60000820

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-17-94
AUTHOR	C. Wineteer; C. Muerhoff; S. Fairclath
DATE OF DOC(S)	1994
MULTI_DIST Y / (N?) Additional Dist_Nos:	
QUAD_NAME	Sulphur 7.5'
P_M_C_NAME (mine, claim & company names)	Rosebud Mine; Hecla Mining Co.; Rosebud Project South Zone
COMMODITY If not obvious	gold; silver
NOTES	Drill log; geology; assay; total depth 303'; receipts; handwritten notes; underground drilling 25p.

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 5/1/08
Initials Date

DB:
Initials Date

SCANNED:
Initials Date

Revised: 1/22/08

Underground Diamond Drill Hole D-17-94

6000 0820

6606 0820

Hecla MINING COMPANY

ROSEBUD PROJECT
DIAMOND DRILL LOG

HOLE NUMBER	D-17-94	LOCATION	South Zone	REMARKS	ORIENTATIONS STATED AS ± TO CORE AXIS; CORE PHOTOGRAPH'D; WHOLE CORE ASSAY SAMPLES; COLLAR LOC. DRILL STA. NO. 6; SECTION 350N
PAGE 1 OF	9	NORTHING	2203489.8		
DATE	8-8-94	EASTING	481414.7		
LOGGED BY	CBWINETEER	ELEVATION	4726.2		
SCALE	1"=5'	AZIMUTH	132.5		
TOTAL DEPTH	~~205~~ 302.5'	INCLINATION	+18.5°		

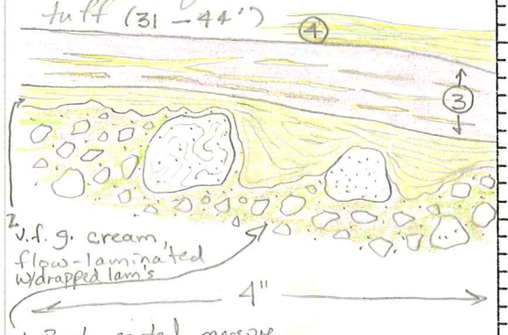
%REC	RQD	LITHOLOGY (HARDNESS / COLOR)	FT	GRAPHIC LOG (LITH / STR / ALT/MINZ)	STRUCTURE	ALTERATION AND MINERALIZATION
67	.09 2>4" .9	MOD HD – HD; Pale grn, H gry & pinkish tan: 0-2' silicified, crackle & veinlet tectonic breccia w/in f.g. flow-laminated, well-sorted tephra/tuff. 2-9.5 Fractured f.g. flow-laminated, massive and contorted laminated well-sorted tephra/tuff.	5		0-2' fault bx; laminations @50°; slicked-surfaces @55°;10° w/ R&G stx on 55° stx's smeared chl. + py	0-2' silicified, partial open-space Q ± abund. f. to med. g. yellowish py frac-coatings of chl + ill/smec/+py ± SiO_2 2-11' $CaCO_3$ + m.g. py @ 20°;70° – contemporaneous minor <1% ill. diss. f.g. cubic py <1%
75	.17 5>4" .19	pale grn frags in pinkish tan matrix: 9.5-31' Coarse-grained, poorly-sorted, massive-bedded, flow-laminated and flow-sheared lithic tuff breccia or tuff w/ a siliceous-taffaceous f.g. matrix & rounded, elongated, and contorted f.g. lithic (tephra/tuff) fragments; local flow-alignment of elongated lithic frags. Largely clast-supported, w/ local poss. matrix-supported.	10		crackle-fracture bx w/ partial open-space ± f.g. Q + smec/ill + Tr py frac/slicks @ 10-15°	11-14' $CaCO_3$ ± As py? stkwk ± smec/ill – discont. fragment ± Tr spl. 14-29.5' @55°;75° m.g. barren $CaCO_3$ ± f.g. minor cubic py 4/1 ft; weakly silic. groundmass. weak clay alt + diss py in clasts, diss. f.g. py Tr – 1%
88	.45 8>4"	MOD HD	15		17' slick post-$CaCO_3$ + py @30°	
			20			
			25			

ANALYTICAL DATA						
FROM	TO	W	(opt) Au	(opt) Ag	(opt) Au2	Ag2
0	2	2.0'	0.002	0.02		
2	6	4.0'	0.017	0.05		
6	10	4.0'	0.003	0.03		
10	15	5.0'	0.011	0.09		
15	20	5.0'	0.059	0.48	0.055 (grav)	
20	25	5.0'	0.015	0.78		

HOLE NUMBER D-17-94 PAGE 2 OF 8

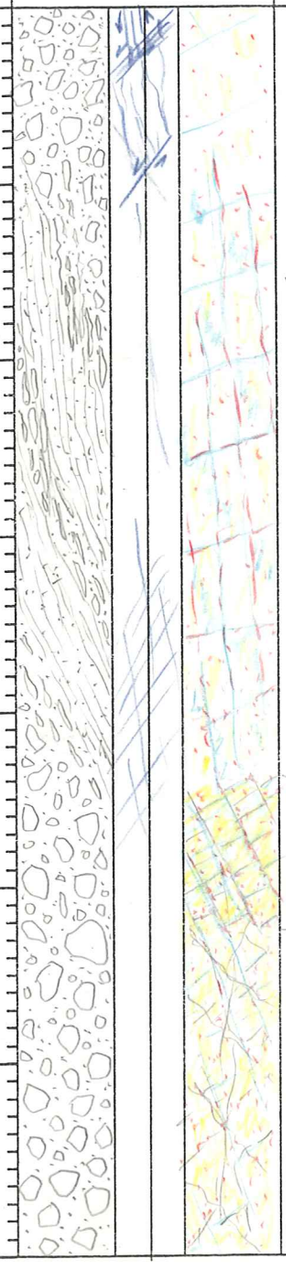
%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2	Ag2
	29	MOD HD; S.A.A.			24-26' Slicks @ 5' w/pale green clay gouge 26' slicked pale green clay gouge @ 45' 26-26.5' Fault bx w/ matrix of pale grn slicked clay gouge 26.5-29.6' pale green clay slicks @ 5-15' 29.6' green clay-slick @ 35'		25	30	5.0'	0.002	0.06		
97	.67 12>4"	Thinly banded pale grn, cream & pinkish tan	30		minor lamination parallel slicks w/ pale green clay gouge (thin)	29.5-47' weakly silic. g.m. w/ loc. pink $CaCO_3$ repl.; 5' & 75' sulf-rich stringers (tarnish platey sulf. + $CaCO_3$) 1-2, 3% cubic f.g. py	30	35	5.0'	0.025	0.47	0.025	
	39		35				35	40	5.0'	0.001	0.04		
90	.52 8>4"	Tan, pinkish grey matrix w/ elongated to equant frags of pale green laminated tuff.	40		S.A.A. w/ 35' microbx ± pale green clay gouge 44' depositional contact @ 10'		40	45	5.0'	0.006	0.13		
	49	MOD HD - HD	45			47-51' Increase in silic. of g.m. w/ minor SiO_2 reaction rims, clay + py alt. of clasts; incr. in $CaCO_3$ + py ↔ marc ± ill/smec at 30' & x-cut 60's. yellow tarnish diss. cubic py (w/ yellow tint) tr to 4% locally.	45	50	5.0'	0.017	0.29		
92	.72 6>4"		50				50	55	5.0'	0.024	0.29		
	54	Block labeled 51' Miss-placed, moved it 2' downhole				51-60' S.A.A. w/ less $CaCO_3$ veinlts & incr. ill/smec @ 50'							
84	.52 4>4'	31-44' Planar-laminated f.g. tephra/tuff. w/ interbedded lithic tuff 36-39' 44- Lithic tuff, poorly-sorted flow-laminated at base (44-50') massive-bedded ↓ matrix-supported	55 60				55	60	5.0'	0.058	1.11	0.069 (grzr)	

31-33' Contact between lithic tuff breccia below (9.5-33') and overlying, in part inter. bedded, flow-laminated tuff (31-44')

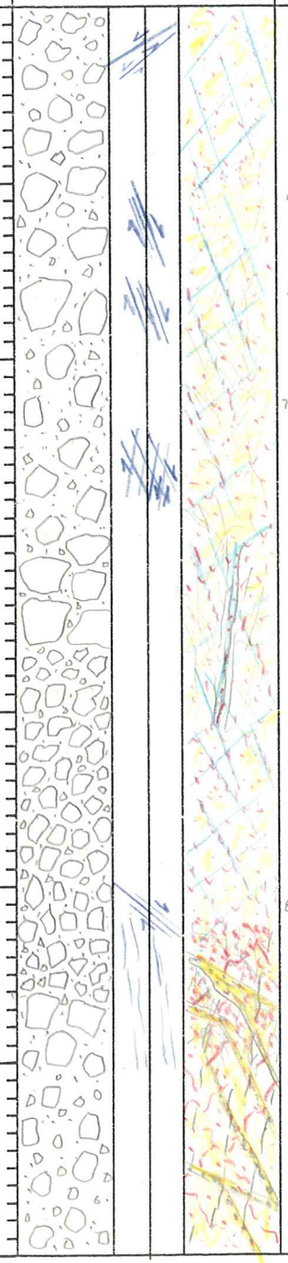


2. v.f.g. cream, flow-laminated w/drapped lam's

1. Poorly-sorted, massive bedded, lithic tuff
3. Pink f.g. siliceous planar-laminated tuff w/ elongated lamilli of cream v.f.g. tuff
4. v.f.g. pale green & cream, planar & wavy laminated tuff.



HOLE NUMBER D-17-94 PAGE 3 OF 8

%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
90	.67 10>4"	mod hcl / pinkish grey 60- Coarse-grained (clasts), poorly-sorted, clast-supported lithic tuff breccia w/ angular to subrounded ash to block size clasts comprised of massive & planar-laminated fine-grained tephra/tuff in a fine-grained siliceous matrix; massive-bedded.	65		post-py slicks @ 60' & 50' Tr spl ± cpy 65.5-66.5' post cht + py slicks w/ pale green clay gouge + microbx @ 20 67.5-69' S.A.A.	60-66.5' 1st order weak reaction rims w/ thin pink SiO_2 exterior & weakly arg. core ± cubic py-f.g. g.m. is mod. silic. w/ sulf. adj. to $CaCO_3$ vnlts $CaCO_3$ + f.g. cubic py @ 40' & 25' 3-5% v.f.g. diss. cubic py 66.5-79' 2nd order Δing to 3rd order ↓ reaction rims w/ SiO_2 → clay + py → SiO_2 $CaCO_3$ + f.g. py @ 20-35' & 40-60' ± smec/ill 3-5‰ v.f to f.g. diss cubic py g.m. mod. argillized + weakly silic.
88	.47 7>4"		70		72-75.5' slicks & microbx @ 10' & 25' post-sulf + carbonate	76-78' $CaCO_3$ + f.g. py ± bladed sulf w/ Tr exsolved pink electrum 77-80' @ 10' $CaCO_3$ + smec/ill + f.g. py
95	.54 7>4"	mod -78-88' Homogeneous clast-supported crackle bx w/ clast-rotation & rounding.	75			68-78' Weakly silic. clast-cores w/ thin clay + sulf rims or total clay + sulf. repl. of clasts. 70-79' 3rd order reaction rims SiO_2 SiO_2 78-88' weak clay + sulf. silic. g.m. weak to mod arg. of clasts 2-4% diss. f.g. py $CaCO_3$ + py @ 35-55' 88-98 SiO_2 flooded microbx vnlts @ 60' & 30' contemp. g.m. mod. arg. + mod. silic.; clasts mod. to intensely arg. ± silic ± sulf. 86-90' diss. cubic f.g. py 1 to +15% 90-98' 1-2% diss. f.g. py
89	.48 9>4"	MOD HP / greenish grey	80		85.7' post-sulf / $CaCO_3$ slicks @ 50' ↓ 90' high ∡ frac's ± microbx	SiO_2 flooded microbx vnlts x-cut discont. irreg. $CaCO_3$ + py; both $CaCO_3$ & SiO_2 stx's x-cut by late-stage high ∡ 0-10' smec/ill ± v.f.g. cubic py

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	Ag2
60	65	5.0'	0.044	1.02		
65	70	5.0'	0.105	0.25	0.119 (grav)	
70	75	5.0'	0.009	0.70	0.007	
75	80	5.0'	0.063	0.60	0.069 (grav)	
80	85	5.0'	0.007	0.10		
85	90	5.0'	0.003	0.06		
90	95	5.0'	0.002	0.08	0.003	

HOLE NUMBER D-17-94 PAGE 4 OF 8

%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		Mod Hd grnish grey			98-100' thin 4th order reaction rims clay → SiO_2 → clay + strong sulf → clay + sulf.	98-105 S.A.A. w/ bleached light grey color; mod. silic. gr. M.; clay alt'n of silic. clasts, Tr pyrr
		100-105 gradual transition from clast-supported to matrix supported lithic tuff breccia	100			99-103 Tr cpy ± spl in $CaCO_3$ py ↓↑ bladed (marc) on 30° smec/ill vnlts Reaction rims decr. ↓ py ± $CaCO_3$ stringers @ 30°; 60° late-stage ill/smec ± v.f.g. py irreg. wavy @ 30°
94	.60 11>4"		105			103-109' Mod. intense silic. of grnd m. w/ mod clay + sulf. alt. of clasts, loc. silic. of clasts.; 3-5% diss f.g. cubic py; $CaCO_3$ ± pyrr bladed marc/py @ 20-25° + 70° discont. irreg.;
			110		low % (0-15' to core) frac's w/ smec/ill + Minor $CaCO_3$ + v.f.g. py	109-118' loc. strong py-repl. of clasts; $CaCO_3$ + sulf microvnlt stkwk, silic g.m. + silic'd/or arg. clasts.; diss sulf. 1-10 + 15% cubic py
87	.38 7>4"	pale pinkish grey	115		113½-116' frac's + microbx & slicks @ 10°-15' 114-116' Tr spl + tabular elongated sulf.	$CaCO_3$ + py + v.f.g. tabular sulf ± spl. @ 10°; 80° contemp'l Tr cpy + Tr spl + Tr. pyrrh SiO_2 + py microvnlts
			120		118.5-119.5' S.A.A.	118-122' Sim. to above w/ < SiO_2 + > $CaCO_3$ stkwk c. xln $CaCO_3$ + > pyrr + < ill/smec. + < diss. sulf
					c. xln open-space $CaCO_3$	122-126 weak silic, $CaCO_3$ vnlt parallel to c. A. w/ white clay + v.f.g. bladed sulf (marc) in pseudomorphic repl. of feld open & salvages & chl ± py
95	.74 11>4"	126-132 Elongation of clasts w/ crude flow-alignment. Flow fabric @ 15-20°	125			126-127 Stk ill/smec ± $CaCO_3$
			130			127-136' weak to mod. silic g.m.; weak arg. alt + minor sulf. repl of clasts; $CaCO_3$ + sulf microveinlet stockwork @ 5; 60°; 30° 1 + 3% diss f.g. py; minor late-stage smec/ill ± $CaCO_3$ microvnlts @ 60°

ANALYTICAL DATA

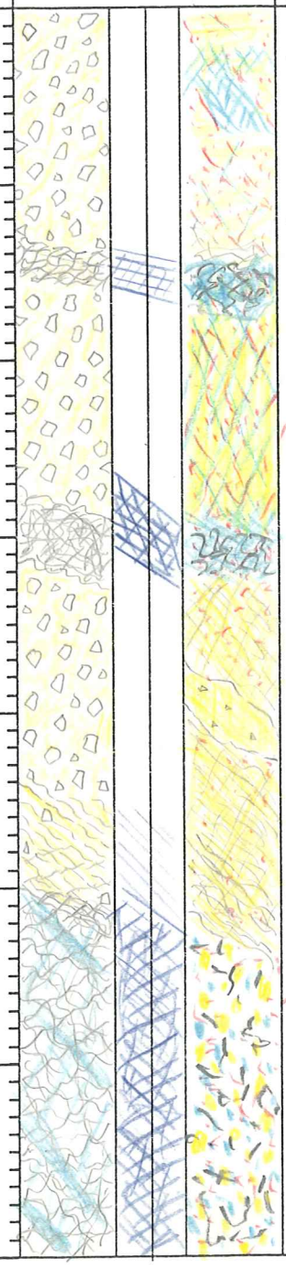
FROM	TO	W	Au	Ag	Au2	Ag2
95	100	5.0'	0.008	0.10		
100	105	5.0'	0.007	0.14		
105	110	5.0'	0.003	0.09		
110	115	5.0'	0.003	0.07		
115	120	5.0'	0.012	0.09		
120	125	5.0'	0.010	0.05		
125	130	5.0	0.005	0.05		

HOLE NUMBER D-17-94 PAGE 5 OF 9

%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
94	.83 12>4" 140	MOD HA → MOD SOFT – MOD Pinkish grey → pink matrix w/ pale grn-gry clasts	135 140		136–143 post-$CaCO_3$ + smec/ill + sulf slicks @ 80°, 20°	136–139 Frac'd – stkwk filling waxy smec/ill ± minor $CaCO_3$ intergrown w/ f.g. bladed sulf (py & ?) & marc.; granular f.g. late-stage $CaCO_3$ + py + Tr spl. minor; mod. silic. g.m. + 1–2% diss f.g. py.
93	.75 18>4" 150	144–148' Elongated, sheared, stretched flow-aligned fine-grained tephra/tuff clasts. Flow fabric @ 5–10° DRILLERS NOTE: HIT H_2O @ 150' 1 Qt?	145 150			139–143 Frac'd a.a. w/ $CaCO_3$ + f.g. py ± Tr py^{cc}; g.m. weak silic – mod org. alt.; clasts mod. intense org. alt.; smec/ill in clasts – unlt. frags
94	.75 12>4" 160	159.85–190' Hydrothermal SiO_2?-rich matrix w/ strongly argillized + sulfide replaced clasts, w/ superimposed tectonic brecciation as shown & described at right. Clasts appear to be all of same lith – f.g. massive bedded tephra/tuff, are generally small and are moderately sorted, highly angular; matrix-supported	155 160		w/ $CaCO_3$ vnlts f.g. py & bladed c. xln. sulf. 154–159.85' $CaCO_3$ / smec/ill silica flooded tectonic bx 159.85' 35° Contact w/ $CaCO_3$ healed tectonic bx + 164' w/ frac's @ 50–60° prim.	143 – 144.5' Mod. intense silic. of. g.m.; microhairline frac's w/ p.f.g. open-space Q → smec/ill → + $CaCO_3$ + f.g. py ± marc, + wk tannish. diss. sulf. cubic py 144.5 – 146.5 fraed w/ smec/ill filled stkwk. x-cutting late-stage $CaCO_3$ + py + cpy + Tr spl. @ 30°; g.m. mod. intense silic. / diss. 2–4% dis. morphic & distorted bright yellow p.g. 146.5 – 159.85 mod. intense g.m. silic. w/ clear, orange-red SiO_2 microhairline stkwk syn 5° to 70° $CaCO_3$ + sulf vnlts mod. org. + mod. sulf. of clasts + weak 2nd order reaction rims; diss. f.g. py 1–3%; smec/ill ± v.f.g. py 154–155'; 156–159.85 $CaCO_3$ a. xln ± chl – SiO_2 frags ± smec/ill ± open-space Q
86	.26 6>4"		165			159.85 – 163' Fragmental c. xln. $CaCO_3$ + smec/ill + Tr f.g. py; SiO_2-rich g.m. diss f.g. (10c. 25%) cubic, dimorph., distorted, twinned py-rons; g.m. to loc. org. alt.; Tr spl

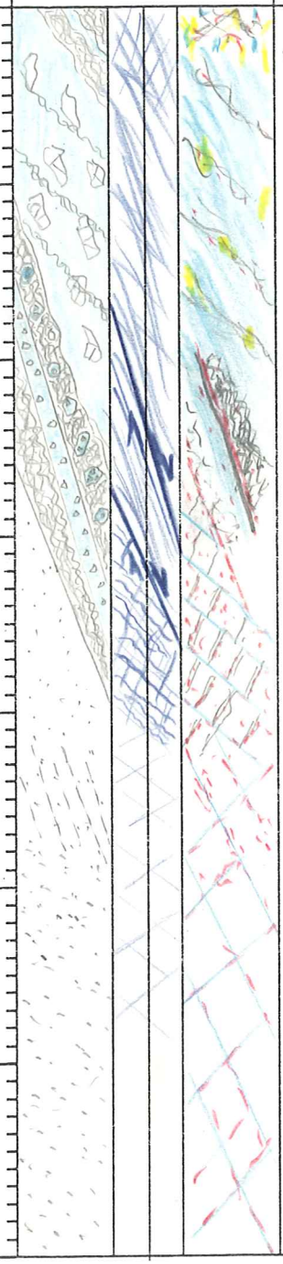
ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	Ag2
130	135	5.0'	0.003	0.05		
135	140	5.0'	0.011	0.05	0.011	
140	144	4.0'	0.006	0.06		
144	147	3.0'	0.006	0.07		
147	151	4.0'	0.002	0.04		
151	154	3.0'	0.004	0.05	0.004	
154	156	2.0'	0.006	0.06		
156	160	4.0'	0.003	0.05		
160	165	5.0'	0.005	0.06		

HOLE NUMBER D-17-94 PAGE 6 OF 9

%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
	170	mod-mod Hd / s.A.A.	170		167-168 C.g. open-space margin at 40°	$CaCO_3$ + f.g. py (at
87	.52 10>4" 179	vugs & mod / bleached pale grn-gy; mod-mod hd / pink matrix w/ pale grn to cream clasts	175		172-173.5' soft clay gouge w/ frac's @ 80° w/ late-stage c.g. open-space $CaCO_3$ ± minor f.g. py	163-172' mod. silic. g.m. w/ mod. arg. clasts + wk sulf.; C, xln $CaCO_3$ + py at margin & open-space @ 167-168'; minor $CaCO_3$ + py micro vnlts; 3-4% diss f.g. cubic py 172-173.5 as at left.
88	.56 8>4" 189	mod soft-mod / mod hd / mod soft-mod & mod hd (clay gouge, wall rx, & $CaCO_3$)	180		179-181' fault breccia w/ bounding 50° slicks w/ angular f.g. tuff frags in soft ill/smec + gouge + $CaCO_3$ matrix	173.5-179' mod. intense silic. g.m. mod intense arg. + sulf. alt. of clasts; $CaCO_3$ + f.g. py +/- bladed sulf. in stkwk, 2-5% diss. cubic f.g. py 179-181 as at left.
40	.00 8>4" 194	sanded Δing to bx'iated pinks, pale grn-gry & wht $CaCO_3$	185		187-190' Strong banding @ 40-50° of SiO_2 & arg. alt.	181-190' clean to med. gry-grn SiO_2 ± f.g. py stkwk in arg. g.m. & arg. + sulf. alt clasts. Silica stkwk Δing ↓ to flooded bx 183.5-185' gen. discont. $CaCO_3$ + py vnlts, 1-2% diss. f.g. py
50	.00 0>4" 197		190		190-201 Fault breccia largely healed w/ c.xln $CaCO_3$	190-210' fragmented - $CaCO_3$ + sulf & SiO_2 + sulf ± ill/smec ± sulf. f.g. py, loc. tarnished & c.g. bladed sulf. on frac & $CaCO_3$ surf's
61	.04 1>4"		200			

ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	Ag2
165	170	5.0'	0.009	0.03		
170	175	5.0'	0.010	0.05		
175	180	5.0'	0.003	0.03		
180	185	5.0'	0.004	0.04		
185	190	5.0'	0.002	0.04		
190	195	5.0'	0.004	0.06		
195	200	5.0'	0.005	0.06		

HOLE NUMBER D-17-94 PAGE 7 OF 89

%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
	205	S.A.A. s.a.a. Prim wht $CaCO_3$ w/ < pink & pale grn wall rx	205		201-210' c. x/n, late-stage $CaCO_3$ w/ subrounded frags of bx'iated tuff; $CaCO_3$ flooded fault bx which in turn contains tuff bx clasts.; loc post-c.g. $CaCO_3$ rubble-bx zones.	
93	.40 8>4"	Prim. v. pale green-grey	210		210-212' pale green fault clay (calcareous) w/ angular to rounded frags of silic. tuff, sulf-rich units, & $CaCO_3$ flooded bx (multiple movement)	←210-216
	215		215		212→ 0.25 – 0.4" med to dk grey sulf.-rich clay-gouge w/ razor sharp contact @ 15° w/ underlying med to lt grey $CaCO_3$-flooded fault bx. w/ rounded pale green clay alt. f.g. tuff. (212-213')	216-220 Minor late-stage $CaCO_3$ + f.g. py @ 50° x-cutting earlier smeared ill (waxy) + clotts segregated sulf. string at opposing 35° w/ tarnished yell cubic, dimorphic Py; mod. silic. g.m. 2-3% diss, f.g. Py ↓ 218'
89	.38 8>4"	MOD/mod MOD HD	220		213-216' granular-clay ground up f.g. tuff. @ 216' clayey sulf-rich grey clay at 20° Contact	
	225		225		216-221 stkwk fracs @ 55° & 25° w/ hairline pale green gouge clay faint lamination @ 20° 221-224'	224- ↓ bleached salvage/halo's on $CaCO_3$ vnlts @ 25-30, 50-60° Tr diss. f.g. py; silic. f.g. gr. m.
95	.76 11>4"	HD	230		224- on 65° & 20° stx cradle bx - healed w/ clay gouge ± $CaCO_3$	
	235		235			

216- Fine-grained, well-sorted, massive-bedded, crudely lamy siliceous, dense tuff. Dozer Tuff

ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	Ag2
200	205	5.0'	0.003	0.02		
205	210'	5.0'	0.010	0.17		
210	216	6.0'	0.036	0.36		
216	220	4.0'	0.002	<0.02		
220	225	5.0'	<0.001	<0.02		
225	230	5.0'	<0.001	<0.02		
230	235	5.0'	<0.001	<0.02		

3" of redrill

HOLE NUMBER D-17-94 PAGE 8 OF 9

%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2	Ag2
80	.41 7>4" 242	HD to mod HD; pale grnish gry	240		237-238 Faint lamination @ 25'; 238.5-242' planar lam at 10'	minor discont. smec/ill vnlts	235	240	5.0'	<0.001	<0.02		
88	.27 2>4" 245		245		prin. slicks @ 40' healed crackle to fault bx ↓ 260'	Minor smec/ill vnlts discont @ 70'	240	245	5.0'	<0.001	<0.02		
1" of REDRILL 89	.62 10>4" 255		250				245	250	5.0'	<0.001	<0.02		
							250	255	5.0'	<0.001	<0.02		
1" REDRILL 88	.63 10>4" 265		255				255	260	5.0'	<0.001	<0.02		
			260				260	265	5.0'	<0.001	<0.02		
		~~T.D. @ 265'~~ NOT	265				265	270	5				
			270										

HOLE NUMBER D-17-94 PAGE 9 OF 9

REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2	Ag2
		Fine grain lt gray dense Tuff minor glassy gsrt like clasts wk foliation @ 30	275 280 285 290 295 300 302.5 EOH		frac @ 20 frac @ 20	Minor calcite vn ± tr py, calcite on frac.	270	275	5				
							275	280	5				
							280	285	5				
							285	290	5				
							290	295	5				
							295	300	5				
							300	302.5	5				

Hecla MINING COMPANY

ROSEBUD PROJECT
DIAMOND DRILL LOG

HOLE NUMBER	D-17-94	LOCATION	
PAGE	1 OF 8	NORTHING	
DATE	8-8-94	EASTING	
LOGGED BY	CBWINETEER	ELEVATION	
SCALE	1"=5'	AZIMUTH	
TOTAL DEPTH	265'	INCLINATION	+20°

REMARKS: ORIENTATIONS STATED AS ∠ TO CORE AXIS; CORE PHOTOGRAPH'D; WHOLE CORE ASSAY SAMPLES; COLLAR LOC. DRILL STA. NO. 6; SECTION 350N

LITHOLOGY

%REC	RQD	HARDNESS / COLOR	LITHOLOGY	FT	GRAPHIC LOG (LITH / STR / ALT/MINZ)	STRUCTURE	ALTERATION AND MINERALIZATION
67	.09 2>4" 9	MOD HD – HD Pale grn, ltgry & pinkish tan	0-2' silicified, crackle ± veinlet tectonic breccia w/in f.g. flow-laminated, well-sorted tephra/tuff. 2-9.5 Fractured f.g. flow-laminated, massive and contorted laminated well-sorted tephra/tuff.	5		0-2' fault bx laminations @ 50° slicked-surfaces @ 55°±10° w/ R&G stx on 55° stx's smeared chl.+py	0-2' silicified, partial open-space Q ± abund. f. to med. g. yellowish py frac-coatings of chl+ill/smec/+py ± SiO2 2-11' CaCO3 + m.g. py @ 20°±70° - contemporaneous minor ∠ ill. diss. f.g. cubic py <1%
75	.17 5>4" 19	pale grn frags in pinkish tan matrix	9.5-31' Coarse-grained, poorly-sorted, massive-bedded, flow-laminated and flow-sheared lithic tuff breccia or tuff w/ a siliceous-taffaceous f.g. matrix & rounded, elongated and contorted f.g. lithic (tephra/tuff) fragments; local flow-alignment of elongated lithic frags. Largely clast-supported, w/ local poss. matrix-supported.	10 15 20		crackle-fracture bx w/ partial open-space ± f.g. Q + smec/ill + Tr py frac/slicks @ 10-15° 17' slick post-CaCO3 + py @ 30°	11-14' CaCO3 ± As py? stkwk ± smec/ill - discont. fragment ± Tr spl. 14-29.5' @ 55°±75° m.g. barren CaCO3 ± f.g. minor cubic py 1/ft; weakly silic. groundmass. weak clay alt + diss py in clasts. diss. f.g. py Tr-1%
86	.45 8>4"	MOD HD		25			

ANALYTICAL DATA

FROM	TO	W	(opt) Au	(opt) Ag	(opt) Au2	Ag2
0	2	2.0'	0.002	0.02		
2	6	4.0'	0.017	0.05		
6	10	4.0'	0.003	0.03		
10	15	5.0'	0.011	0.09		
15	20	5.0'	0.059	0.48	0.055 (grav)	
20	25	5.0'	0.015	0.78		

HOLE NUMBER D-17-94 PAGE 2 OF 8

%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
	29	MOD HD; S.A.A.			24-26' Slicks @ 5° w/pale green clay gouge 26' slicked pale green clay gouge @ 45° 26-26.5' Fault bx w/ matrix of pale grn slicked clay gouge 26.5-29.6' pale green clay slicks @ 5-15° 29.6' green clay - slickenside	
97	.67 12>4" 39	Thinly banded pale grn, cream & pinkish tan 31-33' Contact between lithic tuff breccia below (9.5-33') and overlying, in part inter-bedded, flow-laminated tuff (31-44')	30		minor lamination parallel slicks w/pale green clay gouge (thin)	29.5-47' Weakly silic. g.m. w/ loc. pink $CaCO_3$ repl.; 5' & 75' sulf-rich stringers (tarnish platey sulf. + $CaCO_3$) 1-2, 3% cubic f.g. py
		4 3 2 V.f.g. cream, flow-laminated w/ drapped lam's 4" 1. Poorly-sorted, massive bedded, lithic tuff 3. Pink f.g. siliceous planar-laminated tuff w/ elongated lamilli of cream v.f.g. tuff. 4. V.f.g. pale green, cream, planar, wavy laminated tuff.	35			
90	.52 8>4" 49	MOD HD - HD Tan, pinkish grey matrix w/ elongated to equant frags of pale green laminated tuff.	40		S.A.A. w/ 35° microbx ± pale green clay gouge 44' depositional contact @ 10°	
92	.72 6>4" 54	Block labeled 51' Miss-placed, moved it 2' downhole 31-44' Planar-laminated f.g. tephra/tuff. w/ interbedded lithic tuff 36-39'	45			47-51' Increase in Silic. of g.m. w/ minor SiO_2 reaction rims, clay + py alt. of clasts; incr. in $CaCO_3$ + py ↔ marc ± ill/smec at 30' & x-cut 60's. yellow tarnish diss. cubic py (w/ yellow tint) tr to 4% locally
			50			
84	.52 4>4'	44- Lithic tuff, poorly-sorted flow-laminated at base (44-50') massive-bedded & matrix-supported	55			51-60' S.A.A. w/ less $CaCO_3$ veinlts ? incr. ill/smec @ 50'
			60			

ANALYTICAL DATA

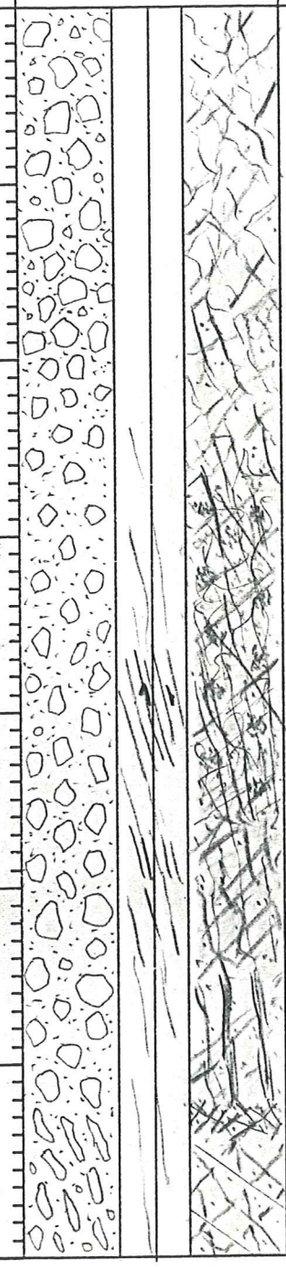
FROM	TO	W	Au	Ag	Au2	Ag2
25	30	5.0'	0.002	0.06		
30	35	5.0'	0.025	0.47	0.025	
35	40	5.0'	0.001	0.04		
40	45	5.0'	0.006	0.13		
45	50	5.0'	0.017	0.29		
50	55	5.0'	0.024	0.29		
55	60	5.0'	0.058	1.11	0.069 (grav)	

HOLE NUMBER D-17-94 PAGE 3 OF 8

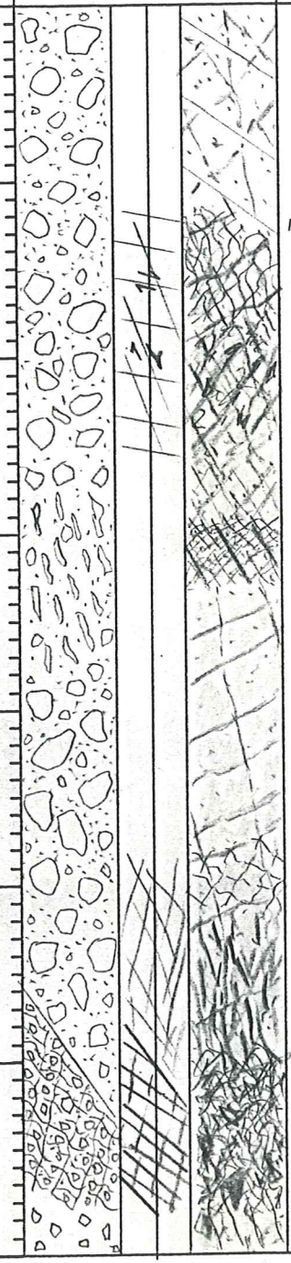
%REC	RQD	LITHOLOGY	FT	STRUCTURE	ALTERATION AND MINERALIZATION
90	.67 10>4" 70	mod hd / pinkish grey 60- Coarse-grained (clasts), poorly-sorted, clast-supported lithic tuff breccia w/ angular to subrounded ash to block size clasts comprised of massive & planar-laminated fine-grained tephra/tuff in a fine-grained siliceous matrix; massive-bedded.	65	post-py slicks @ 60°/50° Tr spl ± cpy 65.5-66.5' post cht + py slicks w/ pale green clay gouge + microbx @ 20 67.5-69' S.A.A.	60-66.5' 1st order weak reaction rims w/ thin pink SiO_2 exterior & weakly arg. core ± cubic py-f.g. g.m. is mod. silic. w/ sulf. adj. to $CaCO_3$ vnlts $CaCO_3$ + f.g. cubic py @ 40°/25° 3-5% v.f.g. diss. cubic py 66.5-79' 2nd order Δ ring to 3rd order + reaction rims w/ SiO_2 → clay + py → SiO_2 $CaCO_3$ + f.g. py @ 20-35°/ 40-60° ± smec/ill
88	.47 7>4" 80	78-88' Homogeneous clast-supported crackle bx w/ clast-rotation & rounding.	70 75 80	72-76.5' slicks & microbx @ 10°; ? 25° post-sulf + carbonate	3-5% v.f. to f.g. diss cubic py g.m. mod. argillized + weakly silic. 76-78' $CaCO_3$ + f.g. py ± bladed sulf w/ Tr exsolved pink electrum 77-80' @ 10° $CaCO_3$ + smec/ill + f.g. py
95	.54 7>4" 90	mod	85	85.7' post-sulf / $CaCO_3$ slicks @ 50° 90' high ∠ frac's ± microbx	68-78' Weakly silic. clast-cores w/ thin clay + sulf rims or total clay + sulf. repl. of clasts. 70-79' 3rd order SiO_2 reaction rims 78-88' weak clay + sulf. silic. g.m.; weak to mod arg. of clasts; 2-3% diss f.g. py $CaCO_3$ + py @ 35°/55° 88-98 SiO_2 ± bladed microbx vnlts @ 60°/30° contemp. g.m. mod arg ± mod. silic.; clasts mod. to intensely arg. ± silic ± sulf.
89	.48 9>4"	mod HP / greenish grey	90 95		86-90' diss. cubic f.g. py 1 to +15% 90-98' 1-2% diss. f.g. py SiO_2 flooded microbx vnlts x-cut discont. irreg. $CaCO_3$ + py; both $CaCO_3$ & SiO_2 stx's x-cut by late-stage high ∠ 0-10° smec/ill ± v.f.g. cubic py

ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	Ag2
60	65	5.0'	0.044	1.02		
65	70	5.0'	0.105	0.25	0.119 (grav)	
70	75	5.0'	0.009	0.70	0.007	
75	80	5.0'	0.063	0.60	0.069 (grav)	
80	85	5.0'	0.007	0.10		
85	90	5.0'	0.003	0.06		
90	95	5.0'	0.002	0.08	0.003	

HOLE NUMBER D-17-94 PAGE 4 OF 8

%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2	Ag2
	100	MOD HD grnish grey	100		98-100' thin 4th order reaction rims clay → SiO_2 → clay + strong sulf → clay + sulf.	98-105 S.A.A. w/ bleached light grey color; mod. silic. gr. M.; clay alt ↗ silic. clasts. Tr pyrr 99-103 Tr cpy ± spl in $CaCO_3$ py ↗ bladed (marc) on 30° smec/ill vnlts Reaction rims decr. ↓ py ± $CaCO_3$ stringers @ 30°; 60° late-stage ill/smec ± v.f.g. py irreg. wavy @ 30°	95	100	5.0'	0.008	0.10		
94	.60 11>4"	100-105 gradual transition from clast-supported to matrix supported lithic tuff breccia	105			103-109' Mod. intense silic. of grnd m. w/ mod clay + sulf. alt. of clasts, loc. silic. of clasts.; 3-5% diss f.g. cubic py; $CaCO_3$ ± pyrr bladed marc/py @ 20-25° + 70° discont. irreg.;	100	105	5.0'	0.007	0.14		
	110		110		low ∡ (0-15' to core) frac's w/ smec/ill + Minor $CaCO_3$ + v.f.g. py 113-115' frac's ± microbx & slicks @ 10°-15' 114-116' Tr spl + tabular elongated sulf.	109-118' loc. strong py-repl. of clasts; $CaCO_3$ + sulf microvnlt stkwk, silic g.m. + silic &/or arg. clasts.; diss sulf 1-10 + 15% cubic py $CaCO_3$ + py + v.f.g. tabular sulf ± spl. @ 10° & 80° contamp. Tr cpy + Tr spl + Tr. pyrrh SiO_2 + py microvnlts	105	110	5.0'	0.003	0.09		
87	.38 7>4"	pale pinkish grey	115		118.5-119.5' S.A.A.	118-122' Sim. to above w/ < SiO_2 + > $CaCO_3$ stkwk c. xln $CaCO_3$ + > pyrr + < ill/smec. + < diss. sulf	110	115	5.0'	0.003	0.07		
	120		120		– c. xln open-space $CaCO_3$	122-126 weak silic, $CaCO_3$ vnlt parallel to C.A. w/ white clay + v.f.g. bladed sulf (marc) in pseudomorphic repl. of feldspar & salvages of chl ± py	115	120	5.0'	0.012	0.09		
95	.74 11>4"	126-132 Elongation of clasts w/ crude flow-alignment. Flow fabric @ 15-20°	125			126-127 stk ill/smec ± $CaCO_3$ 127-136' weak to mod. silic g.m.; weak arg. alt + minor sulf. repl of clasts; $CaCO_3$ + sulf microveinlet stockwork @ 5; 60°; 30° 1-10 3% diss f.g. py; minor late-stage smec/ill ± $CaCO_3$ microvnlts @ 60°	120	125	5.0'	0.010	0.05		
	130		130				125	130	5.0	0.005	0.05		

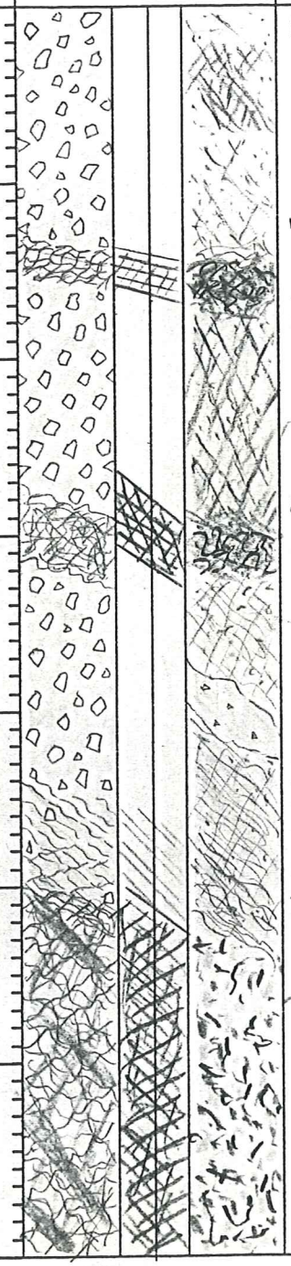
HOLE NUMBER D-17-94 PAGE 5 OF 8

%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
94	.83 12>4"	MOD HD; pinkish grey	135		136-143 post-$CaCO_3$ + smec/ill + sulf slicks @ 80°, 20°	136-139 Frac'd -stkwk filling waxy smec/ill ± minor $CaCO_3$ intergrown w/ f.g. bladed sulf (py ↑ ?) & marc.; granular f.g. late-stage $CaCO_3$ + py + Tr spl. minor; mod. silic. g.m. + 1-2% diss f.g. py.
	140		140			139-143 Frac'd a.a. w/ $CaCO_3$ + f.g. py ± Tr pyrr; g.m. weak silic - mod arg. alt.; clasts mod. intense arg. alt.; smec/ill in clotts - unlt. frags
93	.75 13>4"	144-148' Elongated, sheared, streatched flow-aligned fine-grained tephra/tuff clasts. Flow fabric @ 5-10'	145			143-144.5' Mod. intense silic. of. g.m.; microhairline frac's w/ v.f.g. open-space Q → smec/ill → + $CaCO_3$ + f.g. py ↑ marc. + wk tarnish. diss. sulf. cubic py
	150	DRILLERS NOTE: HIT H_2O @ 150' 1 Qt?	150		w/ $CaCO_3$ unlts f.g. py ↑ bladed C. xln. sulf.	144.5-146.5 frac'd w/ smec/ill filled stkwk. X-cutting late-stage $CaCO_3$ + py + cpy + Tr spl. @ 30°; g.m. mod. intense silic.; diss. 2-4% dimorphic & distorted bright yellow py.
94	.75 12>4"		155		154-159.85' $CaCO_3$/smec/ill silica flooded tectonic bx	146.5-159.85 mod. intense g.m. silic. w/ clear, orange-red SiO_2 microhairline stkwk syn 5°, 70° $CaCO_3$ + sulf unlts mod. arg. + mod. sulf. of clasts + weak 2nd order reaction rims; diss. v.f.g. py 1-3%; smec/ill ± v.f.g. py 154-155; 156-159.85 $CaCO_3$ c. xln ± chl - SiO_2 frags ± smec/ill ± open-space Q
	160	159.85-190' Hydrothermal SiO_2?-rich matrix w/ strongly argillized + sulfide replaced clasts, w/ superimposed tectonic brecciation as shown & described at right. Clasts appear to be all of same lith - f.g. massive bedded tephra/tuff, are generally small and are moderately sorted, highly angular; matrix-supported	160		159.85' 35° Contact w/ $CaCO_3$ healed tectonic bx ↓ 164' w/ frac's @ 50-60° prim.	159.85-163' Fragmented C. xln. $CaCO_3$ + smec/ill + Tr f.g. py; SiO_2-rich g.m. diss. f.g. (loc. +25%) cubic, dimorph., distorted, twinned py-rons; g.m. loc. arg. alt.; Tr spl
86	.26 6>4"	MOD SOFT - MOD; pink matrix w/ pale grn-gry clasts	165			

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	Ag2
130	135	5.0'	0.003	0.05		
135	140	5.0'	0.011	0.05	0.011	
140	144	4.0'	0.006	0.06		
144	147	3.0'	0.006	0.07		
147	151	4.0'	0.002	0.04		
151	154	3.0'	0.004	0.05	0.004	
154	156	2.0'	0.006	0.06		
156	160	4.0'	0.003	0.05		
160	165	5.0'	0.005	0.06		

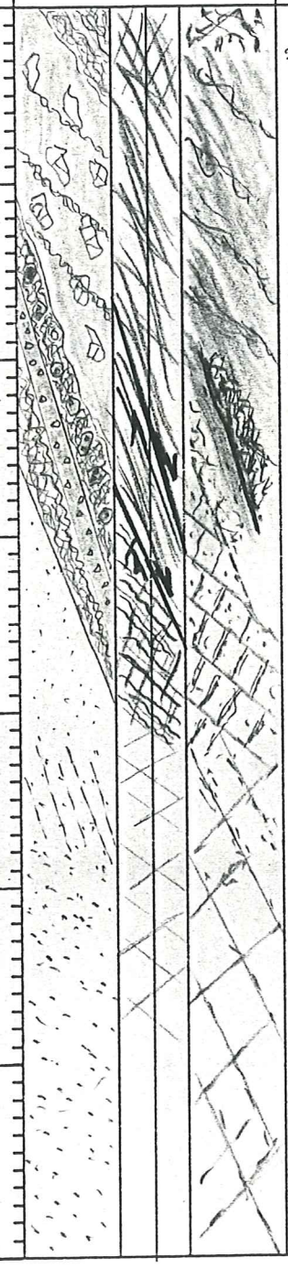
HOLE NUMBER D-17-94 PAGE 6 OF 8

%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
	170	mod-mod hd; S.A.A.	170		167-168 C.g. open-space $CaCO_3$ + f.g. py (at margin at 40°	163-172' mod. silic. g.m. w/ mod. arg. clasts + wk sulf.; C. xln $CaCO_3$ + py at margin ↳ open-space @ 167-168'; minor $CaCO_3$ + py microvnlts; 3-4% diss f.g. cubic py
87	.52 10>4"	VUGS & MOD; bleached pale grn-gry; mod-mod hd; pink matrix w/ pale grn to cream clasts	175		172-173.5' soft clay gouge w/ frac's @ 80° w/ late-stage c.g. open-space $CaCO_3$ ± minor f.g. py	172-173.5 as at left. 173.5-179' mod. intense silic. g.m. mod intense arg. + sulf. alt. of clasts; $CaCO_3$ + f.g. py ↱ bladed sulf. in stkwk. 2-5% diss. cubic f.g. py
	179					
88	.56 8>4"	MOD SOFT - MOD; banded Δing to bx'iated pink & pale grn-gry & wht $CaCO_3$; mod hd	180		179-181' fault breccia w/ bounding 50° slicks w/ angular f.g. tuff frags in soft ill/smec + gouge + $CaCO_3$ matrix	179-181 as at left. 181-190' Clear to med. gry-brn SiO_2 ± f.g. py stkwk in arg. g.m. & arg. + sulf. alt clasts. Silica stkwk Δing ↓ to flooded bx 183.5-185' gen. discont. $CaCO_3$ + py vnlts. 1-2% diss. f.g. py
	189	mod soft - mod & mod hd (clay gouge, wall rx, & $CaCO_3$)	185		187-190' Strong banding @ 40-50° of SiO_2 & arg. alt.	
40	.00 0>4"		190		190-201 Fault breccia largely healed w/ c. xln $CaCO_3$	190-210' fragmented $CaCO_3$ + sulf & SiO_2 + sulf & ill/smec ± sulf. f.g. py, loc. tarnished, ↱ c.g. bladed sulf. on frac & $CaCO_3$ surf's
	194					
50	.00 0>4"		195			
	197					
61	.04 1>4"		200			

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	Ag2
165	170	5.0'	0.009	0.03		
170	175	5.0'	0.010	0.05		
175	180	5.0'	0.003	0.03		
180	185	5.0'	0.004	0.04		
185	190	5.0'	0.002	0.04		
190	195	5.0'	0.004	0.06		
195	200	5.0'	0.005	0.06		

HOLE NUMBER D-17-94 PAGE 7 OF 8

%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
	205	S.A.A. / s.A.A. prim wht $CaCO_3$ w/ < pink & pale grn wall rx	205		201-210' C. xln. late-stage $CaCO_3$ w/ subrounded frags of bx'iated tuff; $CaCO_3$ flooded fault bx which in turn contains tuff bx clasts.; loc post-C.9, $CaCO_3$ rubble-bx zones.	
93	.40 8>4"	prim. U. pale green-gry	210		210-212' pale green fault clay (calcareous) w/ angular to rounded frags of silic. tuff, sulf-rich units, & $CaCO_3$ flooded bx (multiple movement)	← 210-216
	215	MOD/mod MD	215		212→ 0.25 – 0.4" med to dk grey sulf.-rich clay-gouge w/ razor sharp contact @ 15° w/ underlying med to lt grey $CaCO_3$ flooded fault bx. w/ rounded pale green clay alt. f.g. tuff. (212-213')	216 – 220 Minor late-stage $CaCO_3$ + f.g. py @ 50° x-cutting earlier smec/ill (waxy) + clotts segregated sulf. string at opposing 35° w/ tarnished yell cubic, dimorphic py; mod. silic. g.m. 2-3% diss, f.g. py ↓ 218'
89	.38 8>4"	MOD HD	220		213-216' granular-clay ground up f.g. tuff. @ 216' clayey sulf-rich grey clay at 20° Contact	
	225		225		216-221 stkwk frac's @ 55° ± 25° w/ hairline pale green gouge clay faint lamination @ 20° 221-224'	224- ↓ bleached salvage/ halo's on $CaCO_3$ vnlts @ 25-30, 50-60° Tr diss. f.g. py. silic. f.g. gr. m.
95	.76 11>4"	HD	230		224- on 65° & 20° stx cradle bx - healed w/ clay gouge ± $CaCO_3$	
	235		235			

216- Fine-grained, well-sorted, massive - bedded, crudely lamy siliceous, dense tuff. Dozer Tuff

ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	Ag2
200	205	5.0'	0.003	0.02		
205	210'	5.0'	0.010	0.17		
210	216	6.0'	0.036	0.36		
216	220	4.0'	0.002	<0.02		
220	225	5.0'	<0.001	<0.02		
225	230	5.0'	<0.001	<0.02		
230	235	5.0'	<0.001	<0.02		

3" [illegible]

HOLE NUMBER D-17-94 PAGE 8 OF 8

%REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
80	.41 7 > 4" 242	HD to mod HD; pale grnish gry	240		237-238 Faint lamination @ 25° 238.5-242' planar lam at 10°	minor discont. smec/ill veins
88	.27 2 > 4" 245		245		prin. slicks @ 40° healed crackle to fault bx @ 260'	Minor smec/ill veins discont @ 70°
1" of RED RILL						
89	.62 10 > 4" 255		250			
1" REDRILL			255			
88	.63 10 > 4" 265	T.D. @ 265' NOT	260			
			265			
			270			

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	Ag2
235	240	5.0'	<0.001	<0.02		
240	245	5.0'	<0.001	<0.02		
245	250	5.0'	<0.001	<0.02		
250	255	5.0'	<0.001	<0.02		
255	260	5.0'	<0.001	<0.02		
260	265	5.0'	<0.001	<0.02		

ANALYSIS REPORT

American Assay Laboratories

P.O. BOX 71060
RENO, NV,,U.S.A.,
Ph.1-702-356-0606, Fax.1-702-356-1413
Telex:

HECLA MINING CO.

COPIES TO : CHARLIE MUERHOFF
:
:
:

CLIENT REFERENCE No: D-17-94
LABORATORY JOB No. : SP031534
SAMPLE TYPE :

RECEIVED : 4 NOV 1994
REPORTED : 17 NOV 1994
No. SAMPLES : 8

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

OK to pay
14-140-477
CM

SIGNATORY : Sue Faircloth M.S.

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT

American Assay Laboratories

CLIENT : HECLA MINING CO.
PROJECT : ROSEBUD
REFERENCE : D-17-94
JOB NUMBER : SP031534
REPORTED : 17 NOV 1994

SAMPLES	Au(OZ) FA60 OPT	Au(RZ) FA60 OPT	Ag(OZ) D210 OPT
D-17-94 265-270	<0.001		<0.02
D-17-94 270-275	<0.001	<0.001	<0.02
D-17-94 275-280	<0.001		<0.02
D-17-94 280-285	<0.001		<0.02
D-17-94 285-290	<0.001		<0.02
D-17-94 290-295	<0.001		<0.02
D-17-94 295-300	<0.001		<0.02
D-17-94 300-302.5	0.001		0.05

ANALYSIS REPORT

American Assay Laboratories

P.O. BOX 71060
RENO, NV,,U.S.A.,
Ph.1-702-356-0606, Fax.1-702-356-1413
Telex:

HECLA MINING CO.

COPIES TO : CHARLIE MUERHOFF

:

:

:

CLIENT REFERENCE No: D-17-94

LABORATORY JOB No. : SP030462

SAMPLE TYPE :

RECEIVED : 15/08/94

REPORTED : 26/08/94

No. SAMPLES : 56

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 Faircloth M.S.

AMERICAN ASSAY LABORATORIES
ANALYSIS REPORT

American Assay Laboratories

CLIENT : HECLA MINING CO.
PROJECT : ROSEBUD
REFERENCE : D-17-94
JOB NUMBER : SP030462
REPORTED : 26/08/94

SAMPLES	Au(OZ) FA60 OPT	Au(RZ) FA60 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
D-17-94 0-2	0.002			0.02
D-17-94 2-6	0.017			0.05
D-17-94 6-10	0.003			0.03
D-17-94 10-15	0.011			0.09
D-17-94 15-20	0.059		0.055	0.48
D-17-94 20-25	0.015			0.78
D-17-94 25-30	0.002			0.06
D-17-94 30-35	0.025	0.025		0.47
D-17-94 35-40	0.001			0.04
D-17-94 40-45	0.006			0.13
D-17-94 45-50	0.017			0.29
D-17-94 50-55	0.024			0.29
D-17-94 55-60	0.058		0.069	1.11
D-17-94 60-65	0.044			1.02
D-17-94 65-70	0.105		0.119	0.25
D-17-94 70-75	0.009	0.007		0.70
D-17-94 75-80	0.063		0.069	0.60
D-17-94 80-85	0.007			0.10
D-17-94 85-90	0.003			0.06
D-17-94 90-95	0.002	0.003		0.08
D-17-94 95-100	0.008			0.10
D-17-94 100-105	0.007			0.14
D-17-94 105-110	0.003			0.09
D-17-94 110-115	0.003			0.07
D-17-94 115-120	0.012			0.09

AMERICAN ASSAY LABORATORIES
ANALYSIS REPORT

American Assay Laboratories

CLIENT : HECLA MINING CO.
PROJECT : ROSEBUD
REFERENCE : D-17-94
JOB NUMBER : SP030462
REPORTED : 26/08/94

SAMPLES	Au(OZ) FA60 OPT	Au(RZ) FA60 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
D-17-94 120-125	0.010			0.05
D-17-94 125-130	0.005			0.05
D-17-94 130-135	0.003			0.05
D-17-94 135-140	0.011	0.011		0.05
D-17-94 140-144	0.006			0.06
D-17-94 144-147	0.006			0.07
D-17-94 147-151	0.002			0.04
D-17-94 151-154	0.004	0.004		0.05
D-17-94 154-156	0.006			0.06
D-17-94 156-160	0.003			0.05
D-17-94 160-165	0.005			0.06
D-17-94 165-170	0.009			0.03
D-17-94 170-175	0.010			0.05
D-17-94 175-180	0.003			0.03
D-17-94 180-185	0.004			0.04
D-17-94 185-190	0.002			0.04
D-17-94 190-195	0.004			0.06
D-17-94 195-200	0.005			0.06
D-17-94 200-205	0.003			0.02
D-17-94 205-210	0.010			0.17
D-17-94 210-216	0.036			0.36
D-17-94 216-220	0.002			<0.02
D-17-94 220-225	<0.001			<0.02
D-17-94 225-230	<0.001			<0.02
D-17-94 230-235	<0.001			<0.02

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT

American Assay Laboratories

CLIENT : HECLA MINING CO.
PROJECT : ROSEBUD
REFERENCE : D-17-94
JOB NUMBER : SP030462
REPORTED : 26/08/94

SAMPLES	Au(OZ) FA60 OPT	Au(RZ) FA60 OPT	AuGRAV GRAV OPT	Ag(OZ) D210 OPT
D-17-94 235-240	<0.001			<0.02
D-17-94 240-245	<0.001			<0.02
D-17-94 245-250	<0.001			<0.02
D-17-94 250-255	<0.001			<0.02
D-17-94 255-260	<0.001			<0.02
D-17-94 260-265	<0.001			<0.02

SAMPLE SUBMITTAL FORM

American Assay Laboratories Inc.

Sparks Office
1500 Glendale Ave.
Nevada 89431
Box 71060
Reno, NV. 89570
Telephone
(702) 356-0606
Fax
(702) 356-1413

Elko Office
2320 Last Chance Rd.
Nevada 89801
Box 2908
Elko, NV. 89801
Telephone
(702) 738-9100
Fax
(702) 738-2594

Company: HECLA MINING COMPANY

Address: 1255 UPPER VALLEY ROAD / P.O. BOX 1861 LOVELOCK, NV 89419

Telephone Number: (702) 273-0300 Fax Number: (702) 273-1716

Project Name: ROSEBUD Purchase Order Number: _____

Transport Company: _____ Waybill Number: _____

Date Shipped: _____ Number of Packages: 46 [ ] Prepaid [ ] Collect

8-10-94

ANALYSIS REQUIRED

SAMPLE			TYPE	ELEMENTS REQUIRED
D-17-94	0-2	70-75 140-144	core	Au, Ag 2 AT fire assay with
	2-6	75-80 144-147		~~Hecla-Rosebud custom prep~~
	6-10	80-85 147-151		
	10-15	85-90 151-154		* GRAVIMETRIC FINISH
	15-20	90-95 154-156		FOR SAMPLES ≥ 0.05 opt Au
	20-25	95-100 156-160		
	25-30	100-105 160-165		
	30-35	105-110 165-170		
	35-40	110-115 170-175		
	40-45	115-120 175-180		
	45-50	120-125 180-185		
	50-55	125-130 185-190		
	55-60	130-135 190-195		
	60-65	135-140 195-200		
	65-70	~~200~~ 200-205		
		205-210		
		210-216		

COARSE REJECTS (Normally Discarded)

[ ] Return COD after analysis complete
[ ] By prior arrangements

PULPS (Normally Stored Free For One Month)

[ ] Discard after one month
[ ] Return COD after one month
[ ] By prior arrangements

RESULTS AND INVOICES TO BE SENT TO:

Please mark invoice person and address [I]

(1) Charlie Muerhoff

~~same address & phone as above~~

(2) _____

(3) _____

Comments:

GB / sf

CLIENT FILE COPY

SAMPLE SUBMITTAL FORM

American Assay Laboratories Inc.

Sparks Office
1500 Glendale Ave.
Nevada 89431
Box 71060
Reno, NV. 89570
Telephone
(702) 356-0606
Fax
(702) 356-1413

Elko Office
2320 Last Chance Rd.
Nevada 89801
Box 2908
Elko, NV. 89801
Telephone
(702) 738-9100
Fax
(702) 738-2594

Company: Hecla Mining Co

Address: _____

Telephone Number: ( ) _____ Fax Number: ( ) _____

Project Name: Rosebud Purchase Order Number: _____

Transport Company: _____ Waybill Number: _____

Date Shipped: 10/31/94 Number of Packages: 8 [ ] Prepaid [ ] Collect

ANALYSIS REQUIRED

D-17-94 SAMPLE	TYPE	ELEMENTS REQUIRED
265-270	CORE	Au & Ag 2AT FA
270-275		w/ Hecla-Rosebud
275-280		custom prep
280-285		
285-290		* if Au ≥ .05 OPT
290-295		repeat w/ CYAN finish
295-300		
300-302.5		

COARSE REJECTS (Normally Discarded)

[ ] Return COD after analysis complete
[X] By prior arrangements

PULPS (Normally Stored Free For One Month)

[ ] Discard after one month
[ ] Return COD after one month
[X] By prior arrangements

RESULTS AND INVOICES TO BE SENT TO:

Please mark invoice person and address [I]

(1) Charlie Muerhoff

(2) _____

(3) _____

Comments:

CLIENT FILE COPY