DRILL LOGS RE-32
Rosebud

4010 0031

LAC MINERALS (U.S.A.) INC.

DRILL LOG SUMMARY SHEET

PROJECT ROSEBUD

HOLE NUMBER RE-32 TOTAL DEPTH 405' LOGGED BY NHB

Date started 8/14/89 8:10AM

Date completed 8/14/89 ~6:00pm

Initial bearing S2°E

Initial inclination -60°

Elevation 5325

Collar coordinates:

N 2203319

E 481681.3

Contractor: Environmental West Expln.

Drill Type: RCD

Hole Size: 5½" hammer

Drilling Conditions: fair - clay bridge, cave @ ~19

Footage: Wet / Dry 0-347' dry, 347'-TD Wet; moist @ ~150'; good H_2O @ ~39

Comments: 2nds collected: 165' → 245' & 280' → TD. Best zone appears to be bleached & silt/tuff @ 358' — 378'.

DOWN HOLE SURVEY INFORMATION

FROM	TO	SURVEY POINT	INCLI-NATION	BEARING	X (Northing)	Y (Easting)	Z (Elevation)
0	50		-60	S02E			
50	150		-62	"			
150	250		-64	"			
250	350		-66	"			
350	405		-67	"			

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PROJECT Rosebud LOGGED BY NHB HOLE NO. RE-32 PAGE 1 OF 9

Depth	RECOVERY	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	GRAPHIC ALTERATION	ALTERATION: ARGILLIC (W M S)	ALTERATION: SILICIFICATION (W M S)	ALTERATION: PROPYLLITIC (W M S)	COLOR FINES	MINERALIZATION: LIMONITE (W M S)	MINERALIZATION: HEMATITE (W M S)	MINERALIZATION: JAROSITE (W M S)	% SULFIDES	OTHER COMMENTS	ANALYSES: Au	Au ✓	Ag	As	Hg	Sb	Se
0	Fair	0-5: Overburden - CAT Pad/road fill												.006		.14				
5	Fair	~5-10: Overburden: red clay soil? & mix lith. - Bedrock @ ? depth.												.004		.18				
10	Good	~10-35: lg/g. m-s silic in mixed pc and vfd tuff? - Bud breccia? w-m lim + tr hem. (20-30)												.003		.26				
15	"			"										.004		.31				
20	"			"										.005		.20				
25	"			"										.003		<.10				
30	"			"										.004		.70				
35	"	35-55: tan-gy PY w/ 2-3% blk speckled vfc - gy blk frox and w-m silic. - Bud breccia?												.006		<.10				
40	"			"										.006		.18				
45	"			"										.005		.12				
50																				

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PROJECT Rosebud LOGGED BY NHB HOLE NO. RE-32 PAGE 2 OF 9

Depth	RECOVERY	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	GRAPHIC ALTERATION	ALTERATION: ARGILLIC (W M S)	ALTERATION: SILICIFICATION (W M S)	ALTERATION: PROPYLITIC (W M S)	COLOR FINES	MINERALIZATION: LIMONITE (W M S)	MINERALIZATION: HEMATITE (W M S)	MINERALIZATION: JAROSITE (W M S)	% SULFIDES	OTHER COMMENTS	ANALYSES: Au	Au ✓	Ag	As	Hg	Sb
50	good		✓ ? ✓ ✓	X w										.004		.46			
55	"	55-175 Bud breccia: pale green to gray pc ± local qtz frag & w-m silic	✓ ✓	"										.006		.14			
60	"		✓ ✓	"										.005		<.10			
65	"		✓ ✓	"										.006		.12			
70	"		✓ ✓	"										.006		.23			
75	"		✓ ✓	"										.002		.12			
80	"	incl m-s silic bx frags ± w-m lim	✓ ✓	X w +										.001		<.10			
85	"		✓ ✓	X w										.005		<.10			
90	"		✓ ✓	X ↓										.003		.34			
95	"		✓ ✓	"										.004		<.10			
100																			

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PROJECT Rosebud LOGGED BY NHB HOLE NO. RE-32 PAGE 3 OF 9

Depth	RECOVERY	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	GRAPHIC ALTERATION	ARGILLIC W M S	SILICIFICATION W M S	PROPYLLITIC W M S	COLOR FINES	LIMONITE W M S	HEMATITE W M S	JAROSITE W M S	% SULFIDES	OTHER COMMENTS	Au	Au ✓	Ag	As	Hg	Sb
100		As Above: pale green Bud Bx. → ~175																	
	Good	Fracture zone @ 102': Strong silic + m-s. lim. & wk. clay	✓ ✓	X M-S										.004		<.10			
105		lim stng esp. on frax. m silic and minor qtz vnlts continue to 155																	
	"	Possible 10-20% contam. through ~125:	✓ ✓	"										.007		<.10			
110																			
	"		✓ ✓	"										.046		<.10			
115																			
	"		✓ ✓	X M										<.001		<.10			
120																			
	"		✓ ✓	"										.002		<.10			
125																			
	"		✓ ✓	"										<.001		<.10			
130																			
	"	Sample Fuckup! — 135-140 combined w/ 130-135'	✓ ✓	"										<.001		.10			
135																			
	N/S	No chips	N/S					N/S					N/S						
140																			
	Good		✓ ✓	X M										.001		<.10			
145																			
	"	Lim & clay incr. — moist tr. drusy qtz →	✓ ✓	+ Alu										.004		<.10			
150																			

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PROJECT Rosebud LOGGED BY NHB HOLE NO. RE-32 PAGE 4 OF 9

Depth	RECOVERY	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	GRAPHIC ALTERATION	ARGILLIC (W M S)	SILICIFICATION (W M S)	PROPYLLITIC (W M S)	COLOR FINES	LIMONITE (W M S)	HEMATITE (W M S)	JAROSITE (W M S)	% SULFIDES	OTHER COMMENTS	Au	Au ✓	Ag	As	Hg	Sb
150	good	As above – pale green pc – Bud bx 145-155; shg Lim & clay (moist) in fox. zone. Also minor hem.	✓ ✓	Xs				Tan						.003		<.10			
155	"	Lim. stng/clay decr. – becomes gray-green to bleached and wkly argillized?	✓ ✓	Xw				"						.001		<.10			
1600	"		✓ ✓	"				grey						.011		<.10			
165	"	Mod. Contamination → (Begin taking 2nds.)	✓ ✓	"				"					mod. Cont am.	<.001		<.10			
170	"		✓ ✓	"				"						<.001		<.10			
175	"	175-200: m-s fin & hem colored, s. silf zone in ?pc (fragmental) + bx and qtz vnlts. – Overall zone is fractured; caving – possible fault zone	✓ ✓	Xm-s				org						.009		<.10			
180	"		✓ ✓	"				"						.003		2.67			
185	"	includes white m. arg. chips	✓ ✓	Xs				"						.001		.44			
190	"	main fracture zone: qtz vng, minor bx & clay: forms "bridge".	✓ ✓	"				org-red						.001		<.10			
195	"		✓ ✓	"				"						.003		<.10			
200																			

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PROJECT Rosebud LOGGED BY NHB HOLE NO. RE-32 PAGE 5 OF 9

Depth	RECOVERY	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	GRAPHIC ALTERATION	ALTERATION: ARGILLIC (W M S)	ALTERATION: SILICIFICATION (W M S)	ALTERATION: PROPYLITIC (W M S)	COLOR FINES	MINERALIZATION: LIMONITE (W M S)	MINERALIZATION: HEMATITE (W M S)	MINERALIZATION: JAROSITE (W M S)	% SULFIDES	OTHER COMMENTS	ANALYSES: Au	Au V	Ag	As	Hg	Sb
200	Good	200'–305': Fe std and m. sil'd fg pc (Bud?) becoming bleached grey ± hem. clay and dissem S⁻ below ~225'. Local drusy qtz vng.	?	XM										<.001		<.10			
205	Too Much	*This zone may be same as grey ± bleached zone in RE-31.	?	"									? Contam	<.001		<.10			
210	"		?	"									"	.002		<.10			
215	"	Too much return – probable cave from ~195.	?	"									"	.002		<.10			
220	"		?	"									"	.001		<.10			
225	Good	225 → ~285': contains tr–2% dissem py. & black specks – unknown S⁻ ?? in granular fgt ?? or f.g. pc ??	?	"								tr–2% py	better	<.001		.10			
230	"		?	XM								"		<.001		<.10			
235	"	235–305: becomes lghy grey m. sil'd ± w. arg. & bleached pc (or ? fgt)	?	+ ~ w								"		<.001		<.10			
240	"			\								"		.007		.27			
245	"	(Stopped collecting 2nds)		"								"		.034		.15			
250																			

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PROJECT Rosebud LOGGED BY NHB HOLE NO. RE-32 PAGE 6 OF 9

Depth	RECOVERY	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	GRAPHIC ALTERATION	ALTERATION: ARGILLIC (W M S)	ALTERATION: SILICIFICATION (W M S)	ALTERATION: PROPYLITIC (W M S)	COLOR FINES	MINERALIZATION: LIMONITE (W M S)	MINERALIZATION: HEMATITE (W M S)	MINERALIZATION: JAROSITE (W M S)	% SULFIDES	OTHER COMMENTS	ANALYSES: Au	Au V	Ag	As	Hg	Sb
250	Good	As above incl. red hem. clay on fract. → 270		"				red orng						.001		.20			
255	"			"				grey + pink						.005		<.10			
260	"	260-280 argillic altn ? incr		$\sim_M$ + X_W				"						<.001		<.10			
265	"			"				"						<.001		.14			
270	"	1-2% dissem euh. py + hem std. drusy qtz.		"				"						<.001		<.10			
275	"			"				"						<.001		<.10			
280	"	becomes more silicified 5-10% milky qtz. chips		X_{M-S} + X_V $\sim_W$				grey						.001		<.10			
285	"	(Begin collecting 2nds again) incr. % pale green pc. + reddish sild bx! A		X_M + $\sim_W$				grey						.003		<.10			
290	"	Δ		"				"						.002		<.10			
295	"	grey vfg ? tuff ≫ pc		$\sim$				"						.002		<.10			
300																			

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PROJECT Rosebud LOGGED BY NHR HOLE NO. RE-32 PAGE 7 OF 9

Depth	RECOVERY	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	GRAPHIC ALTERATION	ARGILLIC W M S	SILICIFICATION W M S	PROPYLLITIC W M S	COLOR FINES	LIMONITE W M S	HEMATITE W M S	JAROSITE W M S	% SULFIDES	OTHER COMMENTS	Au	Au ✓	Ag	As	Hg	Sb
300		as above		Xw ~ w-m										.001		<.10			
305	Too much	305 - 358: Δ to faly pale & sea green pc (Bud Bx) w/ notable sili 310 - 340 + clays.	✓ ✓	Xm										<.001		<.10			
310	"	fault? 310 → 325' sild fracture zone w/ probable cave. w-m lim on frax	✓ ✓	Xs										<.001		<.10			
315	"	Main cracks @ ~317'	✓ ✓	"										.004		<.10			
320	"	includes mod. tan clay (gouge)	✓ ✓	+ clay										.001		<.10			
325	good	325 - 340: STILL mod sild but green pc + 10-15% milky qtz chips (vng?)	✓ ✓	X m-s				pale green						.001		<.10			
330	"		✓ ✓	"				"						.001		<.10			
335	"	qtz vein chips incr.	✓ ✓	"				"						<.001		<.10			
340	"	340 - 358' Darker "sea" green w. sild → m. arg. pc (Bud?) + mod clay	✓ ✓	Xw ~ m				green						.003		<.10			
345	Fair "	Drilling wet @ 347 — abdt olive clay	✓ ✓	"				green						.002		<.10			
350																			

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PROJECT Rosebud LOGGED BY NHB HOLE NO. RE-32 PAGE 8 OF 9

Depth	RECOVERY	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	GRAPHIC ALTERATION	ALTERATION: ARGILLIC (W M S)	ALTERATION: SILICIFICATION (W M S)	ALTERATION: PROPYLLITIC (W M S)	COLOR FINES	MINERALIZATION: LIMONITE (W M S)	MINERALIZATION: HEMATITE (W M S)	MINERALIZATION: JAROSITE (W M S)	% SULFIDES	OTHER COMMENTS	ANALYSES: Au	Au V	Ag	As	Hg	Sb	Se
350	Fair	includes few % white milky qtz chips	V V	Xw + ~m-s				green						.001		<.10				
355	Fair	358–373' abrupt Δ to grey wash w/ pale clays and strong silic + pyritic fgt? chips. Clays in suspension		Xs + ~				grey				tr ? py	Fair Rec. -Susp.	.001		<.10				
360	Fair	358–365: ±75% milky qtz vein-chips - prob. stockwk zone as in "candy rock in RE-27.		Xs ± ~				grey				tr ?	"	.002		.13				
365	fair	minor pyrite chips – "pinhead pirite"		Xm + ~				grey				3-5%	"	.003		.79				
370	good	~373–395': Becomes mainly v. fg marker tuff "SGT" – silty bleached pale sage green ± tr dissem. f.g. py and tr hairline qtz vnlts.		Xm + ~				pale green				1-3%		.003		.79				
375	"			Xw + ~w				"				tr. py		<.001		<.10				
380	"			"				"				"		<.001		<.10				
385	"			"				"				"		<.001		<.10				
390	"			"				"				"		<.001		<.10				
395	"	@ 395 hit "good" H_2O ⇒ drilling faster – rock somewhat coarser grained & softer		~w				"						<.001		.13				
400																				

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PROJECT Rosebud LOGGED BY NHB HOLE NO. RE-32 PAGE 9 OF 9

	RECOVERY	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	GRAPHIC ALTERATION	ALTERATION: ARGILLIC W M S	ALTERATION: SILICIFICATION W M S	ALTERATION: PROPYLLITIC W M S	COLOR FINES	MINERALIZATION: LIMONITE W M S	MINERALIZATION: HEMATITE W M S	MINERALIZATION: JAROSITE W M S	% SULFIDES	OTHER COMMENTS	ANALYSES: Au	Au V	Ag	As	Hg	Sb
400	4	@ ~400: purple wash and m-c.g. p.c. Δ w/ purple-red hul from ox. hem.		"				purple						<.001		<.10			
405		405' T.D. ~6 pm 8/14																	
0		Close to projection of RE-1; little new info & slow.																	
5																			
0																			
5																			
0																			
5																			
0																			
5																			
0																			

G91-5235

	Sample I.D.	Au o/t	Ag o/t
75	SAMPLE: RE 31 370 375	0.002	0.12
76	SAMPLE: RE 31 375 380	0.003	<.10
77	SAMPLE: RE 31 380 385	0.006	<.10
78	SAMPLE: RE 31 385 390	0.002	0.11
79	SAMPLE: RE 31 390 395	0.002	0.56
80	SAMPLE: RE 31 395 400	0.048	0.23
81	SAMPLE: RE 31 400 405	0.009	<.10
82	SAMPLE: RE 31 405 410	0.002	0.14
83	SAMPLE: RE 31 410 415	0.004	0.26
84	SAMPLE: RE 31 415 420	0.006	0.10
85	SAMPLE: RE 31 420 425	0.002	<.10
86	SAMPLE: RE 31 425 430	0.003	0.11
87	SAMPLE: RE 31 430 435	0.003	0.10
88	SAMPLE: RE 31 435 440	0.002	<.10
89	SAMPLE: RE 31 440 445	0.005	0.58
90	SAMPLE: RE 31 445 450	0.003	<.10
91	SAMPLE: RE 31 450 455	0.003	<.10
92	SAMPLE: RE 31 455 460	0.002	<.10
93	SAMPLE: RE 31 460 465	0.002	<.10
94	SAMPLE: RE 31 465 470	0.003	<.10
95	SAMPLE: RE 31 470 475	0.004	0.18
96	SAMPLE: RE 31 475 480	0.007	0.34
97	SAMPLE: RE 31 480 485	0.010	0.49
98	SAMPLE: RE 31 485 490	0.011	0.27
99	SAMPLE: RE 31 490 495	0.002	0.14
100	SAMPLE: RE 31 495 500	0.005	0.17
101	SAMPLE: RE 31 500 505	0.002	0.11
102	SAMPLE: RE 31 505 510	0.003	0.17
103	SAMPLE: RE 31 510 515	0.002	0.22
104	SAMPLE: RE 32 0 5	0.006	0.14
105	SAMPLE: RE 32 5 10	0.004	0.18
106	SAMPLE: RE 32 10 15	0.003	0.26
107	SAMPLE: RE 32 15 20	0.004	0.31
108	SAMPLE: RE 32 20 25	0.005	0.20
109	SAMPLE: RE 32 25 30	0.003	<.10
110	SAMPLE: RE 32 30 35	0.004	0.70
111	SAMPLE: RE 32 35 40	0.006	<.10
112	SAMPLE: RE 32 40 45	0.006	0.18
113	SAMPLE: RE 32 45 50	0.005	0.12
114	SAMPLE: RE 32 50 55	0.004	0.46
115	SAMPLE: RE 32 55 60	0.006	0.14
116	SAMPLE: RE 32 60 65	0.005	<.10
117	SAMPLE: RE 32 65 70	0.006	0.12
118	SAMPLE: RE 32 70 75	0.006	0.23
119	SAMPLE: RE 32 75 80	0.002	0.12
120	SAMPLE: RE 32 80 85	0.001	<.10

Sample I.D.	Au o/t	Ag o/t
121 SAMPLE: RE 32 85 90	0.005	<.10
122 SAMPLE: RE 32 90 95	0.003	0.34
123 SAMPLE: RE 32 95 100	0.004	<.10
124 SAMPLE: RE 32 100 105	0.004	<.10
125 SAMPLE: RE 32 105 110	0.007	<.10
126 SAMPLE: RE 32 110 115	0.046	<.10
127 SAMPLE: RE 32 115 120	<.001	<.10
128 SAMPLE: RE 32 120 125	0.002	<.10
129 SAMPLE: RE 32 125 130	<.001	<.10
130 SAMPLE: RE 32 130 135	<.001	0.10
131 SAMPLE: RE 32 135 140	0.001	<.10
132 SAMPLE: RE 32 140 145	0.004	<.10
133 SAMPLE: RE 32 145 150	0.003	<.10
134 SAMPLE: RE 32 150 155	0.001	<.10
135 SAMPLE: RE 32 155 160	0.011	<.10
136 SAMPLE: RE 32 160 165	<.001	<.10
137 SAMPLE: RE 32 165 170	<.001	<.10
138 SAMPLE: RE 32 170 175	0.009	<.10
139 SAMPLE: RE 32 175 180	0.003	<.10
140 SAMPLE: RE 32 180 185	0.001	0.44
141 SAMPLE: RE 32 185 190	0.001	<.10
142 SAMPLE: RE 32 190 195	0.003	<.10
143 SAMPLE: RE 32 195 200	<.001	<.10
144 SAMPLE: RE 32 200 205	<.001	<.10
145 SAMPLE: RE 32 205 210	0.002	<.10
146 SAMPLE: RE 32 210 215	0.002	<.10
147 SAMPLE: RE 32 215 220	0.001	<.10
148 SAMPLE: RE 32 220 225	<.001	0.10
149 SAMPLE: RE 32 225 230	<.001	<.10
150 SAMPLE: RE 32 230 235	<.001	<.10
151 SAMPLE: RE 32 235 240	0.007	0.27
152 SAMPLE: RE 32 240 245	0.034	0.15
153 SAMPLE: RE 32 245 250	0.001	0.20
154 SAMPLE: RE 32 250 255	0.005	<.10
155 SAMPLE: RE 32 255 260	<.001	<.10
156 SAMPLE: RE 32 260 265	<.001	0.14
157 SAMPLE: RE 32 265 270	<.001	<.10
158 SAMPLE: RE 32 270 275	<.001	<.10
159 SAMPLE: RE 32 275 280	0.001	<.10
160 SAMPLE: RE 32 280 285	0.003	<.10
161 SAMPLE: RE 32 285 290	0.002	<.10
162 SAMPLE: RE 32 290 295	0.002	<.10
163 SAMPLE: RE 32 295 300	0.001	<.10
164 SAMPLE: RE 32 300 305	<.001	<.10
165 SAMPLE: RE 32 305 310	<.001	<.10
166 SAMPLE: RE 32 310 315	0.004	<.10

	Sample I.D.	Au o/t	Ag o/t
167	SAMPLE: RE 32 315 320	0.001	<.10
168	SAMPLE: RE 32 320 325	0.001	<.10
169	SAMPLE: RE 32 325 330	0.001	<.10
170	SAMPLE: RE 32 330 335	<.001	<.10
171	SAMPLE: RE 32 335 340	0.003	<.10
172	SAMPLE: RE 32 340 345	0.002	<.10
173	SAMPLE: RE 32 345 350	0.001	<.10
174	SAMPLE: RE 32 350 355	0.001	<.10
175	SAMPLE: RE 32 355 360	0.002	0.13
176	SAMPLE: RE 32 360 365	0.003	0.79
177	SAMPLE: RE 32 365 370	0.003	0.29
178	SAMPLE: RE 32 370 375	<.001	<.10
179	SAMPLE: RE 32 375 380	<.001	<.10
180	SAMPLE: RE 32 380 385	<.001	<.10
181	SAMPLE: RE 32 385 390	<.001	<.10
182	SAMPLE: RE 32 390 395	<.001	0.13
183	SAMPLE: RE 32 395 400	<.001	<.10
184	SAMPLE: RE 33 0 5	0.002	<.10
185	SAMPLE: RE 33 5 10	0.001	<.10
186	SAMPLE: RE 33 10 15	0.002	<.10
187	SAMPLE: RE 33 15 20	0.003	<.10
188	SAMPLE: RE 33 20 25	0.002	0.18
189	SAMPLE: RE 33 25 30	0.003	<.10
190	SAMPLE: RE 33 30 35	<.001	<.10
191	SAMPLE: RE 33 35 40	<.001	<.10
192	SAMPLE: RE 33 40 45	0.001	<.10
193	SAMPLE: RE 33 45 50	<.001	<.10
194	SAMPLE: RE 33 50 55	<.001	<.10
195	SAMPLE: RE 33 55 60	0.002	<.10
196	SAMPLE: RE 33 60 65	0.001	<.10
197	SAMPLE: RE 33 65 70	0.003	<.10
198	SAMPLE: RE 33 70 75	0.001	<.10
199	SAMPLE: RE 33 75 80	0.002	<.10
200	SAMPLE: RE 33 80 85	0.003	<.10
201	SAMPLE: RE 33 85 90	0.002	0.41
202	SAMPLE: RE 33 90 95	0.001	0.13
203	SAMPLE: RE 33 95 100	0.001	<.10
204	SAMPLE: RE 33 100 105	0.004	<.10
205	SAMPLE: RE 33 105 110	0.007	0.10
206	SAMPLE: RE 33 110 115	0.012	0.58
207	SAMPLE: RE 33 115 120	0.002	<.10
208	SAMPLE: RE 33 120 125	0.018	<.10
209	SAMPLE: RE 33 125 130	0.010	0.11
210	SAMPLE: RE 33 130 135	0.008	0.30
211	SAMPLE: RE 33 135 140	0.023	0.26
212	SAMPLE: RE 33 140 145	0.100	2.54