60001544

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-96-95
AUTHOR	C. Muerhoff; S. King
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 140' handwritten notes 5p.

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: JV Blue
Initials Date

Revised: 1/22/08

D-96-95 south zone - 975N

60001544 4010

60001544

Hecla MINING COMPANY

- faults, fractures
- FeO_x
- sulfide
- qtz, silicification
- calcite, carbonate
- argillization
- propylitization
- potassic alteration
- chlorite, chloritic clays

ROSEBUD PROJECT
DIAMOND DRILL LOG

HOLE NUMBER	D-96-95	LOCATION	South Zone Chimney	REMARKS	
PAGE 1 OF 3		NORTHING	2,203,980.538	Drilled from decline @ 975N (station 18½)	
DATE	10/7/95	EASTING	481,797.928	Hagby On-Ram 1000 - NW Drilling.	
LOGGED BY	C. Muerhoff	ELEVATION	4651.366	NBDGM core (2.2" diameter)	
SCALE	1" = 10'	AZIMUTH	123.5° (S56.5°E)		
TOTAL DEPTH	140'	INCLINATION	+12° (downhole collar survey only)		

LITHOLOGY

0'-140' LBT

0'-22.8' Heterolithic volcanic breccia. Matrix-supported with large to small (> core diameter to mm in size) sub-angular to angular clasts of green propylitized f.g. planar-laminated ash flow tuff, tan "massive" ash flow, & "Bud-looking" lithic/lithic tuff bxa in medium-grained to fragmental lithic-rich tuffaceous groundmass.

22.8'-32.1' Sharp contact @ 40° to core axis into light green to grey massive ash flow - v.f.g. flow bxa. Looks glassy in places, but really altered to clays - cuts easily w/ knife.

32.1'-65.9' Ash flow continues, but highly variable:

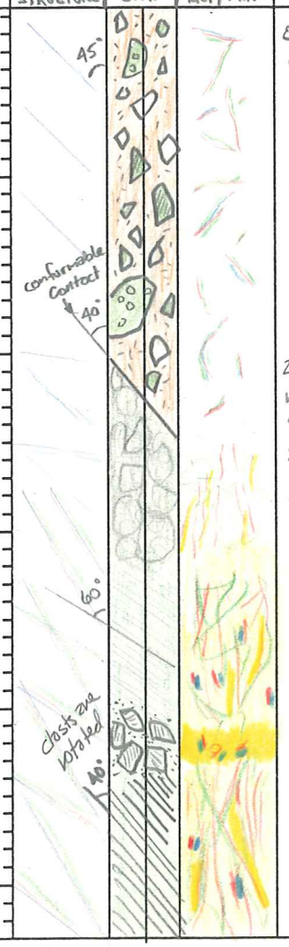
@ 32.1', begin to identify vague flow foliations - planar laminated @ ± 60° to core axis. Bedding planes become much more distinct with depth.

@ 40', planar-laminated ash flow becomes strongly brecciated w/ angular fragments matrix-to-clast supported in dark green to grey fragmental groundmass. (Fault bxa?)

@ 43.5', abupt change back to distinctly planar laminated ash flow. Alternating f.g. & medium-grain beds. Beds @ 40° to core axis.

FT

GRAPHIC LOG



STRUCTURE

0'-22.8' Core is extremely competent with only 3 fractures @ 45° to core axis over entire interval. Filled with light green "massive" waxy clay.

22.8'-32.1' Widely spaced minor fractures @ 50° & 80° to core axis w/ light green clay ± calcite.

32.1'-65.9' Two distinct fracture sets @ 30° & 50° to core axis. Coated w/ white clay + calcite + pyrite + chlorite.

silicification is weak to moderate, but pervasive & strong from 40' to 43.5'.

ALTERATION AND MINERALIZATION

0'-22.8' Groundmass is weakly to moderately hematitic. Propylitized ash flow fragments contain ± 2% fg pyrite. Entire interval cut by v. thin chlorite + pyrite ± calcite discontinuous stockwork. @ 17½', 6" of breccia matrix consists of calcite + pyrite.

22.8'-32.1' ash flow cut by thin, discontinuous, "spider-web" of chlorite veinlets which are cut by occassional qtz + sulfide veinlets; all cut by up to ⅛" fg pyrite veinlets generally @ 0'-20° to core axis.

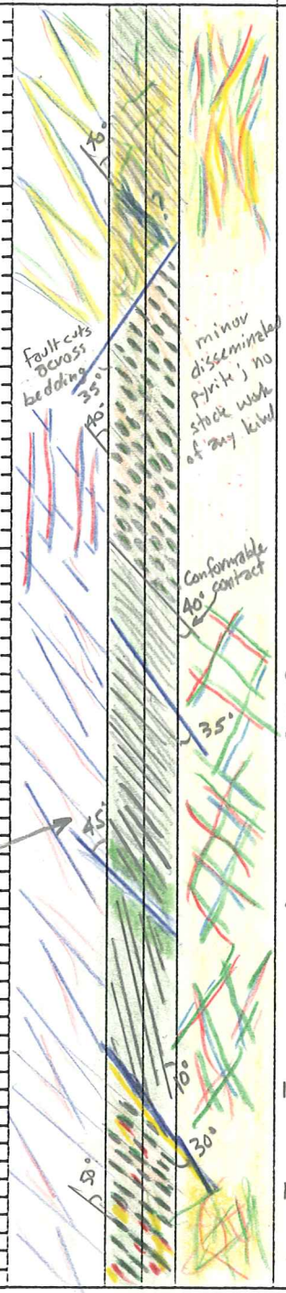
↓ continues, s.a.a., but now much more intense. Where brecciated, often filled w/ white clay + euhedral pyrite xtals + subhedral calcite xtals.

Silicification overprints propylitization.

ANALYTICAL DATA

FROM	TO	W	Au (opt)	Ag (opt)	Au2 (opt)	~~Ag2~~ Au Grav (opt)
0'	5'	5'	0.013	0.11		
5'	10'	5'	0.004	0.07	0.003	
10'	15'	5'	0.005	0.06		
15'	20'	5'	0.008	0.08		
20'	22.8'	2.8'	0.004	0.07		
22.8'	28'	5.2'	0.015	0.03		
28'	32.1'	4.1'	0.002	0.04		
32.1'	36'	3.9'	0.032	0.11		
36'	40'	4'	0.265	0.26		0.299
40'	43.5'	3.5'	0.110	0.38		0.111
43.5'	48'	4.5'	0.291	0.43		0.291
48'	53'	5'	0.212	0.31		0.170

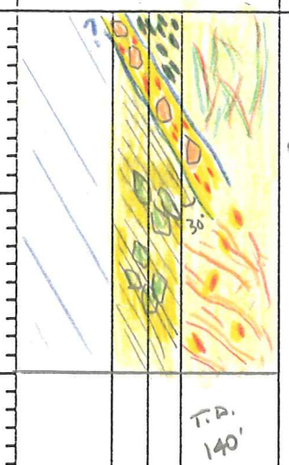
HOLE NUMBER D-96-95 PAGE 2 OF 3

%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		~53', brecciation of planar-laminated ash flow increases dramatically – no rotation of clasts / more of a crackle breccia. 65.9'-81.9' Faulted into "Leopard-skin tuff". Altered pumice-rich tuff w/ flow laminations @ ±40° to core axis. Pumice frame are replaced by light green waxy clays & rimmed by chloritic clays. Rock mass displays hematitic to propylitic to locally argillic alteration. (Doesn't look like high-grade LST.) 81.9'-109.5' Sharp, conformable contact (40° to c.a.) from LST into planar-laminated ash flow tuff with alternating thin "beds" of fine- & medium-grained ash tuff. @ 90.6'-93.6' begins to take on subtle look of LST @ 97.8' beds suddenly change to 30° to core axis – conformable & steepen as fault is approached. ±10° to core axis @ end of interval. 109.5'-122.9' Faulted into silicified (overprinting argillization & propylitization) medium-grained planar-laminated tuff. Resembles LST w/ leached frame(?) replaced by chlorite. "Bedding" generally @ 50° to core axis. Becomes brecciated @ depth. * Not the same unit as 65.9'-81.9'	60 70 80 90 100 110 120		mineralization (at right) also occurs along fractures @ 30° & 50° to core axis. 62'-62.5' Healed fault? rotated ash fragments healed with silica + calcite + pyrite + chlorite + white clays. ± 40° to core axis? Bedding plane fault? 65.9'-81.9' fracture sets @ 35°-40° to core axis w/ light green waxy clays & @ parallel to core axis; sheared with abundant smeared fg "brassy" colored pyrite, ± minor chalcopyrite. 81.9-109.5 fracture sets @ 30° to core axis & along bedding planes. 86.6' fault @ 35° to core axis w/ green & white clay 99.7' fault healed with massive white clay. 45° to core axis. 109.5' Fault (30° to core axis?) healed by qtz + white clay. 109.5'-122.9' Fracture sets @ 30° & 50° to core axis w/ white clay ± pyrite.	s.a.a. ↓ @ 53', silicification begins to increase. Core becomes vugy w/ drusy qtz coated w/ coarse-grained "brassy" pyrite + white clays. 65.9'-81.9' See lithology & structure comments. 81.9'-109.5' abundant chlorite & chlorite + pyrite + clay ± calcite veinlets along bedding planes & ⊥ to bedding planes. Entire core is propylitized to weakly argillized; Overprinted by weak to moderate silicification to ~96'. 85'-90' drusy qtz in vugs; abundant thick veinlets of fg "brassy" colored pyrite. @ 97.8'-100.5' tuff is pervasively intensely propylitized → related to fault @ 99.7'. 109.5'-EOH – Intermittently silicified & vugy w/ white clay, drusy qtz & pyrite (replacing or coating large marcasite blades). Abundant chlorite & pyrite stringers.

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	[redacted]
see	previous	page				Au Grav
53'	57'	4'	0.330	0.43		0.346
57'	61'	4'	0.320	0.82		0.334
61'	65.9'	4.9'	0.929	1.18		1.060
65.9'	71'	5.1'	0.188	0.64		0.229
71'	76'	5'	0.018	0.09		
76'	81.9'	5.9'	0.078	0.43		
81.9'	86'	4.1'	0.111	0.22		
86'	90.6'	4.6'	0.031	0.08		
90.6'	93.6'	3'	0.004	0.09		
93.6'	99.7'	6.1'	0.007	0.07		
99.7'	105'	5.3'	0.007	0.06		
105'	109.5	4.5'	0.006	0.05		
109.5'	114'	4.5'	0.018	0.09		
114'	119'	5'	0.019	0.07		

HOLE NUMBER D-96-95 PAGE 3 OF 3

% REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		122.9'-124.9' Silica-healed fault / fault bxa? Pervasive silicification → silica replacement; vugy w/ drusy qtz + marcasite ↔ pyrite blades. Sub-angular ash fragments completely altered to white clay. Zone appears to be roughly @ 30° to core axis. 124.9'-140' Medium-grained tuff continues w/ zones of strong brecciation healed by grey chalcedony. Bedding generally @ 30° to core axis.	130' 140'		past 124.9', fracture set @ 30° ± to core axis. no mineral on fracture surfaces.	past 124.9' zones of intense silicification, Vugy w/ drusy qtz & fg pyrite. Vugs are "rimmed" w/ white clay or yellow "chuck's butter" clay. White clay & pyrite stringers generally @ 50° to core axis

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	Ag2
119'	122.9'	3.9'	0.013	0.03		
122.9'	124.9'	2'	0.012	0.05		
124.9'	130'	5.1'	0.003	0.05		
130'	135'	5'	0.002	0.04		
135'	140'	5'	0.004	0.06		

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT : SP036054

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HECLA MINING CO.

COPIES TO : CHARLIE MUERHOFF
:
:
:

CLIENT REFERENCE No: D-96-95 RECEIVED : 18 OCT 1995

No. SAMPLES : 31 REPORTED : 26 OCT 1995

MAIN SAMPLE TYPE : DRILL CUTTINGS

ANALYSIS	ANALYTICAL METHOD	QUALITY PARAMETER	UNIT	DETECTION
Au(OZ)	FA60	15%	OPT	0.001
Au(RZ)	FA60	15%	OPT	0.001
AuGRAV	GRAV	15%	OPT	0.001
Ag(OZ)	D210	10%	OPT	0.02

SIGNATORY : Sue King M.S.

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT : SP036054

American Assay Laboratories

CLIENT : HECLA MINING CO.
PROJECT : ROSEBUD
REFERENCE : D-96-95

REPORTED : 26 OCT 1995

SAMPLES	Au(OZ) FA60 OPT	Au(RZ) FA60 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
D-96-95 00-05	0.013			0.11
D-96-95 05-10	0.004	0.003		0.07
D-96-95 10-15	0.005			0.06
D-96-95 15-20	0.008			0.08
D-96-95 20-22.8	0.004			0.07
D-96-95 22.8-28	0.015			0.03
D-96-95 28-32.1	0.002			0.04
D-96-95 32.1-36	0.032			0.11
D-96-95 36-40	0.265		0.299	0.26
D-96-95 40-43.5	0.110		0.111	0.38
D-96-95 43.5-48	0.291		0.291	0.43
D-96-95 48-53	0.212		0.170	0.31
D-96-95 53-57	0.330		0.346	0.43
D-96-95 57-61	0.320		0.334	0.82
D-96-95 61-65.9	0.929		1.060	1.18
D-96-95 65.9-71	0.188		0.229	0.64
D-96-95 71-76	0.018			0.09
D-96-95 76-81.9	0.078			0.43
D-96-95 81.9-86	0.111			0.22
D-96-95 86-90.6	0.031			0.08
D-96-95 90.6-93.6	0.004			0.09
D-96-95 93.6-99.7	0.007			0.07
D-96-95 99.7-105	0.007			0.06
D-96-95 105-109.5	0.006			0.05
D-96-95 109.5-114	0.018			0.09

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ANALYSIS REPORT : SP036054

American Assay Laboratories

CLIENT : HECLA MINING CO.
PROJECT : ROSEBUD
REFERENCE : D-96-95

REPORTED : 26 OCT 1995

SAMPLES	Au(OZ) FA60 OPT	Au(RZ) FA60 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
D-96-95 114-119	0.019			0.07
D-96-95 119-122.9	0.013			0.03
D-96-95 122.9-124.9	0.012			0.05
D-96-95 124.9-130	0.003			0.05
D-96-95 130-135	0.002			0.04
D-96-95 135-140	0.004			0.06