60000721

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. 95-345
AUTHOR	A. Davidson ; M. Sheen
DATE OF DOC(S)	1996
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 ; Far East = Rosebud
COMMODITY If not obvious	gold ; silver
NOTES	drill logs ; geology ; [redacted] ; total depth 713' directional log ; handwritten notes 20p. oversized plate

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: DV 4/30/08
Initials Date

DB:
Initials Date

SCANNED:
Initials Date

Revised: 1/22/08

95-345

6000 0721
4010

547 85 6 241

6060 0721

Hecla
MINING COMPANY

ROSEBUD PROJECT
DIAMOND DRILL LOG

HOLE NUMBER	95-345	LOCATION	Far East - Rosebud	REMARKS	
PAGE 1 OF	1	NORTHING			
DATE	03/22/96	EASTING			
LOGGED BY	Alex B Davidson	ELEVATION			
SCALE	1" = 10'	AZIMUTH	155°		
TOTAL DEPTH	717.8'	INCLINATION	89°		

REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2	Ag2
		0-24' - No recovery	0										
		24 to 497.5 Chocolate Fm. - Mod to Mod hard - Clast to matrix supported flow-breccia, monolith in nature. Andesitic to Latitic Ash tuff w/ good euhedral to subhedral xls of plagioclase & Hornblend. Peru alteration is FeOx w/ zones of prop alt. Interval is slightly argillic w/ small silicified zones. Narrow veinlets and bleb of pyrite and calcite, dispersed throughout interval. - Unit is porphyritic. 24 to 47.9 - Massive - weakly flow banded - weakly prop. Altered - heavily stained w/ FeOx from surface wxing (pre site to 74.2) bleached greenish color w/ yellow staining 47.9 to 620 - Matrix supported breccia - coarse to lapilli w/ frequent blocks subangular to subrounded. Matrix is pinkish color clasts are bleached green in color	10 20 30 40 50		24 to 74.2 : .18 ft/ft 0-20° to CA .20 ft/ft 30-40° to CA .43 ft/ft 50-60° to CA .88 ft/ft 70-90° to CA	24 to 74.2 Primary Alt is FeOx - Limonite/Geothite - 24 to 47.9 is slightly Propylitically Altered. - White clay fills fxs							

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REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2	Ag2
		67 to 74.2' - Massive - weakly laminated - Primarily prop Alterd' - heavily stained w/ FeOx - Yellow-Brown in color. Fxs at	50 60 70		54.8 to 56' - Rubble zn @ 40°&20° to CA.								
		74.2 to 102.6' Surface oxing disappears - Primary Hematite Alt is Perv. - Interval is red-Brown in color.			73.7' - Fx at 15° to CA - slicked								
		74.2 to 76.4' Matrix supported breccia - coarse to lapilli w/ large blocks - subangular to subrounded. - Matrix is red-brown in color. Clasts are bleached grey-green colour, slightly prop. and slightly ansilic			74.2 to 102.6 .21 ft/ft 0-20° to CA .28 ft/ft 30-40° to CA .63 ft/ft 50-60° to CA .63 ft/ft 70-90° to CA	74.2 to 106' - Perv. Hematite Alt present							
		76.4 to 94.1' - Massive - Primarily FeOx Alterd' - Dark red brown in colour weakly laminated	80										
		94.1 to 95' Coarse - Clast supported breccia - Matrix is red-brown in colour - Clast are bleached grey in colour. Clasts are subangular to subrounded	90		95' Fx at 10° to CA line w/ $CaCO_3$ ~1/4" wide.								
		95 to 108.2 - Massive - same as 67-74.2				102.6 to 118.7 - Perv. prop Alt							
		102.6 to 118.7 - Prop Alt	100		102.6 to 118.7 .55 ft/ft 30-40° to CA .25 ft/ft 50-60° to CA .99 ft/ft 70-90° to CA								
		108.2 to 110.5 - Clast supported breccia - coarse to lapilli w/ frequent blocks - subangular to subrounded. Clasts are prop. Alterd' Matrix is FeOx Alterd and red-shpink in color											
		118.7 to 120.2 - FeOx Alt	110										
		110.5 to 121.7 - massive				118.7' - Gradational Alteration change to pervasively Hematite							
			120		118.7 to 119.1 Fxs at 30° to CA. Healed w/ Hematite clay 119.4' Fx at 60° to CA								

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REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2	Ag2
		120.2 to - Perv. Prop. Alt 121.7 to 127.5 - Breccia - clast supported - coarse to lapilli w/ frequent blocks - subangular to subrounded - clasts are light beach green in color - Matrix is red-pink in color. 127.5 to 150.2 - massive - lt green in color 150.2 to 167.2 - Breccia - matrix supported - clasts are coarse to lapilli, angular to subangular and are light green in color matrix is light reddish-pink in color 167.2 to 170.8 - Massive lt green in color 170.8 to 174.0 - Breccia - Clast supported subangular to subrounded coarse to lapilli w/ large blocks. - Clasts are prop Alterd' lt green in color - Matrix is pinkish-brown in color (FeOx Alted) 174. to 176.8 - Massive - same as 167.2 to 170.8 176.8 to 180.2 Breccia same as 170.8 to 174 180.2 to 186.6 - Massive - same as 167.2 to 170.8 186.6 to 191.8 Breccia, matrix supported - clasts are lapilli to coarse w/ few blocks - subangular to subrounded - clasts are lt. yellow brown, matrix is darker yellow brown	120 130 140 150 160 170 180 190		119.9 - Fx at 30° to CA 120.2 to 129.8 .10 fx/ft 0-20° to CA .52 fx/ft 30-40° to CA .73 fx/ft 50-60° to CA .52 fx/ft 70-90° to CA 129.8 to 134.5 Rubble zn/Faultzn - At 132.4 Rubble becomes soft/gouey - surfaces are slicked 134.5 to 150.2 .13 fx/ft 0-20° to CA .76 fx/ft 30-40° to CA .38 fx/ft 50-60° to CA .25 fx/ft 70-90° to CA 150.2 to 151.4 - 2.5 fx/ft 0-20° to CA 1.7 fx/ft 70-90° to CA 151.4 to 154 - Rubble zn 154 to 157.5 1.14 fx/ft 50-60° to CA .86 fx/ft 70-90° to CA 157.5 to 159.5 Rubble zn 159.5 to 173 - .37 fx/ft 0-20° to CA .44 fx/ft 30-40° to CA .88 fx/ft 50-60° to CA .44 fx/ft 70-90° to CA (Note at 169.4' to 170.7' fxs are at 20° to CA and lined w/ white clay) 173. to 238 .21 fx/ft 0-20° to CA .44 fx/ft 30-40° to CA. .50 fx/ft 50-60° to CA. .11 fx/ft 70-90° to CA.	120.2 - - Gradational propylitic Alteration change - in breccia zones, matrix is FeOx Alterd' clasts are propylitized - Massive zones are propylitized. 126 to 126.7 - minor pyritic stockwork and bleb. 145.3 to 147.9 - pyritic bled 164.1 to 170.8 - Pyrite stockwork at 50° to 70° to CA 185.1 to 193.8 Pyrite in disseminated blebs and fill fxs - Large euhedral xls at 185.6 - Large bleb at 192.2' & 193.8							

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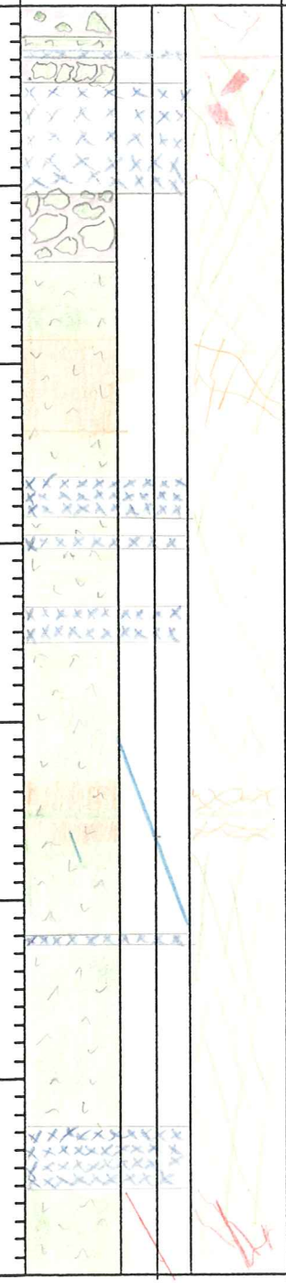
REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2	Ag2
		191.8 to 192.8 Massive dark yellow brown 192.8 to 204.4 breccia - clast supported - coarse to blocky w/few lapilli subangular to subround - clasts are lt green in color matrix is pinkish brown 204.4 to 316.5 - Massive - Interval is pervasively propylitized w/zones of FeOx alteration	190 200 210 220 230 240 250 260		192.4 to 193.2 - Rubble zn/fault zn at 192.6 - Black fine grained sulfides w/small pyrites 194.3 to 200.9 Rubble zn - Rubble surfaces have + white clay & +/- pyrite 216.4 to 218.5 - Rubble zn 238 to 288 : 32 fx/ft 0-20° to CA 62 fx/ft 30-40° to CA 54 fx/ft 50-60° to CA 06 fx/ft 70-90° to CA 252.4 to 256.3 Rubble zn - surface slicked	208.9 to 213.9 Gradational Alteration change from Prop Alt to FeOx Alt 233.9 to 234.4 Gradational alteration change from prop to FeOx 235.6 to 236.5 change from prop alt to FeOx - At 236.5 is an alteration front seperated by fx lined w/calcite at 70° to CA. ~ 1/8" wide - No offset. 256.3 to 259.7 Heavy pyrite stockwork and disseminated blebs and 258.4 fx at 30° to CA filled w/pyrite ~ 1/8" wide.							

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REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2	Ag2
			260		262.4 to 264.3 Rubble zn / Fault zn soft clay gouge - surfaces slicked.								
					267.9 to 271.5 Rubble zone								
			270			272.5 to 282.1 Gradational Alt' change to Fe Ox							
					288 to 338 .38 ft/ft 0-20° to CA .92 ft/ft 30-40° to CA 1.02 ft/ft 50-60° to CA .10 ft/ft 70-90° to CA								
			280			284.8 to 298.8 blebs of disseminated Pyrite and minor pyrite stockwork.							
					285.5 to 286.3 Rubble zn / Fault zn Hangwall at 40° to CA. Footwall at 40° to CA - Rubble surfaces are slicked. covered w/ prop. & lay and fine grained sulfides								
			290		294.6 to 295 - Rubble zn Heavily lined w/ black fine grained sulfides and pyrites. ≈ ½" T.T. +/- prop clay								
			300										
			310										
		316.5 to 317.5 - Breccia - clast supported - coarse to block angular to sub-angular - clasts are propylitized matrix is Fe Ox Altered and is light pink brown in color 317.5 to 323.4 - Massive - weakly laminated - prop altered Lt. Green in color 323.4 to 324 - Breccia - same as 316.5 to 317.5 324 to 354. - Massive - weak to moderately laminated			315 to 316.6 Rubble zn - rubble surfaces lined w/ Fine grained sulfides Surface at 315 is slicked Hangwall at 40° to CA Footwall at 50° to CA								
			320										
						326.1 to 333.9 - Gradational alt change to pervs. Fe Ox							
			330		328.1 Fx @ 40° to CA. Filled w/ Fe Ox and CaCO3 as ½" thick								

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EC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2	Ag2
		354 to 357.4 - Breccia clast supported, coarse to blocky, subangular to subrounded. - clast are prop altered Matrix is Felx altered, and is Pinkish brown in color.	330		338 to 388 - .44 fx/ft 0-20° to CA .78 fx/ft 30-40° to CA .62 fx/ft 50-60 to CA .06 fx/ft 70-90° to CA								
			340										
			350		349 to 351.5 - Rubble/fault zone soft gouge at 351.5' - Rubble surfaces are slicked.								
					355.2 - Fx at 30° to CA lined w/ mostly carbon stibnite? pyrites, silver? - slicked.	354.4 to 356.2 - Fxs lined w/ graphitic material, pyrites, stibnite? silver?							
					357.6 - Fx at 50° to CA - slicked								
					358.1 to 360.2 Fx at 0° to CA lined w/ dark green prop clay - slicked								
			360										
		362.3 to 363 - Breccia, same as 354 to 357.4 - Highly fractured, sheared, - surface slicked.			362.3 to 363 Fxs at 10 to 20° - Lined w/ prop clay slicked								
					366.9 - Fx at 40° lined w/ pyrite soft prop clay - slicked ≈ 1/4" thick								
			370										
			380		379.3 to 381 - Rubble zone								
			390		388 to 438 - .04 fx/ft 0-20° to CA .22 fx/ft 30-40° to CA .40 fx/ft 50-60° to CA .08 fx/ft 70-90° to CA	388.5 to 396.5 - Gradational All change to Fe Ox							
			400										

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REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION	ANALYTICAL DATA FROM	TO	W	Au	Ag	Au2	Ag2
			400			401 to 405.7 - Gradational Alt change to FeOx							
			410		413.5 Fx at 30° to CA Lined w/ Black fine grained sulfides and small pyrites ≈ 1/8" Thick								
			420		424.3 - Shear at 40° to CA - Fx lined w/ Dark green prop clay, $CaCO_3$. Surfaces are strongly slicked.								
			430										
					438 to 482.9 .16 fx/ft 0-20° to CA .29 fx/ft 30-40° to CA .56 fx/ft 50-60° to CA .31 fx/ft 70-80° to CA								
			440			440.5 to 449.3 Gradational Alt Change to FeOx							
		452.7 to 454.1 Breccia - clast to Matrix supported coarse to Blocky - angular to subangular. Clast are prop altered! Lt green in color Matrix is FeOx Altered and is reddish brown.	450		448.5 Fx at 30° to CA Lined w/ prop. clay and $CaCO_3$								
		454.1 to 482.9 - Massive - weakly laminated				454.8 to 455.9 Gradational Alt change to FeOx							
			460		463.8 - Fx at 30° to CA - slicked lined w/ Dark green prop clay - fine grained sulfide and pyrites.	465.7 to 472.5 Gradational Alt Change to FeOx - weakly laminated.							
			470										

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REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		482.9 to 484.3 - Breccia - Matrix to clast supported - clasts are coarse to lapilli w/large blocks - Matrix is FeOx Altered (reddish pink) - clasts are potassicly & propylitically Altered. - Fractures are healed w/prop clay 484.3 to 492. - Massive - weakly to moderately laminated - Highly sheared and fractured - At 484.3 Interval is bleached Green, grades to dark green prop. Alteration. Fractures Healed w/dark green prop clay - fxs at random orientations to CA. 495.1 to 496.3 - Breccia - mod to mod soft - potassic/propylitic Altered (ast supported - clasts are Altered - matrix is prop Altered 496.3 to 497.5 - South Ridge Fault 497.5 to 504.7 Oscar Fm - Clast supported - angular to subangular, lapilli to coarse w/rare blocks. - 497.5 to 499.5 silicified fault Breccia Associated w/SRF. Grades to moderatly hard at 499.5 Fault Breccia changes to Heterolithic Breccia at 501.7' Matrix is strongly prop altered - Heterolithic clasts vary from Potassic Alt to weak prop altered, w/Au'd lava syne clasts. 504.7 to 712.5 Dover Fm. - Ash Tuff - highly to moderatly silicified - stringers And fractures filled w/silica. Zones of Autobreccia and massive Fxs. Zones of potassic and propylitic Alteration 504.7 to 527.3 - massive - weak pyrite stockwork - throughout Interval 527.3 to 535.7 - Breccia - coarse to lapilli w/frequent Blocks Angular to subangular clasts. - Matrix is Quartz and silicified prop clay. Interval is hard. Clasts are propylitized. - Vuggy 535.7 to 542.2 Massive - light green in color, weakly laminated - minor pyrite stockwork.	470 480 490 500 510 520 530 540		482.9 to 486.2 . 30 fx/ft 30°-40° to CA. 2.42 fx/ft 50-60° to CA 1.21 fx/ft 70°-90° to CA 486.2 to 490.3 . 96 fx/ft 30°-40° CA 3.17 fx/ft 50°-60° to CA .24 fx/ft 70°-90° to CA 492 to 495.1 - Fault/Rubble zn. - Material is gouey highly sheared. Hangwall at 70° to CA Footwall at ~80° to CA 495.1 to 496.3 - 496.3 to 497.5 - Fault zn - gouey black graphitic material Hangwall at 50° to CA Footwall at 70° to CA 490.3 to 492 - 1.17 fx/ft 30-40° to CA 1.17 fx/ft 50-60° to CA 504.7 to 517.3 . 08 fx/ft 0-20° to CA .24 fx/ft 50-60 to CA .40 fx/ft 70-90° to CA 517.3 to 577.3 . 04 fx/ft 0-20° to CA .56 fx/ft 30-40° to CA .38 fx/ft 50-60° to CA .04 fx/ft 70°-90° to CA 520.5 to 531.2 - structure at 40° to CA. Healed w/ ++ Quartz	490.3 to 492 Gradational Alt change - from Prop to Potassic 492 to 497.5 - Disseminated pyrites 497.5 to 504.7 - Fxs healed w/ $CaCO_3$ - minor pyrite stringers 504.7 to 504 - Fxs, Vuggs filled w SiO_2, $BaSO_4$ $FeSd$ $CaCO_3$ & prop. clay 517.2 to 522.4 Prop - gradational Alt change. 522.4 to 524.9 Gradational Alt change to Potassic 524.9 to 535.7 - Propylitic Alteration grows stronger to fx at 531 - grows weaker to 535.7 - Pyrite follows quartz stockwork - 530.5 to 535.5 - Vugs filled w/ fine Dog tooted quartz, white clay Barite, Marcasite, silver Sulfasalts. 535 to 548.6 - minor pyrite stockwork

ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	Ag2
474.3	479					
479	482.9					
482.9	484.3					
484.3	489					
489	492					
492	495.1					
495.1	496.3					
496.3	497.5					
497.5	502					
502	504.7					
504.7	509					
509	514					
514	519					
519	522.4					
522.4	524.9					
524.9	527.3					
527.3	531					
531	535.7					
535.7	540					

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REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		550.1 to 561.9 - Breccia - matrix supported - clasts are angular, coarse to blocky w/ lapilli size clasts, they are prop. altered and are moderately hard - Matrix is silica. Interval is vuggy. Vugs are lined w/ Barite and fine dog toothed quartz	540 550		542.8 - Fx at 30° to CA. healed w/ FeOx and silicified. - Potassic Alt stops at structure. 552.4 - Fx at 40° to CA. healed w/ smoky quartz - large euhedral xls of Barite -	542.2 to 542.8 - potassic Alt change 542.8 to 552 - Rxs are weakly Prop. Altered - Lt Bleached green color 552 to 554.9 clasts are strongly Prop Altered - Smoky Quartz present in foot-wall only and disappears at ≈ 554.7 - Sporatically dispersed, disseminated & minor stockwork of Pyrite, marcasite??
		561.9 to 577.3 - Massive - weakly laminated - propylitic Altered Lt green in color. Pyrite/Quartz stock-work - Fxs filled w/ Dark green prop clay	560		561.1 - Fx at 10° to CA, Lined w/ soft Lt. green propclay - large euhedral xls of pyrite 5mm+	561.8 to EOH - widly dispersed Pyrite xls and pyrite stockwork (at random ∠'s to CA) - small bleb associated w/ stockwork
		577.3 to 582 Breccia - clast supported - mod to mod hard, clasts are potassically Altered - coarse to Blocky size. angular to subangular Matrix is ++ Quartz, +/- Barite +/- white clay +/- pyrite/marcasite. 582 to 594.2 - massive - weakly laminated - highly fractured - perv. Prop Altered, propilization becomes stronger towards 594.2'. Strong smoky Quartz stockwork w/ pyrite/marcasite	570 580		577.3 to 712.5 .10 fx/ft 0-20° to CA .30 fx/ft 30-40° to CA .31 fx/ft 50-60° to CA .10 fx/ft 70° to 90° to CA	
		594.2 to 712.5 - Breccia - matrix supported - auto breccia - Matrix is strongly silicified - hard. - Clasts are lapilli to coarse w/ frequent Blocks - Subangular to subrounded and are mod hard. Clasts are weakly prop + potassically Alt'd. Interval is Vuggy - Vugs are filled w/ fine dog toothed quartz. Barite, pyrite/Marcasite sporatic white clay AgS salt and stibnite	590 600 610		592.2 Fx at 50° to CA Lined w/ marcasite and fine grained sulfides 595.9 - Fx at 50° to CA healed w/ Quartz - Fx likely controlls Alt. changes at 594.2' and 602.4'	592 to 594.2 strong Prop Alt. w/ zones of K-alt. - Barite, white clay, pyrite marcasite, Ag, stibnite. 594.2 to 602.4 - Matrix is potassically altered And strongly Silicified

ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	Ag2
540	542.2					
542.2	542.8					
542.8	547					
547	550.1					
550.1	555					
555	560					
560	560.9					
560.9	565					
565	570					
570	575					
575	577.3					
577.3	582					
582	587					
587	592					
592	594.2					
594.2	599					
599	602.1					
602.1	603.1					
603.1	608					

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REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		610 to 680 - same as 584.2 to 712.5	610, 620, 630, 640, 650, 660, 670, 680			627.8 to 629.1 - zone is vuggy - large euhedral xls of Barite, Bladed marcasite - fine dog tooth quartz (Dark grey in color), and white clay

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	Ag2
608	613					
613	617					
617	621					
621	625					
625	627.8					
627.8	629.1					
629.1	634					
634	639					
639	644					
644	649					
649	654					
654	659					
659	664					
664	669					
669	674					
674	679					

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EC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		697.1 to 698.1 - Breccia - changes from course clasts to a lapilli to fine sized clasts - matrix is quartz.	680, 690, 700, 710, 712.5 EOH			

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	Ag2
679	684					
684	689					
689	694					
694	697.1					
697.1	698.1					
698.1	703					
703	708					
~~708~~	~~712.5~~	no assay				

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # 95-345 DATE: 03/22/96 LOGGED BY: Alex B. Davidson PAGE 1 OF 8

DRILL RUN FROM	DRILL RUN TO	SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH DOWNHOLE DEPTH	ROCK STRENGTH POINT LOAD INDEX (psi)	FRACTURE DATA FRACTURE DENSITY/FT.	FRACTURE DATA A/G ANGLE TO C.A.	FRACTURE DATA ROUGHNESS	FRACTURE DATA INFILL	DENSITY DATA DOWNHOLE DEPTH	DENSITY DATA SAMPLE WEIGHT (g)	DENSITY DATA DISPLACEMENT (cc)	DENSITY DATA DENSITY (g/cc)
25.5	31.5	66	101	21							25.7	773.8	320	2.42
31.5	33	44	120	0										
33	39	32	108	0										
39	49	63	99	30										
49	59.4	39	109	6							55.3	373.2	160	2.33
59.4	69.8	47	104	15										
69.8	80.7	56	103	35							72.3 75.9	684.6 478.1	310 220	2.20 2.17
80.2	88.2	48	102	21										
88.2	90.5	23	96	18										
90.5	95.4	17	111	0										
95.4	105	65	99	50										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # 95-346 DATE 03/22/96 LOGGED BY: Alex B Davidson PAGE 2 OF 8

DRILL RUN FROM	DRILL RUN TO	SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH DOWNHOLE DEPTH	ROCK STRENGTH POINT LOAD INDEX (psi)	FRACTURE DATA FRACTURE DENSITY/FT.	FRACTURE DATA A/G ANGLE TO C.A.	FRACTURE DATA ROUGHNESS	FRACTURE DATA INFILL	DENSITY DATA DOWNHOLE DEPTH	DENSITY DATA SAMPLE WEIGHT (g)	DENSITY DATA DISPLACEMENT (cc)	DENSITY DATA DENSITY (g/cc)
105	115	76	99	47							106.4	346.5	160	2.16
115	121.1	74	103	49							119.6	863.4	360	2.40
											121.0	387.9	160	2.42
121.1	131.4	47	107	36										
131.4	134.5	0	145	0							133.3	180.2	80	2.25
134.5	141	84	98	77										
141	156	45	108	21							141.1	373.7	160	2.33
156	159.5	29	69	0										
159.5	170	61	100	43										
170	180.2	51	104	22										
180.2	184.3	20	119	.12										
184.3	192.5	.46	111	43							189.8	431.9	190	2.27

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # 95-345 DATE 03/22/96 LOGGED BY: Alex B Davidson PAGE 3 OF 8

DRILL RUN FROM	DRILL RUN TO	SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH DOWNHOLE DEPTH	ROCK STRENGTH POINT LOAD INDEX (psi)	FRACTURE DATA FRACTURE DENSITY/FT.	FRACTURE DATA A/G ANGLE TO C.A	FRACTURE DATA ROUGHNESS	FRACTURE DATA INFILL	DENSITY DATA DOWNHOLE DEPTH	DENSITY DATA SAMPLE WEIGHT (g)	DENSITY DATA DISPLACEMENT (cc)	DENSITY DATA DENSITY (g/cc)
192.5	199.5	14	103	10										
199.5	209.5	59	103	56							200. 209.6	558 538.7	240 220	2.33 2.45
209.5	217.5	52	91	36							216.4	592.0	245	2.42
217.5	223	30	107	15										
223	227.2	22	94	14										
227.2	237.4	57	99	52							234.1 235.1 236	1194.4 724.0 802.3	480 300 325	2.49 2.41 2.47
237.4	247	55	96	42							241.5	700.0	300	2.33
247	253.5	66	103	58										
253.5	255	0	167	0										
255	263.7	15	118	7										
263.7	268.7	56	108	39										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # 95-345 DATE: 03/22/96 LOGGED BY: Alex B Davidson PAGE 4 OF 8

DRILL RUN FROM	DRILL RUN TO	SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH DOWNHOLE DEPTH	ROCK STRENGTH POINT LOAD INDEX (psi)	FRACTURE DATA FRACTURE DENSITY/FT.	FRACTURE DATA AVG. ANGLE TO C.A.	FRACTURE DATA ROUGHNESS	FRACTURE DATA INFILL	DENSITY DATA DOWNHOLE DEPTH	DENSITY DATA SAMPLE WEIGHT (g)	DENSITY DATA DISPLACEMENT (cc)	DENSITY DATA DENSITY (g/cc)
268.7	271.5	6	125	0										
271.5	281.8	67	98	54							274.6	813.5	330	2.47
281.8	288	52	106	42							282.7	472.6	200	2.36
288	295	82	100	74										
295	299	15	115	9										
299	305	34	107	17										
305	311.5	40	105	22										
311.5	316.5	27	110	7										
316.5	325	71	100	65										
325	334	56	99	29							326.5	530.7	200	2.65
334	335	90	100	40										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # 95-345 DATE: 03/22/96 LOGGED BY: Alex B. Davidson PAGE 5 OF 8

DRILL RUN FROM	DRILL RUN TO	SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH DOWNHOLE DEPTH	ROCK STRENGTH POINT LOAD INDEX (psi)	FRACTURE DATA FRACTURE DENSITY/FT.	FRACTURE DATA A/G. ANGLE TO C.A	FRACTURE DATA ROUGHNESS	FRACTURE DATA INFILL	DENSITY DATA DOWNHOLE DEPTH	DENSITY DATA SAMPLE WEIGHT (g)	DENSITY DATA DISPLACEMENT (cc)	DENSITY DATA DENSITY (g/cc)
335	341.8	48	99	24							336.7	509.2	220	2.31
341.8	347	24	111	10										
347	351.5	8	109	0							349.9	437.8	200	2.19
351.5	362.2	40	101	19							355.1	497.3	210	2.37
362.2	372.5	44	98	28							364.7	294.5	120	2.45
372.5	381	46	100	35										
381	391	60	98	51										
391	401	75	99	58							392.2	261.2	110	2.37
401	411	93	96	80							400.1 402.2	431.4 634.3	200 270	2.16 2.35
411	421	91	99	81							411.9	656.8	290	2.26
421	431	89	100	86										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # 95-345 DATE: 03/22/96 LOGGED BY: Alex R. Davidson PAGE 6 OF 8

DRILL RUN FROM	DRILL RUN TO	SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH DOWNHOLE DEPTH	ROCK STRENGTH POINT LOAD INDEX (psi)	FRACTURE DATA FRACTURE DENSITY /FT.	FRACTURE DATA AVG. ANGLE TO C.A.	FRACTURE DATA ROUGHNESS	FRACTURE DATA INFILL	DENSITY DATA DOWNHOLE DEPTH	DENSITY DATA SAMPLE WEIGHT (g)	DENSITY DATA DISPLACEMENT (cc)	DENSITY DATA DENSITY (g/cc)
431	441	91	98	83							440.9	740.6	320	2.31
441	451	82	95	59							445.6	524.2	220	2.38
457	461	79	99	64							468.8	647.7	280	2.31
461	471	71	98	54										
471	481	66	98	41							476.4	540.3	240	2.25
481	491	49	100	35							483.7	1071.2	460	2.33
											484.5	707.4	300	2.37
											487.0	494.7	200	2.47
											490.8	740	320	2.31
491	501	39	104	17							493.1	338.1	160	2.11
											495.7	473.8	190	2.49
											498.1	436.4	160	2.73
501	511	86	100	73							502.9	381.4	160	2.38
											505.7	956.2	390	2.45
511	521	86	98	64							517.2	859.7	340	2.53
											519.1	428.8	170	2.52
521	531	84	93	77							523.	395.6	160	2.47
											526.5	770.5	300	2.57
531	535	65	92	48										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # 95-345 DATE: 03/27/96 LOGGED BY: Alex B. Davidson PAGE 7 OF 8

DRILL RUN FROM	DRILL RUN TO	SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH DOWNHOLE DEPTH	ROCK STRENGTH POINT LOAD INDEX (psi)	FRACTURE DATA FRACTURE DENSITY/FT.	FRACTURE DATA AVG. ANGLE TO C.A.	FRACTURE DATA ROUGHNESS	FRACTURE DATA INFILL	DENSITY DATA DOWNHOLE DEPTH	DENSITY DATA SAMPLE WEIGHT (g)	DENSITY DATA DISPLACEMENT (cc)	DENSITY DATA DENSITY (g/cc)
535	543	72	91	64							539.4	760.5	320	2.38
											542.2	705.9	280	2.52
543	553	92	100	88							543.2	1083.5	430	2.52
											551.4	604.9	230	2.63
											552	548.5	220	2.49
553	555 changes to NQ	95	100	68							554.7	690.7	280	2.47
555	565	86	87	76							562.5	398.6	170	2.34
565	575	82	97	69										
575	585	88	100	87							575.9	428.2	180	2.38
											581.4	452.5	190	2.38
											584	458.5	200	2.29
585	595	85	96	75							594.5	569.6	230	2.47
595	605	92	100	87							602.5	463.6	180	2.58
											604.7	413.7	180	2.30
605	615	89	100	86							611.7	632.7	260	2.43
615	625	94	97	93										
625	635	55	97	40										

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # 95-345 DATE: 03/22/96 LOGGED BY: Alex B Davidson PAGE 8 OF 8

DRILL RUN FROM	DRILL RUN TO	SOLID CORE RECOVERY (%)	TOTAL CORE RECOVERY (%)	RQD	ROCK STRENGTH DOWNHOLE DEPTH	ROCK STRENGTH POINT LOAD INDEX (psi)	FRACTURE DATA FRACTURE DENSITY/FT.	FRACTURE DATA AVG. ANGLE TO C.A	FRACTURE DATA ROUGHNESS	FRACTURE DATA INFILL	DENSITY DATA DOWNHOLE DEPTH	DENSITY DATA SAMPLE WEIGHT (g)	DENSITY DATA DISPLACEMENT (cc)	DENSITY DATA DENSITY (g/cc)
635	645	77	96	77							635.8	533	220	2.42
											637.5	271.4	120	2.26
645	647.5	70	108	67										
647.5	651.5	83	90	83							649.8	548.0	240	2.28
651.5	661.5	77	97	65										
661.5	672	79	86	70										
672	682.2	87	98	86										
682.2	702.5	88	96	83										
702.5	712.5 EOH	93	94	93										

DRILLHOLE DIP AND DIRECTION MEASUREMENTS WITH REFLEX FOTOBOR DDI

CUSTOMER: HECLA
CUSTOMER REFERENCE: ROSEBUD
SURVEYOR: MIKE SHEEN
DATE: 10-05-95
DRILL HOLE: 95-345
NO CASING

COLLAR POSITION

X(FT)	Y(FT)	Z(FT)	DIP (DEG.)	DIR. (DEG.)
483305.6	2203797	5362.95	89	124.99

POSITION AT 570 FT

X(FT)	Y(FT)	Z(FT)	DIP (DEG.)	DIR. (DEG.)
483299.8	2203803	4793.02	89.24	126.02

LOCAL COORDINATES AT 570 FT
Y-LOC= 1.33 FT TO THE RIGHT
Z-LOC= -1.76 FT DOWNWARDS

N

RESULTS

STATION (FT)	X(FT)	Y(FT)	Z(FT)	DIP (DEG.)	DIR. (DEG.)
0	483305.6	2203797	5362.95	89	124.99
20	483305.4	2203798	5342.95	89.04	128.63
40	483305.3	2203798	5322.95	89.08	134.14
60	483305	2203798	5302.95	88.94	138.45
80	483304.7	2203798	5282.96	88.94	132.8
100	483304.5	2203798	5262.96	89.01	131.24
* 100	1.51	.37	-.23		
120	483304.2	2203799	5242.96	89.01	138.42
140	483304	2203799	5222.97	88.99	140.47
160	483303.7	2203799	5202.97	88.95	142.42
180	483303.4	2203799	5182.97	88.97	138.34
200	483303.1	2203800	5162.98	88.98	131.13
* 200	3.12	.88	-.37		
220	483302.9	2203800	5142.98	89.07	128.45
240	483302.7	2203800	5122.98	89.1	133.87
260	483302.5	2203800	5102.98	89.05	133.02
280	483302.3	2203800	5082.99	89.1	131.77
300	483302.1	2203801	5062.99	89.16	124.62
* 300	4.54	1.13	-.69		
320	483302	2203801	5042.99	89.17	122.85
340	483301.8	2203801	5022.99	89.17	126.26
360	483301.6	2203801	5003	89.16	126.78
380	483301.5	2203801	4983	89.17	129
400	483301.3	2203802	4963	89.12	135.04
* 400	5.85	1.21	-1.13		
420	483301.1	2203802	4943	89.04	132.85
440	483300.9	2203802	4923	89.16	125.56
460	483300.7	2203802	4903.01	89.13	130.47
480	483300.5	2203802	4883.01	89.17	126.27
500	483300.4	2203803	4863.01	89.21	119.33
* 500	7.22	1.38	-1.5		
520	483300.2	2203803	4843.01	89.13	123.54
540	483300.1	2203803	4823.02	89.19	116.53
570	483299.8	2203803	4793.02	89.24	126.02
* 570	8.19	1.33	-1.76		

90
65
155

FIELD NOTE SHEET

DRILLHOLE 345

REFLEX–FOTOBOR DDI

LOCATION S35°E

BY M. SHEEN

DIP -89 DATE 10-5-95

TIME MIN	DEPTH	NOTES	DEPTH	NOTES	TIME MIN	DEPTH	NOTES	DEPTH	NOTES
1	0	SETUP			31	480			
2		SETUP			32	500			
3		SETUP			33	520			
4		MOVEMENT			34	540			
5	0				35		UP		
6	20				36				
7	40				37				
8	60				38				
9	80				39				
10	100				40				
11	120				41		OFF		
12	140				42				
13	160				43				
14	180				44				
15	200				45				
16	220				46				
17	240				47				
18	260				48				
19	280				49				
20	300				50				
21	320				51				
22	340				52				
23	—	MOVEMENT			53				
24	360				54				
25	380	MOVEMENT			55				
26	380				56				
27	400				57				
28	420				58				
29	440				59				
30	460				60				

Hole Depth 605
5' off Bottom 5
600
Surface 1
599
RODS 30
569
Survey to 540