Core Width						
From	To					From	To							
				- 41.46 to 41.55 + 43.58 to 43.81 Black to grey green, felsic <sup>(black rhyolite)</sup> porphyritic flows with plagioclase $\leq 3$ mm.										
				- 41.8 to 44.86 : Becomes lighter green, & more limonitized (weak) toward base. Moderately foliated @ 53° to S.A.										
				Sharp					Cu   Pb   Zn   Ag   AS   AU					
44.86	45.13	65	0	SHEARED & ALTERED INTERMEDIATE VOLCANIC	8402	44.86	45.13	0.27	9   10   61   .2   3   3					
				Yellowish light to buff brown with green tint; contact 62° to S.A.; soft, very well foliated; moderate carbonatization, limonitization & sericitization(?) - potential argillic alt. as well?										
				Sharp										
45.13	47.93			ALTERED INTERMEDIATE TUFFS										
45.13	46.2	56	13	light or buff yellowish green; variably altered; grades from moderate limonitization, & sericitization, into weak carbonatization, to weak to moderate chloritization. Patchy silicification occurs throughout.										
46.2	47.93	86	37	Relict lapilli tuff bands (45.95, 47.1) silicified flow breccias (47.95). Strong limonitization along fractures with fractures decreasing with depth										
				Gradational										

## DIAMOND DRILL LOG

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Interval		Rec'y %	RQD	DESCRIPTION	Sample No.	Interval		Core Width
From	To					From	To	
47.9	50.59	73	.28	INTERMEDIATE (ANDESITIC) LITHIC LAPILLI TUFF  Green to dark green, moderately chloritized & in places silicified. Fragments commonly $\leq 3$ cm, heterolithic w/ @ 75% tuffs, 20% porphyritic flows + 5% altered granitoids. Scattered tension fracture qtz veins & minor limonite along fractures. — sharp? —				
50.59	52.4	59	.08	INTERMEDIATE (ANDESITIC) TUFF & LAPILLI TUFF  Light brownish or yellowish green grading into pale green. Sheared & altered lapilli tuff grading into & interbedded with a fine grained tuff. Foliation at contact @ 55° to SW. Most of unit blocky & broken. Occasional qtz vein(?) or sweat. Alteration grades from moderate limonitization into chloritization. Some of the tuffs may be non to weakly porphyritic flows.				
52.4	61.4	55	.07	— Gradational — INTERMEDIATE (ANDESITIC) LAPILLI TUFF  Dark green, medium to fine grained lapilli, moderate chloritization $\leq 5\%$ granitoid fragments. Predominantly blocky core. Occasional qtz-carb & lim or hematite $\leq 2$ mm vein usually as tension fracture filling. 52.6-53.1 56.84-59.0, 59.4-60.0 very block core.				
61.4	61.67	85	.59	INTERMEDIATE (ANDESITIC) PORPHYRITIC FLOW  Dark green, fine grained 20% 1-2 mm plag, 10% 1 mm chlorite altered x'tals.				

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## DIAMOND DRILL LOG

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Interval		Recy %	RQD	DESCRIPTION	Sample No.	Interval		Core Width	
From	To					From	To		
61.67	67.84	96	.75	INTERMEDIATE (ANDESITIC) LAPILLI TUFF  Contact @ 62° to CIA. Dark green, medium to coarse lapilli fragments w/ occasional bomb (upto 130mm). @ 1% generally coarse 1mm <sup>altered</sup> granitic fragments. Moderate chloritization throughout. Few fractures, qtz-carb &/or limonite infilling; 70°/20° most common.  - 66.02 - 66.15 Feldspar porphyritic andesitic flow (as 61.4 - 61.7).  sharp 72° to CIA.					
67.84	69.14	95	.81	INTERMEDIATE (ANDESITIC) FLOWS & TUFF (?)  Dark green, fine grained porphyritic, 5% ± 1mm plag laths, ~15% mafic-chlorite altered xtals. moderate to strong chloritization. Few scattered q.v. & fractures.					
69.14	74.20	96	.52	sharp ~80° to CIA. INTERMEDIATE (ANDESITIC) LAPILLI TUFF  Dark green, moderately chloritized, in places weak epidatization & <sup>moderate</sup> silicification. Avg fragment size 8mm, with bombs upto 60cm; < 1% granitic fragments. Sparse fractures, < 1mm common, with qtz, qtz + carb or lim + carb infilling. Extent & orientation variable.  - 70.05 to 70.23: moderately magnetic, amygdaloidal (?) andesite (basalt); amygdules epidote rimmed w/ chlorite ± qtz centre.					

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## DIAMOND DRILL LOG

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Interval		Rec'y %	RQD	DESCRIPTION	Sample No.	Interval		Core Width						
From	To					From	To							
				- 71.05 : Epidote & albite(?) breccia thinly bedded 65° to CA										
				- 71.33 - 71.64 : Silicified lapilli tuff w/ 35% angular fragments. Fragments appear darker against matrix.										
				sharp 28° to CA.										
74.20	74.53	92	0	SHEARED & BRECCIATED LAPILLI TUFF	8463	74.20	74.53	.33						
				Dark green broken core & mud grading into broken core. Moderate carb alt. especially along fractures. weak lim & hem.										
				Gradational										
74.53	77.40	87	.52	INTERMEDIATE (ANDESITIC) LAPILLI TUFF										
				Dark green; coarse lapilli fragments & perphyritic volcanic tuff. Weak to moderate chloritization, with qtz & carb ± lim along sparsely scattered fractures.										
				Gradational										
77.40	79.76	85	.30	FOLIATED TO UNFOLIATED INTERMEDIATE (ANDESITIC) TUFFS (AND FLOWS?)										
				Dark green to pale brownish green; grades into then out of stronger foliated bed. Fine grained, moderately chloritized w/ 10% q.v. and/or fractures. Trace to 2% py										
				- 78.24 - 78.83 : Moderately foliated - @ 60° to CA; moderate sericitic & chloritic alteration with irregular qtz-carb-chl hem ± lim veins up to 1cm wide. Weak, spotted argillie alteration in strongest sericitic	8404	78.16	78.83	0.67						

Cu	PB	ZN	AG	AS	AU
24	10	90	.3	6	1

21	17	68	.3	5	2
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## DIAMOND DRILL LOG

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Interval		Recy %	RQD	DESCRIPTION	Sample No.	Interval		Core Width	
From	To					From	To		
				altered zone, 12% py adjacent to 4 in veins. Sheared by at 78.30					
				— — Gradational — — — —					
79.76	81.8	81	.68	INTERMEDIATE (ANDESITIC) LAPILLI TUFF					
				Dark green with green matrix; 50% angular chloritized tuff fragments in a moderately chloritized matrix. Interbedded with up to 3m tuffs. Moderately well fractured, 35° & 65° to C.A. dominant, with chlorite & qtz & carb & lim infillings.					
				— — Gradational — — — —					
81.8	89.46			INTERMEDIATE (ANDESITIC) TUFFS & FLOWS					
81.8	87.0	95	.50	Dark green, fine to very fine grained, occasionally porphyritic with $\leq 7\% \leq 1\text{mm}$ plag phenocrysts. Moderate chloritization, & minor weak epidotization. Few fractures, usually limonite infilling.					
87.0	89.46	41	.21						
				86.3 - 86.7: Very fine grained, well fractured, with $\leq 3\text{mm}$ carb & qtz veins & occasional thin lapilli band					
				88.0: 1.5cm chloritized g.v. by.					
				87.0 - 89.46 Blocky core					
				— — — — —					
89.46	89.61	100	.80	INTERMEDIATE (ANDESITIC) LAPILLI TUFF					
				Dark green, chloritized, 40% porphyritic lapilli fragments.					
				— — Sharp 40° to C.A. — — — —					



## DIAMOND DRILL LOG

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Interval		Recy %	RQD	DESCRIPTION	Sample No.	Interval		Core Width	CU	PB	ZN	AG	AS	AU
From	To					From	To							
89.61	96.35	53	0	FRACTURED CLAY RICH - BRECCIATED (?) INTERMEDIATE (ANDESITIC) LAPILLI TUFFS, CRYSTAL TUFF AND FLOWS.  Dark green broken core often supported by clay mud rx fragment matrix. Moderate chloritization, weak to strong carbonatization, weak-patchy limonization. Scattered gr. $\leq 3$ mm. - 90.83: 2 cm wuggy calcite vein	8405	89.61	90.21	0.60	46	3	77	.4	8	1
					8406	90.2	91.81	1.11	37	13	71	.4	8	1
					8407	92.0	93.0	1.00	47	18	76	.4	7	1
					8408	93.0	94.18	1.18	35	13	83	.4	6	2
				Gradational										
96.35	99.45	69	.54	INTERMEDIATE PORPHYRITIC FLOWS & CRYSTAL TUFF  Dark brownish green, moderate chloritization weak carb, weak limonitization, 10% carbonate veins or fracture filling										
				Gradational										
99.45	103.05	74	.24	MODERATE TO STRONGLY ALTERED INTERMEDIATE LAPILLI TUFF & TUFF.  Brownish green to brown; moderate to strongly Fe carbonate altered; mod carb & lim along fractures, moderate pervasive chloritization. Generally highly fractured &/or broken core. Core rubble - 99.45 - 99.7, 99.8, 100.6 - 100.9, 102.41 - 103.05. Abundant (25%) qtz & carb & lim veins.  - 100.0 - 100.56 10% Qtz-carb & lim breccia "veins" ( $\pm 1$ cm thick). Irregular orientation - 75° & 65° main "veins". - 102.41 - 103.05 Altered hanging wall.	8409	100.1	100.56	.46	13	14	78	.1	26	4
					8410	102.41	103.05	.64	18	16	192	.1	2	2

091991

Property			NTS		Claim		Elevation		Azimuth		Length		Dip	
Coordinates			Dip Tests			Advance			Depth		Date Collared		Date Completed	
Purposes						Drilled by				Assays by			Logged by	
Interval(m)		Rec'y %	RQD	DESCRIPTION	Sample No.	Interval		Core Width						
From	To					From	To							
				— — — — — Sharp — — — — —										
103.05	114.98			SILICIFIED & SERICITIZED RHYOLITE DYKE										
				LIGHT GREENISH-GREY, PORPHYRIC; 15% PLAG. PHENOCRYST IN A STRONGLY SILICIFIED & MOD. SERICITIZED APHYRIC MATRIX. PHENOS. COMMONLY ALTD TO SERICITE, INCREASE IN SIZE (UP TO 2mm) AND NUMBER TOWARD F.W.; QZ VEINS & VEINLETS UP TO 1cm OCCUR PREDOMINANTLY ADJACENT TO THE H.W. WELL FRACTURED W/ LIMONITE INFILLING & ALTN. HALO. Minor (<1%) diss. & fine grained py										

Property			MIDNIGHT GULCH		NTS		Claim		3L		Elevation		Azimuth		Length		Dip							
Coordinates					Dip Tests			Advance			Depth		Date Collared			Date Completed								
Purposes					Drilled by					CARON			Assays by			ACME			Logged by			AL MONTGOMERY HUGH MACKINNON		
Interval		Rec'y %	RQD	DESCRIPTION	Sample No.	Interval		Core Width	Cu	Pb	Zn	Ag	As	Au										
From	To					From	To																	
		67	0.05	- 106.62 to 109.00 : Greenish grey, more strongly sericitized than overlying rhy. Strong lim along & surrounding fractures; 5', 87°, 50°, 60' to C.A. dom dip. V. small q.v. generally increase in # with depth; 1, 85°, 76 to C.A.	8381	106.62	107.5	0.88	18	21	32	0.2	33	8										
					8382	107.5	108.27	0.77	22	68	86	0.1	56	4										
					8383	108.27	108.6	0.33	(Not split, test for Au in fractures) 46, 49, 93, 4, 31, 14															
					8384	108.6	109.0	0.4	40	29	63	0.3	39	7										
		80	0	- 109.00 to 109.88 : Greenish grey, glz vein stockworked. Veins up to 1cm, ave. 5cm. 1% Py (6mm), mostly weathered away; few fresh all anhedral; subhedral relic pits.	8385	109.0	109.4	0.4	32	32	21	0.8	46	58										
					8386	109.4	109.88	0.48	25	31	24	0.4	32	5										
		70	19	- 109.88 to 113.74 : Pale greenish grey to greenish grey. Strong to moderate sericitization both pervasive & as feldspar alteration. Strong limonite alteration halos. Scattered <2mm q.v. generally at a low angle (10-20°) to C.A. Very blocky fracture & broken core 111.0 to 111.55, & 112.1 to 112.40. 2% py diss + in 3mm q.v. & vuggy chy 110.67 to 111.0.	8387	109.88	110.67	0.79	34	48	20	0.6	23	10										
					8388	110.67	111.0	0.33	20	85	21	0.9	43	19										
					8389	111.0	111.55	0.55	28	37	38	0.5	26	12										
					8390	111.55	112.30	0.75	37	32	42	0.7	62	13										
					8391	112.30	113.74	1.44	25	238	49	1.0	16	17										
		95	45	- 113.74 to 114.07 : Pale greenish grey, porphyritic with 2-3mm plag phenocrysts less sericitized than <sup>thick</sup> overlying. Up to 2% euhedral to subhedral py as diss or along fractures. Generally more massive than previous rhy.	8392	113.74	114.07	0.33	24	34	25	0.3	13	11										
		92	29	- 114.07 to 114.48 : Pale greenish grey to pinkish brown or brown. Sharp but irregular contact marked by partially chloritized & strongly silicified porphyritic rhy. Qtz veinlets are sparse, lim & chlorite fill irregular vuggy fractures; - 1% subhedral 1mm pyx. Contact bxn as indicated by several altered to unaltered 1-4cm mafic/intermediate angular volcanic clasts. Contact angle 1 to C.A. but variable.	8393	114.07	114.48	0.41	25	25	86	0.4	10	14										

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Property		MIDNIGHT GULCH		NTS		Claim		JL		Elevation		Azimuth		Length		Dip			
Coordinates				Dip Tests				Advance				Depth		Date Collared				Date Completed	
Purposes								Drilled by				Assays by						Logged by A.M. & H.M.	
Interval		Rec'y %	RQD	DESCRIPTION	Sample No.	Interval		Core Width	Cu	Pb	Zn	Ag	As	Au					
From	To					From	To												
114.98	115.66	66	0.49	SHEARED ANDESITIC CRYSTAL TUFF	8394	114.98	115.21	0.73	6	12	105	0.4	9	3					
					8395	115.21	115.66	0.45	5	7	94	0.2	5	1					
				Dark greenish brown. Very well foliated 25° to C.A., pervasive moderate limonitization, silicification + chloritization. Fine grained to very fine grained with porphyritic or tuffaceous matrix becoming more apparent with distance from contact. Several (14.56 + 14.64) nearly pyritic carb-chl-lim <sup>(14.56)</sup> vein or fracture fillings, with trace py.															
				- 114.78 - 114.92 : As 114.07 to 114.48															
				- Gradational contact -															
115.66	117.95	88	0.48	ANDESITIC CRYSTAL TUFF	8396	115.66	116.65	0.99	11	11	62	0.4	3	1					
					8397	116.65	117.95	0.60	15	10	90	0.2	5	3					
				Yellowish or brownish dark green to dark green. Variably altered & occasionally weakly sheared. Ave. crystal size 1mm, with no preferred orientation. Moderately chloritized, with slight increase in alteration with depth. Irregular fractures filled with carbonate and/or limonite or qtz. General fracture trends 45°, 35°, & 85° to C.A. Trace py in fractures. Slight (1mm) offset at some fractures.															
				- 116.85 - 117.95 : Slightly more fractured & patchy altered; more limonitization															
117.95	118.07			E.O.H.															