60000545

Mining District File Summary Sheet

| | |
|---|---|
| DISTRICT | Rose bud |
| DIST_NO | 4010 |
| COUNTY<br>If different from written on document | Pershing |
| TITLE<br>If not obvious | Rosebud Drill Hole File – Hole No RS-438 |
| AUTHOR | K. Allen; S King; D. White; V. Reid; N. Jex |
| DATE OF DOC(S) | |
| MULTI_DIST Y / (N?)<br>Additional Dist_Nos: | |
| QUAD_NAME | Sulphur 7.5' |
| P_M_C_NAME<br>(mine, claim & company names) | Rosebud Mine, Hecla Mining Co.; Rosebud Project; Rose bud Mining Co. LLC |
| COMMODITY<br>If not obvious | gold; silver |
| NOTES | drill logs; assay; geology; photographs; geochemistry; total depth 850'; invoices<br><br>54 p. |

Keep docs at about 250 pages if no oversized maps attached (for every 1 oversized page (>11x17) with text reduce the amount of pages by ~25)

SS: DD 3/19/08
Initials Date

DB:
Initials Date

SCANNED:
Initials Date

Revised: 1/22/08

RS-438

6000 0545
4010

6000 0545

**Hecla** MINING COMPANY

- quartz, chalcedony, silicification
- faults, fractures
- FeOx
- Barite
- sulfide
- calcite, carbonate
- argillization, white clays
- propylitization
- potassic alteration
- chlorite, chloritic clays

# ROSEBUD PROJECT
# DIAMOND DRILL LOG

| | | | | | |
|---|---|---|---|---|---|
| HOLE NUMBER | RS-438 | LOCATION | EAST, SURFACE | REMARKS | RC PILOTED TO |
| PAGE 1 OF | 4 | NORTHING | | | 600' |
| DATE | 04/23/98 | EASTING | | | |
| LOGGED BY | HBM | ELEVATION | | | |
| SCALE | 1"=10' | AZIMUTH | — | | |
| TOTAL DEPTH | | INCLINATION | -90° | | |

| LITH. | OX/RED. | LITHOLOGY (Core point) | FT | STRUCTURE | ALTERATION AND MINERALIZATION |
|---|---|---|---|---|---|
| 600.0-609.1 FG PINK PORPHYRY | | 600.0-609.1': HARD LT. FLESH PINK GROUNDMASS, WITH A VERY FAINT MOTTLED FOLIATION TEXTURE AT HI & TO C/A. "PORPHYRY" MICROLITES ARE VFG & HARD TO SEE. FROM ~608' TO CONTACT FAINT RUDDY MATRIXED CRACKLE BRECCIA WITHIN THE LOWERMOST PINK PORPHYRY. | 600 | | 600.0-609.1': STRONG VUGGY QZ + WHT CLAY + MARC + BARITE VNS IN UNALTERED ROCK. WKLY BLCHED. |
| 609.1-625.8' CLAY VITROPHYRE | | 609.1': SHARP, IRREGULAR CONTACT. UNFAULTED. | 610 | 610.0-611.5': GOUGE ZONE 40 | |
| | | 609.1'-625.8': LT. TO MEDIUM BLUE-GREEN, PUNKY, PERLITIC-ALLY TEXTURED CLAY VITROPHYRE OR PROBABLE VITROPHYRE. EXTREMELY APHANITIC PROBABLY GLASSY. | | | 609.1-625.8': STRONG BLUE-GREEN ~~CLAY~~ ARGILLIZATION. MOD/STR. BRASSY PYRITE BLEBS. STR WISPY PY VNLTS, RUDDY STAINING IN MATRIX, BELOW 621.1. |
| | | ~616': ROUNDED PINK CLASTS OF OVERLYING MATERIAL. | | | |
| | | ~621': FAINT BRECCIA TEXTURE IN PUNKY BLUE-GRN CLAY. FAINT TO FAIRLY DARK RUDDY BRN STAINING HARDENS SOME OF THE MATRIX. | 620 | 619'-620': GOUGE? | |
| | | 625.8': DIFFUSE/IRREGULAR CONTACT SUB ⊥ TO C/A. | | | |
| 625.8'-649.9' ~~CHOCOLATE~~? CONGLOMERATIC UBUD. | | 625.8'-649.9': PEA-SIZED TO PEBBLE-SIZED ANGULAR HETEROLITHIC FRAGMENTS. LT. BLUE-GRN STR'LY CLAY ALTERED APHANITIC & PUMICEOUS POSSIBLY JUVENILE MATERIAL COMMON. LARGER PEBBLE TO COBBLE-SIZED, DARK GRN, PLAG-BEARING, SUB-ROUND CHOCOLATE COBBLES COMMON BELOW 631' & DIAGNOSTIC OF THE CONGLOMERATIC UBUD SUBUNIT. THESE COBBLES ARE NOT JUVENILE. THERE IS A SUGGESTION OF WEATHER RINDS ON MOST OF THEM. | 630 | | 625.8-644.9': DARK GRY STR. CLAY ALTERATION. VARIABLE FRAGMENT ALT'N. MOD. WISPY SHORT PYRITE VNLTS, PY BLEB & REPLACEMT IN SPECIFIC FRAGMENTS. WK SILICA +/- WHT CLAY + BLADED MARCASITE. |
| | | | 640 | 644.9-649.9': WK SHEAR FABRIC IN BLCHED FUZZY ZONES. | 644.9-649.9': LOCAL MOD. BLCHING & TEXTURE DE-STRUCTION. WK PERVASIVE SILICA OVERPRINTING CONT'D STR. TO MOD. GRN CLAY ALTER-ATION. |
| 649.9'-677.3' | | | 650 | | |

## ANALYTICAL DATA

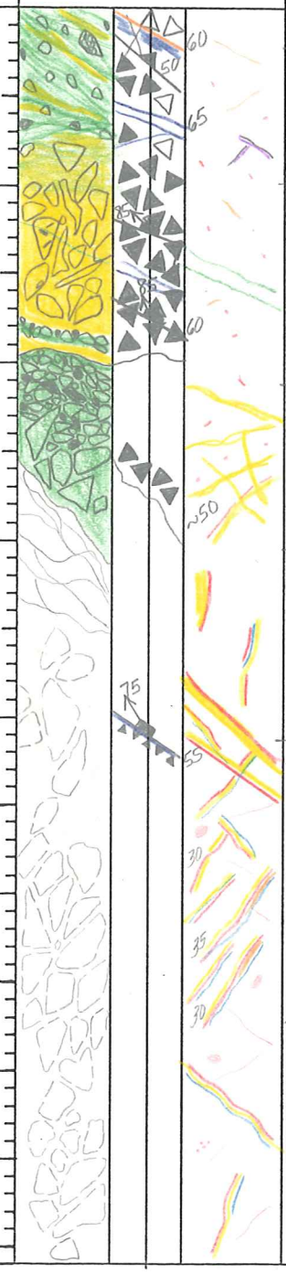
| FROM | TO | W | Au | Ag | Au2 | Ag |
|---|---|---|---|---|---|---|
| 600.0 | 604.6 | | | | | |
| 604.6 | 609.1 | | | | | |
| 609.1 | 611.6 | | | | | |
| 611.6 | 616.4 | | | | | |
| 616.4 | 621.1 | | | | | |
| 621.1 | 625.8 | | | | | |
| 625.8 | 630.7 | | | | | |
| 630.7 | 635.1 | | | | | |
| 635.1 | 639.8 | | | | | |
| 639.8 | 644.9 | | | | | |
| 644.9 | 649.9 | | | | | |

HOLE NUMBER RS-438 PAGE 2 OF 4

| LITH. | OX/RED. | LITHOLOGY |
|---|---|---|
| 649.9-668.9' SOUTH RIDGE FAULT | | 649.9-653.5': SHEARED, SEMI-HEALED, MYLONITE-TEXTURED FAULT ~~ED~~ BRECCIA. LT. TO MEDIUM-GREEN, PLASTICALLY DEFORMED UBUD-DERIVED MATRIX MATERIAL IS FRIABLE/PUNKY & LOCALLY MILLED. CONTAINS SUB-ANGULAR SILICIFIED FRAGMTS. PEBBLE-SIZED & BUD-DERIVED.<br><br>653.5-657.5': LARGELY MILLED, UNHEALED, BUD-DERIVED AS ABOVE.<br><br>658.0'-663.6': STRONGLY SILICIFIED, HETEROLITHIC, MATRIX-SUPPORTED FAULT BRECCIA. MUSHY MELANGE OF GRN & TAN-BRN FRAGMENTS IN BRNISH MATRIX, MULTI-EPISODIC SILICIFICATN WITH GRYISH SULFIDES. CUT WITH VUGGY SEMI-SEALED FRAX W/ WK/TR BARITE & STIBNITE. |
| 668.9-677.3 ~~BUD~~ / TOS! | | 663.6'-668.9': INTENSE SOLID SILICIFICATION OVER-PRINTING HETEROLITHIC PLASTICALLY DEFORMED FLT BRECCIA. PLAG-BEARING APHANITIC TAN LITHOLOGY + GRN CLAY-ALTERED BUD FRAGMT FLOAT IN STRLY SILICIFIED ROCK FLOUR. MULTI-EPISODES OF SILICA-FLOODING & BXATN. WITH SULFIDIC GRY SILICA FOUND BOTH EARLY & LATE WRT MILKY SILICA. GRADATIONAL LOWER CONTACT. GRY SILICA-FLOODING DIES OUT DOWNWARDS. |
| 677.3'-900.0' DOZER | | 668.9-677.3': GRN CLAY ALTERED, SPORADICALLY SILICIFIED BUD. OVERPRINTED WITH CRACKLE BRECCIA FROM 674.5'-677.3': BUD IS EITHER VERY FINE-GRAINED HERE OR GROUND UP. ORIGINAL TEXTURE IS OVERPRINTED WITH SILICA-CEMENTED MOSAIC BXA = BUD FRAGMTS WKLY SILICIFIED WITH BUD RK FLOUR MATRIX STRLY SILICIFIED.<br><br>677.3-683.7': STRONGLY AUTOBXAT'D? DOZER: GRNISH TAN DOZER AUTOBXA HAS A SLIGHTLY MILLED/BOUDINAGED OVERPRINT. CRACKLE/MOSAIC BXA W/ FINE GRN CLAY MATRIX/CEMENTED.<br><br>683.7-723.7': PALE GRN-TAN AUTOBXA'D DOZER. A FAINT RUDDY BRN FeOx STAINING TENDS TO PICK OUT FRAGMTS' AND FLOW BANDING. BRECCIA IS TIGHT CRACKLE AUTOCLASTIC TO ~700 MORE WELL-DEVELOPED MOSAIC TEXTURED AUTOBXA BELOW. |

FT: 650, 660, 670, 680, 690, 700, 710, 720

GRAPHIC LOG

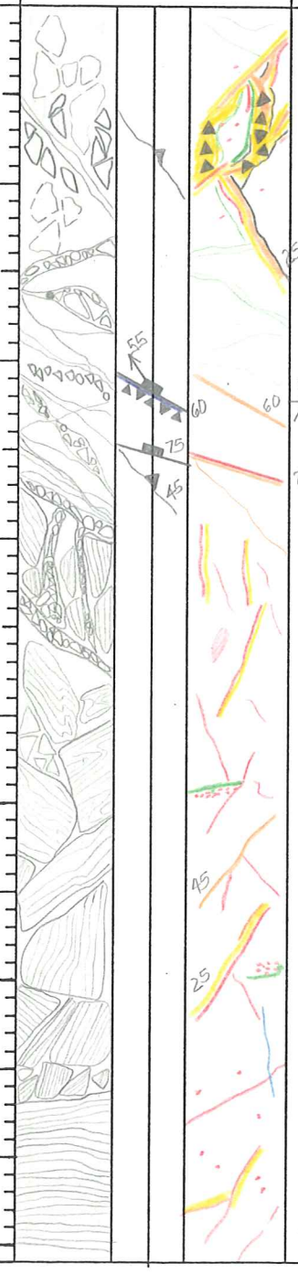


| STRUCTURE | ALTERATION AND MINERALIZATION |
|---|---|
| 649.9-653.5': SHEARED UBUD-DOMINATED. STRANDS OF UNHEALED MILLED WALLRK GRIT & GOUGE. LOCALLY BROKEN.<br>653.5-657.5': STRLY BROKEN UNHEALED WALL RK FRAGMTS & GOUGE.<br>658.0'-663.6': HEALED FAULT MELANGE W/O STR. SHEAR FABRIC.<br>663.6-668.9': STRLY SEALED HETEROLITHIC FAULT BRECCIA.<br>674.5-677.3': SILICA-CEMENTED BUD CRACKLE BRECCIA. WKLY FAULT RELATED.<br>691.3': THIN MILLED SILICA HEALED MYLONITE. SLICKED JOINT.<br>690-708': 30°-35° PREVALENT VNLT TREND. | 649.9'-653.5': STR. GRN CLAY ALT'N LOCALLY BLCHED AND OVERPRINTED WITH STRANDS OF GRY SILICA & GRY SILICA + MARCASITE VNLTS. UNHEALED GOUGE ZONES DUSTED WITH SOOTY SULFIDE.<br>653.5-657.5': MORE UNHEALED GOUGE OTHERWISE AS ABOVE. TRACE WHT CLAY VNLTS.<br>657.5-663.6': STRONG BUT SPOTTY GRY SULFIDIC SILICA OVERPRINTS GRN CLAY ALTER RK FLOUR. VUGGY SEMI-HEAL FRAX IN THE SILICA-FLOODED BXA ARE WKLY EXPLOITED BY BARITE & STIBNITE.<br>663.6-668.9': INTENSE SILICIFICATION LOCALLY TO ~80% REPLACEMT. SIGNIFICANT VFG DISS'D IN GRY SILICA, MOD. FINE SOOTY SULFIDE VNLTS ASSOC'D W/ SLICKED JOINTS. TR WHT CLAY + SILICA.<br>668.9-677.3': WK TO SPOTTY STR. SILICA. MOD. DISS'D MARC WK WHT CLAY IN VUGS PERVASIVE STR. GRN CLAY ALTERATION. SILICIFICATN STRONGER IN BXA FROM 674.5'.<br>677.3'-683.7': MOD/WK WAXY GRN CLAY IN MATRIX PERVASIVE TRACE ARGILLIZATION. MOD. DISS'D PY, AS WISPY VNLTS & SUBHEDRAL CUBES. 680.4-683.7': SILICA + WHT CLAY +/- PY VNS STR<br>683.7'-723.7': TR. PERVASIVE LT GRN ARGILLIZATION AND RUDDY FeOx STAINING IN WALLRK. MOD. SILICA + MARC +/- WHT CLAY VNLTS + SPARRY CALCITE |

ANALYTICAL DATA

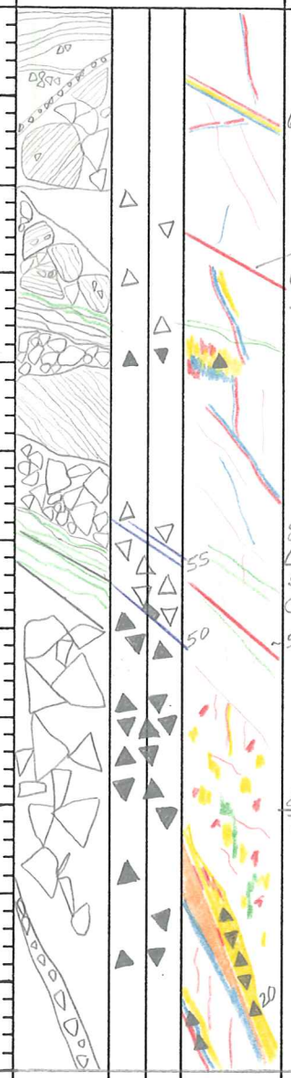
| FROM | TO | W | Au | Ag | Au2 |
|---|---|---|---|---|---|
| 649.9 | 653.5 | | | | |
| 653.5 | 657.5 | | | | |
| 657.5 | 660.6 | | | | |
| 660.6 | 663.6 | | | | |
| 663.6 | 666.3 | | | | |
| 666.3 | 668.9 | | | | |
| 668.9 | 672.6 | | | | |
| 672.6 | 677.3 | | | | |
| 677.3 | 680.4 | | | | |
| 680.4 | 683.7 | | | | |
| 683.7 | 688.7 | | | | |
| 688.7 | 693.6 | | | | |
| 693.6 | 699.0 | | | | |
| 699.0 | 704.3 | | | | |
| 704.3 | 709.1 | | | | |
| 709.1 | 714.1 | | | | |
| 714.1 | 718.8 | | | | |

HOLE NUMBER RS-438 PAGE 3 OF 4

| LITH. | OX/RED. | LITHOLOGY | FT | GRAPHIC LOG | STRUCTURE | ALTERATION AND MINERALIZATION |
|---|---|---|---|---|---|---|
| 677.3'-DOZER | 900.0 | FROM ~725': SILICA-CEMENTED VN CRACKLE BRECCIA/OV OVERPRINTS AUTOBRECCIA. TO 733.9'.<br><br>733.9'-~736.5': WANING HYDROTHERMAL VN BXA OVERPRINT IN UNSILICIFIED RK. RK TEXTURE CONT'D MILLED OR VN BXAD, FAINTLY, TO 744.4'.<br><br>744.4'-753.': MYLONITIC/MILLED BRECCIA, INTERMITTENTLY RUDDY-STAINED. CUT BY WK/MOD QZ+MARCASITE VNING AT LO ∡ TO C/A.<br><br>~768': STRANDS OF MYLONITIC BRECCIA DIE⁄ OUT. DOZER IS VERY APHANITIC & WKLY AUTOCLASTIC TO 800.0'. DISRUPTED FLOW BANDING HILIGHTS AUTOCLASTIC TEXTURE. TAN/CREAM. | 720<br>730<br>740<br>750<br>760<br>770<br>780<br>790 |  | 741.4': SLICKED FNT. SEMI HEALED MILLED ZONE. | 723.7-725.9': VEIN DENSITY INCREASED TO STR. INCREASED WHT CLAY. NO VISIBLE PYRARGERITE XTLS. SPARRY CALCITE DECREASED TO TRACE/ABSENT.<br><br>~725-733.9': STR HYDROTHERMAL VEIN BRECCIA; WAXY GRN CLAY & SILICA MATRIX/CEMENT. VUGS ARE INFILLED WITH LATE WHT CLAY AND COPIOUS SUB- TO ANHEDRAL PYRARGERITE. MOD/WK MARC BLADES + Py DISS'D IN SILICA. SLIGHTLY LESS IN PYRARGERITIC ZONES.<br><br>733.9-~736.5': CONT'D OVERPRINTING VN BXA W/ GRN CLAY MATRIX. MOD. MARC/PYRITE.<br><br>~736.5-744.4': TR. WALLRK ARGILLIZATN. MOD./WK MARC/PY + QZ+/-WHT CLY STOCKWKD VNLTS.<br><br>744.4'-753.8': AS ABOVE. RUDDY HmOx STAIN PICKS UP TO MOD. MOD. QUARTZ-MARCASITE VNING<br><br>753.8'-800.0': RUDDY FeOx STAINING WANES BY 760'. WK QZ-MARC & WHT CLY VNLTS. WK PY BLEBBING W/ GRN CLAY SELVAGES. SCATTERED BLOCKY PY. CALCITE WKLY IN VNS & BCCBS BY ~760. |

| ANALYTICAL DATA | | | | | |
|---|---|---|---|---|---|
| FROM | TO | W | Au | Ag | Au2 |
| 718.8 | 723.7 | | | | |
| 723.7 | 725.9 | | | | |
| 725.9 | 729.3 | | | | |
| 729.3 | 733.9 | | | | |
| 733.9 | 737.3 | | | | |
| 737.3 | 741.4 | | | | |
| 741.4 | 744.4 | | | | |
| 744.4 | 749.7 | | | | |
| 749.7 | 753.8 | | | | |
| 753.8 | 759.1 | | | | |
| 759.1 | 763.6 | | | | |
| 763.6 | 768.7 | | | | |
| 768.7 | 773.3 | | | | |
| 773.3 | 778.5 | | | | |
| 778.5 | 783.4 | | | | |
| 783.4 | 788.5 | | | | |

HOLE NUMBER RS-438 PAGE 4 OF 4

| LITH. | OX/RED. | LITHOLOGY | FT | GRAPHIC LOG | STRUCTURE | ALTERATION AND MINERALIZATION |
|---|---|---|---|---|---|---|
| 677.3' - DOZER | 900' | 800.0 - 823.3 : MYLONITE OVERPRINT?. MYLONITIC ZONE IN DOZER AUTOBRECCIA. RUDDY STAINED PREVIOUSLY BRECCIATED DOZER IS CRACKLE BXA'D AND CEMENTED W/ ARK FLOUR + GRN CLAY ST.KWK MATRIX. BRECCIATION APPEARS INTERMITTENT THRU THIS ZONE BUT MAY SIMPLY ~~BE~~ CONTAIN >6' FRAGMTS THAT APPEAR AS SOLID INTERVALS. MONOLITHIC. | 790 |  | 803.6': SOOTY BLK @ SILICA-SULFIDE VN BLED INTO WALLRK BXA. | 800.0 - 823.3': GRN CLAY ALTERATION WK IN FRAGMENTS TO MODERATE IN BXA MATRIX. WK DISS'D MARC/PY IN MATRIX, WK WHT CLAY +/- CALCITE + MARC VNLTS. |
| | | 820 - 823.3': UNHEALED TO SEMI-HEALED SHEAR FABRIC AT ~ 55° | | | 820.0 - 823.3': WK. THIN UNHEALED SHEARS AT ~ 55° TO C/A IN LT. GRN CLAY. | 820.0 - 823.3': GOUGY LT. GRN CLAY TO MODERATE. VN CALCITE DISAPPEARS. |
| | | 823.3 - 825.0': INTERNAL CONTACT? SELF-DIKING WITHIN DOZER: | | | | |
| ?823.3 | | 823.3 - 824.3': TAN-GRY HEALED MOSAIC BXA. MONOLITHIC WITH RUDDY SHEAR FABRIC IN "MATRIX". ALMOST PSEUDO-BRECCIA. | | | | 823.3 - 824.3': HEALED BRECCIA IS NOT SILICIFIED MODERATELY CLAY ALTERED & STAINED W/ RUDDY FeOx |
| | | 824.3 - 825': STR. TO MOD GRN CLAY + MARC STKWKD LTER GRN APHANITIC DOZER OR APHYRIC FELSIC DIKE. NO FLOW-BANDING. TEXTURALLY DISTINCT FROM OVERLYING DOZER. | | | | 824.3 - 825.0': MOD/STR. PERVASIVE GRN CLAY ALT'N & DARKER GRN CLAY STRINGER STOCKWORK. |
| | | 827.5 - 844.0': TACK-CEMENTED MONOLITHIC CRACKLE TO MOSAIC BRECCIA. QUARTZ + MARCASITE/PY +/- LATE WHT CLAY IN VUGS FORM CEMENT ON FINE-GRAINED ANGULAR DOZER(?) BRECCIA. | | | 827.5 - 844.0': HYDRO-THERMAL CRACKLE BRECCIA | 825' - TD: MOD/WK PERVASIVE GREEN CLAY ALTERATION SOMEWHAT STRONGER THAN IN OVERLYING DOZER. |
| | | 844.0 - 850.0': UNBRECCIATED. TEXTURE, LITHOLOGY & ALTERATION AS DESCRIBED ABOVE. | | | | 842.7 - 844.0': SILICA CEMENTED BXA VN WITH ~ 2" WHT CLAY SEAM AT BASE. |
| | | | | | | 844.0 - 850': VN CALCITE PICKS UP AGAIN. |
| | | TD 850' | | | | |

ANALYTICAL DATA

| FROM | TO | W | Au | Ag | Au2 |
|---|---|---|---|---|---|
| 788.5 | 794.2 | | | | |
| 794.2 | 800.0 | | | | |
| 800.0 | 804.0 | | | | |
| 804.0 | 808.1 | | | | |
| 808.1 | 811.6 | | | | |
| 811.6 | 814.5 | | | | |
| 814.5 | 819.2 | | | | |
| 819.2 | 823.3 | | | | |
| 823.3 | 827.5 | | | | |
| 827.5 | 832.6 | | | | |
| 832.6 | 837.6 | | | | |
| 837.6 | 842.7 | | | | |
| 842.7 | 844.0 | | | | |
| 844.0 | 850.0 | | | | |

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-438 DATE: 04/23/98 LOGGED BY: [illegible] PAGE 1 OF 3

| 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 600.0 | 610.0 | 93.0 | 93.0 | 60.0 | | | | | | | | | | |
| 610.0 | 620.0 | 93.0 | 93.0 | 0 | | | | | | | | | | |
| 620.0 | 629.5 | 108.4 | 108.4 | 24.4 | | | | | | | | | | |
| 629.5 | 639.8 | 98.1 | 98.1 | 85.4 | | | | | | | | | | |
| 639.8 | 650.0 | 98.0 | 98.0 | 68.6 | | | | | | | | | | |
| 650.0 | 658.0 | 93.0 | 97.5 | 0 | | | | | | | | | | |
| 658.0 | 666.0 | 93.8 | 93.8 | 27.5 | | | | | | | | | | |
| 666.0 | 676.0 | 103.0 | 103.0 | 83.0 | | | | | | | | | | |
| 676.0 | 686.0 | 98.0 | 98.0 | 81.0 | | | | | | | | | | |
| 686.0 | 696.0 | 101.0 | 101.0 | 92.0 | | | | | | | | | | |
| 696.0 | 706.0 | 100.0 | 100.0 | 96.0 | | | | | | | | | | |

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-438 DATE: 04/24/98 LOGGED BY: HBM PAGE 2 OF 3

| DRILL RUN | | SOLID CORE RECOVERY (%) | TOTAL CORE RECOVERY (%) | RQD | ROCK STRENGTH | | FRACTURE DATA | | | | DENSITY DATA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FROM | TO | | | | DOWNHOLE DEPTH | POINT LOAD INDEX (psi) | FRACTURE DENSITY /FT. | AVG. ANGLE TO C.A. | ROUGHNESS | INFILL | DOWNHOLE DEPTH | SAMPLE WEIGHT (g) | DISPLACEMENT (cc) | DENSITY (g/cc) |
| 706.0 | 713.5 | 89.3 | 89.3 | 85.3 | | | | | | | | | | |
| 713.5 | 720.0 | 101.5 | 101.5 | 95.4 | | | | | | | | | | |
| 720.0 | 730.0 | 102.0 | 102.0 | 96.0 | | | | | | | | | | |
| 730.0 | 740.0 | 100.0 | 100.0 | 98.0 | | | | | | | | | | |
| 740.0 | 750.0 | 99.0 | 99.0 | 90.0 | | | | | | | | | | |
| 750.0 | 760.0 | 100.0 | 100.0 | 94.0 | | | | | | | | | | |
| 760.0 | 770.0 | 102.0 | 102.0 | 87.0 | | | | | | | | | | |
| 770.0 | 780.0 | 96.0 | 96.0 | 91.0 | | | | | | | | | | |
| 780.0 | 790.0 | 102.0 | 102.0 | 94.0 | | | | | | | | | | |
| 790.0 | 800.0 | 98.0 | 98.0 | 87.0 | | | | | | | | | | |
| 800.0 | 810.0 | 102.0 | 102.0 | 86.0 | | | | | | | | | | |

# HECLA MINING COMPANY – ROSEBUD PROJECT
## GEOTECHNICAL DRILL LOG

HOLE # RS-438 DATE: 04/24/98 LOGGED BY: KDM PAGE 3 OF 3

| DRILL RUN | | SOLID CORE RECOVERY (%) | TOTAL CORE RECOVERY (%) | RQD | ROCK STRENGTH | | FRACTURE DATA | | | | DENSITY DATA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FROM | TO | | | | DOWNHOLE DEPTH | POINT LOAD INDEX (psi) | FRACTURE DENSITY/FT. | AVG. ANGLE TO C.A. | ROUGHNESS | INFILL | DOWNHOLE DEPTH | SAMPLE WEIGHT (g) | DISPLACEMENT (cc) | DENSITY (g/cc) |
| 810.0 | 820.0 | 99.0 | 99.0 | 89.0 | | | | | | | | | | |
| 820.0 | 830.0 | 104.0. | 104.0 | 59.0 | | | | | | | | | | |
| 830.0 | 840.0 | 98.0 | 98.0 | 34.0 | | | | | | | | | | |
| 840.0 | 850.0 | 105.0 | 105.0 | 91.0 | | | | | | | | | | |
| | T.D. | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

**Hecla MINING COMPANY**

**ROSEBUD PROJECT DRILL LOG**

Quick log

HOLE NUMBER: RS-438
PAGE: 1 OF 3
DATE: 5/25/98
LOGGED BY: [illegible]
TOTAL DEPTH: 600' RVC PRE-COLLAR, 850' CORE

LOCATION: EAST ZONE
NORTHING:
EASTING:
ELEVATION:
AZIMUTH: VERT
INCLINATION: -90

AREA: EAST ZONE
DRILLING CO.: EKLUND
RIG TYPE: RVC
HOLE SIZE: 5½
DOWN HOLE SURVEY BY: WELNAU

| 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 % | AG-SULF % | STIBNITE % | BARITE % | METALLURGY: OXIDE | SULF | CARBON | MOCURE | ANALYTICAL DA: FROM | TO | W | Au |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | | Col | Colluvium | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | | Col | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | | Tcfg | FINE-GRAINED ANDESITIC to LATITIC FLOW | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 110 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 120 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 130 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 140 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 150 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 160 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 170 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 180 | | TCLLT | FINE-GRAINED, ANDESITIC to LATITIC AUTO BRECCIA OR VOLCANIC BRECCIA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 190 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Hecla MINING COMPANY

ROSEBUD PROJECT
DRILL LOG

HOLE NUMBER RS-438
PAGE 2 OF 3
DATE
LOGGED BY
TOTAL DEPTH

LOCATION
NORTHING
EASTING
ELEVATION
AZIMUTH
INCLINATION

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

| FEET | GRAPHIC | ROCK TYPE | LITHOLOGY | HARDNESS | TEXTURE | ALTERATION | | | | | | | | | | | | | | | | | MINERALIZATION | | | | | | | | | METALLURGY | | | | ANALYTICAL DA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | SILICIFICATION | | | | | ARGILLIC | | | | PROPYLITIC % | | POTASSIC % | | OXIDATION | | | VIENING | | SULFIDES | | | PY | CPY | MAR | AG-SULF | STIBNITE | BARITE | OXIDE | SULF | CARBON | MIXCURE | FROM | TO | W | Au |
| | | | | | | 5% | 15% | +25% | MATRIX % | CLASTS % | 5% | 15% | +25% | TYPE | CHLORITE | CALCITE | K-SPAR | ALUNITE | 5% | 15% | +25% | % | TYPE | 5% | 15% | +25% | % | % | % | % | % | % | | | | | | | | |
| 210 | D | TCCLT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 220 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 230 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 240 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | D | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 250 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 260 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 270 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 280 | D | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 290 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 300 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 310 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | D | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 320 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 330 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 340 | D | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 350 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 360 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | D | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 370 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 380 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 390 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 400 | D | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Hecla MINING COMPANY**

**ROSEBUD PROJECT DRILL LOG**

HOLE NUMBER RS-438
PAGE 3 OF 3
DATE
LOGGED BY
TOTAL DEPTH

LOCATION
NORTHING
EASTING
ELEVATION
AZIMUTH
INCLINATION

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

| 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 | MOISTURE | ANALYTICAL DA: FROM | TO | W | Au |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 410 | | TCLLT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 420 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 430 | | FGPD + UTRD | FINE-GRAINED SLIGHTLY PORPHYRITIC PINK SILL + UNTROPHYRE CLAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 440 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 450 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 460 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 470 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 480 | | FGPP | FINE-GRAINED, SLIGHTLY PORPHYRITIC PINK SILL, PROBABLY RHYOLITIC? IN COMPOSITION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 490 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 510 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 520 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 530 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 540 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 550 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 560 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 570 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 580 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 590 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 600 | | | ROC PRE-COLLAR TD = 600' | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

AMERICAN ASSAY LABORATORIES

# PROVISIONAL REPORT SP048760

PO BOX 11530
RENO NV, USA
Ph.(702) 356-0606, Fax.(702) 356-1413

## HECLA MINING COMPANY

COPIES TO : KURT ALLEN

:

:

:

CLIENT REFERENCE No: RS-438 RECEIVED : 4 MAY 1998

No. SAMPLES : 60 REPORTED : 15 MAY 1998

MAIN SAMPLE TYPE : DRILL CORE

NEVADA LEGISLATIVE DISCLAIMER :-
The results of this assay were based solely upon the content of the sample submitted. Any decision to invest should be made only after the potential investment value of the claim or deposit has been determined based on the results of assays of multiple samples of geological materials collected by the prospective investor or by a qualified person selected by him and based on an evaluation of all engineering data which is available concerning any proposed project.

| ANALYSIS | ANALYTICAL METHOD | QUALITY PARAMETER | UNIT | DETECTION |
|---|---|---|---|---|
| Au(OZ) | FA30 | 15% | OPT | 0.001 |
| Au(RZ) | FA30 | 15% | OPT | 0.001 |
| AuGRAV | GRAV | 15% | OPT | 0.001 |
| Ag(OZ) | D210 | 10% | OPT | 0.02 |



05/15/1998 15:47 7023561413 AMERICAN ASSAY LABS PAGE 01
7023561413

AMERICAN ASSAY LABORATORIES

# PROVISIONAL REPORT SP048760

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-438

REPORTED : 15 MAY 1998

| SAMPLES | Au(OZ) | Au(RZ) | AuGRAV | Ag(OZ) |
|---|---|---|---|---|
| RS-438 600.0-604.6 | 0.004 | | | 0.09 |
| RS-438 604.6-609.1 | 0.001 | | | 0.04 |
| RS-438 609.1-611.6 | 0.002 | | | 0.04 |
| RS-438 611.6-616.4 | 0.001 | | | 0.04 |
| RS-438 616.4-621.1 | 0.003 | | | 0.05 |
| RS-438 621.1-625.8 | 0.001 | | | 0.06 |
| RS-438 625.8-630.7 | 0.004 | | | 0.14 |
| RS-438 630.7-635.1 | 0.003 | | | 0.05 |
| RS-438 635.1-639.8 | 0.003 | | | 0.25 |
| RS-438 639.8-644.9 | 0.010 | | | 0.58 |
| RS-438 644.9-649.9 | 0.006 | | | 1.21 |
| RS-438 649.9-653.5 | 0.020 | | | 2.39 |
| RS-438 653.5-655.7 | 0.032 | | | 0.13 |
| RS-438 655.7-657.5 | 0.007 | | | 2.88 |
| RS-438 657.5-660.6 | 0.017 | | | 0.87 |
| RS-438 660.6-663.6 | 0.009 | | | 0.93 |
| RS-438 663.6-666.3 | 0.024 | | | 0.43 |
| RS-438 666.3-668.9 | 0.008 | 0.009 | | 0.04 |
| RS-438 668.9-672.6 | 0.004 | | | 0.04 |
| RS-438 672.6-677.3 | 0.032 | | | 0.07 |
| RS-438 677.3-680.4 | 0.092 | | 0.102 | 4.79 |
| RS-438 680.4-683.7 | 0.404 | | 0.335 | 6.18 |
| RS-438 683.7-688.7 | 0.022 | | | 0.05 |
| RS-438 688.7-693.6 | 0.044 | | | 0.04 |
| RS-438 693.6-699.0 | 0.081 | | 0.087 | 0.05 |

AMERICAN ASSAY LABORATORIES

# PROVISIONAL REPORT SP048760

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-438

REPORTED : 15 MAY 1998

| SAMPLES | Au(OZ) | Au(RZ) | AuGRAV | Ag(OZ) |
|---|---|---|---|---|
| RS-438 699.0-704.3 | 0.033 | | | 0.79 |
| RS-438 704.3-709.1 | 0.070 | | 0.065 | 0.15 |
| RS-438 709.1-714.1 | 0.069 | | 0.078 | 0.13 |
| RS-438 714.1-718.8 | 0.091 | 0.073 | 0.070 | 0.14 |
| RS-438 718.8-723.3 | 0.017 | | | 0.15 |
| RS-438 723.3-725.9 | 0.013 | | | 0.97 |
| RS-438 725.9-729.3 | 0.015 | | | 0.08 |
| RS-438 729.3-733.9 | 0.029 | | | 38.00 |
| RS-438 733.9-737.3 | 0.003 | | | 0.12 |
| RS-438 737.3-741.4 | 0.012 | | | 0.09 |
| RS-438 741.4-744.4 | 0.001 | | | 0.04 |
| RS-438 744.4-749.7 | 0.050 | 0.030 | 0.172 | 0.09 |
| RS-438 749.7-753.8 | 0.038 | | | 0.30 |
| RS-438 753.8-759.1 | 0.008 | | | 1.74 |
| RS-438 759.1-763.6 | 0.002 | | | 0.06 |
| RS-438 763.6-768.7 | 0.010 | | | 0.10 |
| RS-438 768.7-773.3 | 0.006 | | | 0.07 |
| RS-438 773.3-778.5 | 0.009 | | | 0.05 |
| RS-438 778.5-783.4 | 0.010 | | | 0.07 |
| RS-438 783.4-788.5 | 0.008 | | | 0.26 |
| RS-438 788.5-794.2 | 0.005 | | | 0.13 |
| RS-438 794.2-800.0 | 0.002 | | | 0.06 |
| RS-438 800-804 | 0.015 | | | 0.04 |
| RS-438 804.0-808.1 | 0.007 | | | 0.04 |
| RS-438 808.1-811.6 | 0.021 | | | 0.09 |

AMERICAN ASSAY LABORATORIES

# PROVISIONAL REPORT SP048760

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-438

REPORTED : 15 MAY 1998

| SAMPLES | Au(OZ) | Au(RZ) | AuGRAV | Ag(OZ) |
|---|---|---|---|---|
| RS-438 811.6-814.5 | 0.015 | | | 0.07 |
| RS-438 814.5-819.2 | 0.010 | | | 0.07 |
| RS-438 819.2-823.3 | 0.005 | 0.005 | | 0.08 |
| RS-438 823.3-827.5 | 0.003 | | | 0.14 |
| RS-438 827.5-832.6 | 0.005 | | | 0.05 |
| RS-438 832.6-837.6 | 0.003 | | | 0.06 |
| RS-438 837.6-842.7 | 0.007 | | | 0.09 |
| RS-438 842.7-844.0 | 0.009 | | | 2.46 |
| RS-438 844-850 | 0.009 | | | 0.09 |
| 31051 | 0.535 | | | 2.68 |

**American Assay Laboratories**

# INVOICE

Remit To: P.O. Box11530
Reno, Nevada 89510
Phone NO.: 702-356-0606
Fax No.: 702-356-1413

AMERICAN ASSAY LABORATORIES
1500 GLENDALE AVE.
SPARKS, NV 89431

(702) 356-0606

INVOICE NO: SP 0048760-IN
INVOICE DATE: 05/18/98

INVOICE TO:
THE ROSEBUD MINING CO., LLC
HECLA MINING COMPANY, OPERATOR
P.O. BOX 2610
WINNEMUCCA NV 89446

THE ROSEBUD MINING CO., LLC
HECLA MINING COMPANY, OPERATOR
P.O. BOX 2610
WINNEMUCCA NV 89446

| CUSTOMER P.O. | PROJECT | TERMS |
|---|---|---|
| RS-438 | DEVELOPMENT | NET 30 - DUE IN U.S. DOLLARS |

| QUANTITY | DESCRIPTION | PRICE | AMOUNT |
|---|---|---|---|
| 60 | SAMPLES RECEIVED | .00 | .00 |
| 59 | JAW CRUSHING CHARGE | 1.30 | 76.70 |
| 59 | COARSE MILLING CHARGE | 4.50 | 265.50 |
| 59 | SPLITTING CHARGE | 2.40 | 141.60 |
| 59 | RING MILLING CHARGE | 2.00 | 118.00 |
| 60 | Au (1 A.T. FIRE ASSAY) | 8.00 | 480.00 |
| 7 | Au ANALYSES/GRAVIMETRIC | 8.75 | 61.25 |
| 60 | HYDROCHLORIC/NITRIC DIGESTION | 2.00 | 120.00 |
| 60 | Ag ANALYSES | 1.00 | 60.00 |

86-5210-477
AA

| | |
|---|---|
| NET INVOICE: | 1,323.05 |
| LESS DISCOUNT: | 264.61 |
| FREIGHT: | .00 |
| INVOICE TOTAL: | 1,058.44 |

xAMERICAN ASSAY LABORATORIES

# ANALYSIS REPORT SP048760

American Assay Laboratories

PO BOX 11530
RENO NV,USA
Ph.(702) 356-0606, Fax.(702) 356-1413

## HECLA MINING COMPANY

COPIES TO : KURT ALLEN

:

:

:

CLIENT REFERENCE No: RS-438

No. SAMPLES : 60

MAIN SAMPLE TYPE : DRILL CORE

RECEIVED : 4 MAY 1998

REPORTED : 18 MAY 1998

NEVADA LEGISLATIVE DISCLAIMER :-
The results of this assay were based solely upon the content of the sample submitted. Any decision to invest should be made only after the potential investment value of the claim or deposit has been determined based on the results of assays of multiple samples of geological materials collected by the prospective investor or by a qualified person selected by him and based on an evaluation of all engineering data which is available concerning any proposed project.

| ANALYSIS | ANALYTICAL METHOD | QUALITY PARAMETER | UNIT | DETECTION |
|---|---|---|---|---|
| Au(OZ) | FA30 | 15% | OPT | 0.001 |
| Au(RZ) | FA30 | 15% | OPT | 0.001 |
| AuGRAV | GRAV | 15% | OPT | 0.001 |
| Ag(OZ) | D210 | 10% | OPT | 0.02 |

SIGNATORY : Susan King M.S.

AMERICAN ASSAY LABORATORIES

# ANALYSIS REPORT SP048760

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-438

REPORTED : 18 MAY 1998

| SAMPLES | Au(OZ) FA30 OPT | Au(RZ) FA30 OPT | AuGRAV GRAV OPT | Ag(OZ) D210 OPT |
|---|---|---|---|---|
| RS-438 600.0-604.6 | 0.004 | | | 0.09 |
| RS-438 604.6-609.1 | 0.001 | | | 0.04 |
| RS-438 609.1-611.6 | 0.002 | | | 0.04 |
| RS-438 611.6-616.4 | 0.001 | | | 0.04 |
| RS-438 616.4-621.1 | 0.003 | | | 0.05 |
| RS-438 621.1-625.8 | 0.001 | | | 0.06 |
| RS-438 625.8-630.7 | 0.004 | | | 0.14 |
| RS-438 630.7-635.1 | 0.003 | | | 0.05 |
| RS-438 635.1-639.8 | 0.003 | | | 0.25 |
| RS-438 639.8-644.9 | 0.010 | | | 0.58 |
| RS-438 644.9-649.9 | 0.006 | | | 1.21 |
| RS-438 649.9-653.5 | 0.020 | | | 2.39 |
| RS-438 653.5-655.7 | 0.032 | | | 0.13 |
| RS-438 655.7-657.5 | 0.007 | | | 2.88 |
| RS-438 657.5-660.6 | 0.017 | | | 0.87 |
| RS-438 660.6-663.6 | 0.009 | | | 0.93 |
| RS-438 663.6-666.3 | 0.024 | | | 0.43 |
| RS-438 666.3-668.9 | 0.008 | 0.009 | | 0.04 |
| RS-438 668.9-672.6 | 0.004 | | | 0.04 |
| RS-438 672.6-677.3 | 0.032 | | | 0.07 |
| RS-438 677.3-680.4 | 0.092 | | 0.102 | 4.79 |
| RS-438 680.4-683.7 | 0.404 | | 0.335 | 6.18 |
| RS-438 683.7-688.7 | 0.022 | | | 0.05 |
| RS-438 688.7-693.6 | 0.044 | | | 0.04 |
| RS-438 693.6-699.0 | 0.081 | | 0.087 | 0.05 |

AMERICAN ASSAY LABORATORIES

# ANALYSIS REPORT SP048760

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-438

REPORTED : 18 MAY 1998

| SAMPLES | Au(OZ) FA30 OPT | Au(RZ) FA30 OPT | AuGRAV GRAV OPT | Ag(OZ) D210 OPT |
|---|---|---|---|---|
| RS-438 699.0-704.3 | 0.033 | | | 0.79 |
| RS-438 704.3-709.1 | 0.070 | | 0.065 | 0.15 |
| RS-438 709.1-714.1 | 0.069 | | 0.078 | 0.13 |
| RS-438 714.1-718.8 | 0.091 | 0.073 | 0.070 | 0.14 |
| RS-438 718.8-723.3 | 0.017 | | | 0.15 |
| RS-438 723.3-725.9 | 0.013 | | | 0.97 |
| RS-438 725.9-729.3 | 0.015 | | | 0.08 |
| RS-438 729.3-733.9 | 0.029 | | | 38.00 |
| RS-438 733.9-737.3 | 0.003 | | | 0.12 |
| RS-438 737.3-741.4 | 0.012 | | | 0.09 |
| RS-438 741.4-744.4 | 0.001 | | | 0.04 |
| RS-438 744.4-749.7 | 0.050 | 0.030 | 0.172 | 0.09 |
| RS-438 749.7-753.8 | 0.038 | | | 0.30 |
| RS-438 753.8-759.1 | 0.008 | | | 1.74 |
| RS-438 759.1-763.6 | 0.002 | | | 0.06 |
| RS-438 763.6-768.7 | 0.010 | | | 0.10 |
| RS-438 768.7-773.3 | 0.006 | | | 0.07 |
| RS-438 773.3-778.5 | 0.009 | | | 0.05 |
| RS-438 778.5-783.4 | 0.010 | | | 0.07 |
| RS-438 783.4-788.5 | 0.008 | | | 0.26 |
| RS-438 788.5-794.2 | 0.005 | | | 0.13 |
| RS-438 794.2-800.0 | 0.002 | | | 0.06 |
| RS-438 800-804 | 0.015 | | | 0.04 |
| RS-438 804.0-808.1 | 0.007 | | | 0.04 |
| RS-438 808.1-811.6 | 0.021 | | | 0.09 |

AMERICAN ASSAY LABORATORIES

# ANALYSIS REPORT SP048760

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-438

REPORTED : 18 MAY 1998

| SAMPLES | Au(OZ) FA30 OPT | Au(RZ) FA30 OPT | AuGRAV GRAV OPT | Ag(OZ) D210 OPT |
|---|---|---|---|---|
| RS-438 811.6-814.5 | 0.015 | | | 0.07 |
| RS-438 814.5-819.2 | 0.010 | | | 0.07 |
| RS-438 819.2-823.3 | 0.005 | 0.005 | | 0.08 |
| RS-438 823.3-827.5 | 0.003 | | | 0.14 |
| RS-438 827.5-832.6 | 0.005 | | | 0.05 |
| RS-438 832.6-837.6 | 0.003 | | | 0.06 |
| RS-438 837.6-842.7 | 0.007 | | | 0.09 |
| RS-438 842.7-844.0 | 0.009 | | | 2.46 |
| RS-438 844-850 | 0.009 | | | 0.09 |
| 31051 | 0.535 | | | 2.68 |

SP

# SUBMITTAL FORM


**American Assay Laboratories**

**Geochemical • Environmental • Metallurgical**

Sparks Office
1500 Glendale Ave.
Nevada 89431
Box 11530
Reno, NV 89510
Telephone
(702) 356-0606
Fax
(702) 356-1413

Tucson Office
2775 E. Ganley
Tucson, AZ 85706
Telephone
(520) 294-8078
Fax
(520) 294-6352

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

Mazatlan Office
Telephone/Fax
011-52-69-170035

Other Offices
Lima, Peru
Santiago, Chile
Mendoza, Argentina


Company: ROSEBUD MINING CO. LLT

Address: P.O. BOX 2610

City WINNEMUCCA State NV Zip 89820

Telephone Number: (702) 623-6912 Fax Number: (702) 623-6967

Project Name: DEVELOPMENT Purchase Order Number:

Date Submitted: 03/ /98 Number of Samples: SEE BELOW

**RESULTS REPORTED IN:** ppm [ ] ppb [ ] opt [X]

| SAMPLE IDENTIFICATION | TYPE | ELEMENTS REQUIRED |
|---|---|---|
| RS-438 0-10' TO 590-600' (60 SAMPLES) | RC | AQ-AU ROSEBUD MINE PROTOCOL |
| RS-439 0-10' TO 590-600' (60 SAMPLES) | | |

**COARSE REJECTS (Normally Discarded After 60 Days)**

[ ] Return COD after analysis complete

**PULPS (Normally Stored Free For One Month)**

[ ] Discard after one month
[ ] Return COD after one month

**RESULTS AND INVOICES TO BE SENT TO:**

Invoice to:

KURT ALLEN

Results to:

KURT ALLEN

**Comments:**

CLIENT FILE COPY

AMERICAN ASSAY LABORATORIES

# PROVISIONAL REPORT SP048365

PO BOX 11530
RENO NV, USA
Ph.(702) 356-0606, Fax.(702) 356-1413

## HECLA MINING COMPANY

COPIES TO : KURT ALLEN

:

:

:

NSI

CLIENT REFERENCE No: RS-438 RECEIVED : 26 MAR 1998

No. SAMPLES : 60 REPORTED : 9 APR 1998

MAIN SAMPLE TYPE : DRILL CUTTINGS

NEVADA LEGISLATIVE DISCLAIMER :-
The results of this assay were based solely upon the content of the sample submitted. Any decision to invest should be made only after the potential investment value of the claim or deposit has been determined based on the results of assays of multiple samples of geological materials collected by the prospective investor or by a qualified person selected by him and based on an evaluation of all engineering data which is available concerning any proposed project.

| ANALYSIS | ANALYTICAL METHOD | QUALITY PARAMETER | UNIT | DETECTION |
|---|---|---|---|---|
| Au(OZ) | FA30 | 15% | OPT | 0.001 |
| Au(RZ) | FA30 | 15% | OPT | 0.001 |
| Ag(OZ) | D210 | 10% | OPT | 0.02 |

SIGNATORY : Susan King M.S.

AMERICAN ASSAY LABORATORIES

# PROVISIONAL REPORT SP048365

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-438

REPORTED : 9 APR 1998

| SAMPLES | Au(OZ) | Au(RZ) | Ag(OZ) |
|---|---|---|---|
| RS-438 000-010 | 0.001 | | <0.02 |
| RS-438 010-020 | <0.001 | | <0.02 |
| RS-438 020-030 | <0.001 | | 0.02 |
| RS-438 030-040 | 0.001 | | 0.02 |
| RS-438 040-050 | 0.001 | | <0.02 |
| RS-438 050-060 | <0.001 | | <0.02 |
| RS-438 060-070 | 0.001 | | <0.02 |
| RS-438 070-080 | 0.001 | | 0.03 |
| RS-438 080-090 | <0.001 | | 0.02 |
| RS-438 090-100 | <0.001 | | <0.02 |
| RS-438 100-110 | <0.001 | <0.001 | <0.02 |
| RS-438 110-120 | <0.001 | | <0.02 |
| RS-438 120-130 | <0.001 | | <0.02 |
| RS-438 130-140 | <0.001 | | <0.02 |
| RS-438 140-150 | <0.001 | | <0.02 |
| RS-438 150-160 | <0.001 | | <0.02 |
| RS-438 160-170 | <0.001 | | 0.04 |
| RS-438 170-180 | <0.001 | <0.001 | <0.02 |
| RS-438 180-190 | <0.001 | | <0.02 |
| RS-438 190-200 | <0.001 | | <0.02 |
| RS-438 200-210 | <0.001 | | 0.02 |
| RS-438 210-220 | <0.001 | | 0.02 |
| RS-438 220-230 | <0.001 | | <0.02 |
| RS-438 230-240 | <0.001 | | <0.02 |
| RS-438 240-250 | 0.001 | | <0.02 |

AMERICAN ASSAY LABORATORIES

# PROVISIONAL REPORT SP048365

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-438

REPORTED : 9 APR 1998

| SAMPLES | Au(OZ) | Au(RZ) | Ag(OZ) |
|---|---|---|---|
| RS-438 250-260 | <0.001 | | <0.02 |
| RS-438 260-270 | <0.001 | | <0.02 |
| RS-438 270-280 | <0.001 | | <0.02 |
| RS-438 280-290 | <0.001 | | 0.02 |
| RS-438 290-300 | 0.002 | 0.002 | 0.10 |
| RS-438 300-310 | <0.001 | | <0.02 |
| RS-438 310-320 | 0.003 | | 0.05 |
| RS-438 320-330 | 0.001 | | 0.06 |
| RS-438 330-340 | 0.001 | | 0.05 |
| RS-438 340-350 | <0.001 | <0.001 | 0.02 |
| RS-438 350-360 | <0.001 | | 0.03 |
| RS-438 360-370 | 0.002 | | 0.04 |
| RS-438 370-380 | <0.001 | | 0.03 |
| RS-438 380-390 | <0.001 | | 0.03 |
| RS-438 390-400 | 0.003 | | 0.13 |
| RS-438 400-410 | 0.006 | | 0.12 |
| RS-438 410-420 | 0.004 | | 0.11 |
| RS-438 420-430 | 0.003 | | 0.12 |
| RS-438 430-440 | <0.001 | | 0.04 |
| RS-438 440-450 | 0.001 | | 0.08 |
| RS-438 450-460 | 0.001 | | 0.04 |
| RS-438 460-470 | 0.001 | | 0.04 |
| RS-438 470-480 | 0.005 | | 0.03 |
| RS-438 480-490 | 0.007 | | 0.05 |
| RS-438 490-500 | 0.002 | | 0.03 |

AMERICAN ASSAY LABORATORIES

# PROVISIONAL REPORT SP048365

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-438

REPORTED : 9 APR 1998

| SAMPLES | Au(OZ) | Au(RZ) | Ag(OZ) |
|---|---|---|---|
| RS-438 500-510 | 0.002 | | 0.04 |
| RS-438 510-520 | 0.002 | | 0.07 |
| RS-438 520-530 | 0.004 | | 0.09 |
| RS-438 530-540 | 0.003 | | 0.07 |
| RS-438 540-550 | 0.002 | | 0.08 |
| RS-438 550-560 | 0.002 | | 0.06 |
| RS-438 560-570 | 0.004 | | 0.05 |
| RS-438 570-580 | 0.004 | | 0.04 |
| RS-438 580-590 | 0.018 | | 0.07 |
| RS-438 590-600 | 0.004 | | 0.15 |

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

**********
* ROSEBUD MINING COMPANY, LLC *
**********

JOB NUMBER: 29-0588-311

WELL NAME: RS-438

LOCATION: ROSEBUD MINE

SURVEY DATE: 03/23/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

WATER CONTACT= 551'

WELNAV

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

COMMENTS: ***** EKLUND *****
** DENNIS WHITE **

**********
**********
*** 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-438

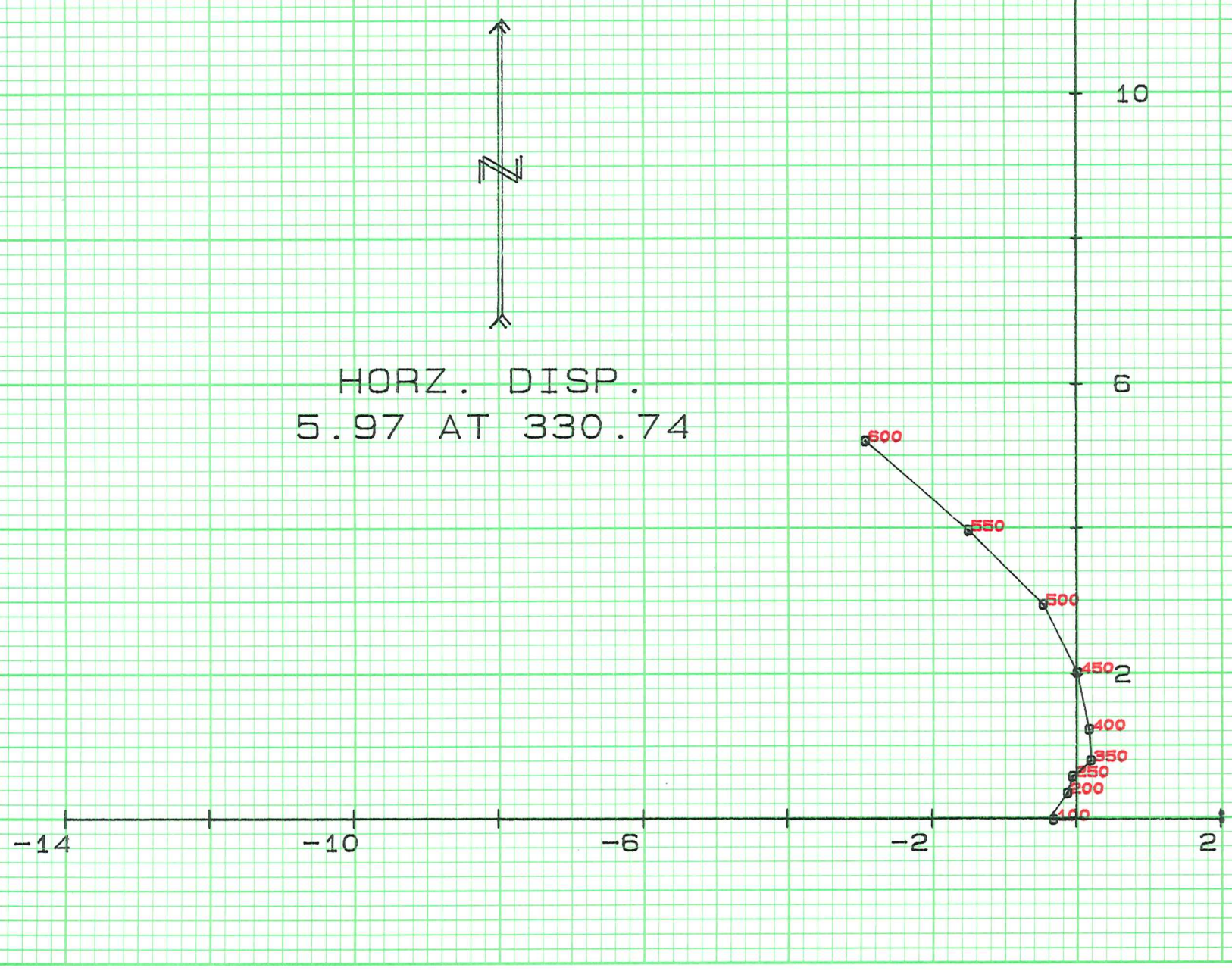
INRUN SURVEY
BY MINIMUM CURVATURE

| MEAS. DEPTH | VERT. DEPTH | VERT. SECT. | L/R CLOS. | INCL HORZ | BEARING AZIMUTH | COORDINATES LATITUDE | COORDINATES DEPARTURE | D-LEG /100 | D-LEG /CL | STATION DISP. | DISPLACEMENT DIRECTION | TEMP. DEG F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50.0 | 50.00 | 0.03 | -0.099 | -89.76 | 259.30 | 0.02 S | 0.10 W | 0.48 | 0.24 | 0.10 | AT 259.30 | 058.72 |
| 100.0 | 100.00 | 0.14 | -0.288 | -89.73 | 281.09 | 0.02 S | 0.32 W | 0.20 | 0.10 | 0.32 | AT 267.11 | 060.85 |
| 150.0 | 150.00 | 0.22 | -0.252 | -89.71 | 058.94 | 0.07 N | 0.33 W | 1.05 | 0.52 | 0.34 | AT 282.31 | 061.73 |
| 200.0 | 200.00 | 0.37 | 0.061 | -89.46 | 023.11 | 0.35 N | 0.13 W | 0.70 | 0.35 | 0.38 | AT 340.14 | 062.16 |
| 250.0 | 250.00 | 0.54 | 0.241 | -89.95 | 311.94 | 0.58 N | 0.05 W | 1.05 | 0.53 | 0.59 | AT 354.97 | 062.21 |
| 300.0 | 300.00 | 0.55 | 0.369 | -89.69 | 062.00 | 0.66 N | 0.05 E | 0.66 | 0.33 | 0.67 | AT 004.46 | 062.30 |
| 350.0 | 350.00 | 0.60 | 0.569 | -89.81 | 021.61 | 0.80 N | 0.20 E | 0.41 | 0.21 | 0.83 | AT 014.09 | 062.31 |
| 400.0 | 399.99 | 0.99 | 0.760 | -89.17 | 351.27 | 1.24 N | 0.18 E | 1.35 | 0.67 | 1.25 | AT 008.14 | 062.42 |
| 450.0 | 449.99 | 1.76 | 0.999 | -88.99 | 345.43 | 2.02 N | 0.01 E | 0.41 | 0.20 | 2.02 | AT 000.32 | 062.56 |
| 500.0 | 499.98 | 2.81 | 1.040 | -88.57 | 324.28 | 2.96 N | 0.46 W | 1.22 | 0.61 | 2.99 | AT 351.09 | 062.80 |
| 550.0 | 549.96 | 4.20 | 0.636 | -88.07 | 307.37 | 3.97 N | 1.50 W | 1.40 | 0.70 | 4.25 | AT 339.36 | 063.58 |
| 600.0 | 599.92 | 5.97 | 0.000 | -87.60 | 313.99 | 5.21 N | 2.92 W | 1.06 | 0.53 | 5.97 | AT 330.74 | 064.24 |

```
*************************************************************
*                        ********                           *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                        ********                           *
*   600.0 FEET EQUALS      5.97   FEET AT  330.74            *
*                        ********                           *
*************************************************************
```

STARLIGHT PRINTING (801) 467-2841

WELLBORE NAVIGATION, INC.
HORIZONTAL PROJECTION
FOR
ROSEBUD MINING COMPANY, LLC
WELL NAME: RS-438
JOB NUMBER: 29-0588-311
DATE: 03/23/98
SCALE: 2 FT./INCH



WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

**********
* ROSEBUD MINING COMPANY, LLC *
**********

JOB NUMBER: 29-0588-311

WELL NAME: RS-438 / VS 305.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 03/23/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 035.00
WATER CONTACT= 551'

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

COMMENTS: ***** EKLUND *****
** DENNIS WHITE **

**********
**********
*** 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

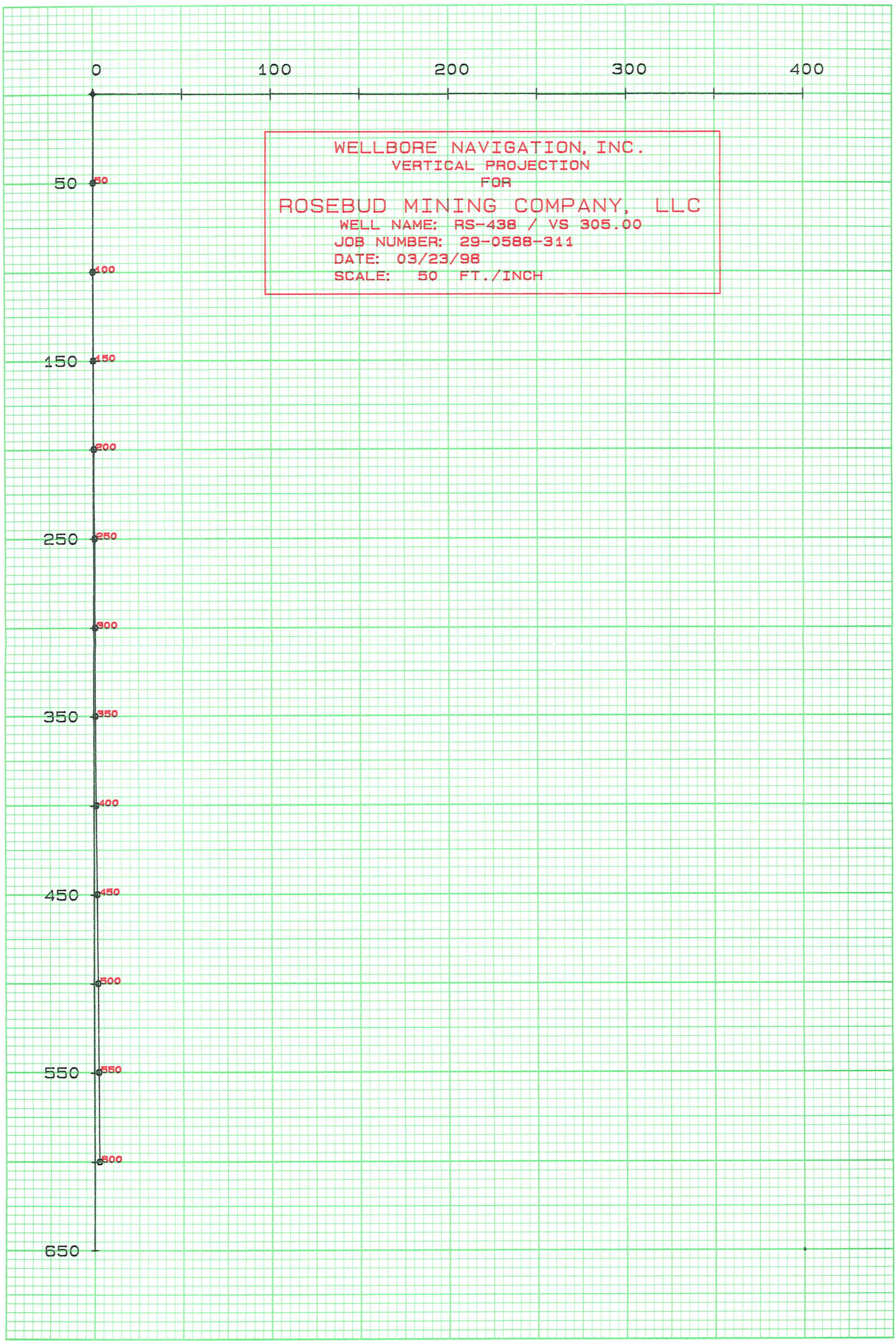
JOB NUMBER: 29-0588-311 WELL NAME: RS-438 / VS 305.00

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 DISP. | DISPLACEMENT DIRECTION | TEMP. DEG F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50.0 | 50.00 | -0.07 | -0.073 | -89.76 | 259.30 | 0.02 S | 0.10 W | 0.48 | 0.24 | 0.10 | AT 259.30 | 058.72 |
| 100.0 | 100.00 | -0.20 | -0.254 | -89.73 | 281.09 | 0.02 S | 0.32 W | 0.20 | 0.10 | 0.32 | AT 267.11 | 060.85 |
| 150.0 | 150.00 | -0.13 | -0.310 | -89.71 | 058.94 | 0.07 N | 0.33 W | 1.05 | 0.52 | 0.34 | AT 282.31 | 061.73 |
| 200.0 | 200.00 | 0.22 | -0.308 | -89.46 | 023.11 | 0.35 N | 0.13 W | 0.70 | 0.35 | 0.38 | AT 340.14 | 062.16 |
| 250.0 | 250.00 | 0.45 | -0.378 | -89.95 | 311.94 | 0.58 N | 0.05 W | 1.05 | 0.53 | 0.59 | AT 354.97 | 062.21 |
| 300.0 | 300.00 | 0.57 | -0.338 | -89.69 | 062.00 | 0.66 N | 0.05 E | 0.66 | 0.33 | 0.67 | AT 004.46 | 062.30 |
| 350.0 | 350.00 | 0.77 | -0.296 | -89.81 | 021.61 | 0.80 N | 0.20 E | 0.41 | 0.21 | 0.83 | AT 014.09 | 062.31 |
| 400.0 | 399.99 | 1.12 | -0.565 | -89.17 | 351.27 | 1.24 N | 0.18 E | 1.35 | 0.67 | 1.25 | AT 008.14 | 062.42 |
| 450.0 | 449.99 | 1.66 | -1.151 | -88.99 | 345.43 | 2.02 N | 0.01 E | 0.41 | 0.20 | 2.02 | AT 000.32 | 062.56 |
| 500.0 | 499.98 | 2.16 | -2.075 | -88.57 | 324.28 | 2.96 N | 0.46 W | 1.22 | 0.61 | 2.99 | AT 351.09 | 062.80 |
| 550.0 | 549.96 | 2.40 | -3.506 | -88.07 | 307.37 | 3.97 N | 1.50 W | 1.40 | 0.70 | 4.25 | AT 339.36 | 063.58 |
| 600.0 | 599.92 | 2.59 | -5.381 | -87.60 | 313.99 | 5.21 N | 2.92 W | 1.06 | 0.53 | 5.97 | AT 330.74 | 064.24 |

```
*************************************************************
*                         ********                          *
*     THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF           *
*                         ********                          *
*   600.0 FEET EQUALS      5.97   FEET AT  330.74            *
*                         ********                          *
*************************************************************
```

STARLIGHT PRINTING (801) 467-2841



WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

**********
* ROSEBUD MINING COMPANY, LLC *
**********

JOB NUMBER: 29-0588-311

WELL NAME: RS-438 / VS 035.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 03/23/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

WELNAV

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 125.00
WATER CONTACT= 551'

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

COMMENTS: ***** EKLUND *****
** DENNIS WHITE **

**********
**********
*** 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

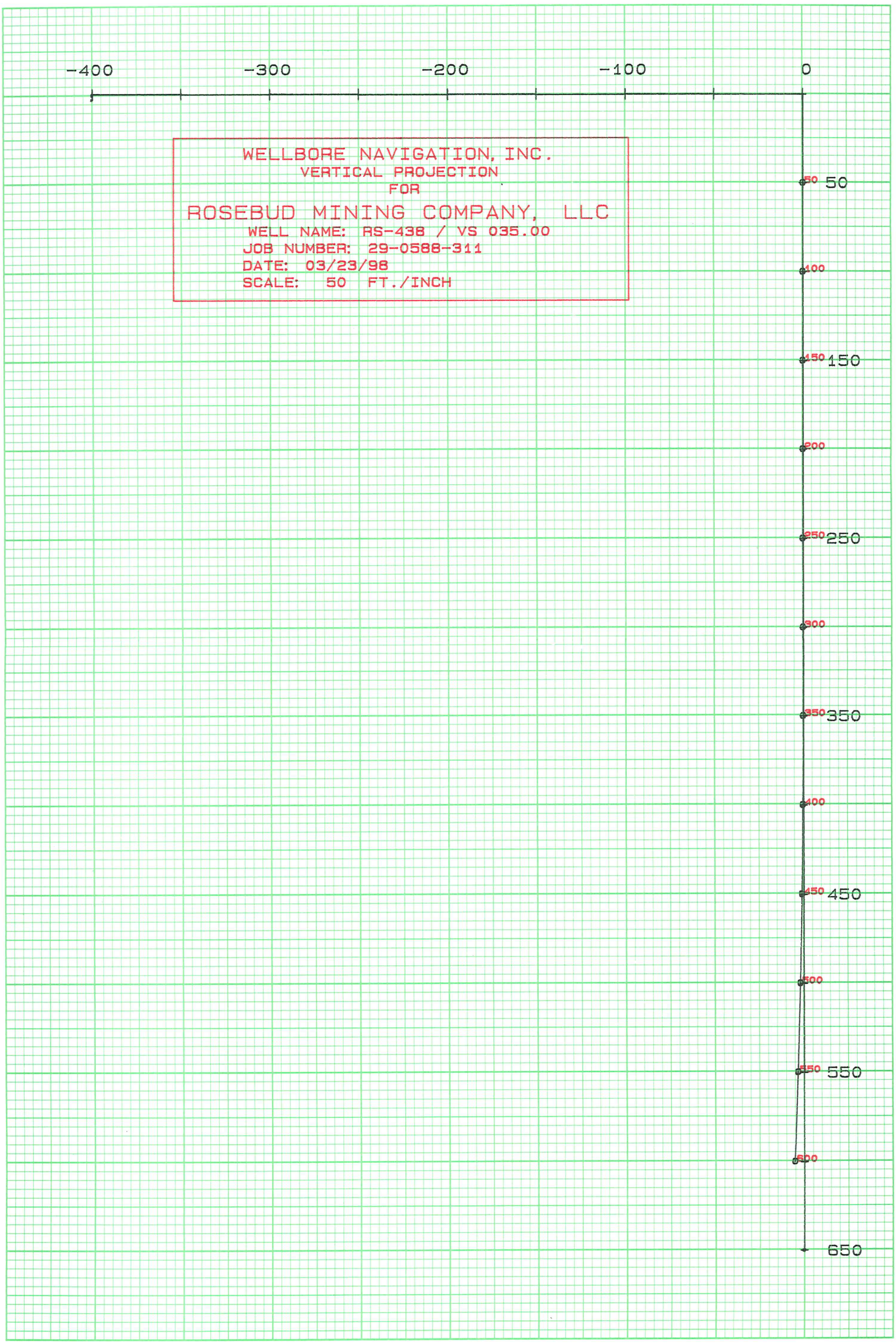
JOB NUMBER: 29-0588-311 WELL NAME: RS-438 / VS 035.00

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 DISP. | DISPLACEMENT DIRECTION | TEMP. DEG F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50.0 | 50.00 | -0.07 | 0.075 | -89.76 | 259.30 | 0.02 S | 0.10 W | 0.48 | 0.24 | 0.10 | AT 259.30 | 058.72 |
| 100.0 | 100.00 | -0.25 | 0.198 | -89.73 | 281.09 | 0.02 S | 0.32 W | 0.20 | 0.10 | 0.32 | AT 267.11 | 060.85 |
| 150.0 | 150.00 | -0.31 | 0.130 | -89.71 | 058.94 | 0.07 N | 0.33 W | 1.05 | 0.52 | 0.34 | AT 282.31 | 061.73 |
| 200.0 | 200.00 | -0.31 | -0.216 | -89.46 | 023.11 | 0.35 N | 0.13 W | 0.70 | 0.35 | 0.38 | AT 340.14 | 062.16 |
| 250.0 | 250.00 | -0.38 | -0.450 | -89.95 | 311.94 | 0.58 N | 0.05 W | 1.05 | 0.53 | 0.59 | AT 354.97 | 062.21 |
| 300.0 | 300.00 | -0.34 | -0.573 | -89.69 | 062.00 | 0.66 N | 0.05 E | 0.66 | 0.33 | 0.67 | AT 004.46 | 062.30 |
| 350.0 | 350.00 | -0.30 | -0.774 | -89.81 | 021.61 | 0.80 N | 0.20 E | 0.41 | 0.21 | 0.83 | AT 014.09 | 062.31 |
| 400.0 | 399.99 | -0.57 | -1.116 | -89.17 | 351.27 | 1.24 N | 0.18 E | 1.35 | 0.67 | 1.25 | AT 008.14 | 062.42 |
| 450.0 | 449.99 | -1.15 | -1.664 | -88.99 | 345.43 | 2.02 N | 0.01 E | 0.41 | 0.20 | 2.02 | AT 000.32 | 062.56 |
| 500.0 | 499.98 | -2.08 | -2.156 | -88.57 | 324.28 | 2.96 N | 0.46 W | 1.22 | 0.61 | 2.99 | AT 351.09 | 062.80 |
| 550.0 | 549.96 | -3.51 | -2.396 | -88.07 | 307.37 | 3.97 N | 1.50 W | 1.40 | 0.70 | 4.25 | AT 339.36 | 063.58 |
| 600.0 | 599.92 | -5.38 | -2.595 | -87.60 | 313.99 | 5.21 N | 2.92 W | 1.06 | 0.53 | 5.97 | AT 330.74 | 064.24 |

```
*****************************************************
*                   ********                        *
*   THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF     *
*                   ********                        *
*   600.0 FEET EQUALS    5.97   FEET AT  330.74     *
*                   ********                        *
*****************************************************
```

STARLIGHT PRINTING (801) 467-2841



WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

**********
* ROSEBUD MINING COMPANY, LLC *
**********

JOB NUMBER: 29-0588-311

WELL NAME: RS-438

LOCATION: ROSEBUD MINE

SURVEY DATE: 04/17/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

WELNAV

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

COMMENTS: ** BOART LONGYEAR **
***** NORM JEX *****

**********
**********
*** 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

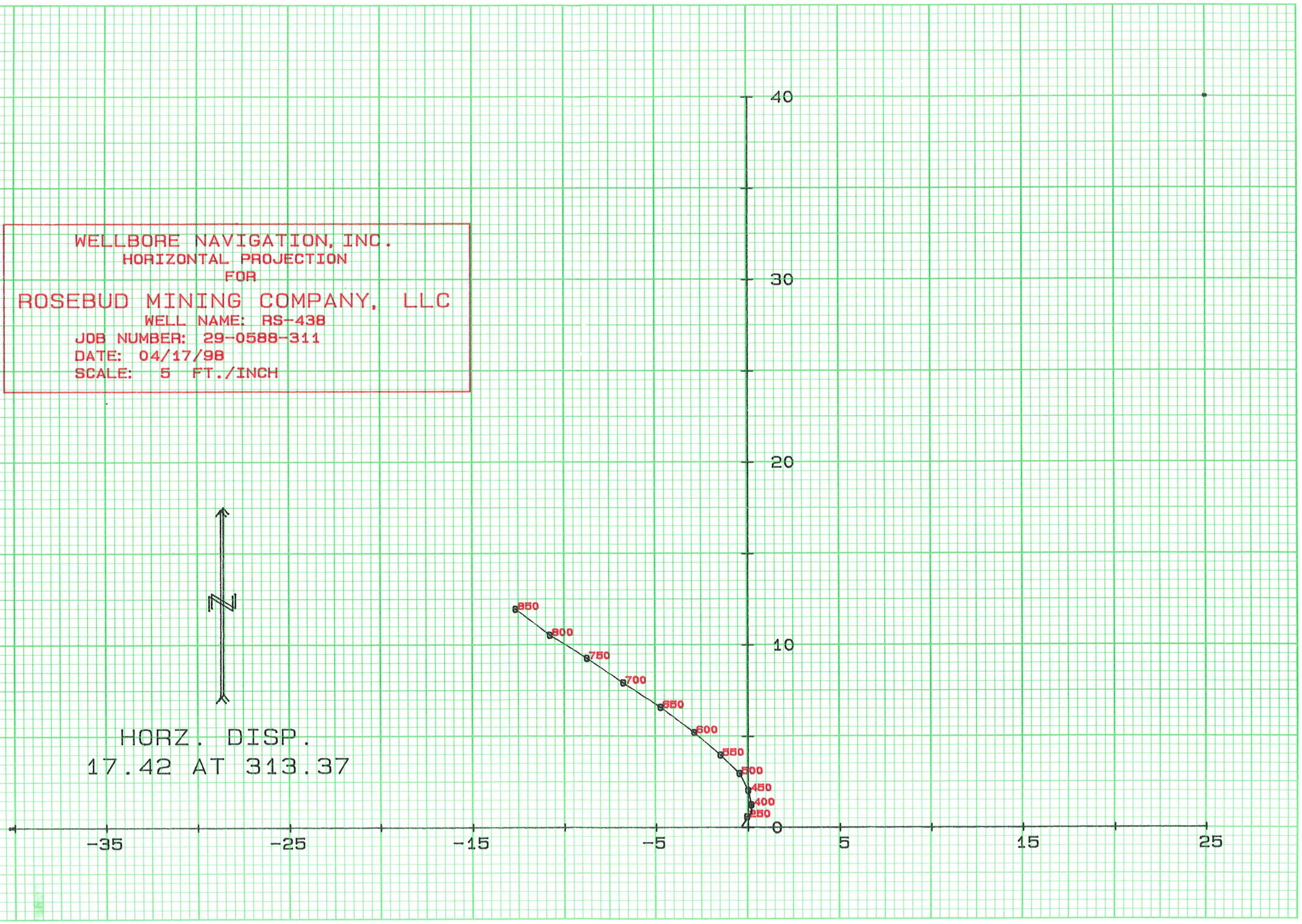
JOB NUMBER: 29-0588-311 WELL NAME: RS-438

INRUN SURVEY
BY MINIMUM CURVATURE

| MEAS. DEPTH | VERT. DEPTH | VERT. SECT. | L/R CLOS. | INCL HORZ | BEARING AZIMUTH | COORDINATES LATITUDE | COORDINATES DEPARTURE | D-LEG /100 | D-LEG /CL | STATION DISP. | DISPLACEMENT DIRECTION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 50.0 | 50.00 | 0.06 | -0.085 | -89.76 | 259.30 | 0.02 S | 0.10 W | 0.48 | 0.24 | 0.10 | AT 259.30 |
| 100.0 | 100.00 | 0.22 | -0.233 | -89.73 | 281.09 | 0.02 S | 0.32 W | 0.20 | 0.10 | 0.32 | AT 267.11 |
| 150.0 | 150.00 | 0.29 | -0.174 | -89.71 | 058.94 | 0.07 N | 0.33 W | 1.05 | 0.52 | 0.34 | AT 282.31 |
| 200.0 | 200.00 | 0.34 | 0.169 | -89.46 | 023.11 | 0.35 N | 0.13 W | 0.70 | 0.35 | 0.38 | AT 340.14 |
| 250.0 | 250.00 | 0.44 | 0.390 | -89.95 | 311.94 | 0.59 N | 0.05 W | 1.05 | 0.53 | 0.59 | AT 354.97 |
| 300.0 | 300.00 | 0.42 | 0.518 | -89.69 | 062.00 | 0.66 N | 0.05 E | 0.66 | 0.33 | 0.67 | AT 004.46 |
| 350.0 | 350.00 | 0.41 | 0.723 | -89.81 | 021.61 | 0.80 N | 0.20 E | 0.41 | 0.21 | 0.83 | AT 014.09 |
| 400.0 | 399.99 | 0.72 | 1.022 | -89.17 | 351.27 | 1.24 N | 0.18 E | 1.35 | 0.67 | 1.25 | AT 008.14 |
| 450.0 | 449.99 | 1.38 | 1.479 | -88.99 | 345.43 | 2.02 N | 0.01 E | 0.41 | 0.20 | 2.02 | AT 000.32 |
| 500.0 | 499.98 | 2.37 | 1.831 | -88.57 | 324.28 | 2.96 N | 0.46 W | 1.22 | 0.61 | 2.99 | AT 351.09 |
| 550.0 | 549.96 | 3.82 | 1.861 | -88.07 | 307.37 | 3.97 N | 1.50 W | 1.40 | 0.70 | 4.25 | AT 339.36 |
| 600.0 | 599.92 | 5.70 | 1.784 | -87.60 | 313.99 | 5.21 N | 2.92 W | 1.06 | 0.53 | 5.97 | AT 330.74 |
| 650.0 | 649.87 | 7.98 | 1.529 | -87.12 | 301.12 | 6.59 N | 4.75 W | 1.52 | 0.76 | 8.12 | AT 324.22 |
| 700.0 | 699.81 | 10.38 | 1.113 | -87.29 | 306.13 | 7.93 N | 6.78 W | 0.59 | 0.30 | 10.44 | AT 319.49 |
| 750.0 | 749.75 | 12.73 | 0.727 | -87.23 | 302.04 | 9.27 N | 8.76 W | 0.41 | 0.20 | 12.75 | AT 316.64 |
| 800.0 | 799.69 | 15.09 | 0.237 | -87.26 | 301.16 | 10.53 N | 10.80 W | 0.10 | 0.05 | 15.09 | AT 314.27 |
| 850.0 | 849.64 | 17.42 | 0.000 | -87.33 | 314.17 | 11.96 N | 12.66 W | 1.23 | 0.62 | 17.42 | AT 313.37 |

```
*************************************************************
*                         ********                          *
*     THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF           *
*                         ********                          *
*   850.0 FEET EQUALS    17.42   FEET AT  313.37             *
*                         ********                          *
*************************************************************
```

WELLBORE NAVIGATION, INC.
HORIZONTAL PROJECTION
FOR
ROSEBUD MINING COMPANY, LLC
WELL NAME: RS-438
JOB NUMBER: 29-0588-311
DATE: 04/17/98
SCALE: 5 FT./INCH




STARLIGHT PRINTING (801) 467-2841

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

**********
* ROSEBUD MINING COMPANY, LLC *
**********

JOB NUMBER: 29-0588-311

WELL NAME: RS-438 / VS 305.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 04/17/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 035.00

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

COMMENTS: ** BOART LONGYEAR **
***** NORM JEX *****

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

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

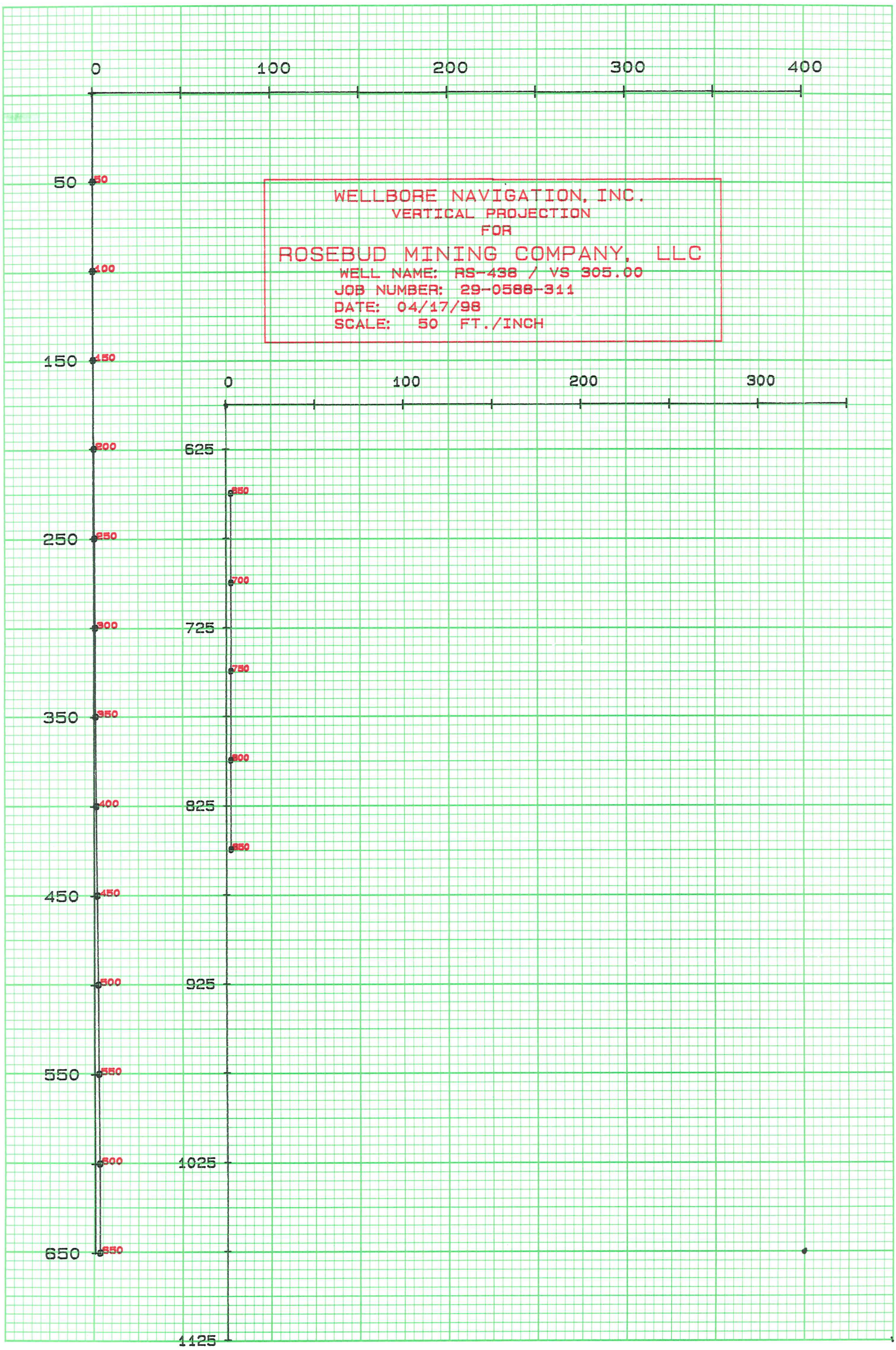
JOB NUMBER: 29-0588-311 WELL NAME: RS-438 / VS 305.00

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 DISP. | DISPLACEMENT DIRECTION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 50.0 | 50.00 | -0.07 | -0.073 | -89.76 | 259.30 | 0.02 S | 0.10 W | 0.48 | 0.24 | 0.10 | AT 259.30 |
| 100.0 | 100.00 | -0.20 | -0.254 | -89.73 | 281.09 | 0.02 S | 0.32 W | 0.20 | 0.10 | 0.32 | AT 267.11 |
| 150.0 | 150.00 | -0.13 | -0.310 | -89.71 | 058.94 | 0.07 N | 0.33 W | 1.05 | 0.52 | 0.34 | AT 282.31 |
| 200.0 | 200.00 | 0.22 | -0.308 | -89.46 | 023.11 | 0.35 N | 0.13 W | 0.70 | 0.35 | 0.38 | AT 340.14 |
| 250.0 | 250.00 | 0.45 | -0.378 | -89.95 | 311.94 | 0.59 N | 0.05 W | 1.05 | 0.53 | 0.59 | AT 354.97 |
| 300.0 | 300.00 | 0.57 | -0.338 | -89.69 | 062.00 | 0.66 N | 0.05 E | 0.66 | 0.33 | 0.67 | AT 004.46 |
| 350.0 | 350.00 | 0.77 | -0.296 | -89.81 | 021.61 | 0.80 N | 0.20 E | 0.41 | 0.21 | 0.83 | AT 014.09 |
| 400.0 | 399.99 | 1.12 | -0.565 | -89.17 | 351.27 | 1.24 N | 0.18 E | 1.35 | 0.67 | 1.25 | AT 008.14 |
| 450.0 | 449.99 | 1.66 | -1.151 | -88.99 | 345.43 | 2.02 N | 0.01 E | 0.41 | 0.20 | 2.02 | AT 000.32 |
| 500.0 | 499.98 | 2.16 | -2.075 | -88.57 | 324.28 | 2.96 N | 0.46 W | 1.22 | 0.61 | 2.99 | AT 351.09 |
| 550.0 | 549.96 | 2.40 | -3.506 | -88.07 | 307.37 | 3.97 N | 1.50 W | 1.40 | 0.70 | 4.25 | AT 339.36 |
| 600.0 | 599.92 | 2.59 | -5.381 | -87.60 | 313.99 | 5.21 N | 2.92 W | 1.06 | 0.53 | 5.97 | AT 330.74 |
| 650.0 | 649.87 | 2.67 | -7.668 | -87.12 | 301.12 | 6.59 N | 4.75 W | 1.52 | 0.76 | 8.12 | AT 324.22 |
| 700.0 | 699.81 | 2.61 | -10.103 | -87.29 | 306.13 | 7.93 N | 6.78 W | 0.59 | 0.30 | 10.44 | AT 319.49 |
| 750.0 | 749.75 | 2.57 | -12.492 | -87.23 | 302.04 | 9.27 N | 8.76 W | 0.41 | 0.20 | 12.75 | AT 316.64 |
| 800.0 | 799.69 | 2.43 | -14.891 | -87.26 | 301.16 | 10.53 N | 10.80 W | 0.10 | 0.05 | 15.09 | AT 314.27 |
| 850.0 | 849.64 | 2.54 | -17.233 | -87.33 | 314.17 | 11.96 N | 12.66 W | 1.23 | 0.62 | 17.42 | AT 313.37 |

```
*************************************************************
*                         ********                          *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                         ********                          *
*   850.0 FEET EQUALS     17.42    FEET AT   313.37         *
*                         ********                          *
*************************************************************
```

STARLIGHT PRINTING (801) 467-2841



WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

**********
* ROSEBUD MINING COMPANY, LLC *
**********

JOB NUMBER: 29-0588-311

WELL NAME: RS-438 / VS 035.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 04/17/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 125.00

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

COMMENTS: ** BOART LONGYEAR **
***** NORM JEX *****

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

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

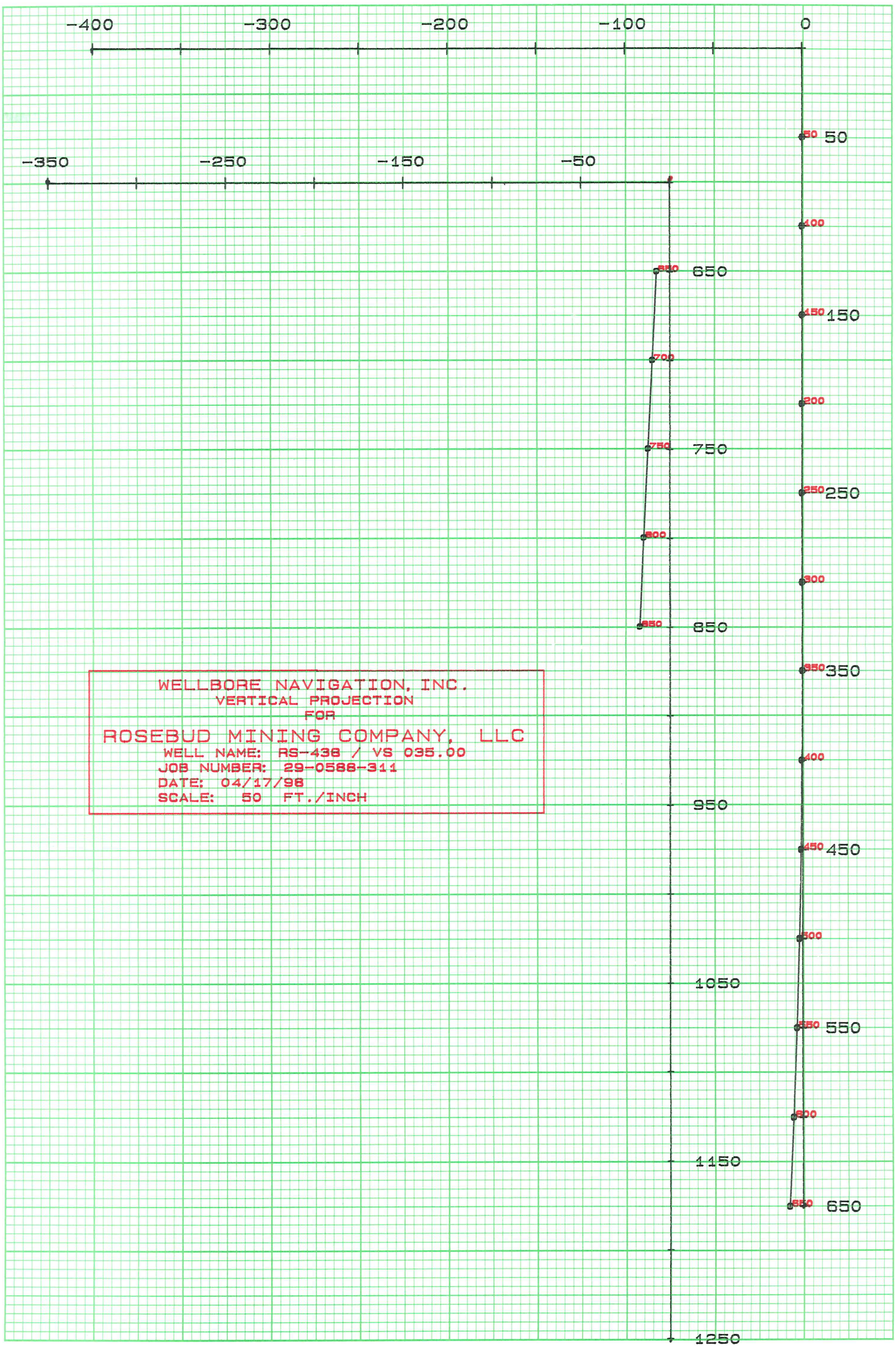
JOB NUMBER: 29-0588-311 WELL NAME: RS-438 / VS 035.00

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 DISP. | DISPLACEMENT DIRECTION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 50.0 | 50.00 | -0.07 | 0.075 | -89.76 | 259.30 | 0.02 S | 0.10 W | 0.48 | 0.24 | 0.10 | AT 259.30 |
| 100.0 | 100.00 | -0.25 | 0.198 | -89.73 | 281.09 | 0.02 S | 0.32 W | 0.20 | 0.10 | 0.32 | AT 267.11 |
| 150.0 | 150.00 | -0.31 | 0.130 | -89.71 | 058.94 | 0.07 N | 0.33 W | 1.05 | 0.52 | 0.34 | AT 282.31 |
| 200.0 | 200.00 | -0.31 | -0.216 | -89.46 | 023.11 | 0.35 N | 0.13 W | 0.70 | 0.35 | 0.38 | AT 340.14 |
| 250.0 | 250.00 | -0.38 | -0.450 | -89.95 | 311.94 | 0.59 N | 0.05 W | 1.05 | 0.53 | 0.59 | AT 354.97 |
| 300.0 | 300.00 | -0.34 | -0.573 | -89.69 | 062.00 | 0.66 N | 0.05 E | 0.66 | 0.33 | 0.67 | AT 004.46 |
| 350.0 | 350.00 | -0.30 | -0.774 | -89.81 | 021.61 | 0.80 N | 0.20 E | 0.41 | 0.21 | 0.83 | AT 014.09 |
| 400.0 | 399.99 | -0.57 | -1.116 | -89.17 | 351.27 | 1.24 N | 0.18 E | 1.35 | 0.67 | 1.25 | AT 008.14 |
| 450.0 | 449.99 | -1.15 | -1.664 | -88.99 | 345.43 | 2.02 N | 0.01 E | 0.41 | 0.20 | 2.02 | AT 000.32 |
| 500.0 | 499.98 | -2.08 | -2.156 | -88.57 | 324.28 | 2.96 N | 0.46 W | 1.22 | 0.61 | 2.99 | AT 351.09 |
| 550.0 | 549.96 | -3.51 | -2.396 | -88.07 | 307.37 | 3.97 N | 1.50 W | 1.40 | 0.70 | 4.25 | AT 339.36 |
| 600.0 | 599.92 | -5.38 | -2.595 | -87.60 | 313.99 | 5.21 N | 2.92 W | 1.06 | 0.53 | 5.97 | AT 330.74 |
| 650.0 | 649.87 | -7.67 | -2.673 | -87.12 | 301.12 | 6.59 N | 4.75 W | 1.52 | 0.76 | 8.12 | AT 324.22 |
| 700.0 | 699.81 | -10.10 | -2.612 | -87.29 | 306.13 | 7.93 N | 6.78 W | 0.59 | 0.30 | 10.44 | AT 319.49 |
| 750.0 | 749.75 | -12.49 | -2.573 | -87.23 | 302.04 | 9.27 N | 8.76 W | 0.41 | 0.20 | 12.75 | AT 316.64 |
| 800.0 | 799.69 | -14.89 | -2.430 | -87.26 | 301.16 | 10.53 N | 10.80 W | 0.10 | 0.05 | 15.09 | AT 314.27 |
| 850.0 | 849.64 | -17.23 | -2.536 | -87.33 | 314.17 | 11.96 N | 12.66 W | 1.23 | 0.62 | 17.42 | AT 313.37 |

```
*************************************************************
*                          ********                         *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                          ********                         *
*   850.0 FEET EQUALS     17.42    FEET AT   313.37         *
*                          ********                         *
*************************************************************
```

STARLIGHT PRINTING (801) 467-2841



SP

# SUBMITTAL FORM


**American Assay Laboratories**

**Geochemical • Environmental • Metallurgical**

Sparks Office
1500 Glendale Ave.
Nevada 89431
Box 11530
Reno, NV 89510
Telephone
(702) 356-0606
Fax
(702) 356-1413

Tucson Office
2775 E. Ganley
Tucson, AZ 85706
Telephone
(520) 294-8078
Fax
(520) 294-6352

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

Mazatlan Office
Telephone/Fax
011-52-69-170035

Other Offices
Lima, Peru
Santiago, Chile
Mendoza, Argentina


Company: ROSEBUD MINING CO LTD

Address: P.O. BOX 2610

City WINNEMUCCA State NV Zip 89446

Telephone Number: (702) 623-6912 Fax Number: (702) 623-6967

Project Name: DEVELOPMENT Purchase Order Number:

Date Submitted: 04/ /98 Number of Samples: 59

**RESULTS REPORTED IN:** ppm [ ] ppb [ ] opt [X]

| RS-438 SAMPLE IDENTIFICATION | | | TYPE | ELEMENTS REQUIRED | |
|---|---|---|---|---|---|
| 600.0-604.6 | 660.6-663.6 | | CORE | AU-AA ACCORDING TO ROSEBUD | |
| 604.6-609.1 | 663.6-666.3 | | | & MINING PROTOCOLS | |
| 609.1-611.6 | 666.3-668.9 | 723.3-725.9 | | | |
| 611.6-616.4 | 668.9-672.6 | 725.9-729.3 | | 778.5-783.4 | 832.6-837.6 |
| 616.4-621.1 | 672.6-677.3 | 729.3-733.9 | | 783.4-788.5 | 837.6-842.7 |
| 621.1-625.8 | 677.3-680.4 | 733.9-737.3 | | 788.5-794.2 | 842.7-844.0 |
| 625.8-630.7 | 680.4-683.7 | 737.3-741.4 | | 794.2-800.0 | 844.0-850.0 |
| 630.7-635.1 | 683.7-688.7 | 741.4-744.4 | | 800.0-804.0 | |
| 635.1-639.8 | 688.7-693.6 | 744.4-749.7 | | 804.0-808.1 | |
| 639.8-644.9 | 693.6-699.0 | 749.7-753.8 | | 808.1-811.6 | |
| 644.9-649.9 | 699.0-704.3 | 753.8-759.1 | | 811.6-814.5 | |
| 649.9-653.5 | 704.3-709.1 | 759.1-763.6 | | 814.5-819.2 | |
| 653.5-655.7 | 709.1-714.1 | 763.6-768.7 | | 819.2-823.3 | |
| 655.7-657.5 | 714.1-718.8 | 768.7-773.3 | | 823.3-827.5 | |
| 657.5-660.6 | 718.8-723.3 | 773.3-778.5 | | 827.5-832.6 | |

**COARSE REJECTS (Normally Discarded After 60 Days)**

[ ] Return COD after analysis complete

**PULPS (Normally Stored Free For One Month)**

[ ] Discard after one month
[ ] Return COD after one month

**RESULTS AND INVOICES TO BE SENT TO:**

Invoice to:

KURT ALLEN

Results to:

KURT ALLEN

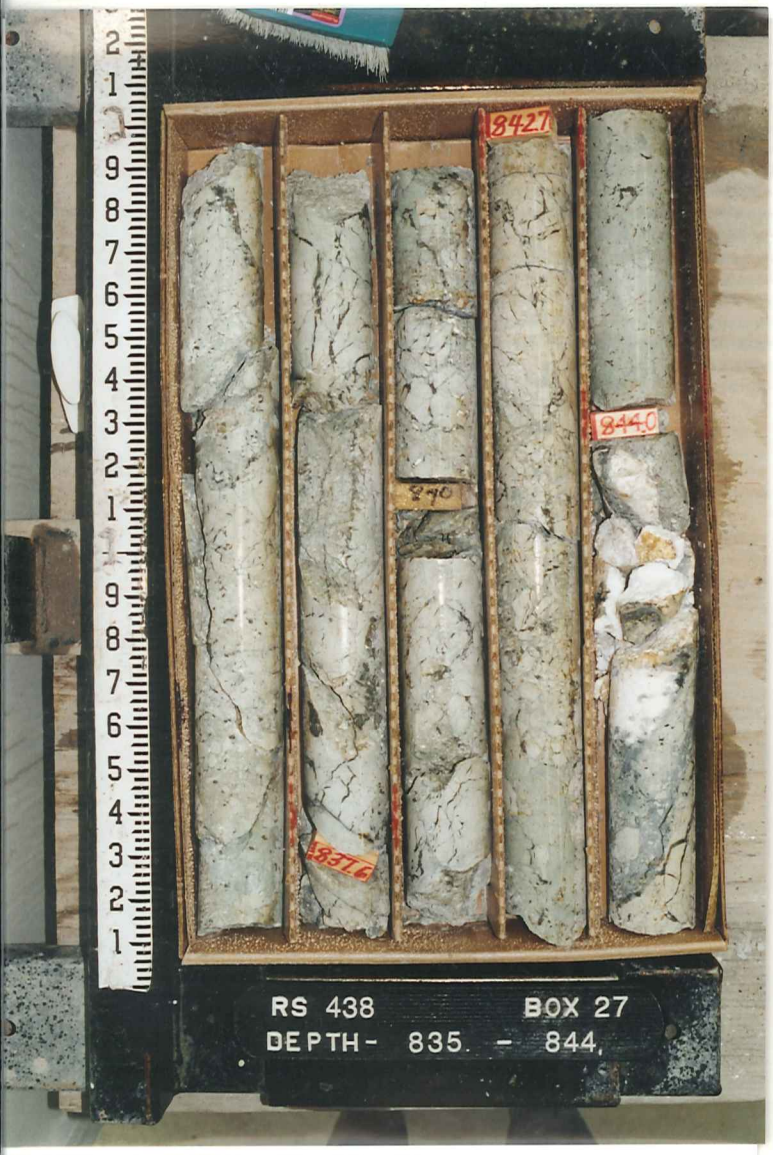
**Comments:**

CLIENT FILE COPY

811.6
810
RS 438 BOX 24
DEPTH- 808.5 - 817.

820
819.2
RS 438 BOX 25
DEPTH- 817. - 826.

832.6
RS 438 BOX 26
DEPTH- 826. - 835.


8427
844.0
840
837.6
RS 438
BOX 27
DEPTH- 835. - 844.

850
D.10
R.10
RS 438
BOX 28
DEPTH- 844. - 850. TD

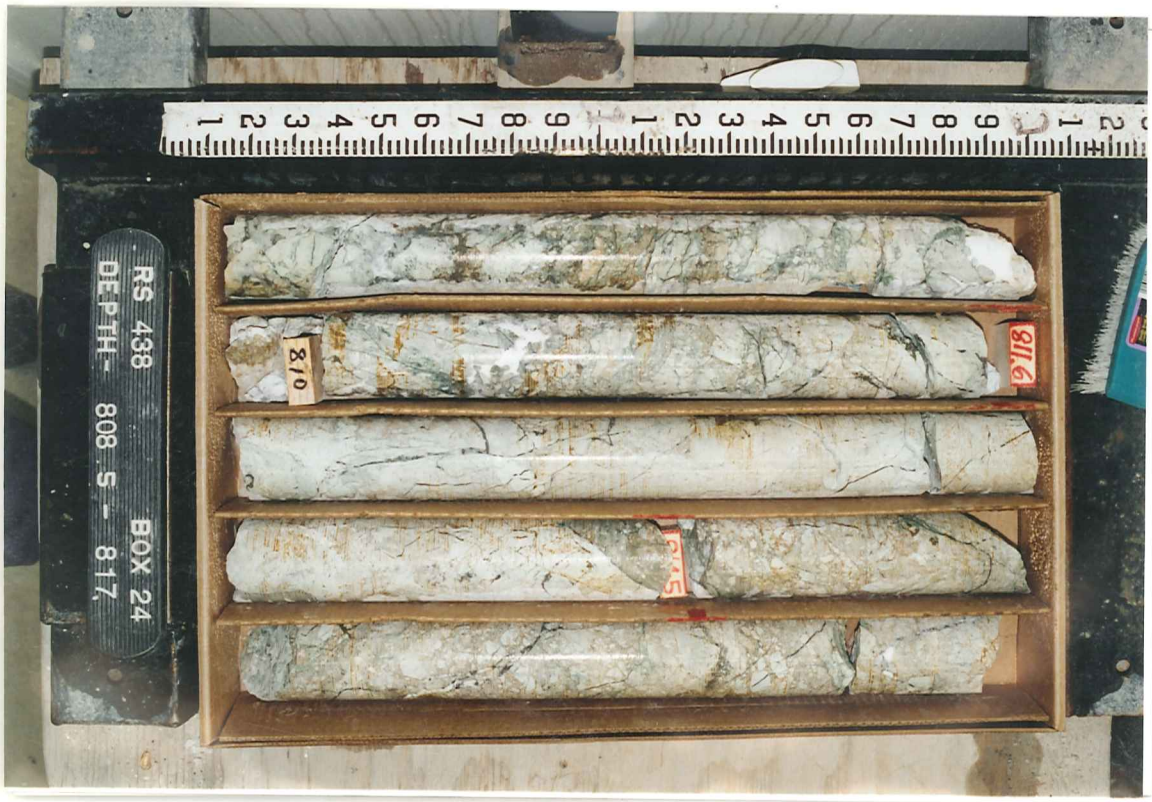
770
D
R-16
RS 438
BOX 19
DEPTH- 763.5 - 772.

7785
RS 438
BOX 20
DEPTH- 772. - 781.

790
7885
7834
RS 438
BOX 21
DEPTH- 781. - 790.

794.2
RS 438 BOX 22
DEPTH- 790. - 799.5

808.1
804.0
800
RS 438 BOX 23
DEPTH- 799.5 - 808.


RS 438 BOX 24
DEPTH- 808.5 - 817.
810
811.6

RS 438
BOX 13
DEPTH- 709 - 719.5
714.1
718.8

RS 438
BOX 14
DEPTH- 719.5 - 728.
720
723.7
725.9

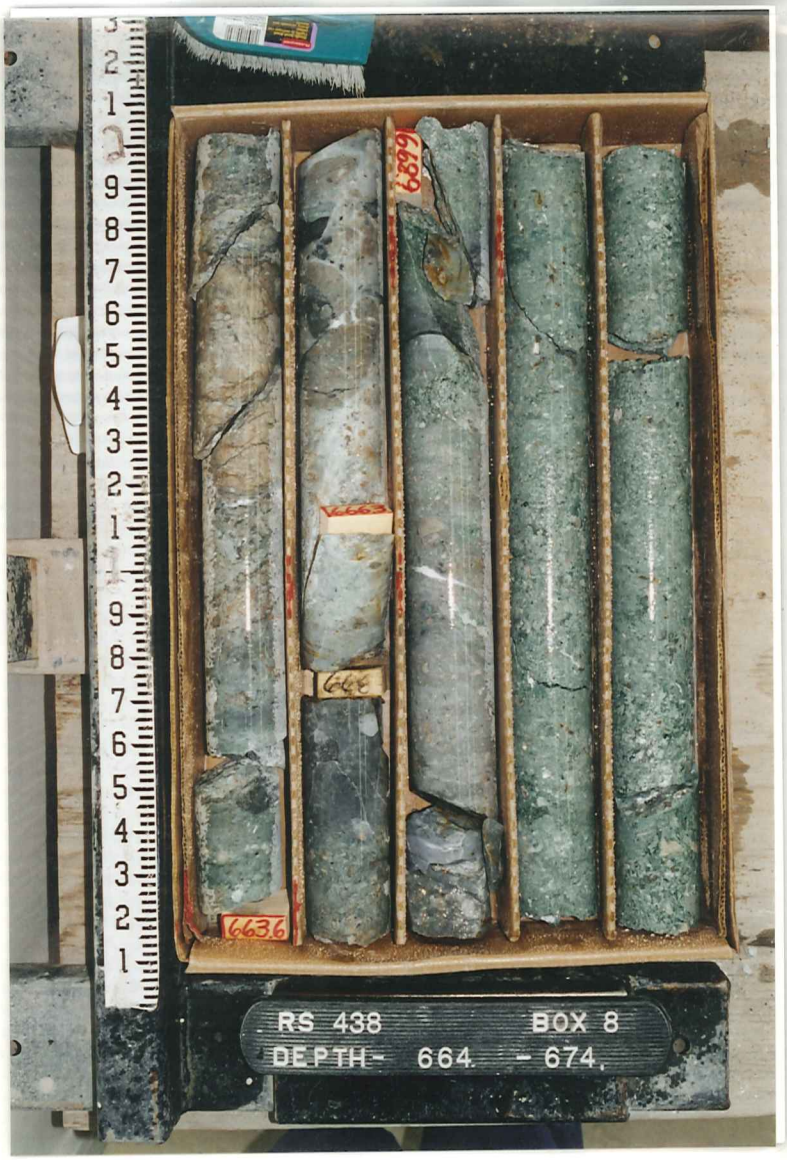
RS 438
BOX 15
DEPTH- 728 - 737.
733.9
729.2

RS 438
BOX 16
DEPTH- 737 - 746.
737.3
741.4
744.4

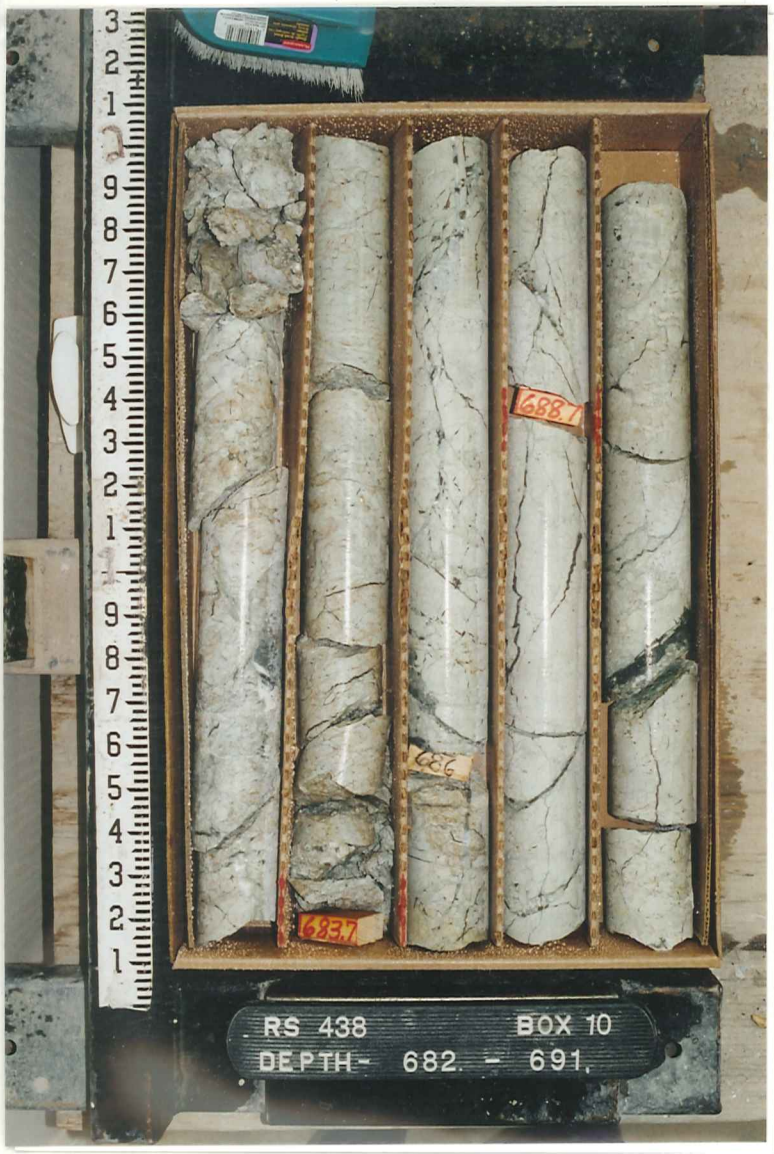
RS 438
BOX 17
DEPTH- 746 - 755.
749.7
750

RS 438
BOX 18
DEPTH- 755 - 763.5
757.1
760
763.6

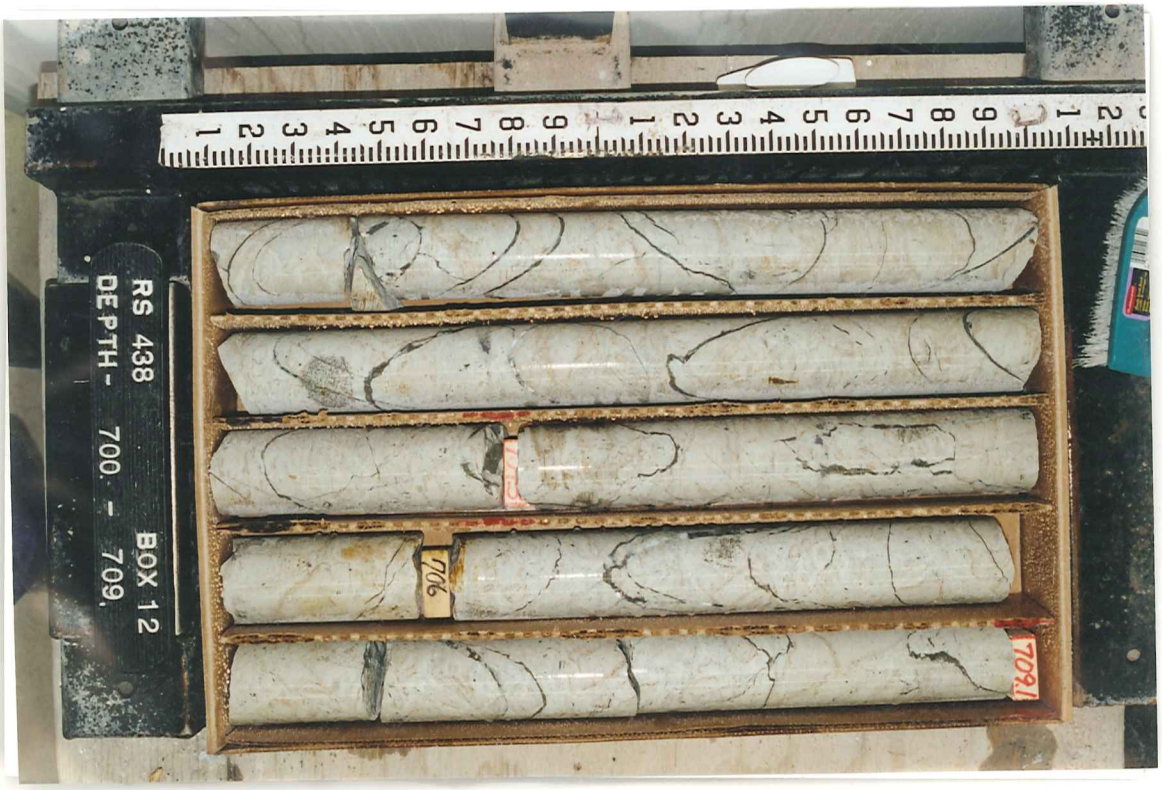
RS 438
BOX 7
DEPTH- 654. - 664.


RS 438
BOX 8
DEPTH- 664. - 674.

RS 438
BOX 9
DEPTH- 673. - 682.


683.7
686
688.7
RS 438
BOX 10
DEPTH- 682. - 691.

696
697.6
699.8
RS 438
BOX 11
DEPTH- 691. - 700.


706
708.1
RS 438
BOX 12
DEPTH- 700. - 709.

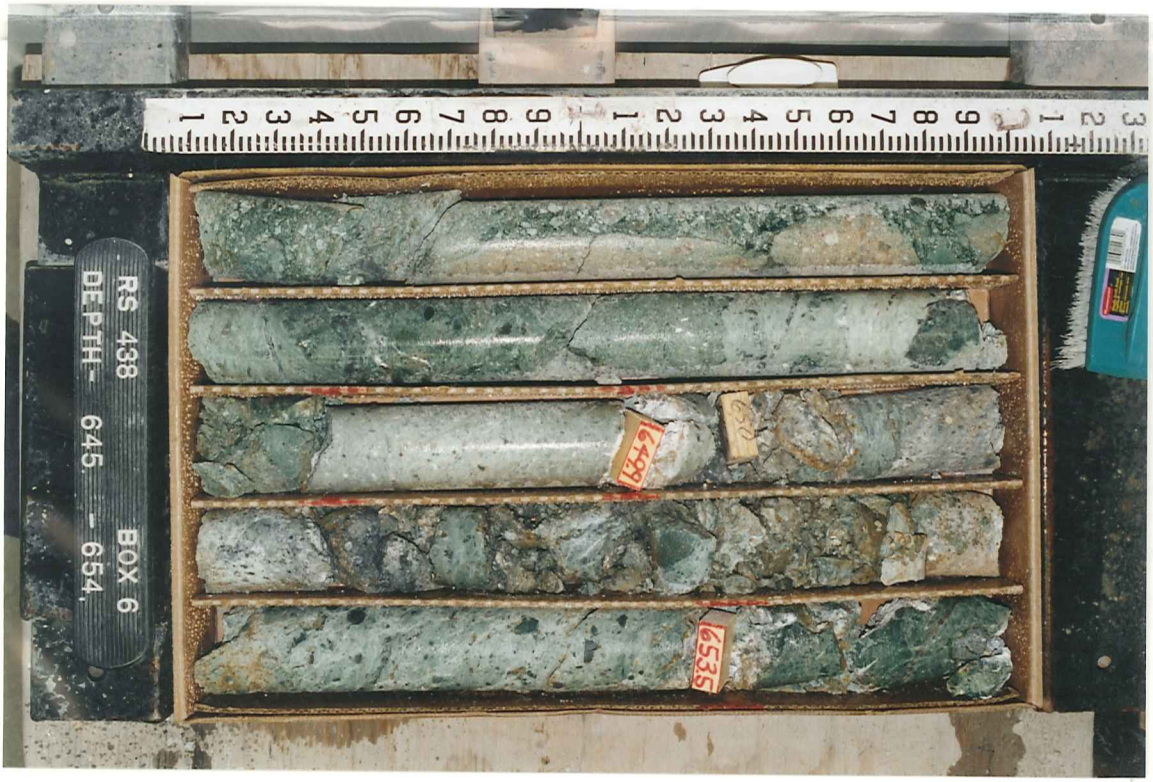
RS 438
BOX 1
DEPTH- 600 - 609.5

RS 438
BOX 2
DEPTH- 609.5 - 619.

RS 438
BOX 3
DEPTH- 619.5 - 628.5

630.7
628.5
635.1
RS 438
BOX 4
DEPTH- 628.5 - 636.5

639.5
RS 438
BOX 5
DEPTH- 636.5 - 645.


RS 438
BOX 6
DEPTH- 645. - 654.
649.1
653.5