6000 0601

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. RS-480
AUTHOR	D. Schood; K. Allen, V. Reid; J.P. Rogowski
DATE OF DOC(S)	1999 - 2000
MULTI_DIST Y / N? Additional Dist_Nos:	
QUAD_NAME	Sulphur 7.5'
P_M_C_NAME (mine, claim & company names)	Rosebud Mine; Rosebud Mining Co. LLC Hecla Mining Co.; Rosebud Project; Wild Rose prospect
COMMODITY If not obvious	gold; silver
NOTES	drill logs; geology; assay; total depth 1815'; correspondence; geochemistry 53p.

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 3/20/08
Initials Date
DB:
Initials Date
SCANNED:
Initials Date

Revised: 1/22/08

RS-480 99

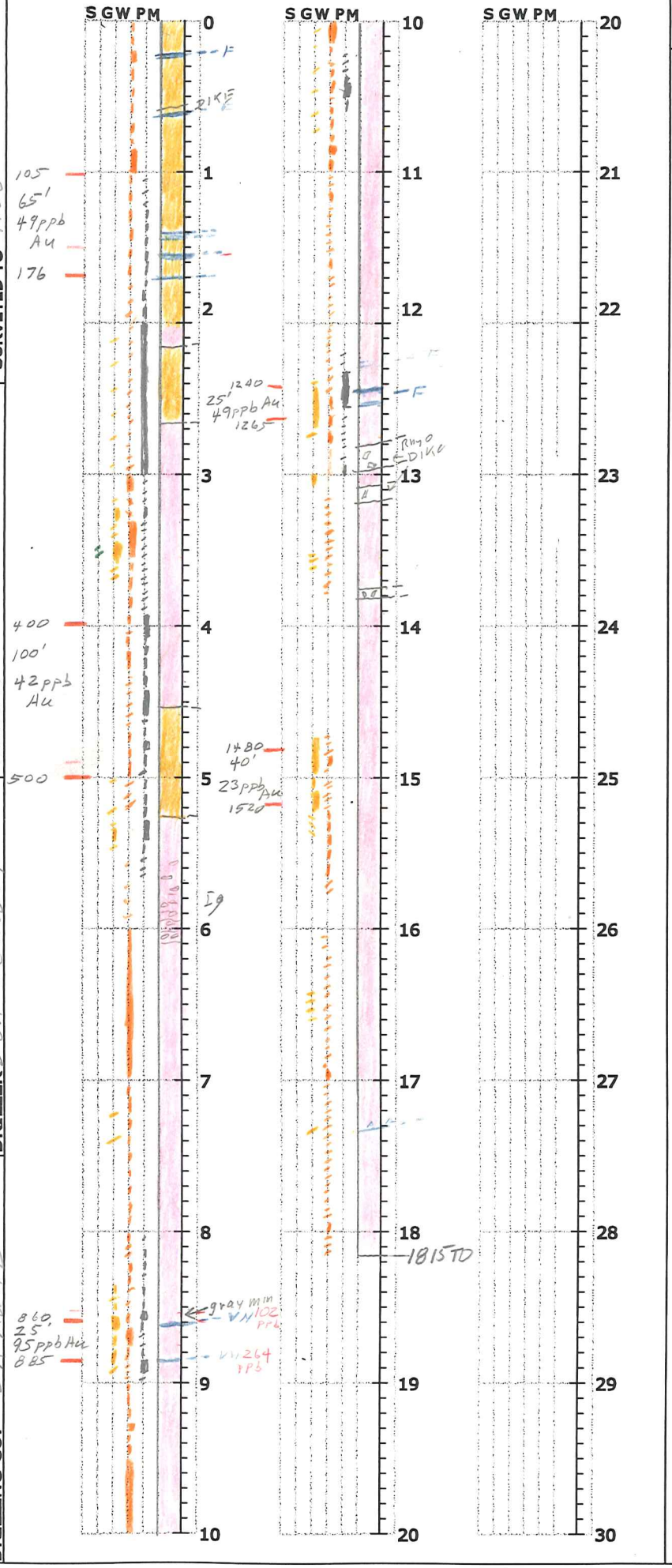
6000 0601
4010

6000 0601

ROSEBUD MINING COMPANY, LLC.

2nd Hole @ Wildrose
Dec 1999

HOLE #	RS-480
FINISH HOLE	21 Dec 1999
LOGGED BY	Rogowski
T.D	1815'
ANGLE	-90°
SURVEYED TO	1100 Vern - Well-Nav
START HOLE	15 Dec 1999
HOLE TYPE	RC
BEARING	—
PAGE 1 OF	20
COLLAR COORDINATES	
NORTH	2,220,570
EAST	476,065
ELEV	5680
DRILLER	Don Schoor
DRILLING CO.	Ekblund



ALTERATION INTENSITY

1 WEAK	2 MODERATE	3 STRONG

VERITHIN COLOR

737	SILICIFICATION
751	GREEN CLAY
747½	WHITE CLAY
755	PYRITE
757	MARCASITE

GRAPHIC LOG

VERITHIN COLOR

	BRECCIA
741	FAULT 741
	CONTACT
737	QUARTZ VEIN
741½	CALCITE VEIN
747½	CLAY VEIN
755	PYRITE VEIN

LBT/WR
WRP
BUD-Like

INSPECTORATE

ROCKY MOUNTAIN GEOCHEMICAL

A MEMBER OF THE INSPECTORATE GROUP OF COMPANIES
840 GREG STREET • SPARKS, NEVADA 89431 • PHONE (775) 359-6311 • FAX (775) 359-2944

Don- please deliver to Pete R.

Fax Cover Sheet

DATE: 1/11/00

ATTENTION: KURT

FROM: FRED

MESSAGE:
WILL GET Ag VALUES IN MORNING AS WELL AS 1000 - 1810 ASSAYS. ASSAY LOOK ABOUT THE SAME AS 0-1000.

FRED

Number of pages including cover sheet: 20

DATE: Tuesday, January 11, 2000

JOB NO: 99-51-78

CLIENT: Hecla (Rosebud Mine)
P.O. Box 2610
Winnemucca, NV 89446 US

INVOICE NO:

CLIENT ORDER NO:

REPORT ON: 201 RC

SUBMITTED BY: Kurt Allen

DATE RECIEVED: Tuesday, December 21, 1999

ANALYSES: Rosebud Mine Development Protocol

ANALYTICAL METHODS: Fire Assay, Fire/AA

REMARKS:

CC: RMG File

E-MAILED TO:

CLIENT: Hecla (Rosebud Mine)

JOB NO.: 995178

SAMPLE NO	ppb Gold	oz/ton Gold	oz/ton Gold	ppm Silver	oz/ton Silver
RS-480 0'-5'	2				
RS-480 5'-10'	2				
RS-480 10'-15'	2				
RS-480 15'-20'					
RS-480 20'-25'	-2				
RS-480 25'-30'	-2				
RS-480 30'-35'	-2				
RS-480 35'-40'	-2				
RS-480 40'-45'	-2				
RS-480 45'-50'	-2				
RS-480 50'-55'	-2				
RS-480 55'-60'	-2				
RS-480 60'-65'	-2				
RS-480 65'-70'	-2				
RS-480 70'-75'	-2				
RS-480 75'-80'	-2				
RS-480 80'-85'	-2				
RS-480 85'-90'	-2				
RS-480 90'-95'	-2				
RS-480 95'-100'	-2				
RS-480 100'-105'	9				
RS-480 105'-110'	23				
RS-480 110'-115'	60				
RS-480 115'-120'	83				

105 TO 170 65'

48.7
13 | 633

CLIENT: Hecla (Rosebud Mine)

SAMPLE NO	ppb Gold	oz/ton Gold	oz/ton Gold	ppm Silver	oz/ton Silver
RS-480 120'-125'	101				
RS-480 125'-130'	97				
RS-480 130'-135'	69				
RS-480 135'-140'	54				
RS-480 140'-145'	15				
RS-480 145'-150'	24				
RS-480 150'-155'	69				
RS-480 155'-160'	12				
RS-480 160'-165'	14				
RS-480 165'-170'	12				
RS-480 170'-175'	-2				
RS-480 175'-180'	-2				
RS-480 180'-185'	9				
RS-480 185'-190'	4				
RS-480 190'-195'	4				
RS-480 195'-200'	2				
RS-480 200'-205'	-2				
RS-480 205'-210'	-2				
RS-480 210'-215'	-2				
RS-480 215'-220'	-2				
RS-480 220'-225'	-2				
RS-480 225'-230'	-2				
RS-480 230'-235'	2				
RS-480 235'-240'	2				

CLIENT: Hecla (Rosebud Mine)

JOB NO.: 995178

SAMPLE NO	ppb Gold	oz/ton Gold	oz/ton Gold	ppm Silver	oz/ton Silver
RS-480 240'-245'	3				
RS-480 245'-250'	6				
RS-480 250'-255'	2				
RS-480 255'-260'	4				
RS-480 260'-265'	2				
RS-480 265'-270'	5				
RS-480 270'-275'	2				
RS-480 275'-280'	-2				
RS-480 280'-285'	-2				
RS-480 285'-290'	-2				
RS-480 290'-295'	11				
RS-480 295'-300'	-2				
RS-480 300'-305'	-2				
RS-480 305'-310'	-2				
RS-480 310'-315'	-2				
RS-480 315'-320'	-2				
RS-480 320'-325'	5				
RS-480 325'-330'	35				
RS-480 330'-335'	-2				
RS-480 335'-340'	-2				
RS-480 340'-345'	-2				
RS-480 345'-350'	-2				
RS-480 350'-355'	5				
RS-480 355'-360'	35				

CLIENT: Hecla (Rosebud Mine)

SAMPLE NO	ppb Gold	oz/ton Gold	oz/ton Gold	ppm Silver	oz/ton Silver
RS-480 360'-365'	-2				
RS-480 365'-370'	-2				
RS-480 370'-375'	-2				
RS-480 375'-380'	-2				
RS-480 380'-385'	-2				
RS-480 385'-390'	-2				
RS-480 390'-395'	-2				
RS-480 395'-400'	-2				
RS-480 400'-405'	52		400 -500		
RS-480 405'-410'	73			20) 837	41.9
RS-480 410'-415'	57				
RS-480 415'-420'	36				
RS-480 420'-425'	60				
RS-480 425'-430'	48				
RS-480 430'-435'	46				
RS-480 435'-440'	65				
RS-480 440'-445'	24				
RS-480 445'-450'	54				
RS-480 450'-455'	87				
RS-480 455'-460'	65				
RS-480 460'-465'	47				
RS-480 465'-470'	23				
RS-480 470'-475'	14				
RS-480 475'-480'	17				

CLIENT: Hecla (Rosebud Mine)

JOB NO.: 995178

SAMPLE NO	ppb Gold	oz/ton Gold	oz/ton Gold	ppm Silver	oz/ton Silver
RS-480 480'-485'	14				
RS-480 485'-490'	24				
RS-480 490'-495'	5				
RS-480 495'-500'	26				
RS-480 500'-505'	2				
RS-480 505'-510'	-2				
RS-480 510'-515'	-2				
RS-480 515'-520'	-2				
RS-480 520'-525'	-2				
RS-480 525'-530'	-2				
RS-480 530'-535'	-2				
RS-480 535'-540'	-2				
RS-480 540'-545'	13				
RS-480 545'-550'	35				
RS-480 550'-555'	-2				
RS-480 555'-560'	-2				
RS-480 560'-565'	-2				
RS-480 565'-570'	-2				
RS-480 570'-575'	-2				
RS-480 575'-580'	-2				
RS-480 580'-585'	-2				
RS-480 585'-590'	-2				
RS-480 590'-595'	3				
RS-480 595'-600'	8				

CLIENT: Hecla (Rosebud Mine)

SAMPLE NO	ppb Gold	oz/ton Gold	oz/ton Gold	ppm Silver	oz/ton Silver
RS-480 600'-605'	-2				
RS-480 605'-610'	-2				
RS-480 610'-615'	3				
RS-480 615'-620'	2				
RS-480 620'-625'	53				
RS-480 625'-630'	-2				
RS-480 630'-635'	-2				
RS-480 635'-640'	-2				
RS-480 640'-645'	12				
RS-480 645'-650'	-2				
RS-480 650'-655'	3				
RS-480 655'-660'	-2				
RS-480 660'-665'	-2				
RS-480 665'-670'	-2				
RS-480 670'-675'	-2				
RS-480 675'-680'	-20				
RS-480 680'-685'	10				
RS-480 685'-690'	-2				
RS-480 690'-695'	-2				
RS-480 695'-700'	-2				
RS-480 700'-705'	-2				
RS-480 705'-710'	-2				
RS-480 710'-715'	-2				
RS-480 715'-720'	-2				

Tuesday, January 11, 2000

CLIENT: Hecla (Rosebud Mine)

JOB NO.: 995178
Page 12 of 19

SAMPLE NO	ppb Gold	oz/ton Gold	oz/ton Gold	ppm Silver	oz/ton Silver
RS-480 600'-605'	-2				
RS-480 605'-610'	-2				
RS-480 610'-615'	3				
RS-480 615'-620'	2				
RS-480 620'-625'	53				
RS-480 625'-630'	-2				
RS-480 630'-635'	-2				

SAMPLE NO	ppb Gold	oz/ton Gold	oz/ton Gold	ppm Silver	oz/ton Silver
RS-480 720'-725'	2				
RS-480 725'-730'	6				
RS-480 730'-735'	-2				
RS-480 735'-740'	-2				
RS-480 740'-745'	-2				
RS-480 745'-750'	-2				
RS-480 750'-755'	-2				
RS-480 755'-760'	-2				
RS-480 760'-765'	-2				
RS-480 765'-770'	-2				
RS-480 770'-775'	-2				
RS-480 775'-780'	-2				
RS-480 780'-785'	-2				
RS-480 785'-790'	-2				
RS-480 790'-795'	-2				
RS-480 795'-800'	-2				
RS-480 800'-805'	-2				
RS-480 805'-810'	3				
RS-480 810'-815'	-2				
RS-480 815'-820'	-2				
RS-480 820'-825'	3				
RS-480 825'-830'	-2				
RS-480 830'-835'	3				
RS-480 835'-840'	3				

SAMPLE NO	ppb Gold	oz/ton Gold	oz/ton Gold	ppm Silver	oz/ton Silver
RS-480 840'-845'	-2				
RS-480 845'-850'	4				
RS-480 850'-855'	72				
RS-480 855'-860'	-2				
RS-480 860'-865'	102		860 - 885 - 25'		
RS-480 865'-870'	57			95.4	
RS-480 870'-875'	36			5) 477	
RS-480 875'-880'	18				
RS-480 880'-885'	264				
RS-480 885'-890'	-2				
RS-480 890'-895'	-2				
RS-480 895'-900'	-2				
RS-480 900'-905'	-2				
RS-480 905'-910'	6				
RS-480 910'-915'	2				
RS-480 915'-920'	-2				
RS-480 920'-925'	-2				
RS-480 925'-930'	-2				
RS-480 930'-935'	-2				
RS-480 935'-940'	-2				
RS-480 940'-945'	-2				
RS-480 945'-950'	-2				
RS-480 950'-955'	-2				
RS-480 955'-960'	-2				

SAMPLE NO	ppb Gold	oz/ton Gold	oz/ton Gold	ppm Silver	oz/ton Silver
RS-480 960'-965'	7				
RS-480 965'-970'	6				
RS-480 970'-975'	-2				
RS-480 975'-980'	36				
RS-480 980'-985'	-2				
RS-480 985'-990'	91				
RS-480 990'-995'	8				
RS-480 995'-1000'	3				
STD 75313	14110				

INSPECTORATE

ROCKY MOUNTAIN GEOCHEMICAL

A MEMBER OF THE INSPECTORATE GROUP OF COMPANIES
840 GREG STREET • SPARKS, NEVADA 89431 • PHONE (775) 359-6311 • FAX (775) 358-2944

Fax Cover Sheet

DATE: 1/12/00

ATTENTION: KURT

FROM: FRED

MESSAGE:
PRELIMS FOR RS 480
1000 - 1820.

Number of pages including cover sheet:_____

DATE: Wednesday, January 12, 2000

JOB NO: 99-51-98

CLIENT: Hecla (Rosebud Mine)
P.O. Box 2610
Winnecmucca, NV 89446 US

INVOICE NO:

CLIENT ORDER NO:

REPORT ON: 165 RC

SUBMITTED BY: Kurt Allen

DATE RECIEVED: Tuesday, December 21, 1999

ANALYSES: Rosebud Mine Development Protocol

ANALYTICAL METHODS: Fire Assay, Fire/AA

REMARKS:

CC: RMG File

E-MAILED TO:

CLIENT: Hecla (Rosebud Mine)

99-51-98	Sample Designation	Gold Fire/AA ppb	Gold Fire/AA oz/ton	Gold Fire Assay oz/ton	Silver Fire/AA ppm	Silver Fire/AA oz/ton	Silver Fire Assay oz/ton
1	RS-480 1000'-1005'	5				0.018	
2	RS-480 1005'-1010'	16				0.011	
3	RS-480 1010'-1015'	3				0.013	
4	RS-480 1015'-1020'	6				0.022	
5	RS-480 1020'-1025'	-2				0.010	
6	RS-480 1025'-1030'	-2				0.007	
7	RS-480 1030'-1035'	-2				0.011	
8	RS-480 1035'-1040'	-2				0.007	
9	RS-480 1040'-1045'	-2				0.013	
10	RS-480 1045'-1050'	-2				0.006	
11	RS-480 1050'-1055'	-2				0.007	
12	RS-480 1055'-1060'	15				0.009	
13	RS-480 1060'-1065'	-2				0.010	
14	RS-480 1065'-1070'	-2				0.009	
15	RS-480 1070'-1075'	-2				0.009	
16	RS-480 1075'-1080'	-2				0.012	
17	RS-480 1080'-1085'	-2				0.011	
18	RS-480 1085'-1090'	-2				0.009	
19	RS-480 1090'-1095'	6				0.005	
20	RS-480 1095'-1100'	-2				0.006	
21	RS-480 1100'-1105'	-2				0.010	
22	RS-480 1105'-1110'	-2				0.007	
23	RS-480 1110'-1115'	-2				0.001	
24	RS-480 1115'-1120'	-2				0.005	
25	RS-480 1120'-1125'	-2				0.005	
26	RS-480 1125'-1130'	-2				0.004	
27	RS-480 1130'-1135'	-2				0.012	
28	RS-480 1135'-1140'	-2				0.008	
29	RS-480 1140'-1145'	-2				0.016	
30	RS-480 1145'-1150'	-2				0.014	
31	RS-480 1150'-1155'	-2				0.011	
32	RS-480 1155'-1160'	-2				0.011	
33	RS-480 1160'-1165'	-2				0.006	

CLIENT: Hecla (Rosebud Mine)

99-51-98	Sample Designation	Gold Fire/AA ppb	Gold Fire/AA oz/ton	Gold Fire Assay oz/ton	Silver Fire/AA ppm	Silver Fire/AA oz/ton	Silver Fire Assay oz/ton
34	RS-480 1165'-1170'	-2				0.011	
35	RS-480 1170'-1175'	-2				0.009	
36	RS-480 1175'-1180'	-2				0.007	
37	RS-480 1180'-1185'	-2				0.003	
38	RS-480 1185'-1190'	-2				0.006	
39	RS-480 1190'-1195'	-2				0.009	
40	RS-480 1195'-1200'	-2				0.001	
41	RS-480 1200'-1205'	-2				0.010	
42	RS-480 1205'-1210'	-2				0.007	
43	RS-480 1210'-1215'	5				0.018	
44	RS-480 1215'-1220'	-2				0.006	
45	RS-480 1220'-1225'	-2				0.006	
46	RS-480 1225'-1230'	-2				0.009	
47	RS-480 1230'-1235'	-2				0.005	
48	RS-480 1235'-1240'	4				0.009	
49	RS-480 1240'-1245'	10				0.010	
50	RS-480 1245'-1250'	92				1.230	
51	RS-480 1250'-1255'	98				1.000	
52	RS-480 1255'-1260'	22				0.350	
53	RS-480 1260'-1265'	23				0.190	
54	RS-480 1265'-1270'	9				0.180	
55	RS-480 1270'-1275'	4				0.020	
56	RS-480 1275'-1280'	3				0.014	
57	RS-480 1280'-1285'	3				0.024	
58	RS-480 1285'-1290'	3				0.078	
59	RS-480 1290'-1295'	3				0.022	
60	RS-480 1295'-1300'	2				0.030	
61	RS-480 1300'-1305'	12				0.012	
62	RS-480 1305'-1310'	-2				0.011	
63	RS-480 1310'-1315'	-2				0.019	
64	RS-480 1315'-1320'	10				0.008	
65	RS-480 1320'-1325'	-2				0.013	
66	RS-480 1325'-1330'	-2				0.065	
67	RS-480 1330'-1335'	2				0.012	
68	RS-480 1335'-1340'	-2				0.012	
69	RS-480 1340'-1345'	-2				0.006	

1240-1265 25
49
5) 245

Wednesday, January 12, 2000

CLIENT: Hecla (Rosebud Mine)

99-51-98	Sample Designation	Gold Fire/AA ppb	Gold Fire/AA oz/ton	Gold Fire Assay oz/ton	Silver Fire/AA ppm	Silver Fire/AA oz/ton	Silver Fire Assay oz/ton
70	RS-480 1345'-1350'	-2				0.046	
71	RS-480 1350'-1355'	-2				0.014	
72	RS-480 1355'-1360'	-2				0.014	
73	RS-480 1360'-1365'	-2				0.006	
74	RS-480 1365'-1370'	-2				0.046	
75	RS-480 1370'-1375'	-2				0.015	
76	RS-480 1375'-1380'	-2				0.014	
77	RS-480 1380'-1385'	-2				0.017	
78	RS-480 1385'-1390'	-2				0.054	
79	RS-480 1390'-1395'	-2				0.030	
80	RS-480 1395'-1400'	-2				0.017	
81	RS-480 1400'-1405'	-2				0.019	
82	RS-480 1405'-1410'	-2				0.054	
83	RS-480 1410'-1415'	-2				0.016	
84	RS-480 1415'-1420'	-2				0.034	
85	RS-480 1420'-1425'	-2				0.032	
86	RS-480 1425'-1430'	-2				0.023	
87	RS-480 1430'-1435'	-2				0.015	
88	RS-480 1435'-1440'	-2				0.020	
89	RS-480 1440'-1445'	-2				0.010	
90	RS-480 1445'-1450'	7				0.051	
91	RS-480 1450'-1455'	2				0.025	
92	RS-480 1455'-1460'	6				0.022	
93	RS-480 1460'-1465'	-2				0.022	
94	RS-480 1465'-1470'	3				0.040	
95	RS-480 1470'-1475'	-2				0.018	
96	RS-480 1475'-1480'	3				0.023	
97	RS-480 1480'-1485'	64				0.048	
98	RS-480 1485'-1490'	24				0.042	
99	RS-480 1490'-1495'	13				0.057	
100	RS-480 1495'-1500'	-2				0.028	
101	RS-480 1500'-1505'	10				0.041	
102	RS-480 1505'-1510'	37				0.053	
103	RS-480 1510'-1515'	21				0.046	
104	RS-480 1515'-1520'	10				0.033	
105	RS-480 1520'-1525'	3				0.022	

1480-1520 40'
22.6
8 | 181

CLIENT: Hecla (Rosebud Mine)

99-51-98	Sample Designation	Gold Fire/AA ppb	Gold Fire/AA oz/ton	Gold Fire Assay oz/ton	Silver Fire/AA ppm	Silver Fire/AA oz/ton	Silver Fire Assay oz/ton
106	RS-480 1525'-1530'	-2				0.033	
107	RS-480 1530'-1535'	-2				0.019	
108	RS-480 1535'-1540'	8				0.029	
109	RS-480 1540'-1545'	-2				0.012	
110	RS-480 1545'-1550'	3				0.010	
111	RS-480 1550'-1555'	2				0.032	
112	RS-480 1555'-1560'	4				0.031	
113	RS-480 1560'-1565'	-2				0.014	
114	RS-480 1565'-1570'	-2				0.022	
115	RS-480 1570'-1575'	-2				0.017	
116	RS-480 1575'-1580'	-2				0.028	
117	RS-480 1580'-1585'	6				0.032	
118	RS-480 1585'-1590'	2				0.008	
119	RS-480 1590'-1595'	3				0.005	
120	RS-480 1595'-1600'	6				0.028	
121	RS-480 1600'-1605'	2				0.017	
122	RS-480 1605'-1610'	-2				0.014	
123	RS-480 1610'-1615'	2				0.029	
124	RS-480 1615'-1620'	-2				0.030	
125	RS-480 1620'-1625'	-2				0.020	
126	RS-480 1625'-1630'	-2				0.033	
127	RS-480 1630'-1635'	-2				0.021	
128	RS-480 1635'-1640'	-2				0.019	
129	RS-480 1640'-1645'	-2				0.015	
130	RS-480 1645'-1650'	-2				0.029	
131	RS-480 1650'-1655'	-2				0.026	
132	RS-480 1655'-1660'	9				0.112	
133	RS-480 1660'-1665'	-2				0.031	
134	RS-480 1665'-1670'	-2				0.015	
135	RS-480 1670'-1675'	-2				0.013	
136	RS-480 1675'-1680'	-2				0.025	
137	RS-480 1680'-1685'	-2				0.012	
138	RS-480 1685'-1690'	-2				0.030	
139	RS-480 1690'-1695'	-2				0.011	
140	RS-480 1695'-1700'	26				0.042	
141	RS-480 1700'-1705'	-2				0.025	

CLIENT: Hecla (Rosebud Mine)

99-51-98	Sample Designation	Gold Fire/AA ppb	Gold Fire/AA oz/ton	Gold Fire Assay oz/ton	Silver Fire/AA ppm	Silver Fire/AA oz/ton	Silver Fire Assay oz/ton
142	RS-480 1705'-1710'	-2				0.030	
143	RS-480 1710'-1715'	-2				0.003	
144	RS-480 1715'-1720'	-2				0.020	
145	RS-480 1720'-1725'	-2				0.023	
146	RS-480 1725'-1730'	-2				0.008	
147	RS-480 1730'-1735'	-2				0.035	
148	RS-480 1735'-1740'	-2				0.013	
149	RS-480 1740'-1745'	-2				0.014	
150	RS-480 1745'-1750'	-2				0.014	
151	RS-480 1750'-1755'	-2				0.017	
152	RS-480 1755'-1760'	-2				0.014	
153	RS-480 1760'-1765'	-2				0.018	
154	RS-480 1765'-1770'	-2				0.016	
155	RS-480 1770'-1775'	9				0.031	
156	RS-480 1775'-1780'	2				0.034	
157	RS-480 1780'-1785'	4				0.018	
158	RS-480 1785'-1790'	11				0.025	
159	RS-480 1790'-1795'	5				0.008	
160	RS-480 1795'-1800'	-2				0.013	
161	RS-480 1800'-1805'	2				0.008	
162	RS-480 1805'-1810'	-2				0.013	
163	RS-480 1810'-1815'	5				0.010	
164	RS-480 1815'-1820'	6				0.037	
165	STD 73528	12500				3.000	

Wednesday, January 12, 2000

By _____

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* HECLA MINING COMPANY *
****

JOB NUMBER: 29-0588-311

WELL NAME: RS-480 / VS 000.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 12/17/99

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

TIE-ON COORDINATES AT: 0 M.D.
TAKEN FROM: COLLAR

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 090.00
WATER CONTACT= 799'

****
****** DEPTH MEASURED IN FEET *******
****

COMMENTS: ***** EKLUND ****
** DON SCHOORL **

PROJECTED F/1060' T/1100'.

****
****
*** THIS DIRECTIONAL SURVEY REPORT IS ****
** CORRECT TO THE BEST OF MY KNOWLEDGE ***
* AND IS SUPPORTED BY ACTUAL FIELD DATA! *
**
**
** **********
** COMPANY REPRESENTATIVE **
****
****

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

JOB NUMBER: 29-0588-311 WELL NAME: RS-480 / VS 000.00

INRUN SURVEY
BY MINIMUM CURVATURE

MEAS. DEPTH	VERT. DEPTH	VERT. SECT.	L/R PROP.	INCL HORZ	BEARING AZIMUTH	COORDINATES LATITUDE	COORDINATES DEPARTURE	D-LEG /100	D-LEG /CL	STATION DISPLACEMENT DISP.	DIRECTION	TEMP. DEG F
0.0	0.00	0.00	0.000	-89.28	299.30	0.00 N	0.00 E	0.00		0.00	AT 000.00	
50.0	49.99	-0.96	-0.515	-88.23	297.87	0.51 N	0.96 W	2.10	1.05	1.09	AT 298.28	051.08
100.0	99.96	-2.17	-1.490	-88.14	319.20	1.49 N	2.17 W	1.35	0.68	2.63	AT 304.48	051.73
150.0	149.93	-2.51	-3.328	-87.16	008.87	3.33 N	2.51 W	4.33	2.16	4.17	AT 322.99	053.01
200.0	199.83	-1.69	-6.235	-85.88	020.45	6.24 N	1.69 W	2.91	1.45	6.46	AT 344.83	053.91
250.0	249.68	-0.00	-9.776	-85.09	029.75	9.78 N	0.00 W	2.15	1.07	9.78	AT 360.00	055.00
300.0	299.41	2.97	-13.927	-83.15	039.73	13.93 N	2.97 E	4.37	2.19	14.24	AT 012.03	056.05
350.0	349.01	6.23	-19.325	-82.21	023.65	19.33 N	6.23 E	4.49	2.24	20.31	AT 017.88	057.34
400.0	398.54	9.93	-25.029	-81.97	041.91	25.03 N	9.93 E	5.03	2.51	26.93	AT 021.63	058.33
450.0	448.05	14.62	-30.252	-81.88	042.00	30.25 N	14.62 E	0.18	0.09	33.60	AT 025.79	059.51
500.0	497.52	19.53	-35.592	-81.44	043.13	35.59 N	19.53 E	0.94	0.47	40.60	AT 028.75	060.63
550.0	546.93	24.71	-41.238	-80.93	041.96	41.24 N	24.71 E	1.08	0.54	48.07	AT 030.93	062.08
600.0	596.26	30.10	-47.347	-80.31	040.96	47.35 N	30.10 E	1.28	0.64	56.10	AT 032.45	063.46
650.0	645.51	35.64	-53.955	-79.82	039.08	53.95 N	35.64 E	1.18	0.59	64.67	AT 033.45	065.22
700.0	694.74	41.23	-60.665	-80.06	040.52	60.66 N	41.23 E	0.70	0.35	73.35	AT 034.20	066.67
750.0	743.98	46.94	-67.239	-79.89	041.36	67.24 N	46.94 E	0.45	0.22	82.00	AT 034.92	068.00
800.0	793.15	52.87	-74.053	-79.29	040.75	74.05 N	52.87 E	1.22	0.61	90.99	AT 035.52	077.98
850.0	842.28	58.94	-81.072	-79.32	040.95	81.07 N	58.94 E	0.10	0.05	100.23	AT 036.02	081.38
900.0	891.42	64.95	-88.112	-79.34	040.04	88.11 N	64.95 E	0.34	0.17	109.46	AT 036.40	085.02
950.0	940.56	70.93	-95.149	-79.37	040.69	95.15 N	70.93 E	0.25	0.12	118.68	AT 036.70	086.77
1000.0	989.66	77.29	-102.130	-78.85	043.89	102.13 N	77.29 E	1.59	0.80	128.08	AT 037.12	089.67
1050.0	1038.70	84.10	-109.125	-78.64	044.52	109.12 N	84.10 E	0.49	0.24	137.77	AT 037.62	091.45
1100.0	1087.71	91.05	-116.159	-78.54	044.82	116.16 N	91.05 E	0.23	0.12	147.59	AT 038.09	091.74

```
*************************************************************
*                          ********                         *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                          ********                         *
*  1100.0 FEET EQUALS    147.59    FEET AT   038.09         *
*                          ********                         *
*************************************************************
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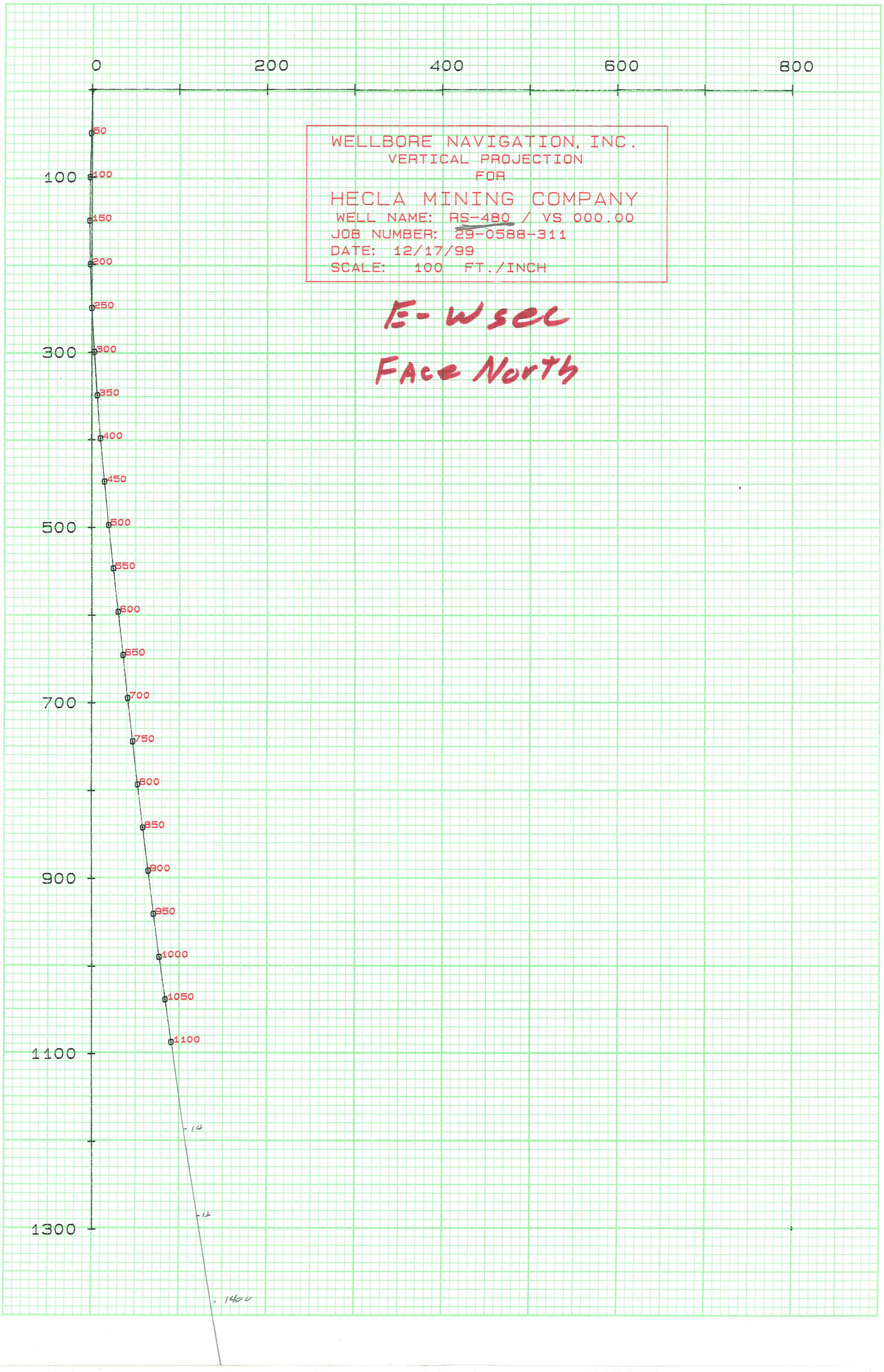
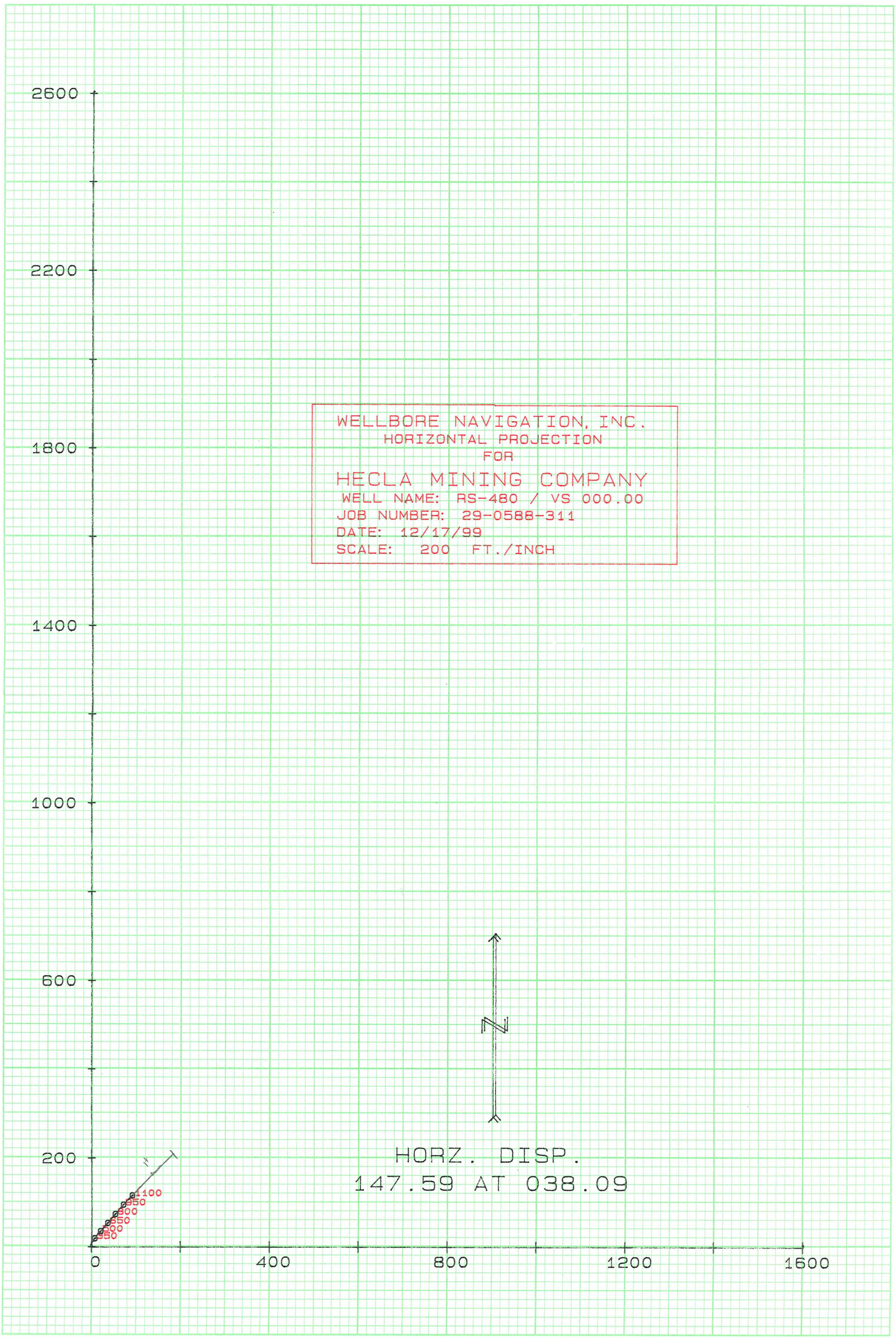
STARLIGHT PRINTING (801) 467-2841



STARLIGHT PRINTING (801) 467-2841



Robert

363
5
18/5

INSPECTORATE

ROCKY MOUNTAIN GEOCHEMICAL

A MEMBER OF THE INSPECTORATE GROUP OF COMPANIES

840 GREG STREET • SPARKS, NEVADA 89431 • PHONE (775) 359-6311 • FAX (775) 359-2944

Work Order #	
Date Received	
Purchase Order #	
Project #	
Date Shipped	
Shipped Via	
# of Cartons	
# of Samples	

Rogowski
21 Dec 1999

Geochemical Laboratory Instruction Sheet

Copy of Results:	Results And Invoice To:
Kurt Allen	SAME
Rosebud Mining, LLC	
P.O. Box 2610	
Winnemucca NV 89446	
(775) 623-6912 FAX:(775)623-6967	AUTHORITY:

No. of Samples	Sample Type	List of Sample Numbers	Elements Requested
363	RC	RS-480	Au, Ag: Use Rosebud Mine Development Protocol.
	NOTE:	Please make up 20 foot composits for the trace element method.	
1	Pulp	Rosebud Production Standard at end of run	

Orig of Copy

COARSE REJECT (Free storage for 30 days)
- [x] Return/collect after analysis
- [ ] Return/collect after 30 days
- [ ] Discard after 30 days

IF NOT MARKED, REJECT DISCARDED AFTER 30 DAYS

PULP (Free storage for 6 months)
- [x] Return/collect after analysis
- [ ] Return/collect at 6 months
- [ ] Discard at 6 months

IF NOT MARKED, PULP IS DISCARDED AFTER 6 MONTHS

COARSE REJECTS/PULPS WILL BE DISCARDED UNLESS OTHERWISE REQUESTED

Au - GOLD METHOD
- [x] Fire Assay/A.A.
- [ ] Fire Assay/Gravimetric
- [ ] NaCN/A.A.

RESULTS REPORTED IN:
- [x] ppb
- [ ] PPM
- [x] oz/T
- [ ] grams/T

TRACE ELEMENT METHOD
- [ ] Wet Chem./A.A.
- [x] Wet Chem./ICP +Se

RESULTS REPORTED IN:
- [x] ppm
- [ ] Percent %
- [ ] oz/T
- [ ] grams/T

ADDITIONAL INSTRUCTIONS:
FAX copy of results to
J.P. Rogowski (775) 623-6967

NOV96:PM5:RENO3:GEOCHEM

01/25 '00 08:42 NO.408 02/18
7753592944
ROCKY MOUNTAIN GEO

INSPECTORATE

ROCKY MOUNTAIN GEOCHEMICAL

A MEMBER OF THE INSPECTORATE GROUP OF COMPANIES

840 GREG STREET • SPARKS, NEVADA 89431 • PHONE (775) 359-6311 • FAX (775) 359-2944

Certificate of Analysis

JOB NO: 99-51-99

INVOICE NO: 33100419

DATE: Thursday, January 20, 2000

CLIENT: Hecla (Rosebud Mine)
P.O. Box 2610
Winnecmucca, NV 89446 US

CLIENT ORDER NO: RS 480 ICP

REPORT ON: 91 RC Composites

SUBMITTED BY: Kurt Allen

DATE RECIEVED: Tuesday, December 21, 1999

ANALYSES: ICP30

ANALYTICAL METHODS: AA, ICP

REMARKS:

CC: RMG File

E-MAILED TO:

ROCKY MOUNTAIN GEO 7753592944 01/25 '00 08:43 NO.408 03/18

99-51-99	Sample Designation	Silver ICP ppm	Aluminum ICP %	Arsenic ICP ppm	Boron ICP ppm	Barium ICP ppm	Bismuth ICP ppm	Calcium ICP %	Cadmium ICP ppm	Cobalt ICP ppm	Chromium ICP ppm	Copper ICP ppm	Iron ICP %
1	RS-480 0'-20'	-0.1	0.43	-2	11.4	60	-1	0.73	0.6	-1	16	5	2.20
2	RS-480 20'-40'	-0.1	0.46	-2	11.0	61	-1	0.37	0.6	-1	8	5	2.39
3	RS-480 40'-60'	-0.1	0.41	-2	11.3	39	-1	0.81	0.7	-1	10	5	2.74
4	RS-480 60'-80'	-0.1	0.38	-2	10.4	23	-1	1.42	0.6	-1	3	5	2.51
5	RS-480 80'-100'	-0.1	0.26	3	11.6	33	-1	0.17	0.5	-1	2	5	2.63
6	RS-480 100'-120'	-0.1	0.22	44	13.3	50	-1	0.07	0.7	-1	3	5	3.01
7	RS-480 120'-140'	-0.1	0.33	83	17.5	90	-1	0.10	1.0	-1	4	6	4.25
8	RS-480 140'-160'	-0.1	0.29	60	12.9	43	-1	0.07	0.7	-1	2	6	3.00
9	RS-480 160'-180'	-0.1	0.47	7	10.1	51	-1	0.15	1.0	-1	2	6	2.18
10	RS-480 180'-200'	-0.1	0.52	-2	12.4	25	-1	1.25	0.8	-1	2	5	3.12
11	RS-480 200'-220'	-0.1	0.45	-2	11.8	58	-1	1.38	0.6	-1	4	7	2.81
12	RS-480 220'-240'	-0.1	0.46	-2	13.1	55	-1	0.27	0.7	-1	14	7	3.32
13	RS-480 240'-260'	-0.1	0.52	8	12.2	45	-1	0.32	1.0	1	14	10	2.89
14	RS-480 260'-280'	-0.1	0.65	-2	12.0	41	-1	0.34	0.8	1	10	5	2.95
15	RS-480 280'-300'	-0.1	0.60	-2	13.9	50	-1	0.77	1.0	-1	11	8	3.71
16	RS-480 300'-320'	-0.1	0.76	-2	16.9	80	-1	0.32	1.2	-1	9	5	4.36
17	RS-480 320'-340'	-0.1	0.64	11	11.7	140	-1	0.08	0.7	-1	14	6	2.72
18	RS-480 340'-360'	-0.1	0.50	3	22.7	211	-1	0.03	1.2	-1	7	13	5.82
19	RS-480 360'-380'	-0.1	0.44	-2	10.8	200	-1	0.03	-0.5	-1	8	6	2.22
20	RS-480 380'-400'	-0.1	0.39	-2	13.1	164	-1	0.02	0.7	-1	4	7	2.83
21	RS-480 400'-420'	0.2	0.33	74	12.7	71	-1	0.03	0.7	-1	11	8	2.96
22	RS-480 420'-440'	0.2	0.26	92	12.8	26	-1	0.04	0.7	2	17	12	2.87
23	RS-480 440'-460'	2.6	0.24	99	8.6	11	-1	0.07	0.5	-1	36	121	1.98
24	RS-480 460'-480'	-0.1	0.31	70	10.2	73	-1	0.03	0.8	4	9	7	2.31
25	RS-480 480'-500'	-0.1	0.34	21	7.3	61	-1	0.05	-0.5	-1	10	13	1.57
26	RS-480 500'-520'	-0.1	0.40	5	2.7	51	-1	0.06	-0.5	-1	13	10	0.35
27	RS-480 520'-540'	-0.1	0.42	12	4.4	79	-1	0.08	-0.5	-1	16	17	0.79
28	RS-480 540'-560'	-0.1	0.44	4	4.1	48	-1	0.12	-0.5	-1	9	10	0.68
29	RS-480 560'-580'	-0.1	0.40	-2	9.6	15	-1	0.14	1.0	-1	9	16	2.12
30	RS-480 580'-600'	-0.1	0.43	-2	7.0	19	-1	0.13	-0.5	-1	16	21	1.57
31	RS-480 600'-620'	-0.1	0.43	-2	10.4	16	-1	0.19	-0.5	-1	10	12	2.37
32	RS-480 620'-640'	-0.1	0.46	-2	12.0	43	-1	0.25	0.6	-1	12	4	2.97
33	RS-480 640'-660'	-0.1	0.47	-2	8.2	25	-1	1.30	-0.5	-1	8	2	1.90

CLIENT: Hecla (Rosebud Mine)

99-51-99	Sample Designation	Mercury AA ppb	Potassium ICP %	Lanthanum ICP ppm	Magnesium ICP %	Manganese ICP ppm	Molybdenum ICP ppm	Sodium ICP %	Nickel ICP ppm	Phosphorous ICP ppm	Lead ICP ppm
	1 RS-480 0'-20'	228	0.15	11	0.09	473	1	0.03	3	221	15
	2 RS-480 20'-40'	20	0.15	14	0.07	594	-1	0.04	2	208	13
	3 RS-480 40'-60'	20	0.12	14	0.06	716	1	0.04	2	181	19
	4 RS-480 60'-80'	59	0.17	17	0.06	595	-1	0.04	-1	214	19
	5 RS-480 80'-100'	1227	0.18	21	0.01	176	-1	0.01	-1	410	17
	6 RS-480 100'-120'	2497	0.13	19	-0.01	13	-1	-0.01	-1	171	20
	7 RS-480 120'-140'	2758	0.15	14	-0.01	81	-1	-0.01	1	284	23
	8 RS-480 140'-160'	3101	0.12	19	-0.01	108	3	-0.01	-1	153	18
	9 RS-480 160'-180'	829	0.20	19	0.04	468	-1	0.04	-1	210	15
	10 RS-480 180'-200'	228	0.18	17	0.10	909	-1	0.05	-1	207	14
	11 RS-480 200'-220'	111	0.19	16	0.11	772	-1	0.03	-1	177	13
	12 RS-480 220'-240'	199	0.19	14	0.07	1002	-1	0.04	-1	174	17
	13 RS-480 240'-260'	49	0.21	17	0.11	920	-1	0.05	-1	230	14
	14 RS-480 260'-280'	29	0.21	17	0.09	697	-1	0.05	-1	212	14
	15 RS-480 280'-300'	23	0.21	16	0.09	806	-1	0.06	-1	190	17
	16 RS-480 300'-320'	20	0.23	16	0.08	853	-1	0.06	-1	239	17
	17 RS-480 320'-340'	441	0.16	14	0.01	40	2	-0.01	-1	146	14
	18 RS-480 340'-360'	1502	0.11	10	-0.01	73	-1	-0.01	-1	187	20
	19 RS-480 360'-380'	118	0.22	14	-0.01	229	-1	-0.01	-1	131	13
	20 RS-480 380'-400'	503	0.17	12	-0.01	158	-1	-0.01	-1	120	15
	21 RS-480 400'-420'	2383	0.09	10	-0.01	938	10	0.02	-1	113	20
	22 RS-480 420'-440'	986	0.06	8	-0.01	35	11	-0.01	1	62	20
	23 RS-480 440'-460'	1129	0.07	7	-0.01	28	10	0.04	4	85	45
	24 RS-480 460'-480'	855	0.23	26	-0.01	16	4	0.05	1	47	20
	25 RS-480 480'-500'	486	0.30	32	-0.01	24	3	0.04	-1	57	17
	26 RS-480 500'-520'	140	0.33	33	-0.01	19	2	0.04	-1	61	11
	27 RS-480 520'-540'	118	0.34	31	-0.01	26	2	0.06	1	60	15
	28 RS-480 540'-560'	13	0.32	35	0.01	77	1	0.02	-1	63	19
	29 RS-480 560'-580'	10	0.31	35	0.02	1574	2	0.15	-1	48	21
	30 RS-480 580'-600'	52	0.35	34	0.02	394	3	0.09	-1	45	90
	31 RS-480 600'-620'	36	0.32	30	0.03	1619	-1	0.16	-1	46	72
	32 RS-480 620'-640'	49	0.33	33	0.03	2673	-1	0.15	-1	69	27
	33 RS-480 640'-660'	29	0.35	30	0.04	531	-1	0.04	-1	52	17

CLIENT: Hecla (Rosebud Mine)

99-51-99	Sample Designation	Antimony ICP ppm	Selenium ICP ppm	Strontium ICP ppm	Titanium ICP %	Thallium ICP ppm	Vanadium ICP ppm	Tungsten ICP ppm	Zinc ICP ppm
1	RS-480 0'-20'	-2	-.5	30	-0.01	-0.5	3	1	55
2	RS-480 20'-40'	-2	-.5	27	-0.01	-0.5	-2	1	60
3	RS-480 40'-60'	-2	-.5	37	-0.01	-0.5	-2	1	64
4	RS-480 60'-80'	-2	-.5	42	-0.01	-0.5	-2	1	63
5	RS-480 80'-100'	-2	-.5	45	-0.01	-0.5	-2	1	32
6	RS-480 100'-120'	7	-.5	56	-0.01	-0.5	-2	-1	11
7	RS-480 120'-140'	13	-.5	72	-0.01	-0.5	-2	1	34
8	RS-480 140'-160'	8	-.5	29	-0.01	-0.5	-2	-1	20
9	RS-480 160'-180'	-2	-.5	28	-0.01	-0.5	-2	1	66
10	RS-480 180'-200'	-2	-.5	55	-0.01	-0.5	-2	1	86
11	RS-480 200'-220'	-2	-.5	67	-0.01	-0.5	-2	1	57
12	RS-480 220'-240'	-2	-.5	15	-0.01	-0.5	-2	2	76
13	RS-480 240'-260'	-2	-.5	10	-0.01	-0.5	-2	1	80
14	RS-480 260'-280'	-2	-.5	10	-0.01	-0.5	-2	1	85
15	RS-480 280'-300'	-2	-.5	27	-0.01	-0.5	-2	2	97
16	RS-480 300'-320'	-2	-.5	17	-0.01	-0.5	-2	2	110
17	RS-480 320'-340'	-2	-.5	24	-0.01	-0.5	-2	-1	20
18	RS-480 340'-360'	-2	-.5	10	-0.01	-0.5	-2	2	22
19	RS-480 360'-380'	-2	-.5	22	-0.01	-0.5	-2	-1	14
20	RS-480 380'-400'	-2	-.5	15	-0.01	-0.5	-2	1	11
21	RS-480 400'-420'	17	-.5	12	-0.01	-0.5	-2	-1	37
22	RS-480 420'-440'	17	-.5	7	-0.01	-0.5	-2	2	16
23	RS-480 440'-460'	11	-.5	12	-0.01	-0.5	-2	2	71
24	RS-480 460'-480'	7	-.5	4	-0.01	-0.5	-2	2	82
25	RS-480 480'-500'	6	-.5	4	-0.01	-0.5	-2	-1	68
26	RS-480 500'-520'	-2	-.5	3	-0.01	-0.5	-2	-1	53
27	RS-480 520'-540'	-2	-.5	4	-0.01	-0.5	-2	1	93
28	RS-480 540'-560'	-2	-.5	5	-0.01	-0.5	-2	-1	34
29	RS-480 560'-580'	-2	-.5	5	-0.01	-0.5	-2	3	222
30	RS-480 580'-600'	-2	-.5	5	-0.01	-0.5	-2	2	140
31	RS-480 600'-620'	-2	-.5	8	-0.01	-0.5	-2	3	235
32	RS-480 620'-640'	-2	-.5	10	-0.01	-0.5	-2	3	217
33	RS-480 640'-660'	-2	-.5	35	-0.01	-0.5	-2	2	57

CLIENT: Hecla (Rosebud Mine)

99-51-99	Sample Designation	Silver ICP ppm	Aluminum ICP %	Arsenic ICP ppm	Boron ICP ppm	Barium ICP ppm	Bismuth ICP ppm	Calcium ICP %	Cadmium ICP ppm	Cobalt ICP ppm	Chromium ICP ppm	Copper ICP ppm	Iron ICP %
	34 RS-480 660'-680'	-0.1	0.44	-2	7.7	26	-1	1.70	-0.5	-1	7	2	1.67
	35 RS-480 680'-700'	-0.1	0.38	-2	6.9	23	-1	1.91	-0.5	-1	11	4	1.58
	36 RS-480 700'-720'	-0.1	0.40	-2	5.6	22	-1	1.98	-0.5	-1	9	3	1.19
	37 RS-480 720'-740'	-0.1	0.59	-2	6.3	15	-1	1.33	-0.5	-1	21	4	1.16
	38 RS-480 740'-760'	-0.1	0.59	-2	7.2	17	-1	1.58	-0.5	-1	17	3	1.60
	39 RS-480 760'-780'	-0.1	0.45	-2	6.1	15	-1	1.49	-0.5	-1	8	4	1.47
	40 RS-480 780'-800'	-0.1	0.45	-2	5.9	28	-1	2.92	-0.5	-1	13	3	1.38
	41 RS-480 800'-820'	-0.1	0.52	-2	8.6	46	-1	1.39	-0.5	-1	26	10	2.14
	42 RS-480 820'-840'	0.1	0.43	-2	10.8	19	-1	0.60	0.6	-1	20	7	2.58
	43 RS-480 840'-860'	-0.1	0.40	18	11.8	15	-1	0.13	0.6	-1	33	9	2.59
	44 RS-480 860'-880'	-0.1	0.27	12	9.0	33	-1	0.14	-0.5	-1	20	6	2.20
	45 RS-480 880'-900'	-0.1	0.45	-2	8.6	13	-1	0.20	0.5	-1	13	6	1.96
	46 RS-480 900'-920'	-0.1	0.59	-2	9.2	24	-1	0.29	-0.5	-1	27	7	2.03
	47 RS-480 920'-940'	-0.1	0.52	-2	8.8	20	-1	0.28	-0.5	-1	26	6	2.01
	48 RS-480 940'-960'	-0.1	0.73	-2	9.4	24	-1	0.28	-0.5	-1	32	5	2.31
	49 RS-480 960'-980'	-0.1	0.73	-2	9.3	26	-1	0.26	-0.5	-1	20	7	2.22
	50 RS-480 980'-1000'	-0.1	0.70	-2	8.2	17	-1	0.22	-0.5	-1	29	5	1.81
	51 RS-480 1000'-1020'	-0.1	0.67	-2	8.4	50	-1	0.35	-0.5	-1	16	5	2.02
	52 RS-480 1020'-1040'	-0.1	0.60	-2	7.5	23	-1	1.08	-0.5	-1	17	5	1.64
	53 RS-480 1040'-1060'	-0.1	0.51	-2	7.1	31	-1	1.33	-0.5	-1	19	8	1.55
	54 RS-480 1060'-1080'	-0.1	0.49	-2	8.1	16	-1	2.27	-0.5	-1	21	30	1.97
	55 RS-480 1080'-1100'	-0.1	0.60	-2	8.4	21	-1	1.81	-0.5	-1	29	10	1.86
	56 RS-480 1100'-1120'	-0.1	0.53	-2	8.8	19	-1	1.44	-0.5	-1	23	12	2.13
	57 RS-480 1120'-1140'	-0.1	0.43	-2	7.7	21	-1	1.41	-0.5	-1	16	7	1.84
	58 RS-480 1140'-1160'	-0.1	0.43	-2	9.1	16	-1	1.90	-0.5	-1	16	5	2.14
	59 RS-480 1160'-1180'	-0.1	0.41	-2	8.2	16	-1	2.12	-0.5	-1	18	5	1.89
	60 RS-480 1180'-1200'	-0.1	0.37	-2	8.5	14	-1	1.81	-0.5	-1	16	5	1.88
	61 RS-480 1200'-1220'	-0.1	0.45	-2	8.7	18	-1	1.91	-0.5	-1	12	7	1.98
	62 RS-480 1220'-1240'	-0.1	0.46	-2	8.4	22	-1	0.49	-0.5	-1	13	6	1.76
	63 RS-480 1240'-1260'	100.0	0.34	45	10.1	18	-1	0.35	-0.5	-1	29	8	2.52
	64 RS-480 1260'-1280'	2.8	0.45	5	8.9	20	-1	0.85	-0.5	-1	15	7	2.00
	65 RS-480 1280'-1300'	0.8	0.39	-2	9.1	18	-1	1.63	-0.5	-1	12	9	2.06
	66 RS-480 1300'-1320'	-0.1	0.43	-2	9.1	19	-1	1.26	0.6	-1	7	8	2.07
	67 RS-480 1320'-1340'	-0.1	0.35	-2	8.6	14	-1	1.11	-0.5	-1	10	7	1.84
	68 RS-480 1340'-1360'	-0.1	0.38	-2	8.5	18	-1	1.24	-0.5	-1	8	6	1.95
	69 RS-480 1360'-1380'	-0.1	0.38	2	9.0	23	-1	1.05	-0.5	-1	9	7	1.87

ROCKY MOUNTAIN GEO 7753592944 01/25 '00 08:44 NO.408 06/18

CLIENT: Hecla (Rosebud Mine)

JOB NO.: 99-51-99

99-51-99	Sample Designation	Mercury	Potassium	Lanthanum	Magnesium	Manganese	Molybdenum	Sodium	Nickel	Phosphorous	Lead
		AA	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP
		ppb	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm
34	RS-480 660'-680'	23	0.36	32	0.03	566	-1	0.04	-1	65	17
35	RS-480 680'-700'	26	0.31	31	0.02	1064	1	0.03	-1	56	21
36	RS-480 700'-720'	42	0.34	30	0.03	714	1	0.04	-1	64	15
37	RS-480 720'-740'	199	0.37	31	0.03	425	2	0.04	-1	69	17
38	RS-480 740'-760'	137	0.39	33	0.04	504	2	0.04	1	63	22
39	RS-480 760'-780'	39	0.36	34	0.03	718	-1	0.04	-1	63	23
40	RS-480 780'-800'	23	0.34	31	0.03	810	2	0.04	1	61	36
41	RS-480 800'-820'	42	0.33	29	0.03	670	7	0.04	12	54	36
42	RS-480 820'-840'	65	0.26	29	0.04	2459	4	0.07	5	71	27
43	RS-480 840'-860'	281	0.23	18	0.01	207	3	0.06	2	41	28
44	RS-480 860'-880'	281	0.27	23	-0.01	87	2	0.05	2	50	45
45	RS-480 880'-900'	114	0.31	28	0.03	1052	2	0.06	1	44	25
46	RS-480 900'-920'	65	0.36	32	0.04	1383	3	0.05	3	52	45
47	RS-480 920'-940'	46	0.34	31	0.03	848	4	0.04	5	69	29
48	RS-480 940'-960'	42	0.39	33	0.05	930	2	0.04	1	71	31
49	RS-480 960'-980'	104	0.41	31	0.07	828	2	0.06	1	66	39
50	RS-480 980'-1000'	104	0.39	33	0.06	704	2	0.06	1	75	25
51	RS-480 1000'-1020'	137	0.39	33	0.05	719	1	0.05	1	54	48
52	RS-480 1020'-1040'	111	0.36	29	0.04	748	3	0.05	2	49	25
53	RS-480 1040'-1060'	52	0.36	30	0.03	737	4	0.05	4	51	21
54	RS-480 1060'-1080'	59	0.34	32	0.04	1134	5	0.07	7	69	136
55	RS-480 1080'-1100'	20	0.43	35	0.03	959	4	0.05	4	67	51
56	RS-480 1100'-1120'	16	0.38	35	0.03	518	9	0.04	19	77	28
57	RS-480 1120'-1140'	-10	0.35	34	0.04	593	4	0.05	5	67	34
58	RS-480 1140'-1160'	13	0.33	34	0.05	887	4	0.05	2	73	20
59	RS-480 1160'-1180'	13	0.36	35	0.04	853	4	0.05	2	69	27
60	RS-480 1180'-1200'	-10	0.37	33	0.02	661	4	0.04	2	63	29
61	RS-480 1200'-1220'	26	0.46	33	0.02	674	3	0.04	1	64	27
62	RS-480 1220'-1240'	124	0.44	31	0.02	262	3	0.05	2	78	30
63	RS-480 1240'-1260'	2089	0.27	24	-0.01	110	3	0.06	6	66	39
64	RS-480 1260'-1280'	353	0.34	26	0.03	904	4	0.05	4	84	23
65	RS-480 1280'-1300'	20	0.34	26	0.03	1001	2	0.04	2	92	16
66	RS-480 1300'-1320'	36	0.31	22	0.04	433	2	0.05	1	128	34
67	RS-480 1320'-1340'	-10	0.37	33	0.03	435	3	0.04	1	70	35
68	RS-480 1340'-1360'	29	0.38	31	0.03	556	4	0.04	2	60	21
69	RS-480 1360'-1380'	49	0.39	29	0.03	643	3	0.05	2	60	26

CLIENT: Hecla (Rosebud Mine)

99-51-99	Sample Designation	Antimony ICP ppm	Selenium ICP ppm	Strontium ICP ppm	Titanium ICP %	Thallium ICP ppm	Vanadium ICP ppm	Tungsten ICP ppm	Zinc ICP ppm
34	RS-480 660'-680'	-2	-.5	53	-0.01	-0.5	-2	1	56
35	RS-480 680'-700'	-2	-.5	51	-0.01	-0.5	-2	2	52
36	RS-480 700'-720'	-2	-.5	55	-0.01	-0.5	-2	-1	55
37	RS-480 720'-740'	-2	-.5	40	-0.01	-0.5	-2	1	59
38	RS-480 740'-760'	-2	-.5	47	-0.01	-0.5	-2	1	60
39	RS-480 760'-780'	-2	-.5	42	-0.01	-0.5	-2	1	53
40	RS-480 780'-800'	-2	-.5	109	-0.01	-0.5	-2	1	61
41	RS-480 800'-820'	-2	-.5	48	-0.01	-0.5	-2	2	67
42	RS-480 820'-840'	-2	-.5	16	-0.01	-0.5	-2	2	111
43	RS-480 840'-860'	5	-.5	7	-0.01	-0.5	-2	2	95
44	RS-480 860'-880'	4	-.5	10	-0.01	-0.5	-2	2	85
45	RS-480 880'-900'	-2	-.5	12	-0.01	-0.5	-2	2	92
46	RS-480 900'-920'	-2	-.5	17	-0.01	-0.5	-2	2	82
47	RS-480 920'-940'	-2	-.5	17	-0.01	-0.5	-2	2	66
48	RS-480 940'-960'	-2	-.5	17	-0.01	-0.5	-2	2	66
49	RS-480 960'-980'	-2	-.5	16	-0.01	-0.5	-2	2	88
50	RS-480 980'-1000'	-2	-.5	13	-0.01	-0.5	-2	1	87
51	RS-480 1000'-1020'	-2	-.5	19	-0.01	-0.5	-2	1	78
52	RS-480 1020'-1040'	-2	-.5	35	-0.01	-0.5	-2	1	69
53	RS-480 1040'-1060'	-2	-.5	42	-0.01	-0.5	-2	1	70
54	RS-480 1060'-1080'	-2	-.5	73	-0.01	-0.5	-2	2	99
55	RS-480 1080'-1100'	-2	-.5	62	-0.01	-0.5	-2	2	75
56	RS-480 1100'-1120'	-2	-.5	57	-0.01	-0.5	-2	2	61
57	RS-480 1120'-1140'	-2	-.5	53	-0.01	-0.5	-2	1	69
58	RS-480 1140'-1160'	-2	-.5	65	-0.01	-0.5	-2	2	74
59	RS-480 1160'-1180'	-2	-.5	74	-0.01	-0.5	-2	1	70
60	RS-480 1180'-1200'	-2	-.5	61	-0.01	-0.5	-2	2	62
61	RS-480 1200'-1220'	-2	-.5	63	-0.01	-0.5	-2	2	61
62	RS-480 1220'-1240'	-2	-.5	22	-0.01	-0.5	-2	2	73
63	RS-480 1240'-1260'	5	11.4	21	-0.01	-0.5	-2	3	97
64	RS-480 1260'-1280'	-2	-.5	26	-0.01	-0.5	-2	1	79
65	RS-480 1280'-1300'	-2	-.5	40	-0.01	-0.5	-2	2	65
66	RS-480 1300'-1320'	-2	-.5	40	-0.01	-0.5	-2	2	74
67	RS-480 1320'-1340'	-2	-.5	41	-0.01	-0.5	-2	1	65
68	RS-480 1340'-1360'	-2	-.5	48	-0.01	-0.5	-2	1	63
69	RS-480 1360'-1380'	-2	-.5	44	-0.01	-0.5	-2	1	73

ROCKY MOUNTAIN GEO 7753592944 01/25 '00 08:45 NO.408 09/18

99-51-99	Sample Designation	Silver ICP ppm	Aluminum ICP %	Arsenic ICP ppm	Boron ICP ppm	Barium ICP ppm	Bismuth ICP ppm	Calcium ICP %	Cadmium ICP ppm	Cobalt ICP ppm	Chromium ICP ppm	Copper ICP ppm	Iron ICP %
70	RS-480 1380'-1400'	-0.1	0.31	-2	8.4	20	-1	0.91	-0.5	-1	7	4	1.59
71	RS-480 1400'-1420'	-0.1	0.29	3	9.0	24	-1	0.95	-0.5	-1	8	6	1.79
72	RS-480 1420'-1440'	2.0	0.33	-2	7.5	18	-1	1.31	-0.5	-1	7	10	1.63
73	RS-480 1440'-1460'	0.4	0.32	4	8.3	38	-1	1.86	-0.5	-1	14	6	2.02
74	RS-480 1460'-1480'	0.8	0.35	2	7.7	30	-1	1.46	-0.5	-1	18	6	1.69
75	RS-480 1480'-1500'	0.5	0.24	36	13.2	25	-1	0.26	0.7	-1	13	7	3.21
76	RS-480 1500'-1520'	2.1	0.29	22	10.9	40	-1	0.32	0.7	-1	14	7	2.56
77	RS-480 1520'-1540'	0.5	0.48	8	7.8	45	-1	1.66	-0.5	-1	13	4	1.63
78	RS-480 1540'-1560'	0.3	0.53	6	8.3	62	-1	0.57	-0.5	-1	14	5	1.95
79	RS-480 1560'-1580'	0.2	0.41	4	7.9	37	-1	1.00	-0.5	-1	11	4	1.65
80	RS-480 1580'-1600'	0.3	0.36	7	8.9	47	-1	1.71	-0.5	-1	14	6	2.00
81	RS-480 1600'-1620'	0.3	0.36	4	8.0	44	-1	1.27	-0.5	-1	9	5	1.86
82	RS-480 1620'-1640'	0.2	0.41	2	8.5	27	-1	1.45	-0.5	-1	10	4	1.96
83	RS-480 1640'-1660'	-0.1	0.44	9	8.0	33	-1	1.00	-0.5	-1	13	4	1.84
84	RS-480 1660'-1680'	0.1	0.52	5	9.1	42	-1	1.20	0.5	-1	15	4	2.11
85	RS-480 1680'-1700'	-0.1	0.39	3	7.1	24	-1	1.56	-0.5	-1	13	3	1.66
86	RS-480 1700'-1720'	0.2	0.46	3	6.9	28	-1	2.13	-0.5	-1	13	4	1.66
87	RS-480 1720'-1740'	0.2	0.40	6	7.1	34	-1	0.96	-0.5	-1	17	4	1.62
88	RS-480 1740'-1760'	-0.1	0.40	-2	7.9	13	-1	1.21	-0.5	-1	19	5	1.76
89	RS-480 1760'-1780'	0.4	0.45	4	9.1	59	-1	0.71	-0.5	-1	21	7	2.20
90	RS-480 1780'-1800'	-0.1	0.39	-2	9.7	35	-1	0.58	-0.5	1	26	7	2.06
91	RS-480 1800'-1820'	0.2	0.35	2	8.3	45	-1	0.97	-0.5	2	21	6	1.83

CLIENT: Hecla (Rosebud Mine)

99-51-99	Sample Designation	Mercury	Potassium	Lanthanum	Magnesium	Manganese	Molybdenum	Sodium	Nickel	Phosphorous	Lead
		AA	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP
		ppb	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm
70	RS-480 1380'-1400'	20	0.34	29	0.02	585	3	0.04	1	77	27
71	RS-480 1400'-1420'	33	0.37	29	0.02	940	3	0.04	2	77	18
72	RS-480 1420'-1440'	20	0.40	30	0.02	917	3	0.04	2	72	20
73	RS-480 1440'-1460'	69	0.38	30	0.02	1137	5	0.05	2	84	18
74	RS-480 1460'-1480'	46	0.39	26	0.03	1009	4	0.05	2	88	15
75	RS-480 1480'-1500'	91	0.29	19	-0.01	150	2	0.04	3	60	27
76	RS-480 1500'-1520'	75	0.37	21	-0.01	624	3	0.06	4	70	24
77	RS-480 1520'-1540'	85	0.58	30	0.02	1480	3	0.06	2	80	24
78	RS-480 1540'-1560'	219	0.53	27	0.02	792	3	0.05	2	79	23
79	RS-480 1560'-1580'	55	0.59	34	0.02	984	3	0.05	2	83	23
80	RS-480 1580'-1600'	65	0.45	29	0.02	1271	4	0.05	2	83	22
81	RS-480 1600'-1620'	52	0.38	29	0.03	1223	4	0.05	2	98	20
82	RS-480 1620'-1640'	59	0.39	31	0.03	912	3	0.04	2	93	17
83	RS-480 1640'-1660'	108	0.47	33	0.02	727	5	0.04	2	90	21
84	RS-480 1660'-1680'	59	0.44	35	0.04	1257	3	0.05	2	93	19
85	RS-480 1680'-1700'	52	0.48	33	0.02	853	2	0.04	2	76	20
86	RS-480 1700'-1720'	29	0.58	35	0.02	1106	3	0.04	2	71	23
87	RS-480 1720'-1740'	82	0.46	32	0.01	1039	4	0.05	2	92	22
88	RS-480 1740'-1760'	13	0.41	29	0.02	794	2	0.04	2	67	43
89	RS-480 1760'-1780'	85	0.40	30	0.02	1662	5	0.06	2	83	62
90	RS-480 1780'-1800'	33	0.34	27	0.01	983	4	0.05	4	93	42
91	RS-480 1800'-1820'	104	0.38	30	0.01	1251	3	0.05	2	95	31

CLIENT: Hecla (Rosebud Mine)

99-51-99	Sample Designation	Antimony ICP ppm	Selenium ICP ppm	Strontium ICP ppm	Titanium ICP %	Thallium ICP ppm	Vanadium ICP ppm	Tungsten ICP ppm	Zinc ICP ppm
70	RS-480 1380'-1400'	-2	-.5	33	-0.01	-0.5	-2	1	61
71	RS-480 1400'-1420'	-2	-.5	32	-0.01	-0.5	-2	-1	65
72	RS-480 1420'-1440'	-2	-.5	41	-0.01	-0.5	-2	-1	59
73	RS-480 1440'-1460'	-2	-.5	75	-0.01	-0.5	-2	-1	71
74	RS-480 1460'-1480'	-2	-.5	46	-0.01	-0.5	-2	-1	75
75	RS-480 1480'-1500'	3	-.5	17	-0.01	-0.5	-2	2	80
76	RS-480 1500'-1520'	-2	-.5	19	-0.01	-0.5	-2	1	101
77	RS-480 1520'-1540'	-2	-.5	46	-0.01	-0.5	-2	-1	88
78	RS-480 1540'-1560'	-2	-.5	29	-0.01	-0.5	-2	1	79
79	RS-480 1560'-1580'	-2	-.5	35	-0.01	-0.5	-2	-1	70
80	RS-480 1580'-1600'	-2	-.5	53	-0.01	-0.5	-2	1	70
81	RS-480 1600'-1620'	-2	-.5	50	-0.01	-0.5	-2	1	77
82	RS-480 1620'-1640'	-2	-.5	54	-0.01	-0.5	-2	1	66
83	RS-480 1640'-1660'	-2	-.5	49	-0.01	-0.5	-2	-1	69
84	RS-480 1660'-1680'	-2	-.5	51	-0.01	-0.5	-2	-1	77
85	RS-480 1680'-1700'	-2	-.5	64	-0.01	-0.5	-2	-1	63
86	RS-480 1700'-1720'	-2	-.5	83	-0.01	-0.5	-2	-1	57
87	RS-480 1720'-1740'	-2	-.5	46	-0.01	-0.5	-2	1	73
88	RS-480 1740'-1760'	-2	-.5	47	-0.01	-0.5	-2	-1	66
89	RS-480 1760'-1780'	-2	-.5	39	-0.01	-0.5	-2	1	93
90	RS-480 1780'-1800'	-2	-.5	26	-0.01	-0.5	-2	5	75
91	RS-480 1800'-1820'	-2	-.5	38	-0.01	-0.5	-2	8	79

Thursday, January 20, 2000

By _____

Hecla MINING COMPANY

ROSEBUD PROJECT DRILL LOG

Intensity
1 - weak
2 - moderate
3 - strong
or % by vol

HOLE NUMBER RS-480
PAGE 2 OF 20
DATE 15 Dec to 21 Dec 1999
LOGGED BY Rogowski
TOTAL DEPTH 1825

LOCATION Wildrose Prospect
NORTHING 2,220,570
EASTING 476,065
ELEVATION 5,680
AZIMUTH —
INCLINATION -90°

AREA Rosebud
DRILLING CO. Eklund - Donschoorl
RIG TYPE RC
HOLE SIZE 5 3/4
DOWN HOLE SURVEY BY Wel Nav to 1100'

0-100 2/20

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MATRIX	SILICIFICATION QUARTZ	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	X-SULF %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOCURE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
0			0 -																																						
			Wildrose rhyolite porphyry (Wrp). mottled pink + gray Fxln ground mass w/ specularite specks + (+0.5mm) Bio + qtz phenos - poss Feld phenos also	M	Fxln porp	1+ 2					2					Tr		Yes 1 or 2?	2	Jarosite / Goethite From Surface OX 10										OX Tr					OX 2							
10		Wrp Pink-gray + Yel/Bru Feld																																							
20																																									
		Yellow F? 50%	Poss Fault (Qt is 90%	S							3	+75% clay							1																						
30			as a mosaic of +/- interconnected grains.)	M							2								2																						
		Wrp Pink, Gray mottled +	0 - 60 Tr MnOx, Tr																																						
40			flow banding																																						
		Yel-Brn Poor	* MATRIX IS PINK, silica																																						
50			gray + Feld cream																																						
			yes! Dike unalt Gimo plag sun + Bio																																						
60		? Dike? F? ?	Poss silicified OVFxln dike on fault?	VH	VFxln	3?	+80% SiO2				0					0		0	0									0						Tr							
70		Wrp + wt + yel. Brn	65 - 80 - same as	M	Fxln porp	1+ 2					2					Tr		Yes	2										OX Tr					OX 1 2							
			0 to 60													1																									
80			← Tr silicified By													0																									
			80-100	M+D																																					
		Wrp Yel-Brn, Wt + Pink Feld	Wrp is white +	5						Some as 0-60	2					Tr													OX Tr to 1												
90			Hem pink w/ strong								3					0			1																						
			clay alt								3					0			2										On Fract					Strong Goet, Jaro on fract + disc							
100											3					0			1																						

Mixed w/ clay & FeOx

Altered unusual silicification matrix is hard + silicified but feld is soft + clay

On Fract + Tr cubes

— Very strong Goet from Py

Hecla MINING COMPANY

ROSEBUD PROJECT
DRILL LOG

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AZIMUTH
INCLINATION

AREA 100 - 200
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

3/20

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MAJ. QZ %	SILICIFICATION QZ STS %	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	X-SUL %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOLYBDENITE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
100			Wrp - Ox py veinlets	med soft	Fx In porp	1-2	weak				1 TO							yes	2-3			tr	Py				as Ox						Ox	Hem to Goethite very minor Jarosite						
110		Wrp - wt, w/ Purp & Pink Hem stain	vuggy. Mottled				Poss.				2								med to strong From surface Ox								?- 1 TO 5%														
			gray & white																																						
120			very strong Argillic													Tr																										
			w/ prop. alunite &													Tr																										
130			Hem stain. Rare			2-3										Tr																										
			py stgrs.		mottled gray & white Porp text Lumpy																																				
140			* Feld to wt clay																																						
	Vn silic	WRP - same w/ Jaro	* poss Alunite -																																						
	F?		* SiO_2 as mo																																						
			clay gouge ← LARGE STRUCT	S					NOTE				FROM					150			to		180		is		Prob		a	major		shear		zone								
	?F?												but					very			little		BX		is		seen.														
160			* 100-200 Tr QT in	m to s	MOSAIC of Quartz																																				
			vugs + along fract.																																						
			FAULT CLAY GOUGE	S												Tr																										
170	?F?			med soft																																						
																											Goet stain on ↑						Ox									
180		↑ ox																															↑									
		↓ un-ox	180-215 LBT/WR?	med Hard		2?					Tr TO 1					1											Py Cubic as Tr Sulfide							↓ NOT OX								
190		WRP LT to med gray	below oxidization		← Lumpy Fx In											1																										
			blue-gray - tr Blk bio													1																										
			* poss. this is LBT													1			Do not See Any																							
			but still has the Lumpy													1																										
200			port text																								← on fract															

Hecla MINING COMPANY

ROSEBUD PROJECT
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AREA
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

•209 - 300

4/20

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY 215 to 265 ??	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	15%	+25%	MATRIX %	QUARTS %	ARGILLIC 5%	15%	+25%	TYPE	PROPYLITIC % CHLORITE	CALCITE	POTASSIC % K-SPAR	ALUNITE	OXIDATION 5%	15%	+25%	VIENING %	TYPE	MINERALIZATION: SULFIDES 5%	15%	+25%	PY %	CPY %	MAR %	AC-SUL %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOISTURE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
200		BX	Wrp - unoxidized med to Lt gray, (has blk bio <0.5mm), soft + Feld is clay alt but still grays. Very minor cubic Py. Has Num <0.1mm blk specks (mag + specularite) * clear Qt phenos are very rare. Some blk specks are square, Not all bio. * From 260 to 275 is planar Lam. in part	med Hard to soft	Fxln to VFxln Lumpy text	? 3? Prob. STRONG but NO MAG DISTRICTION						Prob (1) moderate to strong Argillic					0		? Poss mixed w/clay	Trace quartz + Poss along struct or fract - yell brn Jaro-Goet						Tr							Py						
210																																									
220																																									
230																																									
240																																									
250																																									
260					weak Planar Lam																																				
270																																									
280		LB T/WR Rhyo Flow?	Abrupt change to Very Fine xln + smooth. Suspect it is LB T/WR	m. Hard	CHANGE to VFxln smooth tr Planar Lam	3					Tr to 1					0											-Tr								Py						
						3										Tr		very little if any	T.R. along Fract Yell-Brn					Trace only very fine cubic			cubic disseminated rare hairline w/QT												
300																0																									

Hecla MINING COMPANY

ROSEBUD PROJECT
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AZIMUTH
INCLINATION

AREA 3-400
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

5/20

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	15%	±25%	MAJOR %	CLASTS %	ARGILLIC 5%	15%	±25%	TYPE	PROPYLITIC % CHLORITE	CALCITE	POTASSIC % K-SPAR	ALUNITE	OXIDATION 5%	15%	±25%	VIENING %	TYPE	MINERALIZATION: SULFIDES 5%	15%	±25%	PY %	CPY %	MAR %	X-SUL %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOISTURE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
300		Flow banded LBT	LBT/wR like, VFxln	VH	VFxln	1	50% Sil/Al				2-3							O	Tr	Goet & Jar? stain	Tr	O Py				Tr						—								
310			+ flow banded	"	"	1					2-3							O	Tr							Tr						—								
			" ox	H	"	Tr					1							Tr?	2							0						Ox								
320			" Bx w/goet filling	H	"	Tr					1							1?	2	Blk Goet						0						3 Ox								
		LBT	Silicified LBT? @325 poss gray sulf.	H	Fxln	2+3					1+2							?	Tr	"						3 to 5 % some Py tolied.						—	Py							
330						Tr	1+2				1							?	2	Hem & Goet	Tr	Ox Py				Tr						Ox	Hem							
			~~2 Wrp~~? No, think	mH	FTO med xln	1					3								1		Tr	Ox Py										Hem-Goet stain								
340			It is all LBT/wR								3								Tr																				
		Prob WrP but Not Sure									3								3																				
350			@355 gray min. on clay filled fract * Not mar or Ag.								2								2							1%		? MAP												
											3								0							3%		Tr.					Py							
360			Very fine Py, Not cubes has - Triangular reflection Poss octahedrons								2								2	Hem Pink & Goet						2-5%						Hem	Py							
											2								Tr																				
370											2								Tr																				
			375 - silicified Micro breccia								2								Tr							1%	V. fine													
380											2								1																				
						Tr					2								1																				
390						Tr					2								2																				
		VF Rhyo LBT	Very FXln, Flow banded or plan Lam. Tr of silic micro Bx LBT?	MH	VFxln	2-3					1+2								2	on Fract Hem Pink Turgite																			
400						1					1+2								1																				

Poss Alunite Vein/Clay

Note: Strong Hem stain

Hecla MINING COMPANY
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AREA 4-600
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

6/20

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MASSIVE	SILICIFICATION QUARTZ	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	OXIDATION %	OXIDATION TYPE	VIENING	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	K-SUL %	SILBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOCURE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
400		BX	380 to 460 LBT/WR, bxed	VH	VF to mixtu	2-3 - up to 90%					1+2 wt clay							2	3	Hem stains															ox	Goet Hem							
410		BX	in part w/silica								1 soft							2	1	& Blk																								
		tr BX	matrix															1	1	Goet on Fract																								
420																		tr											2 to 4% Quartz															
430		LBT/WR	430-460 has very fine diss Py								2																																
			← * gray Alunite stgr			2					2																		2-3%							ox	Goet Py							
440						2					2							Tr											1															
						3-+80%					tr																		1															
450						1+3					1																		1/4	VF diss														
		Hematite with Gray SiO2				2+3					1																		tr							ox								
460						3					1																		1-10%															
			452 to 525 Prob Wrp ~~but could be WR/LBT or even dacite~~	MH	mixtu w/ clasts	2					1																		Tr-1%															
470						2					1																		2%															
						1+2					2																		3-7%															
480		Wrp Rhyo Porh with to LtGray	* some Py as octah			1+3					2																		3															
			most is cubic & Pyrro's			2					2								wt clay only										4															
490			- occa bxed mottled gray, Lt Brn & wt w/ Qt phenos (rare			2					2																		3															
		Lt Brownish				2					2																		1															
500						1					2																		tr															

Hecla MINING COMPANY

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AREA
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

5-600

7/20

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION WAVES	SILICIFICATION QUARTS %	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	X-SLF %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOISTURE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
500		BX	Wrp? ~~or LBT~~? tr flow banding?	H to m-H	"porp" Mix/ly to Auto	2	± 50%				1	Partial Feld to wt clay					✓	0									1%						0	tr							
510		Wrp Rhyo Porp wt Lt Brn gray	single veinlet alunite				Lt Brn silicification				1						yes																								
			NOTE: A tough call LBT? or Wrp?								1						✓																								
520											1						✓										1%														
			single fault slick			2					1						✓										tr														
530		LBT Rhyo Flow wt Brown & wt	LBT - Rhyo, flow banded	H	Flow banded & fragmental	3					1								2	Hem stain							tr							2	Hem						
						3																					3%														
540			Flow or Auto Bx			3																					tr														
			Input. strong			2																					tr														
550			Hem stain			1																																			
						1																																			
560						1																																			
						1																																			
570		"Ignimbrite" Rhyo Flow Bx mixed gray	"Ignimbrite" LBT strongly fragmental w/ very strong flow laminations that curve around the fragments. Clasts all look like LBT. * is prob. a flow BX or Auto bx.	Ignimbrite	Auto Bx flow text	0	?				1	very weak							0	0							0							0								
580																																									
590			* looks Fresh to unalt.																																						
600																																									

Hecla MINING COMPANY
ROSEBUD PROJECT DRILL LOG

INTENSITY
1 = WEAK
2 = MODERATE
3 = STRONG
or % by Vol

HOLE NUMBER RS-480
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TOTAL DEPTH

LOCATION ROSEBUD, NV
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AREA 6-700
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

8/20

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MATRIX	SILICIFICATION CLASTS	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	K-SUL %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOLYBDE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
600			"Ignimbrite" Flow Bx LBT gray	F.xln	Flow Bx	tr					tr					0		0									0							0							
610		Rhyolite cream to pale green	Appears to be a clay alt rhyo. looks almost like a sandy text. Guess Dozer Fm strongly clay alt. Has micro Qt grains w/ clay matrix weakly laminated to 660	Sft	Dozer text MTO Fxln	0					2	6	3			0		?	1	Hem stain bon fract mottled & spotted throughout								0							0							
620																																									
630																																									
																tr																									
640																																									
650																																									
660			end of Laminations																																						
																1																									
670																																									
680		White																	tr																						
690																																									
700																																									

Hecla MINING COMPANY
ROSEBUD PROJECT DRILL LOG

INTENSITY
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2 = MODERATE
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AREA
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

7-800

9/20

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	15%	+25%	MAJPCX %	QUARTS %	ARGILLIC 5%	15%	+25%	TYPE	PROPYLITIC % CHLORITE	CALCITE	POTASSIC % K-SPAR	ALUNITE	OXIDATION 5%	15%	+25%	VIENING %	TYPE	MINERALIZATION: SULFIDES 5%	15%	+25%	PY %	CPY %	MAR %	AC-SUL %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOISTURE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
700			same as START	Soft	Fx/m	0					2					1			Tr/Hem																					
			@ 605'		Dozed like											tr																									
710			occa. sec.a. laminated																																						
			text																								tr														
720	±Cl		Is prob LBT/WR													1																									
			under high power													1																									
730			it has micro Qt													tr																									
			grains or xls													1											tr														
740																tr																									
																tr																									
750																0																									
																tr																									
760		LST/WR L.13T Rhyolite Flow mottled, Hem maroon + cream		M																																					
				↓																																					
770																																									
		(Dozer like Appearance)																																							
780			Alu															tr				veinlet																			
			Alu													1		tr																							
790			Alunite veinlet													1		tr				Hair line																			
																1																									
800																1																									

Hem stains but no oxide

825 "sand grain layer - seen before in LBT always only one 1 am thick. ? ?

Hecla MINING COMPANY
ROSEBUD PROJECT DRILL LOG

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or % by Vol

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AREA
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

8 - 900

Py·h - Pyrohedrite

10/20

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE
800			(cont.) LBT/WR	soft to very soft	gray
810		LBT/WR	or possibly Dozer		
				MH	
820			← single slick w/ Red-Fe ox & some gray silicifi (sand layer-grains)	H	
				MH	
830		Alu	drk specularite		
		Alu	specks very common		
840		Alu Frag	1 or 2%		
850					
		Ag?	Tr gray min		
860	VG	Ag	* gray-soft-fr inley min w/ silici & pyroh prob. vn. or silici struct.		
		Ag?	" Poss VG	MH	
870		Ag?	"	S	
				S	
880				H	
	VH?		Py·h	MH	
890				VH	
			Gray SiO2	VH	
900			← Red-Hem frag (stain)	MH	

START PALE GREEN

Pale Green in part

LBT/WR

Dozer like w/ occ. planar lams.

FEET	ALTERATION: SILICIFICATION 5%	15%	+25%	MATRIX %	CLASTS %	ARGILLIC 5%	15%	+25%	TYPE	PROPYLITIC % CHLORITE	CALCITE	POTASSIC % K-SPAR	ALUNITE	OXIDATION 5%	15%	+25%	VIENING %	TYPE
800	Tr					2					Tr							
810	Tr					1												
	1					1												
820	2					1					0							
	1					2					Tr		Tr					
830	0					2					0		V					
	Tr					2							V					
840	2	wt + Gray				1							V					
	2	wt				1												
850	2	WT				1												
	2	WT				2												
860	3	Gray				1												
	2	Gray				1												
870	1	Gray + wt				3												
	Tr					3					Tr							
880	1					3					0							
	2	gray				2												
890	3	gray				0												
	3	gray				0												
900	1	wt				2	wt										tr	Py·h

FEET	MINERALIZATION: SULFIDES 5%	15%	+25%	PY %	CPY %	MAR %	X-SUL %	SULFATE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOLYBDE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
800				0%														
810				0														
				0														
820				Tr	in SiO2													
				0														
830																		
840				Tr	oxid color - pale disseminated													
				3%	disseminated & vuglet													
850				1														
				1	Fine diss.													
860				4	Pyh xls oct.	Tr gray sulfide												
				7	Also Octo very small													
870				2														
				2														
880				3	Py·c Py·h													
				3	Tr Py·H													
890				1														
				Tr														
900				Tr														

Hecla MINING COMPANY

ROSEBUD PROJECT DRILL LOG

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AREA 9-1000
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

11/20

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MATRIX	SILICIFICATION QUARTZ	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	X-SUL %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOLYBDE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
900		LBT/WR, RHYOLITE FLOW	LBT/WR?	S.	Fx/n	1	Crav to wt				2					0		?									Tr	Py Cu												
			Note: where clay alt															?																							
			see up to 30% Qt grain				"											?																							
910			or xls, some elongated			1					2							?									0														
																		?																							
			Would definitely			0					2																														
920			call this LBT/WR								2																														
			but it has occa								3																														
930			larger Qt → phen.								2																														
											2																														
940											2																														
						Tr	Qt Vnl				2											Vnlets																		
			← Qt w/Py - veinlet?			Tr	Qt Vnl				3											Tr	Qt				Tr	Py												
950			planar lam.																																						
						0					3																0														
						0					3											Tr	Qt																		
960			Tr silici veinlet?																																						
						Tr 0.5mm Vnl - Qt					3																														
970			single Qt Vnlet			Tr Vnl					3											Tr	Qt																		
						0					3																Tr	Py												
980						0					3																0														
						Tr Vnl					3																														
990						0					3																1	Py.c													
											3																0														
1000						0					3					0											Tr	Py.H												

Pale green color is prob clay + not chlor

Hem color is prob orig - not frag

Hem stain - spiderweb

WT + Pale green

Hecla MINING COMPANY
ROSEBUD PROJECT DRILL LOG

INTENSITY
1 = WEAK
2 = MODERATE
3 = STRONG
or % by Vol

HOLE NUMBER RS-480
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LOCATION ROSEBUD, NV
NORTHING
EASTING
ELEVATION
AZIMUTH
INCLINATION

AREA 10-1100
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

12/20

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MATRIX	SILICIFICATION QZ STS	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	K-SUL %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOISTURE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
1000		Rhyolite (micro specular) L BT/WP Pale green to white	tr cubic Py	S	F.x lin some Flow Bands	Tr					3					0											tr	Py-P						Hem red on fract							
1010			tr Qt-Py veinlet (Hairline)			0					3					0											1															
						vnlets?					3					0											Tr															
1020						0					2					0											0															
			Py veinlets																																						
			Part. Ox. Qt-Py veinlet	m-H		1					1					0						tr	Py				tr														
1030						1					1					tr						tr	Py				tr							0							
						1					2					1											tr							0							
1040			calcite on Py-Qt veinlet			1-2					2					tr						tr	Py				tr															
			silicified LBT has	H		2-3					1					0											0															
1050			encap. specularite	H		3					tr					0											0															
			* mottled drk & LT Gry	H		2					1					0											0															
1060				m H		2					2					tr						tr	Cal				0															
			Py veinlet	S		Tr					2					1						Tr	Py				tr															
1070			Gyp. veinlet	S		0					2-3					2						tr	Gyp				tr															
			single slick								2					1																										
1080			single blk xl of mag.								2					1																										
			Tr WT clay on fract								3					0	?																									
1090			two frag w/Py octo & gray mm			1					2					1						Tr	Py octo																			
						0					2					1						tr	QT																			
			Hair line Qt																																						
1100						0					2-3					0																									

Hecla MINING COMPANY

ROSEBUD PROJECT DRILL LOG

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or % by Vol

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NORTHING
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INCLINATION

AREA 11-1200
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

13/20

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	15%	+25%	MATRIX %	CLASTS %	ARGILLIC 5%	15%	+25%	TYPE	PROPYLITIC % CHLORITE	CALCITE	POTASSIC % K-SPAR	ALUNITE	OXIDATION 5%	15%	+25%	VIENING %	TYPE	MINERALIZATION: SULFIDES 5%	15%	+25%	PY %	CPY %	MAR %	AG-SLF %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOLYBDENITE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
1100				M.S							1					tr																								
			wt clay on Bx struct w/Hem								1					1		?																						
1110				M																																				
											2					tr																								
1120											1					0																								
			Gyp & calc stgr.								1					tr																								
1130					Fxln Massive Tr Flow bands						1					1																								
			at veinlet								1					0						tr	Qt																	
1140											1																												
											1																												
1150											1					2																								
											1					0																								
1160											2					0																								
				M							1					tr																								
1170			Clay Gouge Poss Fault	M tr		1 vein silica					1					2																								
				MS							1					1						tr	Qt																	
1180											tr-1					1																								
											1					0																								
1190											1					tr																								
			Single Feld phenos								1					1																								
1200											1					0																								

Note: Entire 100' has micro black specks that are in part magnetite & part specularite. All has Hem on Frxt. Very little iron. Also

Phyllite

LBT/wpr?

Hem on frxt

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AREA
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

12-1300

14/20

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	15%	+25%	MATRIX %	CLASTS %	ARGILLIC 5%	15%	+25%	TYPE	PROPYLITIC % CHLORITE	CALCITE	POTASSIC % K-SPAR	ALUNITE	OXIDATION 5%	15%	+25%	%	VIENING TYPE	MINERALIZATION: SULFIDES 5%	15%	+25%	PY %	CPY %	MAR %	AS-SLF %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOISTURE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
1200		LBT/WR unit to Lt gray - Specular mag & spec	1200 to 1176 –	M to	Fxln - granular tuff	0					1					1											0														
1210			Prob LBT/WR	M H							1					tr																									
			do not see Flowbands								1					tr																									
1220			Dozen like text								1					0																									
			Has magnetite &								1-2																														
1230			specularite specks								1																														
											2					0											0														
1240						tr					1					tr											1														
						tr					2					0											3	cubic													
1250			Prob silici struct. ← Gray min. Hi index Ref M: Hard Gry streak ← gray min			2?					tr																5	cubic													
						3					tr																7	cubic													
1260						1					3																5	cubic													
						1					2																5														
1270						0					2																1														
				S		0					2					0											Tr														
1280		Rhyolite Dike	M to Drk gray, Hem stn on fract., V. Fxln. Dike.	H	Aphanitic Porphyry	1?					0					tr											0														
			See sanidine + Plag + one Femag. – Appears	H		1?					0																0														
1290			silicified + maybe in part.																																						
			mod. magnetic & tr better.	H		1?					0																0														
			Bx frags + strong Flow text.	H		1?					0																0														
1300		LBT/WR	LBT/WR? 2. magnetic	M-H	Fxln	2					tr					0											0														

Hem stain

Maroon Hem on fract.

Hecla MINING COMPANY

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DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

13-1400 15

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MATRIX	SILICIFICATION QZ STS	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	K-SUL %	SULFATE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOLYBDE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
1300			wt – LBT/WR? Tr Fragment Py-cubes & Fract fill	MH	Fxln	2					Tr					Tr						Tr	Py				2							✓							
1310		Rhyo Dike Gy	VF xln – Aphanitic, m-drk gray – has micro phenos of sani, plag & Bio (clomo Plag) Hem on fract	VH	Aph porp	? ?					0 0					Tr 1		single calc 1.5 mm									8														
1320			?LBT/WR? – Trace of Bio, has numerous (±2%) blk specks that are in part magnetite. Poss some spec. Hem stain on fract.	H	Dozer like	Tr					1 1 1					0																									
1340																0		Cal Hair Lines																							
1350																Tr 0																									
1360		?? LBT/WR (Ltgray) Looks a lot like Dozer			Fxln – Dozer like						1					0											Tr 1 0	dis cubic & Py. H. "												
1370											1																														
1380		Rhyo Dike	Dike – VF xln – Aphanitic Porp, Sani-plag – Bio		Aphan porp	?					Tr					0																									
1390		LBT/WR (Ltgray)			Fxln Dozer like	0										1 0		Veinlet X																							
1400																0																									

Hecla MINING COMPANY
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DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

14-1500

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE
1400–1500		Rhyolitic; ? LBT/WR Lt gray; ? Rhyo White; RLBT?/WR?	14-1500 call LBT/WR, but looks very much like Dozer. 1400 to 1470 is relatively unalt. also has 1-10% Hem blotches as staining. Blk mag. see a single clay & calcite Feld. pheno. Gray w/ Blk mag speck; white w/o mag. 1475 to 1560 Has microlaths of py or mar 5%. Destroyed mag	H; M	1F x 1n, 9 parallel (Dozer like) No flow bands

FEET	ALTERATION: SILICIFICATION 5%	15%	+25%	MARCA %	QUARTS %	ARGILLIC 5%	15%	+25%	TYPE	PROPYLITIC % CHLORITE	CALCITE	POTASSIC % K-SPAR	ALUNITE	OXIDATION 5%	15%	+25%	VIENING %	TYPE
1400	? Tr ?					Tr					0							
1410																		
1420																		
1430																		
1440											0							
											Tr.							
1450											0		V.	Imm Stgr				
											0							
1460											Tr							
											0							
1470						Tr												
1480						1												
						1												
1490						1												
						1												
						2												
1500						1												

FEET	MINERALIZATION: SULFIDES 5%	15%	+25%	PY %	CPY %	MAR %	AS-SUL %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOLYBDE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
1400				0							V	Tr Hem						
1410																		
1420																		
1430																		
1440																		
1450																		
1460																		
1470				0														
1480				Tr	cubic VF x/s													
				3	?													
				2	Diss Py.H	← a'so encup in SiO2												
1490				4	diss Py.H													
				2	"	diss Py "				Tr								
1500				4	"	some on Fract				TV								

Hecla MINING COMPANY
ROSEBUD PROJECT DRILL LOG

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DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

15-1600 17/20

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MATRIX %	SILICIFICATION QUARTS %	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	X-SUL %	SULFATE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOLYBDE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
1500			white LBt/wh	Hardly		Tr	Si stgr w Py				1-2					0											2	As ov	clusters stgr				Tr								
1510			weakly clay alt	soft							1																4														
			w/ some Py.								1																4														
1520			- mag is gone								1																5	w/ Si stgr						Tr							
											1-2					0											1	disp Py	H					Tr							
1530						0					2					Tr											Tr														
											1					0						Tr	Qt				Tr														
1540		WT Rhyolite	mag distruction w/ white clay		Dozer like or granular						1					0											0							Tr								
											2					0																									
1550											2					0																									
						Tr	Si stgr w Py				2					0																									
1560						0					1					0																		1							
			Has mag	H	FX/M - w/ minor QT.	0					Tr					0																		Tr							
1570																0																		tr							
																0											0								Hem						
1580			@1580 silic veinlet w/ Py													Tr											Tr														
			@1580 has ltgrn clay on fract.													Tr											0														
1590		Gray to pale green Rhyo	very weak clay ALT still has Mag													1																									
																1																									
1600						0										Tr											0														

Hecla MINING COMPANY
ROSEBUD PROJECT
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DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

16-1700 18/20

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE
1600–1700		WT; LBT/WR Rhyolite Pale green; WT	1615 to 1680 Some pale green spots, very small, assuming partial clay & chlorite Rep of Feld. Also numerous black very small specks of mag & poss sphalerite (Planar Lam or flow band); Mag Distribution	m; m-s	Granular Dozer like text Mixin

ALTERATION

FEET	SILICIFICATION 5%	15%	+25%	MATRIX %	CLASTS %	ARGILLIC 5%	15%	+25%	TYPE	PROPYLITIC % CHLORITE	CALCITE	POTASSIC % K-SPAR	ALBITE	OXIDATION 5%	15%	+25%	VIENING %	TYPE
1600	0					1				0	0							
1610																		
1620										0	0							
1630										tr	tr							
1640										tr	0							
1650										tr								
1660										tr								
1670										tr								
1680										1								
1690						1												
1700	0					2					0							

MINERALIZATION

FEET	SULFIDES 5%	15%	+25%	PY %	CPY %	MAR %	AC-SUL %	STIBNITE %	BARITE %
1600–1700									
1620				tr					
1640				1	vFine diss				
1650				1	veinlet ??				
1660				tr					

METALLURGY

FEET	OXIDE	SULF	CARBON	MOLYBDE
1600–1700				

ANALYTICAL DATA

FEET	FROM	TO	W	Au	Ag
1600–1700					

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AREA
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

17-1800 19/20

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE
1700			? LBT/WR ?		
1710			poss Dozer — Has numerous black specks (magnetite & poss specularite).		
1720					
1730		minor strut BX	Mottled cream + very pale green.		Dozer like
1740			Pale green looks like clay rep of Fold		
1750		Rhyo	orit could have chlor	Hard	Fxlw —
			T.r.i. cone		
1760				Med	granular
1770		? LBT/WR ? or poss Dozer ?			
1780					
1790					
1800					

FEET	ALTERATION: SILICIFICATION 5%	15%	+25%	MAGNET %	QUARTZ %	ARGILLIC 5%	15%	+25%	TYPE	PROPYLITIC % CHLORITE	CALCITE	POTASSIC % K-SPAR	ALBITE	OXIDATION 5%	15%	+25%	VIENING %	TYPE
1700	0					1				? Tr ?	0							
1710											0							
											Tr							
1720											0							
1730											0							
1740											Tr							
1750											0							
1760																		
1770																		
1780																		
1790						1												
						1												
1800						2					0							

FEET	MINERALIZATION: SULFIDES 5%	15%	+25%	PY %	CPY %	MAR %	K-SUL %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOLCULE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
1730				1	on fract													

Hecla MINING COMPANY

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AREA
DRILLING CO.
RIG TYPE
HOLE SIZE
DOWN HOLE SURVEY BY

18-1815TD 20/20

FEET	GRAPHIC	ROCK TYPE	LITHOLOGY	HARDNESS	TEXTURE	ALTERATION: SILICIFICATION 5%	SILICIFICATION 15%	SILICIFICATION +25%	SILICIFICATION MATRIX %	SILICIFICATION QUARTZ %	ARGILLIC 5%	ARGILLIC 15%	ARGILLIC +25%	ARGILLIC TYPE	PROPYLITIC % CHLORITE	PROPYLITIC % CALCITE	POTASSIC % K-SPAR	POTASSIC % ALUNITE	OXIDATION 5%	OXIDATION 15%	OXIDATION +25%	VIENING %	VIENING TYPE	MINERALIZATION: SULFIDES 5%	SULFIDES 15%	SULFIDES +25%	PY %	CPY %	MAR %	AG-SULF %	STIBNITE %	BARITE %	METALLURGY: OXIDE	SULF	CARBON	MOLYBDE	ANALYTICAL DATA: FROM	TO	W	Au	Ag
0			? LBT/WR? Dozer?			0					1																0														
			Tr (SAME) By								1																														
10			Has mag specks								1																														
						0					1																														
			TD 1815																																						
20																																									
30																																									
40																																									
50																																									
60																																									
70																																									
80																																									
90																																									
100																																									