60001557

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-109-95
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 1416' handwritten notes 7 p.

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-109-95

SOUTH ZONE / 850 N

60001557 4010

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

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Hecla MINING COMPANY

ROSEBUD PROJECT DIAMOND DRILL LOG

HOLE NUMBER	D-109-95	LOCATION	South Zone / 850N	REMARKS	
PAGE 1 OF 3		NORTHING	2,203,872.628	Drilled from decline station 16	
DATE	11/3/95	EASTING	481,734.354	NW Drilling – Hagby Onram 1000	
LOGGED BY	C. Muerhoff	ELEVATION	4647.979	NDB6M Core (2.2" diameter)	
SCALE	1"=10'	AZIMUTH	collar: 121° (S59°E)	70': 122.5° (S57.5°E)	140': 122.5° (S57.5°E)
TOTAL DEPTH	146'	INCLINATION	collar: -60°	70': -60°	140': -60.5°

%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		0' – 146' LBT 0'-24.8' Matrix-supported, monolithic breccia with sub-rounded vfg ash clasts (<1mm – 2" in size) which display varying degrees of alteration: K-alteration → propylitization → moderate argillization; floating a very fine-grained tan to light pink groundmass. First few feet display subtle flow foliation (?) @ ±50° to c.a. (?) Also difficult to see clasts over first few feet as both groundmass & clasts are strongly K-altered → dark pink color/intense K-alteration of groundmass by end of interval. Local zones of silica flooding of groundmass. 24.8'-41.8' Chaotic breccia rapidly grades into extremely convoluted ash flow / flow breccia. Light brown to pink to dark pink (increasing K-alteration) fg to locally fragmental groundmass with convoluted, brecciated (mimics epiclastic soft-sed deformation) discontinuous bands of light green to moderately argillized vfg ash. Occassional reddish-brown angular vfg to aphanitic fragments caught up in groundmass (± 1/4" in diameter). Flow banding @ 40° to c.a at 25', but slowly changes to 60° by end of interval. 41.8'-49.4' Convoluted flow/flow breccia rapidly grades into tan vfg ash flow with extremely subtle flow foliation (only distinguishable by preferential chloritization/propylitization along foliation planes) @ ±70° to c.a.	10 20 30 40 50		0'-24.8' Fracture/joint set @50° to c.a. (~1/3 ft) w/ drusy quartz + large marc. blades ± grey clay on surfaces 24.8'-41.8' Widely-spaced fracture/joint set @ 50° to c.a. continues. Minor pyrite ± grey clay on irregular surfaces. -past 35', begin to pick up light green waxy clay on fracture/joint surfaces. Slicked @ 50° 41.8'-49.4 Widely-spaced fracturing (2/interval) @ 50° to c.a. persists w/ minor white to green waxy clay ± fg pyrite on planar surfaces.	0'-24.8' Stockwork/stringers with grey chalcedony along margins & pyrite in centers ± white clay. Typically @ ±50° to c.a. & cut by set @ 5-10° to c.a. (~3/ft.) Also, thin discontinuous "wisps" of white clay stringers. → High ∡ set locally vugy w/ open space pyrite ↔ wave on drusy qtz → packed by later white clay (halloysite?) -past 20', begin to pick up a few ± 1/4" light green waxy clay veinlets @ ± ⊥ to c.a. 24.8'-41.8' chalcedony + pyrite stringers wave quickly past 25' downhole. No pyrite + calcite ± white clay stringers & veinlets (up to 1/2" thick) dominate. 50°-60° to c.a. (3-4/ft.) Occassional pyrite ± chalcedony stringers @ ±5° to c.a. → Clearly cut by calcite stringers. 41.8'-49.4' Chlorite + pyrite ± calcite stringers @ varying orientation; 20°, 40°, & 70° to c.a. All appear contemporaneous. Propylitization bleeds ± 1/2" into wall rock outward from stringers.

ANALYTICAL DATA (opt)

FROM	TO	W	Au	Ag	Au2	Au grav ~~Ag2~~
0'	5'	5'	0.359	0.54		0.389
5'	10'	5'	0.041	0.22		
10'	15'	5'	0.344	0.51		0.385
15'	20'	5'	0.887	1.94		0.800
20'	24.8'	4.8'	0.319	2.68		0.315
24.8'	30'	5.2'	0.221	0.38		0.180
30'	36'	6'	0.014	0.14		
36'	41.8'	5.8'	0.011	0.08	0.013	
41.8'	49.4'	7.6'	0.002	0.03		

HOLE NUMBER D-109-95 PAGE 2 OF 3

REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		49.4'-55.2' Healed fault breccia. Ash flow frags (from preceeding unit) are angular & rotated → nearly clast supported in dark green waxy clay ± v. minor white illitic clay. Intensity of brecciation increases w/ depth. @55.2' Sharp fault contact @ 60° to c.a w/ 1/2" black, carbonaceous clay & ~1" rock flour/grey clay gouge.	60		49.4'-55.2' see lithology comments.	49.4'-55.2' see lithology comments.
		55.2'-60.7' Matrix-supported, monolithic breccia (not tectonic) with sub-rounded to sub-angular light green to bleached/moderately argillized fg "massive-textured" ash fragments in tan to fleshy-pink (k-alt) vfg to locally fragmental groundmass which has been pervasively silica-flooded.			55.2'-60.7' no fractures/joints in interval.	55.2'-60.7' Discontinuous, random stringers of light green, waxy clay. Dominant stockwork is grey chalcedony + pyrite ± calcite @
		60.7'-77.3' Vfg, tan ash flow with very subtle flow foliation @ ±45° to c.a (only discernible by preferential propylitization → chloritization along flow planes). Local zones of brecciation; clast-supported with little to no rotation of clasts & cemented by white clay > calcite ± chlorite ± fg pyrite.	70		60.7'-77.3' fracture set @ ±70° to c.a. (~1/ft.) with light to dark green waxy clay (no slicks) ± calcite ± minor grey clay ± fg pyrite.	60.7'-77.3' Strong dense stockwork of pyrite + chalcedony + white clay + chlorite ± calcite (white clays fizz a little w/ HCl) @ random ∠'s to c.a. Cut by later veinlets (≤1/4") of light green waxy clay. Where brecciated, clasts are moderately silicified.
		77.3'-146.0' Vfg ash flow grades into planar foliated (no distinct, sharp laminations) med-grained ash flow tuff. Looks like original color was tan/light brown, now ~2/3's moderately propylitically altered (light green in color). Bands of layered med-gr ash/pumice fiammé(?) are argillized or strongly propylitized. Flow banding @ 70° to c.a @ 80'; steepens to ±50° to c.a @ 100'.	80		77.3'-146' Consistent joint/fracture set @ 45'-50° to c.a. throughout entire interval. ~2/ft at beginning of interval → decreases to <1/ft by EOH.	
		alteration v. constant & consistent to EOH ↓	90		↳ 77.3'-100' clean, unmineralized, v. planar surfaces.	77.3'-114' Chlorite + pyrite stockwork preferentially @ 70° to c.a. & 0° (±10°) to c.a. Cut by later calcite + pyrite stringers @ ± 40° to c.a.
			100		↳ 100'-112' surfaces contain calcite + white clay (± FeOx staining) ± minor pyrite ± pyrite ↔ marc.	
			110		↳ 112'-EOH Green waxy clay ± pyrite ± chlorite on surfaces.	- between 110' & 114', a couple of short intervals of mild brecciation - cemented by calcite. → could not detect any carbonate past ~114'
		~117.3'-118' Short interval of matrix-supported breccia w/ rounded fragments of ash flow floating in dark red (FeO_x + K-alt?) fragmental groundmass. Doesn't look tectonic	120			

ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	~~Ag2~~ Au Grav
49.4'	55.2'	5.8'	0.001	<0.02		
55.2'	60.7'	5.5'	0.032	0.16		
60.7'	66'	5.3'	0.042	0.23		
66'	71'	5'	0.064	0.49		
71'	77.3'	6.3'	0.718	1.03		0.680
77.3'	82'	4.7'	1.300	1.19		1.480
82'	87'	5'	0.564	0.29		0.480
87'	92'	5'	0.005	0.06		
92'	97'	5'	0.008	0.08		
97'	102'	5'	0.004	0.06		
102'	107'	5'	0.011	0.09		
107'	112'	5'	0.022	0.10		
112'	117'	5'	0.015	0.04		
117'	122'	5'	0.006	0.07		

HOLE NUMBER D-109-95 PAGE 3 OF 3

REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2	~~Ag2~~ AuGrav
		~125', grain size nor alteration changes, but grades into a more massive ash flow tuff (lose flow foliation)	130		~120', pick up another fracture set @ ±35° to c.a. (appears to cut set @ 45°-50°) w/grey clay ± white clay ± fg pyrite ± light green waxy clay → no slicks (~1/2ft.)	114'-EOH stockwork density diminishes downhole. Mainly chlorite + pyrite ± chalcedony ± white clay stringers. Preferentially @ 60° to c.a.	122'	127'	5'	0.015	0.18		
		~140' ash (or pumice fiammé) fragments double in size to ~ 2-3 mm.	140			~125'-128 A couple of short (≤4") intervals of brecciation - cemented by grey chalcedony (sulfide-poor).	127'	132'	5'	0.028	0.16		
						~132'-135' A couple of short intervals of brecciation - cemented by white massive waxy clay.	132'	137'	5'	0.013	0.06		
						↳ two(2) weird clay veins 4" & 2" thick @ 50° to c.a. Is this strangely altered calcite? (Doesn't fizz at all) Definitely looks veined as it incorporates fragments of surrounding ash flow. Texture is massive, featureless, waxy/soapy to the touch. What the hell is this? ↓ feldspar vein completely altered to clay?	137'	142'	5'	0.021	0.14		
				T.D. 146'			142'	146'	4'	0.235	0.57		0.250

HECLA MINING COMPANY - ROSEBUD PROJECT
1995 SOUTH ZONE FILL-IN DRILLING PROGRAM

Date: 11/3/95

HOLE ID: D-109-95

By: C. Muerhoff

Sample ID	Description	Mass (g)	H2O Level (cc)		Displacement (cc)	Sp. Grav. (g/cc)
			Beginning	Ending		
7.6'-7.9'	fg K-altered ash flow/flow bxa	490.2	1070	1275	205	2.39
22.8'-23.1'	pink-matrix monolithic breccia	537.4	1275	1580	305	1.76 ?
41.8'-42.1'	planar-laminated fg ash	614.3	1580	1820	240	2.56
50.6'-51.1	clast-supported heterolithic bxa	901.6	1260	1620	360	2.50
70.4'-70.8	vfg massive ash tuff w/ abund. sitkuk	860.1	1620	1950	330	2.61
100.6'-100.9	flow-banded/foliated fg ash	518.1	1280	1485	205	2.53
136.5'-136.8'	med-gr. tuffaceous ash	526.7	1485	1695	210	2.51

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP036446

American Assay Laboratories

P.O. BOX 11530
RENO, NV,,USA
Ph.1-702-356-0606, Fax.1-702-356-1413

HECLA MINING CO.

COPIES TO : CHARLIE MUERHOFF

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CLIENT REFERENCE No: D-109-95 RECEIVED : 14 NOV 1995

No. SAMPLES : 28 REPORTED : 22 NOV 1995

MAIN SAMPLE TYPE : DRILL CORE

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 SP036446

American Assay Laboratories

CLIENT : HECLA MINING CO.
PROJECT : ROSEBUD
REFERENCE : D-109-95

REPORTED : 22 NOV 1995

SAMPLES	Au(OZ) FA60 OPT	Au(RZ) FA60 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
D-109-95 00-05	0.359		0.389	0.54
D-109-95 05-10	0.041			0.22
D-109-95 10-15	0.344		0.385	0.51
D-109-95 15-20	0.887		0.800	1.94
D-109-95 20-24.8	0.319		0.315	2.68
D-109-95 24.8-30	0.221		0.180	0.38
D-109-95 30-36	0.014			0.14
D-109-95 36-41.8	0.011	0.013		0.08
D-109-95 41.8-49.4	0.002			0.03
D-109-95 49.4-55.2	0.001			<0.02
D-109-95 55.2-60.7	0.032			0.16
D-109-95 60.7-66	0.042			0.23
D-109-95 66-71	0.064			0.49
D-109-95 71-77.3	0.718		0.680	1.03
D-109-95 77.3-82	1.300		1.480	1.19
D-109-95 82-87	0.564		0.480	0.29
D-109-95 87-92	0.005			0.06
D-109-95 92-97	0.008			0.08
D-109-95 97-102	0.004			0.06
D-109-95 102-107	0.011			0.09
D-109-95 107-112	0.022			0.10
D-109-95 112-117	0.015			0.04
D-109-95 117-122	0.006			0.07
D-109-95 122-127	0.015			0.18
D-109-95 127-132	0.028			0.16

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP036446

American Assay Laboratories

CLIENT : HECLA MINING CO.
PROJECT : ROSEBUD
REFERENCE : D-109-95

REPORTED : 22 NOV 1995

SAMPLES	Au(OZ) FA60 OPT	Au(RZ) FA60 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
D-109-95 132-137	0.013			0.06
D-109-95 137-142	0.021			0.14
D-109-95 142-146	0.235		0.250	0.57