60001558

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-110-95
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 274' handwritten notes NOTE: Scan notes on front of folder 10p.

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)

	Initials	Date
SS:	DD	5/29/08
DB:	mah	
SCANNED:	NV Blue	

Revised: 1/22/08

D-110-95 SOUTH ZONE /850N

60001558 4010

$$\frac{PPB}{1000} \times 0.02916 = OPT \frac{1000}{0.02916}$$

PPB X PPB =

PPB = 34,293 OPT

100 PPB = 0.100 PPM X 0.02916

1000 PPB = 1 PPM = 0.02916 OPT Au

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

6006 1558

Hecla MINING COMPANY

ROSEBUD PROJECT
DIAMOND DRILL LOG

HOLE NUMBER	D-110-95	LOCATION	South Zone / 850 N	REMARKS	
PAGE 1 OF 5		NORTHING	2,203,871.945	Drilled from decline station # 16	
DATE	11/4/95	EASTING	481,735.522	NW Drilling - Hagby Onram 1000	
LOGGED BY	C. Muerhoff	ELEVATION	4651.880	NDBGM Core (2.2" diameter)	
SCALE	1"=10'	AZIMUTH	collar: 125° (S55°E)	140': 123° (S57°E)	270': 123° (S57°E)
TOTAL DEPTH	274'	INCLINATION	collar: -8.5°	140': -10°	270': -10°

%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		0'-274' LBT 0'-56' Matrix-supported nearly monolithic ash tuff breccia with light tan to bleached (mild argillization) sub-rounded to occassionally sub-angular fg ash clasts floating in light grey to fleshy pink (k-alt) fg to fragmental groundmass. Very rare dark brown angular vfg to nearly aphanitic fragments ~1/4" in size (see one about every couple of feet). Breccia clast size rarely exceeds 1/2"-3/4" in size. Interval includes short (≤1ft) intervals of fg to fragmental ash flow (i.e., breccia groundmass w/o the clasts). Very subtle flow foliation @ ±45° to c.a. ↓ becoming heterolithic ↓ ~35', begin to pick up an occassional rounded fragment of convoluted-laminated ash flow tuff. ~40', begin to pick up a few light tan, aphanitic angular fragments.	10 20 30 40 50		0'-56' Interval is extremely competent; v. widely-spaced fractures/joints @ 20° & 65° to c.a. Set @ 20° are very planar with no mineralization or gouge on planar surfaces. Set @ 65° often with drusy quartz + pyrite ↔ marc blades ± grey clay (may just be drill-induced breaks along veins/stringers. (≤1/5ft.)	0'-15'(±) Strong stockwork @ 55°-60° to c.a. Dark grey to black chalcedony + pyrite + marcasite ± yellowish-brown clay. Often open-space/vugy with the pyrite ↔ marc blades cemented by drusy qtz. (4.5/ft.). - past 15'(±) Stockwork density increases to ~10/ft. Same mineralogy as above, only now just rarely vugy & occurring @ random ∠s to c.a. in addition to 50°-60° to c.a. Set @ 50°-60° appear to cross-cut all others. Continues to end of interval. ↓ Potassic alteration increasing in intensity w/depth ↓

ANALYTICAL DATA (opt)

FROM	TO	W	Au	Ag	Au2	Au Gravy
0'	5'	5'	0.299	0.92	0.299	0.270
5'	10'	5'	0.508	1.24		0.540
10'	15'	5'	1.690	3.44		1.650
15'	20'	5'	0.102	0.30		
20'	25'	5'	0.023	0.17		
25'	30'	5'	0.017	0.14		
30'	35'	5'	0.057	0.19		
35'	40'	5'	0.044	0.24		
40'	45'	5'	0.004	0.09		
45'	50'	5'	0.009	0.10		

HOLE NUMBER D-110-95 PAGE 2 OF 5

REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		@ 50'-56' breccia clasts become rare; strongly K-altered fg ash (matrix) displays subtle flow foliation @ 45° to c.a				50'-56' begin to pick up a few light green waxy clay stringers @ 70° to c.a. → cutting chalcedony + sulfide stockwork
		56'-97.8' Conformable contact into matrix-supported heterolithic breccia with angular, thinly-laminated propylitized to argillized ash fragments & light tan to fleshy-pink sub-rounded to sub-angular "massive" ash frags floating in a dark pink to tan vfg groundmass.	60		56'-97.8' s.a.a. Unit is extremely competent w/ only occassional fractures @ ±25° & ± 50° to c.a. Both fracture sets contain light green to white waxy clay + pyrite ↔ marcasite (c.g. to large blades on open fractures).	56'-97.8' Interval is intensely stockworked by grey to black chalcedony + pyrite + marcasite @ 55°, 30° & random ∡s to c.a. (>10/ft) Majority of interval has been re-brecciated & healed by above-mentioned mineralization, often vugy with calcite + white clay in vugs (however, can't find any calcite stringers).
			70			
			80			
			90			
		97.8' rapid, conformable gradational contact				
		97.8'-105.7' Pinkish-tan colored massive fg ash flow grading into mildly-convoluted laminated ash flow @ ±55° to c.a.	100		97.8'-105.7' Only fractures are along veinlets (drill-induced?)	97.8'-105.7' Entire interval is moderately silica-flooded. Cut by (& locally brecciated by) grey chalcedony + c.g. pyrite + marc + talc white clay stringers/veinlets (some open-space) @ 60°-70° to c.a. (~2/ft.) up to 3/4" thick.
		105.7'-145'(±) gradational, conformable contact into matrix-supported heterolithic breccia. Dominant clasts are large (often exceeding core diameter) propylitized to argillized, thinly planar laminated angular ash fragments. Also sub-angular to sub-rounded, light green, completely devitrified glassy flow fragments + subangular, tan vfg to (con't)	110		105.7'-145' v. competent unit with widely-spaced (~1/10 ft.) fractures/joints @ 70° to c.a. Looks like white "gooey" clay on surfaces, but fizzes like crazy when HCl applied.	105.7'-145' v. minor stockwork of pyrite + grey chalcedony (often vugy) @ random ∡s to c.a. (2-3/ft.). Cut by calcite + pyrite + white clay stringers @ roughly 25° to c.a. (<1/ft.)
			120			

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	AuGray
50'	56'	6'	0.062	0.18		
56'	61'	5'	0.025	0.27		
61'	66'	5'	0.069	0.19		
66'	71'	5'	0.030	0.15		
71'	76'	5'	0.335	1.72		0.329
76'	81'	5'	0.328	0.49		0.296
81'	86'	5'	0.038	0.32		
86'	92'	6'	0.114	0.25		
92'	97.8'	5.8'	0.197	0.28		0.150
97.8'	102'	4.2'	0.682	0.83		0.630
102'	105.7'	3.7'	3.000	3.28		2.960
105.7'	110'	4.3'	1.200	1.87		1.260
110'	115'	5'	0.222	0.35		0.188
115'	120'	5'	0.254	0.46		0.240

HOLE NUMBER D-110-95 PAGE 3 OF 5

REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		(con't) nearly aphanitic fragments + small (≤ 1/4") angular totally argillized (replaced by clay) white fragments. All floating in a moderately to strongly K-altered vfg to locally fragmental groundmass. Clast size generally decreases with depth. ↓	130, 140		120.4' fault @ 60° to c.a. with 1/2" rock flour & white "powdery" clay gouge. No lithology change across fault.	- past fault @ 120.4' to ± 130', groundmass of breccia is pervasively silicified & locally brecciated & healed by grey chalcedony.
		145' - 158.7' Heterolithic breccia continues (as described above), but now clasts are distinctly flow-aligned. Also intervals (≤2') of thickly (≤1") flow-banded ash flow with convoluted "beds" of bleached white / argillized devitrified glassy ash alternating with K-altered fg / fragmental ash flow. 50° - 60° to c.a.	150		145' - 158.7' Minor, infrequent (<1/5 ft.) fractures @ ±75° to c.a. with light green waxy clay + pyrite on irregular surfaces.	145' - 158.7' Stockwork decreases in intensity. Minor pyrite + calcite + white clay stringers @ ± 35°-45° to c.a. Also minor, random chlorite + pyrite stringers.
		158.7' - 174.3' Healed fault zone? / Hydrothermally brecciated & healed contact? Sharp fault / fracture at 158.7' - 15° to c.a. with 1/4" light green rock flour + clay gouge. No slicks. Breccia with same clast lithology as described above except now nearly clast-supported in either pervasively silica-flooded fragmental groundmass or in grey, vugy chalcedony with large pyrite ↔ marcasite blades & minor white clay.	160, 170		158.7 - 174.3 See lith comments. Still not convinced this is a healed fault breccia. - 173' - 174.3' last foot or so has 5 parallel shears @ ± 40° to c.a. with light green clay on surfaces. Horse blocks are of following unit @ 174.3'	158.7 - 174.3' In addition to lith comments, silica-flooded breccia is cut by pyrite + chlorite + grey chalcedony ± white clay ± yellow "duck's butter" clay.
		* 174.3' - 205.5' (±) Light green (originally tan; now propylitized) vfg planar-laminated (flow bands are extremely subtle) ash flow. First 5 ft (±) display banding @ ± 45° to c.a., then remainder of interval is intensely brecciated (with some clast rotation) & healed by grey chalcedony & pyrite. Mainly clast-supported, but several intervals are matrix-supported (laminated ash frags floating in chalcedony.) Extremely vugy (con't)	180, 190		174.3' - 205.5' Intensely hydrothermally brecciated banded ash tuff is fractured @ 70° & 45° to c.a. Abundant white clay ± pyrite ± Ag-salts ± green clay on surfaces. (≤ 1/ft.)	174.3' - 205.5' In addition to lith comments, breccia is post-dated by pyrite + chlorite + white clay stringers; generally @ 50°-60° to c.a. & nearly 0° to c.a. (~10 ± 1/ft.)

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	AuGrav
120'	125'	5'	0.463	1.31		0.451
125'	130'	5'	0.075	0.54		
130'	135'	5'	0.149	0.37		0.136
135'	140'	5'	0.034	2.50		
140'	145'	5'	0.043	0.81		
145'	150'	5'	0.070	0.31		
150'	155'	5'	0.020	0.14		
155'	158.7'	3.7'	0.045	1.39		
158.7'	164'	5.3'	0.061	0.28		
164'	169'	5'	0.249	5.54		0.338
169'	174.3'	5.3'	0.370	9.57		0.383
174.3'	180'	5.7'	0.039	0.30		
180'	185'	5'	0.690	34.00		0.704
185'	190'	5'	0.797	27.90		0.729

REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		(con't) with chalcedony + drusy quartz + white clay + pyrite ± marcasite ± yellow "duck's butter" clay ± Ag-salts. Tuff is not silicified.				
		205.5'-236.5' fg, planar-laminated ash tuff grades into "wavy"-laminated ash tuff w/ alternating bands of tan vfg ash & argillized med-grain ash/pumice-rich bands. Flow banding @ 60° to c.a. Brecciation by grey chalcedony begins to decrease in intensity, but still quite strong – a few short intervals of chalcedony-matrix-supported brecciation, but no rotation of clasts.	200 210 220 230		205.5'-236.5' Interval is strongly fractured (2-3/ft) @ 40° & ±60° (bedding planes) to c.a. Chlorite + white clay + grey chalcedony + pyrite ± marcasite ± Ag-salts(?) on surfaces.	205.5'-236.5' Intense stockwork continues with vugy veinlets/stringers of chalcedony + chlorite ± drusy qtz + white clay + pyrite ↔ marcasite + abundant yellow "duck's butter" clay. First 5' of interval is extremely vugy with above mentioned mineralization. Post 210'(±) preferentially oriented @ ±20° to c.a. & along flow planes, but also randomly oriented. These veinlets cross-cut random chlorite + pyrite stringers.
		236.5'-249.0' Unit above continues, but now is intensely hydrothermally brecciated, with extremely argillized ash tuff frags floating in white → grey → deep black chalcedony. Only minor fg. pyrite visible in chalcedony. Where vugy, packed with yellow "duck's butter" clay.	240		236.5'-249.0' Post-hydrothermal brecciation fractures @ ± 40° to c.a. with chlorite + white clay ± pyrite on surfaces (~1/2ft).	236.5'-249.0 see lith comments.
		249.0'-254.0' Intensely argillized wavy-laminated ash tuff (same as 205.5'-236.5). Flow foliation @ 60° to c.a.	250		249.0'-254.0' Strongly fractured @ 45° & 60° (flow planes) to c.a. w/ chlorite + white clay + pyrite on planar surfaces. (~4/ft)	249.0'-254.0' Chlorite + light green clay + pyrite stringers @ 20° & ±60° to c.a. Set @ 20° post dates set @ 60°.
		254' – see next page.	260		-254.0 Sharp fracture contact @ 60° with 1/4" light green-grey clay gouge.	

ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2	AuGrav ~~Ag2~~
190'	195'	5'	1.510	28.00		1.480
195'	200'	5'	3.770	13.60		4.250
200'	205.5'	5.5'	0.350	27.80		0.330
205.5'	211'	5.5'	0.512	2.50		0.525
211'	216'	5'	0.312	1.01		0.385
216'	221'	5'	0.032	0.47		
221'	226'	5'	0.018	0.13		
226'	231'	5'	0.004	0.07		
231'	236.5'	5.5'	0.006	0.05		
236.5'	241'	4.5'	0.004	0.09		
241'	245'	4'	0.005	0.08		
245'	249'	4'	0.006	0.13		
249'	254'	5'	0.002	0.04		
254'	259'	5'	0.001	0.03		

HOLE NUMBER D-110-95 PAGE 5 OF 5

REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		254'-274' Heterolithic, clast-supported breccia. (Epiclastic pebble conglomerate? – could be Oscar seds?) Very small (≤ 1/4 max) volcanic fragments, mostly angular, of extreme variable lithology: tan aphanitic frags, propylitized to argillized fg ash frags, black argillite(?) chips, coarse ash/pumice frags; all dark green-grey vfg groundmass. Paylicles are crudely aligned @ ±45° to c.a.	270	T.D. 274'	254'-274 Only a couple of fractures in interval @70° to c.a. w/ minor light green clay on surfaces.	254'-274' Random white→grey chalcedony veinlets to ±260', then groundmass of breccia/conglomerate is either pervasively silica-flooded or silica-replaced. Vugy in a few spots with drusy quartz + white clay ± minor pyrite ↔ small mare blades. With the exception of the vugs, sulfides are noticeably absent from this interval. Late "spider-web" micro-stockwork of white clay.

If this is Tos, was the silicified breccia preceding this interval the South Ridge Fault?

ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	Ag2
259'	264'	5'	0.001	0.04		
264'	269'	5'	0.002	0.02		
269'	274'	5'	0.002	0.04		

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

Date: 11/4/95

HOLE ID: D-110-95

By: C. Muerhoff

Sample ID	Description	Mass (g)	H2O Level (cc)		Displacement (cc)	Sp. Grav. (g/cc)
			Beginning	Ending		
62.3' - 62.7'	pink matrix breccia ; monolithic & matrix-supported vugy w/ drusy qtz + sulfide + abundant white clay	597.3	1065	1315	250	2.39
101.1' - 101.5'	pink k-altered fg ash flow (massive to weakly foliated)	708.7	1315	1600	285	2.49
182.7' - 183.0'	planar-laminated ash tuff	621.0	1375	1620	245	2.54
214.6' - 215.0'	alternating bands of fg & med-gr. convoluted-laminated ash flow	614.1	1620	1880	260	2.36
223.7' - 224.0'	s.a.a. only brecciated & healed by white to yellow clays	569.2	1205	1440	235	2.42
246.4' - 246.8'	s.a.a. only intensely brecciated. Extremely vugy w/ chalc + sulfide + white clays.	622.5	1440	1700	260	2.39

nearly LST texture

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP036444

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
:
:
:

CLIENT REFERENCE No: D-110-95 RECEIVED : 14 NOV 1995

No. SAMPLES : 55 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 SP036444

American Assay Laboratories

CLIENT : HECLA MINING CO.
PROJECT : ROSEBUD
REFERENCE : D-110-95

REPORTED : 22 NOV 1995

SAMPLES	Au(OZ) FA60 OPT	Au(RZ) FA60 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
D-110-95 00-05	0.299	0.299	0.270	0.92
D-110-95 05-10	0.508		0.540	1.24
D-110-95 10-15	1.690		1.650	3.44
D-110-95 15-20	0.102			0.30
D-110-95 20-25	0.023			0.17
D-110-95 25-30	0.017			0.14
D-110-95 30-35	0.057			0.19
D-110-95 35-40	0.044			0.24
D-110-95 40-45	0.004			0.09
D-110-95 45-50	0.009			0.10
D-110-95 50-56	0.062			0.18
D-110-95 56-61	0.025			0.27
D-110-95 61-66	0.069			0.19
D-110-95 66-71	0.030			0.15
D-110-95 71-76	0.335		0.329	1.72
D-110-95 76-81	0.328		0.296	0.49
D-110-95 81-86	0.038			0.32
D-110-95 86-92	0.114			0.25
D-110-95 92-97.8	0.197		0.150	0.28
D-110-95 97.8-102	0.682		0.630	0.83
D-110-95 102-105.7	3.000		2.960	3.28
D-110-95 105.7-110	1.200		1.260	1.87
D-110-95 110-115	0.222		0.188	0.35
D-110-95 115-120	0.254		0.240	0.46
D-110-95 120-125	0.463		0.451	1.31

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP036444

American Assay Laboratories

CLIENT : HECLA MINING CO.
PROJECT : ROSEBUD
REFERENCE : D-110-95

REPORTED : 22 NOV 1995

SAMPLES	Au(OZ) FA60 OPT	Au(RZ) FA60 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
D-110-95 125-130	0.075			0.54
D-110-95 130-135	0.149		0.136	0.37
D-110-95 135-140	0.034			2.50
D-110-95 140-145	0.043			0.81
D-110-95 145-150	0.070			0.31
D-110-95 150-155	0.020			0.14
D-110-95 155-158.7	0.045			1.39
D-110-95 158.7-164	0.061			0.28
D-110-95 164-169	0.249		0.338	5.54
D-110-95 169-174.3	0.370		0.383	9.57
D-110-95 174.3-180	0.039			0.30
D-110-95 180-185	0.690		0.704	34.00
D-110-95 185-190	0.797		0.729	27.90
D-110-95 190-195	1.510		1.480	28.00
D-110-95 195-200	3.770		4.250	13.60
D-110-95 200-205.5	0.350		0.330	27.80
D-110-95 205.5-211	0.512		0.525	2.50
D-110-95 211-216	0.312		0.385	1.01
D-110-95 216-221	0.032			0.47
D-110-95 221-226	0.018			0.13
D-110-95 226-231	0.004			0.07
D-110-95 231-236.5	0.006			0.05
D-110-95 236.5-241	0.004			0.09
D-110-95 241-245	0.005			0.08
D-110-95 245-249	0.006			0.13

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP036444

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SAMPLES	Au(OZ) FA60 OPT	Au(RZ) FA60 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
D-110-95 249-254	0.002			0.04
D-110-95 254-259	0.001			0.03
D-110-95 259-264	0.001			0.04
D-110-95 264-269	0.002			0.02
D-110-95 269-274	0.002			0.04