60001578

Mining District File Summary Sheet

DISTRICT	Rosebud
DIST_NO	4010
COUNTY If different from written on document	Pershing
TITLE If not obvious	Rosebud Drill Hole File - Hole No. D-130-95
AUTHOR	C. Murchoff
DATE OF DOC(S)	1995
MULTI_DIST Y / (N?) Additional Dist_Nos:	
QUAD_NAME	Sulphur 7.5'
P_M_C_NAME (mine, claim & company names)	Rosebud Mine; Rosebud Project; Hecla Mining Co.; South Zone
COMMODITY If not obvious	gold silver
NOTES	Drill log; geology; assay; total depth 220' handwritten notes 4p.

Keep docs at about 250 pages if no oversized maps attached
(for every 1 oversized page (>11x17) with text reduce
the amount of pages by ~25)

SS: DD 5/29/08
Initials Date

DB: mah
Initials Date

SCANNED: NV Blue
Initials Date

Revised: 1/22/08

D-130-95 SOUTH ZONE/675 N

6000 1578 4010

Hecla MINING COMPANY

- ☐ quartz, chalcedony, silicification
- ☐ faults, fractures, joints
- ☐ FeO_X
- ☐ sulfide
- ☐ calcite, carbonate
- ☐ argillization, white clays
- ☐ propylitization
- ☐ potassic alteration
- ☐ chlorite, chloritic clays

ROSEBUD PROJECT
DIAMOND DRILL LOG

60001578

HOLE NUMBER	D-130-95	LOCATION	South Zone / 675N
PAGE	1 OF 4	NORTHING	2,203,741.608
DATE	10/26/95	EASTING	481,620.549
LOGGED BY	C. Muerhoff	ELEVATION	4677.294
SCALE	1" = 10'	AZIMUTH	123° (S57°E)
TOTAL DEPTH	220'	INCLINATION	+24° (downhole survey shot @ collar only)

REMARKS

Drilled from decline @ station 12 1/2

NW Drilling - Hagby On-ram 1000

NDBGM Core (2.2" diameter)

%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		0'-220 LBT 0'-33.0' Mixed interval of flow breccia > finely-laminated vfg ash flow. 0'-4' flow breccia w/ angular, argillized ash frags & large (≤1" long) elongated, argillized pumice fiamme floating in grey to slightly pink (K-alt) vfg groundmass. Flow foliation @ 5-10° to c.a. 4'-8.5'± conformable contact into planar to mod-convoluted laminated very fg ash flow. Light green/mod propylitic. Laminations @ 10° to c.a. 8.5'-33.0' Fault contact? into ash flow/flow breccia w/ v. angular argillized massive (or alt has destroyed texture) ash fragments > argillized, elongated pumice fiamme >> light green, large, strongly propylitized/strong argillized "massive" ash frags. Some exceeding core diameter in size. Crude orientation of frags & pumice @ 20° to c.a. Pinkish-grey vfg groundmass. 33.0'-137' Matrix-supported ash tuff breccia. 33.0'-72'(±) Monolithic breccia w/ light green, propylitized to mod-argillized v. finely laminated vfg ash tuff. Banding in clasts is often obscured by alteration, but pretty sure all clasts are of same composition. Clasts are ≤ ½" in diameter & sub-angular to locally rounded. Clast/groundmass ≈ 20/80. Light pink-grey vfg groundmass.	10 20 30 40 50		0'-33.0' Fracture sets @ 40°>20° to c.a. Set @ 40° contains either green soft clay or dark "sooty" pyrite + white clay on surfaces. (1-2/ft.). Set @ 20° contains white clay + green soft clay ± fg diss pyrite in clays. 8.5'-11.5' Fault zone? Core is extremely broken up - can't determine #s to c.a. 19' 3 parallel shears @ 40° to c.a. w/ strong slicks @ 25° to c.a. 33.0'-72'(±) 2 distinct fracture sets @ 65° & 30° to c.a. w/ white clay ± light green clay + pyrite on surfaces. (±1/2 ft.)	0'-33.0' Only very minor stringers of pyrite ± calcite @ 10° & 40° to c.a. 33.0'-72'(±) V. thin (<<⅛"), occasional (1/2-3 ft.) pyrite ± calcite stringers @ 65°(±) cut by pyrite ± calcite ± white clay stringers @ 0°-20° to c.a. Med-gr. diss. pyrite in breccia clasts which are cut by stringers.

ANALYTICAL DATA (opt)

FROM	TO	W	Au	Ag	Au2	~~Ag2~~ AuGrav
0'	4'	4'	<0.001	<0.02		
4'	8.5'	4.5'	<0.001	0.03		
8.5'	13'	4.5'	0.007	0.48		
13'	18'	5'	0.007	0.19		
18'	23'	5'	0.003	0.10	0.003	
23'	28'	5'	0.003	0.14		
28'	33'	5'	0.005	0.11		
33'	38'	5'	0.001	0.08		
38'	43'	5'	<0.001	0.06		
43'	48'	5'	0.001	0.07		
48'	53'	5'	0.001	0.07		

HOLE NUMBER D-130-95 PAGE 2 OF 4

REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	FROM	TO	W	Au	Ag	Au2	Au Grav
							53'	58'	5'	0.006	0.21		
							58'	63'	5'	0.042	0.23		
							63'	68'	5'	0.002	0.09		
		~72' - 113.7' Matrix-supported breccia continues, but now rapidly (conformably) grades in heterolithic breccia w/ light green "massive" sub-angular to sub-rounded ash frags, small, argillized, angular ash frags, small to locally large (≤ cave diameter), relatively unaltered planar-laminated ash flow frags & small, angular tan to pink (K-alt) ash frags; all floating in pink (K-alt) fragmental to fg glassy-looking groundmass (devitrified). Clast/matrix ≈ 15/85.	60 70 80 90 100 110 120		72' - 113.7' fracture sets @ 65° & 30° to c.a. continue w/ light green clay ± white clay ± calcite ± pyrite.	72' - 113.7' Marked increase in stockwork density. Pyrite ± calcite ± white clay stringers continue @ 65° & 0°-20° to c.a., but are now joined by strong set of calcite ± pyrite veinlets (up to 2" thick) @ ±45° to c.a. (Approx (1/ft). Minor diss fg pyrite in breccia groundmass. * calcite veins are coarsely crystalline.	68'	73'	5'	0.032	0.19		
							73'	78'	5'	0.569	11.54	0.327	1.340 repeat grav. 0.746
							78'	83'	5'	0.194	6.15		0.226
							83'	88'	5'	0.019	0.67		
						~97' - 113.7' nearly all breccia clasts are strong propylitized - light green clay.	88'	93'	5'	0.018	3.18		
						~97' - 113.7' breccia becomes carbonate-flooded w/ calcite replacing groundmass locally - overprinting strong K-alteration stockwork density increases downhole (especially stringers oriented @ ±65° to c.a.	93'	98'	5'	0.131	0.40		0.186
							98'	103'	5'	0.096	0.28		
							103'	108'	5'	0.016	0.14	0.014	
		113.7' - 137.0' past fault, heterolithic, matrix-supported breccia continues, but groundmass loses glassy appearance & nearly all clasts are bleached & argillized. Also begins to incorporate few rounded glassy flow breccia frags which are completely devitrified. Clast/matrix increases to ~ 50/50 past fault @ 113.7'.			113.7' 2" fault @ 35° to c.a. w/ rock frags & grey clay gouge - Minor displacement? 113.7' - 137.0' V. competent w/ dominant fractures @ 40° & 60° to c.a. w/ white & green clays on irregular surfaces	113.7' - 137.0' beyond fault, stockwork intensity dramatically decreases - orientations @ 40° & ±0° to c.a. persists. Lose all calcite veining & flooding.	108'	113.7'	5.7'	0.007	0.16		
							113.7'	118'	4.3'	0.002	0.15		
							118'	123'	5'	0.003	0.14		

HOLE NUMBER D-130-95 PAGE 3 OF 4

REC | RQD | LITHOLOGY | FT | GRAPHIC LOG | STRUCTURE | ALTERATION AND MINERALIZATION

coarsening-upward sequence ↓

~128', breccia clast size begins increasing → becomes clast-supported by 133' downhole w/ majority of clasts > cave diameter.

137.0'-168.2' Very fine-grained, very finely planar to mildly-convoluted-laminated ash tuff. First few feet are brecciated → gradational conformable contact with tuff breccia. Laminations are extremely subtle - distinguishable by preferential propylitization/chloritization along flow planes. Generally light grey to light green in color. Foliation @ 50° to c.a.

~162', begin to pick-up thin interbeds of med-grain ash tuff.

~168', moderate brecciation of laminated ash tuff w/ little to no rotation of clasts; pink, K-altered fragmental groundmass.

168.2'-180.7' fine-to-medium grain tuff conformably grades into flow-laminated, pumice-rich(?) weak "leopard-skin tuff textured ash flow. Banding @ 60° to c.a. Elongated pumice(?) fiamme propylitized in K-altered fg ash groundmass. Moderate silica overprinting of groundmass. Short intervals of brecciation/vugs → filled with white clay ± Ag-salts(?!).

180.7'-194.3' Conformable contact → propylitized to bleached vfg ash flow tuff w/ flow foliation @ 60° to c.a. ± 10% totally chloritized (phenos?). Mild flow auto-brecciation & random hairline stockwork of green clay + chlorite + pyrite stringers. Thick (≤ 1") calcite + pyrite veinlets along foliation planes (±60° to c.a.)

130 140 150 160 170 180 190

137.0'-168.2' fracture sets @ 60°±30° to c.a. 60° fractures contain chlorite + calcite + pyrite on surfaces (~ 1/2ft); 30° set contains chlorite + calcite but little or no pyrite (~1/5 ft.)

168.2'-180.7' strong fracture set @ 30° to c.a. (± 2/ft.) w/ white clay + pyrite ± marc ± ruby Ag (pyrargyrite?)

180.7'-194.3'

133'-134' groundmass of breccia is nearly entirely composed of pyritic chlorite/chloritic clay. Not fault gouge.

137.0'-168.2' Dense stockwork of calcite + chlorite + pyrite stringers along bedding planes, @ 60° to c.a., @ ±0° to c.a. & random "spider-web" pattern. Short intervals of brecciation/cemented by calcite. ± white clay.

stockwork density increasing downhole ↓

168.2'-180.7' Random stockwork of pyrite + white clay ± grey chalcedony ± chlorite. A distinct stringer orientation of pyrite + white clay @ ±0° to c.a. Also white clay + Ag-salts (coarse-gr. pyrargyrite) ± chalcopyrite ± pyrite? ± marc? veins (≤ 1/8") @ 30° to c.a. looks like Ag-salts may be coating marc blades.

180.7'-194.3' see lith comments

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	~~Au2~~ AuGrav
123'	128'	5'	0.005	0.08		
128'	133'	5'	0.004	0.09		
133'	137'	4'	0.001	0.09		
137'	142'	5'	0.002	0.10		
142'	147'	5'	0.004	0.17		
147'	152'	5'	0.040	0.55	0.043	
152'	157'	5'	0.023	1.10		
157'	162'	5'	0.008	0.58		
162'	168.2'	6.2'	0.033	1.18		
168.2'	173.8'	5.6'	0.072	6.68		
173.8'	180.7'	6.9'	0.756	13.97		0.704
180.7'	185'	4.3'	0.131	0.78		0.149
185'	190'	5'	0.019	1.05		

HOLE NUMBER D-130-94 PAGE 4 OF 4

REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		194.3'~216' vfg ash tuff grades into heterolithic breccia with large (up to core diameter in size) angular fragments of preceding interval & light green glassy-textured flow breccia fragments (w/ internal spherical textures); now completely devitrified. Matrix-supported to ~200' by pervasively silica-flooded, light grey vfg groundmass (not chalcedonic), then clast-supported in strongly chloritized vfg groundmass w/ only minor intervals of silica-flooding (in groundmass only). ~216'-220' breccia grades into medium-grained tuffaceous ash flow w/ weak flow foliation @ 30° to c.a. Light green (mild propylitization) w/ argillized feldspars.	200 210 220	T.D. 220'	194.3'-220' occassional fractures/joint sets @ 40° & 60° to c.a. w/ chlorite ± calcite ± pyrite. 203'-207' core is split by fracture/fault @ ±0° to c.a. - very irregular w/ v. rough surface coated by light green clay ± chlorite ± calcite ± large euhedral pyrite.	194.3'-220' V. randomly oriented thin stockwork of chlorite ± pyrite ± calcite. Wanes with depth.

ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	Ag2
190'	194.3'	4.3'	0.003	0.29	0.003	
194.3'	200'	5.7'	0.003	0.15		
200'	205'	5'	0.002	0.09		
205'	210'	5'	0.005	0.08		
210'	215'	5'	0.004	0.07		
215'	220'	5'	0.004	0.10	.	