6000 0551

Mining District File Summary Sheet

| | |
|---|---|
| DISTRICT | Rosebud |
| DIST_NO | 4010 |
| COUNTY<br>If different from written on document | Pershing |
| TITLE<br>If not obvious | Rosebud Drill Hole File – Hole No. RS-441 |
| AUTHOR | K. Allen; S. King; V. Reid; R. Schmidt; D. White |
| DATE OF DOC(S) | 1998 |
| 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; Rosebud Mining Co., LLC |
| COMMODITY<br>If not obvious | gold; silver |
| NOTES | drill logs; assay; geology; photographs; geochemistry; total depth 850'; invoices<br><br>63p |

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-441

6000 0551
4010

60000851

**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-441 | LOCATION | SURFACE, EAST | REMARKS | PILOTED TO 650' |
| PAGE 1 OF 4 | | NORTHING | | | |
| DATE | 04/30/98 | EASTING | | | |
| LOGGED BY | HDM | ELEVATION | | | |
| SCALE | 1" = 10' | AZIMUTH | — | | |
| TOTAL DEPTH | 850' | INCLINATION | -90° | | |

| LITH. | OX/RED. | LITHOLOGY | FT | GRAPHIC LOG | STRUCTURE | ALTERATION AND MINERALIZATION |
|---|---|---|---|---|---|---|
| 650.0-666.0 CHOCOLATE? "PORPHYRITIC" AUTOBRECCIA | | 650.0-666.0': HARD MATRIX-SUPPORTED, HETEROLITHIC BRECCIA. GRAY, POSSIBLY ZONEOUS MATRIX MATERIAL POSSIBLY WKLY SILICIFIED OR POTASSIFIED ROCK FLOUR. MATRIX HAS A FAINT COMMINUTED TEXTURE WHICH HAS BEEN BLURRED BY MODERATE BLEACHING AND ALT'N. FRAGMENTS VARY FROM APHANITIC GRN CLAY ALTERED, TO LT. AND MEDIUM GRAY-TAN & FLECKED WITH DARK MICROLITES. MOST FRAGMTS = SUB-ANGULAR TO SUB-ROUNDED & COBBLE-SIZED; MOST ~ 70%-80% TAN-GRY & FINELY PORPHYRITIC. | 650 660 | | 655.0-659.0': MOD'LY BROKEN WK WHT CLAY GOUGE ON FRAX. | 650.0-666.0': MOD. /WK MILKY SILICA + MARCASITE VNLTS. SOME SILICA OVERPRINTS LT. GRN CLAY VNLTS. MOD. BLCHING & POSS. WK SILICIFICATN. FRAGMT SPECIFIC GRN CLAY ALTN. WK/TR DISS'D BRASSY PY. |
| 666.0-692.8 FINER-GRAINED BRECCIA | | 666.0': APPARENT DEPOSITIONAL CONTACT. 2 RUDDY TAN SILTY DEPOSITIONAL BANDS ~ 2-4" WIDE FROM 666-667. 666.0-692.8': VARIABLY CLAST- TO MATRIX-SUPPORTED HETEROLITHIC VOLCANIC BRECCIA. LESS TEXTURE-OBSCURED THAN ABOVE. STILL MOD'LY TO WKLY BLCHED. FRAGMENTS ARE SMALLER, ANGULAR & VARIOUSLY TAN APHANITIC OR LT. BLUE-GRN PUNKY, ARGILLIZED AND FLOW-BANDED OR POMICEOUS. | 670 680 | | | 666.0'-692.8': PERVASIVE WK ARGILLIZATN. SPOTTY, PUNKY BLUE-GRN CLAY ALT'N IN SPECIFIC FRAGMTS, W/ MOD/STR DISS'D PYRITE |
| | | 692.8': SHEARED CONTACT, POSSIBLY CONFORMABLE | 690 | | 692.8~-693.5': SHEARING AT CONTACT WITH & IN UBUD SUVER ABOVE FAULT | 692.8-~693.5': MILKY LEACHED SILICA + BARITE AT SHEARED CONTACT. |
| 692.8-696.5 | | 692.8'-696.5': MEDIUM GREEN, SPECKLED, CLAY ALTERED FG CONG TO VCG SAND-SIZED BUD. | | | 695': ~ 2" UNHEALED GOUGE | 692.8'-696.5': STR. GRN CLAY ALT'N LOCALLY OVERPRINTED WITH VEIN SILICA |
| | UBUD | 696.5'-702.0': FAULT BRECCIA: SUB-ROUNDED COBBLES OF SILICIFIED, BROWN CATACLASTIZED MATERIAL GRADING DOWN INTO GRY SILICA-FLOODED ROCK FLOUR. LACED WITH FINE LATE WHT SILICA VEINLETS. SHEARED GRN BUD. FORMS A MATRIX TO BRN COBBLES. GIVES WAY TO SILICA SOAKED | 700 | | 696-702': STRONGLY BROKEN CATACLASTIC TEXTURE IN BRN COBBLES. SOME SI SOAKED RK FLOUR. | 696.5-700': MOD. DISS'D MARC & BLK PYRITE IK MOD PERVASIVE SILICIFICATN. OVERPRINTS WK/MOD. GRK CLAY |
| 696.5-708.6 SOUTH RIDGE FAULT | | | | | | |

| ANALYTICAL DATA | | | | | | |
|---|---|---|---|---|---|---|
| FROM | TO | W | Au | Ag | Au2 | Ag |
| 650.0 | 655.0 | | | | | |
| 655.0 | 660.6 | | | | | |
| 660.6 | 666.0 | | | | | |
| 666.0 | 670.7 | | | | | |
| 670.7 | 675.0 | | | | | |
| 675.0 | 680.0 | | | | | |
| 680.0 | 685.0 | | | | | |
| 685.0 | 690.0 | | | | | |
| 690.0 | 692.8 | | | | | |
| 692.8 | 696.6 | | | | | |
| 696.6 | 700.0 | | | | | |

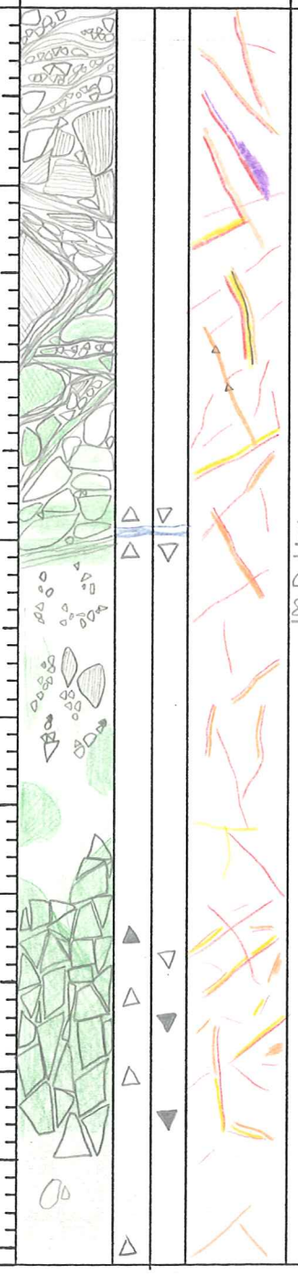
HOLE NUMBER RS-441 PAGE 2 OF 4

| LITH. | OX/RED. | LITHOLOGY | FT | GRAPHIC LOG | STRUCTURE | ALTERATION AND MINERALIZATION |
|---|---|---|---|---|---|---|
| 696.5- SOUTH RIDGE FAULT ↓ 708.6' - DOZER ↓ | 708.6' 350' | 702.0'-708.6': EARLIER SILICA-FLOODED, COMMINUTED HETEROLITHIC BRECCIA IS REBRECCIATED. ROUNDED MOTTLED SILICIFIED FRAGMENTS ARE RE-CEMENTED W/ WHT BARITE + SILICA OR SILICA AFTER BARITE. MATRIX ABSENT. MOSAIC TEXTURE WELL-DEVELOPED. TO 705.0', STRWKD VEINS TO 708.6'.<br>702-705': TOTAL TO 80% REPLACEMENT GRY SILICA.<br>705'-708.6': STR'LY SILICIFIED PROBABLE DOZER PROTOLITH. STRLY CRACKLE BXA'D & REHEALED WITH BLK SILICA + SULFIDE & LATER WHT SILICA + BARITE +/- STIBNITE INFILLING VUGS. | 700<br>710 | | 701.5-702.0': WHT-GRY CLAY GOUGE & SILICIFIED GRIT UNHEALED GOUGE<br>702.0-705.0': HYDROTHERMALLY OVERPRINTED HETERDLITHIC BRECCIA. REBXAT'D AND OVERPRINTED WITH BA+SI CEMENTED MOSAIC BRECCIA.<br>705-715.4': HYDROTHERMALLY OVERPRINTED WANING TECTONIC BXA. GROUND/CATACLASTIC FABRIC | 700.0'-701.9': STRLY SILICIFIED HETEROLITHIC BRECCIA. MOD DARK DISS'D SULFIDES.<br>701.5-702': STR CLAY, MOD/WK DISS'D DARK SULFIDES<br>702-705': STR/INT. SILICIFICATION, SILICA + BARITE CEMENT, LATE BARITE + STIBNITE IN VUGS.<br>705'-708.6': STR. BLK SILICA SULFIDE CRACKLE BXA CEMENT. MOD. SILICA + BARITE + STIBNITE IN VUGS |
| | | | 720 | LOSS | GIVES WAY TO LESS INTENSE CLAST-SUPPORTED CRACKLE BXA DOWNHOLE. | STR. PERVASIVE SILICIFICATION OVER MOD GRN CLAY ALTERATION. |
| | | 708.6-715.4': LT. GRN CLAY ALTERED, BRECCIATED DOZER, OVERPRINTED WITH WANING SILICIFICATION, AND SPOTTY DISS'D MARCASITE BLADES. CATACLASTIC TO AUTOCLASTIC TEXTURE IS LARGELY OVERPRINTED.<br>715.4-725.0': TAN, INTERMITTENTLY SILICIFIED, LOCALLY ~~S~~BRECCIATED MOTTLED DOZER. LOCALLY STR'LY CLAY ALTERED BTWN 721.5-724.5': LT TAN PUNKY FRAGMTS.<br>725.0'-729.0': STR'LY SILICA-CEMENTED, SILICA-SOAKED VEIN BRECCIA. VARIABLY WHITE CLAY + SILICA TO DARK SILICA + SULFIDE VNING.<br>729.0-~758': TAN DOZER, STRONGLY SILICA-SOAKED, MODERATELY SILICA-CEMENTED, VEIN RUBBLE BXA. CLAST-SUPPORTED, TIGHTLY-PACKED, MONOMICT DOZER IS SOAKED WITH MODERATE SILICA, + BLADED MARCASITE RUDDY BROWN FeOx(?) MOTTLED & BANDED DOZER. FRAGMENTAL TO DISTURBED DOZER.<br>~758.0-770.0': CONTINUED SILICA + MARC/SULFIDE VNED & BXA VNED DOZER. DOZER IS LESS BRECCIATED THAN ABOVE BUT CONTINUES STRLY VEINED & DISRUPTED. CONTINUED MODERATE RUDDY MOTTLING. | 730<br>740<br>750<br>760<br>770 | 25<br>5<br>45 | 762-770': INTERMITTENT MYLONITIC SHEAR FABRIC IN HEALED DOZER AT 40°-50° TO C/A. | 708.6-711.9': WK/MOD GRN CLAY ALT'N OVERPRINTED WITH WK/MOD SILICIFICATION. STR. BLK SILICA + SULFIDE VNLTS. WK WHT CLAY.<br>711.9-715.4': LT GRN MOD. CLAY ALT'N OVERPRINTED WITH WK SILICIFICATION, WK WHT CLAY VNLTS<br>715.4'-725': SPOTTY DK VN SILICIFICATION W/ BLEED OUT INTO THE WALLRK. TRACE/WK BARITE +/- WHT CLAY VNLTS, LATE.<br>721.5-724.5': STR. WALLRK ARGILLIZATN, W/ STRONG DISSEMINATED MARC/PY & MODERATE PYRITIC VNING, RUDDY-BRN STAINING<br>725'-729': STR~~E~~ SILICA + SULFIDE VN CRACKLE BXA, W/ WK/MOD. SILICIFICATN/SILICA HEALING IN WALLRK.<br>729.0-758': MOD. TO STR. SPOTTY SILICA + BLADED MARCASITE, LESS GRY SILICA-SULFIDE THAN ABOVE. WK LATE WHT CLAY + SILICA VNLTS ON LATE CRACK~~LES~~. |

ANALYTICAL DATA

| FROM | TO | W | Au | Ag | Au2 |
|---|---|---|---|---|---|
| 700.0 | 702.0 | | | | |
| 702.0 | 705.0 | | | | |
| 705.0 | 708.6 | | | | |
| 708.6 | 711.9 | | | | |
| 711.9 | 715.4 | | | | |
| 715.4 | 719.0 | | | | |
| 720.0 | 725.0 | | | | |
| 725.0 | 730.0 | | | | |
| 730.0 | 735.0 | | | | |
| 735.0 | 740.0 | | | | |
| 740.0 | 744.9 | | | | |
| 744.9 | 750.0 | | | | |
| 750.0 | 755.0 | | | | |
| 755.0 | 760.0 | | | | |
| 760.0 | 764.7 | | | | |
| 764.7 | 770.0 | | | | |

HOLE NUMBER RS-441 PAGE 3 OF 4

| LITH. | OX/RED. | LITHOLOGY | FT | GRAPHIC LOG | STRUCTURE | ALTERATION AND MINERALIZATION |
|---|---|---|---|---|---|---|
| 708.6'-850.0 DOZER | | 770.0'-850.0: FINELY AUTOCLASTIC TO AUTOBRECCIATED, LT. GRN DOZER. THE DOZER SHOWS A SIGNIFICANT VARIETY OF BRECCIA TEXTURES THRUOUT THIS INTERVAL, FROM DISTURBED BOUDINAGED BUT UNFRAGMENTED TO MILLED & FAINTLY CATACLASTIC, AND SIMPLE CLAST-SUPPORTED TIGHT-PACKED ~~[illegible]~~ MOSAIC BXA.<br><br>788.0': FIRST SPOTTY, PUNKY LIGHT GREEN PERVASIVE ARGILLIZATION OF DOZER WALLROCK. PUNKY WALLROCK ARGILLIZATION IS INCREASINGLY COMMON FROM 791.5'<br><br>799.1-801.0': GOUGY ARGILLIZED DOZER.<br><br>801.0'-823.5': FINELY AUTOBRECCIATED DOZER.<br><br>823.5-833.6': SILICA + PY/MARC VNLT STKWK/CRACKLE BRECCIA IN STRLY CLAY ALTERED DOZER. OVERPRINTS AUTOBXA.<br><br>833.6-850': DOZER AUTOBRECCIA. | 770<br>780<br>790<br>800<br>810<br>820<br>830<br>840 |  | 799.0-799.5': WK GOUGE + GRIT IN STR. WHT/GRN CLAY ALTERED WALLRK.<br>800.0-801.0': STR. GOUGE | 758.0'-770': SPOTTY MOD. SILICIFICATION. MOD/STR. BLUE-BLK BRECCIA VEINS +/- WK SILICA + MARC X-CUT DOZER AUTOBXA. SULFIDE? CUT BY LATER MARC +/- SI & LT. GRN CLAY VNLTS. ALL OVERPRINT/X-CUT TR/WK PERVASIVE CLAY ALT'N.<br><br>770.0'-788.0': WK/MOD. PERVASIVE GRN CLAY ALT'N. WK MARC + WHT CLAY +/- SILICA VNLTS. PUNKY GRN CLAY SELVAGES ON SOME VNLTS. WK DISS'D Py.<br><br>788.0'-~799': SPOTTY STR. PERVASIVE LT. GRN CLAY ALT'N. PUNKY/FRIABLE. CONT'D MOD. WHT CLAY + MARC + SILICA VNS. MOD. DISS'D & STRINGER PY/MARC<br><br>799'-800.9': INTENSE, GOUGY CLAY ALTERATION. CONT'D MOD. DISS'D & STRINGER PY/MARC.<br><br>800.9-823.5': SPOTTY STR. PUNKY GRN CLAY ALT'N; WK ARGILLIZATN THRUOUT. WK MARC/PY +/- WHT CLAY VNLTS. WK DISS'D Py. TR. QZ VNLTS ~ 818-814. |

| ANALYTICAL DATA | | | | | |
|---|---|---|---|---|---|
| FROM | TO | W | Au | Ag | Au2 |
| 770.0 | 775.1 | | | | |
| 775.1 | 780.0 | | | | |
| 780.0 | 785.1 | | | | |
| 785.1 | 790.3 | | | | |
| 790.3 | 795.3 | | | | |
| 795.3 | 799.1 | | | | |
| 799.1 | 800.9 | | | | |
| 800.9 | 804.9 | | | | |
| 804.9 | 810.0 | | | | |
| 810.0 | 814.2 | | | | |
| 814.2 | 818.4 | | | | |
| 818.4 | 823.5 | | | | |
| 823.5 | 828.5 | | | | |
| 828.5 | 833.6 | | | | |
| 833.6 | 838.1 | | | | |

| | |
|---|---|
| 823.5'-833.6': FRIABLE STR. CLAY ALT'N IN DOZER WALLRK, MOD/STR. MARC/PY + SI CRACKLE STKWK VNLTS. LATE WHT CLAY IN VUGS. | |
| 833.6'-850.0': WK/MOD. PERVASIVE GRN CLAY ALT'N. 839-843.5': MOD. MARC + SILICA CEMENTS VN CRACKLE BXA. MARC + SI VNLTS WK TO TR OTHERWISE. | |

HOLE NUMBER RS-441 PAGE 3 OF 4

| LITH. | OX/RED. | LITHOLOGY | FT | GRAPHIC LOG | STRUCTURE | ALTERATION AND MINERALIZATION |
|---|---|---|---|---|---|---|
| 708.6-850.0 DOZER | | | 840 | | | |
| | | 850' TD | 850 | | | |

ANALYTICAL DATA

| FROM | TO | W | Au | Ag | Au2 |
|---|---|---|---|---|---|
| 838.1 | 842.6 | | | | |
| 842.6 | 846.7 | | | | |
| 846.7 | 850.0 | | | | |

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-441 DATE: 04/30/98 LOGGED BY: HDM PAGE 1 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) |
| 650.0 | 660.0 | 100.0 | 100.0 | 62.0 | | | | | | | | | | |
| 660.0 | 670.0 | 102.0 | 102.0 | 86.0 | | | | | | | | | | |
| 670.0 | 680.0 | 104.0 | 104.0 | 75.0 | | | | | | | | | | |
| 680.0 | 690.0 | 103.0 | 103.0 | 83.0 | | | | | | | | | | |
| 690.0 | 700.0 | 95.0 | 95.0 | 47.0 | | | | | | | | | | |
| 700.0 | 703.5 | 85.7 | 85.7 | 28.6 | | | | | | | | | | |
| 703.5 | 705.5 | 110.0 | 110.0 | 90.0 | | | | | | | | | | |
| 705.5 | 710.0 | 111.0 | 111.0 | 77.8 | | | | | | | | | | |
| 710.0 | 720.0 | 92.0 | 92.0 | 81.0 | | | | | | | | | | |
| 720.0 | 730.0 | 103.0 | 103.0 | 80.0 | | | | | | | | | | |
| 730.0 | 740.0 | 103.0 | 103.0 | 85.0 | | | | | | | | | | |

HECLA MINING COMPANY – ROSEBUD PROJECT
GEOTECHNICAL DRILL LOG

HOLE # RS-441 DATE: 05/06/98 LOGGED BY: HBM PAGE 2 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 740.0 | 750.0 | 100.0 | 100.0 | 91.0 | | | | | | | | | | |
| 750.0 | 760.0 | 105.0 | 105.0 | 75.0 | | | | | | | | | | |
| 760.0 | 770.0 | 100.0 | 100.0 | 67.0 | | | | | | | | | | |
| 770.0 | 780.0 | 100.0 | 100.0 | 65.0 | | | | | | | | | | |
| 780.0 | 790.0 | 100.0 | 100.0 | 66.0 | | | | | | | | | | |
| 790.0 | 800.0 | 104.0 | 104.0 | 56.0 | | | | | | | | | | |
| 800.0 | 810.0 | 100.0 | 100.0 | 59.0 | | | | | | | | | | |
| 810.0 | 820.0 | 100.0 | 100.0 | 74.0 | | | | | | | | | | |
| 820.0 | | 94.1 | 94.1 | 10.6 | | | | | | | | | | |
| | 837.0 | | | | | | | | | | | | | |
| 837.0 | 843.5 | 104.6 | 104.6 | 90.8 | | | | | | | | | | |

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

HOLE # RS-441 DATE 05/06/98 LOGGED BY: HBM 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) |
| 843.5 | 850.0 | 98.5 | 98.5 | 58.0 | | | | | | | | | | |
| | T.D. | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
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**Hecla MINING COMPANY**

**ROSEBUD PROJECT DRILL LOG**

Quick log

HOLE NUMBER RS-441
PAGE 1 OF 4
DATE 6/25/98
LOGGED BY LBA
TOTAL DEPTH 650' RUC PRE-COLLAR
850' CORE

LOCATION EAST ZONE
NORTHING
EASTING
ELEVATION
AZIMUTH VERT.
INCLINATION -90°

AREA EAST ZONE
DRILLING CO. EKLUND
RIG TYPE RUC
HOLE SIZE 5 1/2
DOWN HOLE SURVEY BY WELNAV.

| 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 % | SULFATE % | BARITE % | METALLURGY: OXIDE | SULF | CARBON | MOISTURE | ANALYTICAL DA: FROM | TO | W | Au |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | | Col | Colluvium | | | | | | | | | | X | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | X | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | X | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| 40 | | TCFG | FINE-GRAINED LATITE? FLOW | | | | | | | | | | X | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | | X | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | | X | | | | | | | | X | | | | | | | | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | |
| 80 | | | | | | | | | | | | | | | | | | | X | | | | | | | | | | | | | | | | | | | | | |
| 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 110 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 120 | CLAY | CLAY | FAULT OR CLAY Intermixed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 130 | 0 | TCLLT | FINE-GRAINED, MATRIX SUPPORTED VOLCANIC BRECCIA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 140 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 150 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 160 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 170 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 180 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 190 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 200 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Hecla MINING COMPANY**

**ROSEBUD PROJECT DRILL LOG**

HOLE NUMBER RS-441
PAGE 2 OF 4
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 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 | MOISTURE | ANALYTICAL DA: FROM | TO | W | Au |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 210 | | TCLLT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 220 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 230 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 240 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 250 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 260 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 270 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 280 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 290 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 300 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 310 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 320 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 330 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 340 | UTRD | UIT | UT GREEN CLAY Ultramafic | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 350 | | FGPP | FINE-GRAINED, SLIGHTLY PORPHYRITIC PINK SILL/FLOW | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 360 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 370 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 380 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 390 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 400 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Hecla MINING COMPANY**

**ROSEBUD PROJECT DRILL LOG**

HOLE NUMBER RS-441
PAGE 3 OF 4
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 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 % | AC-SUL % | STIBNITE % | BARITE % | METALLURGY: OXIDE | SULF | CARBON | MOCUPE | ANALYTICAL DA: FROM | TO | W | Au |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 410 | | FGPP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 420 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 430 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 440 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 450 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 460 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 470 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 480 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 490 | | UBUD | FINE- to COARSE GRAINED, BATTIC? As a flow tuff or Epiclastic. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 510 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 520 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 530 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 540 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 550 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 560 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 570 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 580 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 590 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 600 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Hecla MINING COMPANY**

**ROSEBUD PROJECT DRILL LOG**

HOLE NUMBER RS-441
PAGE 4 OF 4
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 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 | MOCLURE | ANALYTICAL DA: FROM | TO | W | Au |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 610 | | LBUD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 620 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 630 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 640 | | PABX | FINE-GRAINED, Porphyritic Auto BRECCIA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 650 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | RUC PRE-COLLAR TD=650' | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

AMERICAN ASSAY LABORATORIES

# PROVISIONAL REPORT SP048812

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-441 RECEIVED : 11 MAY 1998

No. SAMPLES : 46 REPORTED : 20 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 |

SIGNATORY : Susan King M.S.



05/20/1998 15:32 7023561413 AMERICAN ASSAY LABS PAGE 01
7023561413

AMERICAN ASSAY LABORATORIES

# PROVISIONAL REPORT SP048812

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-441

REPORTED : 20 MAY 1998

| SAMPLES | | Au(OZ) | Au(RZ) | AuGRAV | Ag(OZ) | |
|---|---|---|---|---|---|---|
| RS-441 650-655 | | 0.006 | | | 0.05 | |
| RS-441 655.0-660.6 | | 0.018 | | | 2.41 | |
| RS-441 660.6-666.0 | | 0.008 | | | 0.16 | |
| RS-441 666.0-670.7 | | 0.004 | | | 0.07 | |
| RS-441 670.7-675.0 | | 0.048 | | | 0.11 | |
| RS-441 675-680 | | 0.005 | | | 0.07 | |
| RS-441 680-685 | | 0.007 | | | 0.06 | |
| RS-441 685-690 | | 0.007 | | | 0.06 | |
| RS-441 690.0-692.8 | | 0.005 | | | 0.08 | |
| RS-441 692.8-696.6 | | 0.020 | | | 3.83 | |
| RS-441 696.6-700.0 | | 0.004 | | | 0.34 | |
| RS-441 700-702 | | 0.049 | | | 5.80 | |
| RS-441 702-705 | | 0.014 | | | 9.70 | |
| RS-441 705.0-708.6 | | 0.050 | | 0.058 | 6.15 | 708.6-711.9 = 3.3' |
| RS-441 708.6-711.9 | | 0.165 | 0.072 | 0.114 | 1.17 | |
| RS-441 711.9-715.4 | | 0.071 | | 0.074 | 1.21 | |
| RS-441 715.4-719.0 | | 0.047 | | | 1.95 | |
| RS-441 720-725 | | 0.105 | | 0.130 | 0.85 | 725 - 744.9' = 19.9 feet @ |
| RS-441 725-730 | 5 | 0.686 | | 0.750 | 3.80 | |
| RS-441 730-735 | 5 | 0.346 | | 0.350 | 0.57 | 0.514 Au |
| RS-441 735-740 | 5 | 0.521 | | 0.487 | 0.76 | 1.37 Ag |
| RS-441 740.0-744.9 | 4.9 | 0.504 | | 0.465 | 0.33 | |
| RS-441 744.9-750.0 | | 0.134 | | 0.111 | 0.35 | |
| RS-441 750-755 | | 0.090 | | 0.103 | 0.27 | |
| RS-441 755-760 | | 0.040 | | | 0.78 | |

AMERICAN ASSAY LABORATORIES

# PROVISIONAL REPORT SP048812

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-441

REPORTED : 20 MAY 1998

| SAMPLES | Au(OZ) | Au(RZ) | AuGRAV | Ag(OZ) |
|---|---|---|---|---|
| RS-441 760.0-764.7 | 0.021 | | | 0.29 |
| RS-441 764.7-770.0 | 0.023 | | | 1.62 |
| RS-441 770.0-775.1 | 0.043 | | | 0.52 |
| RS-441 775.1-780.0 | 0.123 | | 0.108 | 5.04 |
| RS-441 780.0-785.1 | 0.048 | | | 0.13 |
| RS-441 785.1-790.3 | 0.035 | | | 0.13 |
| RS-441 790.3-795.3 | 0.010 | | | 0.33 |
| RS-441 795.3-799.1 | 0.079 | | 0.072 | 0.30 |
| RS-441 799.1-800.9 | 0.031 | 0.028 | | 0.26 |
| RS-441 800.9-804.9 | 0.060 | | 0.062 | 0.33 |
| RS-441 804.9-810.0 | 0.013 | | | 0.60 |
| RS-441 810.0-814.2 | 0.023 | | | 0.21 |
| RS-441 814.2-818.4 | 0.069 | | 0.057 | 0.10 |
| RS-441 818.4-823.5 | 0.042 | | | 0.04 |
| RS-441 823.5-828.5 | 0.048 | | | 0.22 |
| RS-441 828.5-833.6 | 0.126 | | 0.110 | 0.17 |
| RS-441 833.6-838.1 | 0.105 | | 0.096 | 0.10 |
| RS-441 838.1-842.6 | 0.049 | | | 0.09 |
| RS-441 842.6-846.7 | 0.069 | | 0.060 | 0.17 |
| RS-441 846.7-850.0 | 0.016 | | | 0.04 |
| 31076 | 0.134 | | | 2.69 |

**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 0048812-IN
INVOICE DATE: 05/21/98

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-441 | DEVELOPMENT | NET 30 - DUE IN U.S. DOLLARS |

| QUANTITY | DESCRIPTION | PRICE | AMOUNT |
|---|---|---|---|
| 46 | SAMPLES RECEIVED | .00 | .00 |
| 45 | JAW CRUSHING CHARGE | 1.30 | 58.50 |
| 45 | COARSE MILLING CHARGE | 4.50 | 202.50 |
| 45 | SPLITTING CHARGE | 2.40 | 108.00 |
| 45 | RING MILLING CHARGE | 2.00 | 90.00 |
| 46 | Au (1 A.T. FIRE ASSAY) | 8.00 | 368.00 |
| 17 | Au ANALYSES/GRAVIMETRIC | 8.75 | 148.75 |
| 46 | HYDROCHLORIC/NITRIC DIGESTION | 2.00 | 92.00 |
| 46 | Ag ANALYSES | 1.00 | 46.00 |
| 9 | Ag (ore grade) ANALYSES | 5.00 | 45.00 |

86-5210-477
FDA

| | |
|---|---|
| NET INVOICE: | 1,158.75 |
| LESS DISCOUNT: | 231.75 |
| FREIGHT: | .00 |
| INVOICE TOTAL: | 927.00 |

xAMERICAN ASSAY LABORATORIES

# ANALYSIS REPORT SP048812

American Assay Laboratories

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

## HECLA MINING COMPANY

COPIES TO : KURT ALLEN

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CLIENT REFERENCE No: RS-441 RECEIVED : 11 MAY 1998

No. SAMPLES : 46 REPORTED : 20 MAY 1998

MAIN SAMPLE TYPE : DRILL CORE

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| 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 SP048812

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-441

REPORTED : 20 MAY 1998

| SAMPLES | Au(OZ) FA30 OPT | Au(RZ) FA30 OPT | AuGRAV GRAV OPT | Ag(OZ) D210 OPT |
|---|---|---|---|---|
| RS-441 650-655 | 0.006 | | | 0.05 |
| RS-441 655.0-660.6 | 0.018 | | | 2.41 |
| RS-441 660.6-666.0 | 0.008 | | | 0.16 |
| RS-441 666.0-670.7 | 0.004 | | | 0.07 |
| RS-441 670.7-675.0 | 0.048 | | | 0.11 |
| RS-441 675-680 | 0.005 | | | 0.07 |
| RS-441 680-685 | 0.007 | | | 0.06 |
| RS-441 685-690 | 0.007 | | | 0.06 |
| RS-441 690.0-692.8 | 0.005 | | | 0.08 |
| RS-441 692.8-696.6 | 0.020 | | | 3.83 |
| RS-441 696.6-700.0 | 0.004 | | | 0.34 |
| RS-441 700-702 | 0.049 | | | 5.80 |
| RS-441 702-705 | 0.014 | | | 9.70 |
| RS-441 705.0-708.6 | 0.050 | | 0.058 | 6.15 |
| RS-441 708.6-711.9 | 0.165 | 0.072 | 0.114 | 1.17 |
| RS-441 711.9-715.4 | 0.071 | | 0.074 | 1.21 |
| RS-441 715.4-719.0 | 0.047 | | | 1.95 |
| RS-441 720-725 | 0.105 | | 0.130 | 0.85 |
| RS-441 725-730 | 0.686 | | 0.750 | 3.80 |
| RS-441 730-735 | 0.346 | | 0.350 | 0.57 |
| RS-441 735-740 | 0.521 | | 0.487 | 0.76 |
| RS-441 740.0-744.9 | 0.504 | | 0.465 | 0.33 |
| RS-441 744.9-750.0 | 0.134 | | 0.111 | 0.35 |
| RS-441 750-755 | 0.090 | | 0.103 | 0.27 |
| RS-441 755-760 | 0.040 | | | 0.78 |

AMERICAN ASSAY LABORATORIES

# ANALYSIS REPORT SP048812

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-441

REPORTED : 20 MAY 1998

| SAMPLES | Au(OZ) FA30 OPT | Au(RZ) FA30 OPT | AuGRAV GRAV OPT | Ag(OZ) D210 OPT |
|---|---|---|---|---|
| RS-441 760.0-764.7 | 0.021 | | | 0.29 |
| RS-441 764.7-770.0 | 0.023 | | | 1.62 |
| RS-441 770.0-775.1 | 0.043 | | | 0.52 |
| RS-441 775.1-780.0 | 0.123 | | 0.108 | 5.04 |
| RS-441 780.0-785.1 | 0.048 | | | 0.13 |
| RS-441 785.1-790.3 | 0.035 | | | 0.13 |
| RS-441 790.3-795.3 | 0.010 | | | 0.33 |
| RS-441 795.3-799.1 | 0.079 | | 0.072 | 0.30 |
| RS-441 799.1-800.9 | 0.031 | 0.028 | | 0.26 |
| RS-441 800.9-804.9 | 0.060 | | 0.062 | 0.33 |
| RS-441 804.9-810.0 | 0.013 | | | 0.60 |
| RS-441 810.0-814.2 | 0.023 | | | 0.21 |
| RS-441 814.2-818.4 | 0.069 | | 0.057 | 0.10 |
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| RS-441 823.5-828.5 | 0.048 | | | 0.22 |
| RS-441 828.5-833.6 | 0.126 | | 0.110 | 0.17 |
| RS-441 833.6-838.1 | 0.105 | | 0.096 | 0.10 |
| RS-441 838.1-842.6 | 0.049 | | | 0.09 |
| RS-441 842.6-846.7 | 0.069 | | 0.060 | 0.17 |
| RS-441 846.7-850.0 | 0.016 | | | 0.04 |
| 31076 | 0.134 | | | 2.69 |

xAMERICAN ASSAY LABORATORIES

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## HECLA MINING COMPANY

COPIES TO : KURT ALLEN

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:

CLIENT REFERENCE No: RS-441

No. SAMPLES : 46

MAIN SAMPLE TYPE : DRILL CORE

RECEIVED : 11 MAY 1998

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| 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 SP048812

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-441

REPORTED : 20 MAY 1998

| SAMPLES | Au(OZ) FA30 OPT | Au(RZ) FA30 OPT | AuGRAV GRAV OPT | Ag(OZ) D210 OPT |
|---|---|---|---|---|
| RS-441 650-655 | 0.006 | | | 0.05 |
| RS-441 655.0-660.6 | 0.018 | | | 2.41 |
| RS-441 660.6-666.0 | 0.008 | | | 0.16 |
| RS-441 666.0-670.7 | 0.004 | | | 0.07 |
| RS-441 670.7-675.0 | 0.048 | | | 0.11 |
| RS-441 675-680 | 0.005 | | | 0.07 |
| RS-441 680-685 | 0.007 | | | 0.06 |
| RS-441 685-690 | 0.007 | | | 0.06 |
| RS-441 690.0-692.8 | 0.005 | | | 0.08 |
| RS-441 692.8-696.6 | 0.020 | | | 3.83 |
| RS-441 696.6-700.0 | 0.004 | | | 0.34 |
| RS-441 700-702 | 0.049 | | | 5.80 |
| RS-441 702-705 | 0.014 | | | 9.70 |
| RS-441 705.0-708.6 | 0.050 | | 0.058 | 6.15 |
| RS-441 708.6-711.9 | 0.165 | 0.072 | 0.114 | 1.17 |
| RS-441 711.9-715.4 | 0.071 | | 0.074 | 1.21 |
| RS-441 715.4-719.0 | 0.047 | | | 1.95 |
| RS-441 720-725 | 0.105 | | 0.130 | 0.85 |
| RS-441 725-730 | 0.686 | | 0.750 | 3.80 |
| RS-441 730-735 | 0.346 | | 0.350 | 0.57 |
| RS-441 735-740 | 0.521 | | 0.487 | 0.76 |
| RS-441 740.0-744.9 | 0.504 | | 0.465 | 0.33 |
| RS-441 744.9-750.0 | 0.134 | | 0.111 | 0.35 |
| RS-441 750-755 | 0.090 | | 0.103 | 0.27 |
| RS-441 755-760 | 0.040 | | | 0.78 |

AMERICAN ASSAY LABORATORIES

# ANALYSIS REPORT SP048812

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-441

REPORTED : 20 MAY 1998

| SAMPLES | Au(OZ) FA30 OPT | Au(RZ) FA30 OPT | AuGRAV GRAV OPT | Ag(OZ) D210 OPT |
|---|---|---|---|---|
| RS-441 760.0-764.7 | 0.021 | | | 0.29 |
| RS-441 764.7-770.0 | 0.023 | | | 1.62 |
| RS-441 770.0-775.1 | 0.043 | | | 0.52 |
| RS-441 775.1-780.0 | 0.123 | | 0.108 | 5.04 |
| RS-441 780.0-785.1 | 0.048 | | | 0.13 |
| RS-441 785.1-790.3 | 0.035 | | | 0.13 |
| RS-441 790.3-795.3 | 0.010 | | | 0.33 |
| RS-441 795.3-799.1 | 0.079 | | 0.072 | 0.30 |
| RS-441 799.1-800.9 | 0.031 | 0.028 | | 0.26 |
| RS-441 800.9-804.9 | 0.060 | | 0.062 | 0.33 |
| RS-441 804.9-810.0 | 0.013 | | | 0.60 |
| RS-441 810.0-814.2 | 0.023 | | | 0.21 |
| RS-441 814.2-818.4 | 0.069 | | 0.057 | 0.10 |
| RS-441 818.4-823.5 | 0.042 | | | 0.04 |
| RS-441 823.5-828.5 | 0.048 | | | 0.22 |
| RS-441 828.5-833.6 | 0.126 | | 0.110 | 0.17 |
| RS-441 833.6-838.1 | 0.105 | | 0.096 | 0.10 |
| RS-441 838.1-842.6 | 0.049 | | | 0.09 |
| RS-441 842.6-846.7 | 0.069 | | 0.060 | 0.17 |
| RS-441 846.7-850.0 | 0.016 | | | 0.04 |
| 31076 | 0.134 | | | 2.69 |

AMERICAN ASSAY LABORATORIES

# PROVISIONAL REPORT SP048576

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

## HECLA MINING COMPANY

COPIES TO : KURT ALLEN

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Luc

CLIENT REFERENCE No: RS-441 RECEIVED : 20 APR 1998

No. SAMPLES : 65 REPORTED : 28 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 SP048576

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-441

REPORTED : 28 APR 1998

| SAMPLES | Au(OZ) | Au(RZ) | Ag(OZ) |
|---|---|---|---|
| RS-441 000-010 | <0.001 | | <0.02 |
| RS-441 010-020 | <0.001 | <0.001 | <0.02 |
| RS-441 020-030 | <0.001 | | <0.02 |
| RS-441 030-040 | 0.001 | | <0.02 |
| RS-441 040-050 | <0.001 | | <0.02 |
| RS-441 050-060 | <0.001 | | <0.02 |
| RS-441 060-070 | 0.001 | | 0.08 |
| RS-441 070-080 | 0.006 | | 0.12 |
| RS-441 080-090 | 0.007 | | 1.49 |
| RS-441 090-100 | 0.004 | | 0.50 |
| RS-441 100-110 | 0.001 | | 0.10 |
| RS-441 110-120 | <0.001 | | 0.02 |
| RS-441 120-130 | 0.003 | | 0.06 |
| RS-441 130-140 | 0.001 | | 0.06 |
| RS-441 140-150 | <0.001 | | 0.04 |
| RS-441 150-160 | 0.003 | 0.005 | 0.03 |
| RS-441 160-170 | <0.001 | | 0.02 |
| RS-441 170-180 | 0.001 | | 0.04 |
| RS-441 180-190 | <0.001 | | 0.02 |
| RS-441 190-200 | 0.003 | | 0.04 |
| RS-441 200-210 | 0.003 | | 0.09 |
| RS-441 210-220 | 0.004 | | 0.13 |
| RS-441 220-230 | 0.002 | | 0.10 |
| RS-441 230-240 | 0.003 | | <0.02 |
| RS-441 240-250 | <0.001 | | <0.02 |

AMERICAN ASSAY LABORATORIES

# PROVISIONAL REPORT SP048576

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-441

REPORTED : 28 APR 1998

| SAMPLES | Au(OZ) | Au(RZ) | Ag(OZ) |
|---|---|---|---|
| RS-441 250-260 | <0.001 | | <0.02 |
| RS-441 260-270 | <0.001 | | 0.04 |
| RS-441 270-280 | 0.003 | 0.003 | 0.10 |
| RS-441 280-290 | <0.001 | | <0.02 |
| RS-441 290-300 | <0.001 | | <0.02 |
| RS-441 300-310 | <0.001 | | <0.02 |
| RS-441 310-320 | 0.002 | | 0.19 |
| RS-441 320-330 | <0.001 | | 0.03 |
| RS-441 330-340 | <0.001 | <0.001 | <0.02 |
| RS-441 340-350 | <0.001 | | 0.02 |
| RS-441 350-360 | 0.001 | | 0.04 |
| RS-441 360-370 | 0.004 | | 0.12 |
| RS-441 370-380 | 0.005 | | 0.09 |
| RS-441 380-390 | 0.003 | | 0.05 |
| RS-441 390-400 | <0.001 | | 0.03 |
| RS-441 400-410 | 0.002 | | 0.05 |
| RS-441 410-420 | 0.013 | | 0.11 |
| RS-441 420-430 | 0.006 | | 0.09 |
| RS-441 430-440 | 0.002 | | 0.03 |
| RS-441 440-450 | 0.004 | | 0.34 |
| RS-441 450-460 | 0.004 | | 0.04 |
| RS-441 460-470 | <0.001 | | 0.02 |
| RS-441 470-480 | 0.002 | 0.001 | 0.07 |
| RS-441 480-490 | 0.005 | | 0.06 |
| RS-441 490-500 | 0.003 | | 0.07 |

AMERICAN ASSAY LABORATORIES

# PROVISIONAL REPORT SP048576

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-441

REPORTED : 28 APR 1998

| SAMPLES | Au(OZ) | Au(RZ) | Ag(OZ) |
|---|---|---|---|
| RS-441 500-510 | 0.001 | | 0.04 |
| RS-441 510-520 | 0.001 | | 0.15 |
| RS-441 520-530 | 0.003 | | 0.05 |
| RS-441 530-540 | 0.004 | | 0.09 |
| RS-441 540-550 | 0.005 | | 0.07 |
| RS-441 550-560 | 0.004 | | 0.05 |
| RS-441 560-570 | 0.020 | | 0.05 |
| RS-441 570-580 | 0.003 | | 0.04 |
| RS-441 580-590 | 0.005 | | 0.04 |
| RS-441 590-600 | 0.014 | | 0.06 |
| RS-441 600-610 | 0.021 | 0.017 | 0.03 |
| RS-441 610-620 | 0.007 | | 0.03 |
| RS-441 620-630 | 0.005 | | 1.24 |
| RS-441 630-640 | 0.004 | | 0.39 |
| RS-441 640-650 | 0.006 | | 0.05 |

**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 0048576-IN
INVOICE DATE: 04/29/98

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-441 | DEVELOPMENT | NET 30 - DUE IN U.S. DOLLARS |

| QUANTITY | DESCRIPTION | PRICE | AMOUNT |
|---|---|---|---|
| 65 | SAMPLES RECEIVED | .00 | .00 |
| 65 | DRYING | 2.00 | 130.00 |
| 65 | EXCESSIVE WETNESS | 2.00 | 130.00 |
| 65 | JAW CRUSHING CHARGE | 2.60 | 169.00 |
| 65 | SPLITTING CHARGE | 1.80 | 117.00 |
| 65 | FINE MILLING CHARGE | 2.00 | 130.00 |
| 65 | Au (1 A.T. FIRE ASSAY) | 8.00 | 520.00 |
| 65 | HYDROCHLORIC/NITRIC DIGESTION | 2.00 | 130.00 |
| 65 | Ag ANALYSES | 1.00 | 65.00 |

86-5210-477

| | |
|---|---|
| NET INVOICE: | 1,391.00 |
| LESS DISCOUNT: | 417.30 |
| FREIGHT: | .00 |
| INVOICE TOTAL: | 973.70 |

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# ANALYSIS REPORT SP048576

American Assay Laboratories

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

## HECLA MINING COMPANY

COPIES TO : KURT ALLEN

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CLIENT REFERENCE No: RS-441 RECEIVED : 20 APR 1998

No. SAMPLES : 65 REPORTED : 28 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

# ANALYSIS REPORT SP048576

American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-441

REPORTED : 28 APR 1998

| SAMPLES | Au(OZ) FA30 OPT | Au(RZ) FA30 OPT | Ag(OZ) D210 OPT |
|---|---|---|---|
| RS-441 000-010 | <0.001 | | <0.02 |
| RS-441 010-020 | <0.001 | <0.001 | <0.02 |
| RS-441 020-030 | <0.001 | | <0.02 |
| RS-441 030-040 | 0.001 | | <0.02 |
| RS-441 040-050 | <0.001 | | <0.02 |
| RS-441 050-060 | <0.001 | | <0.02 |
| RS-441 060-070 | 0.001 | | 0.08 |
| RS-441 070-080 | 0.006 | | 0.12 |
| RS-441 080-090 | 0.007 | | 1.49 |
| RS-441 090-100 | 0.004 | | 0.50 |
| RS-441 100-110 | 0.001 | | 0.10 |
| RS-441 110-120 | <0.001 | | 0.02 |
| RS-441 120-130 | 0.003 | | 0.06 |
| RS-441 130-140 | 0.001 | | 0.06 |
| RS-441 140-150 | <0.001 | | 0.04 |
| RS-441 150-160 | 0.003 | 0.005 | 0.03 |
| RS-441 160-170 | <0.001 | | 0.02 |
| RS-441 170-180 | 0.001 | | 0.04 |
| RS-441 180-190 | <0.001 | | 0.02 |
| RS-441 190-200 | 0.003 | | 0.04 |
| RS-441 200-210 | 0.003 | | 0.09 |
| RS-441 210-220 | 0.004 | | 0.13 |
| RS-441 220-230 | 0.002 | | 0.10 |
| RS-441 230-240 | 0.003 | | <0.02 |
| RS-441 240-250 | <0.001 | | <0.02 |

AMERICAN ASSAY LABORATORIES

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| SAMPLES | Au(OZ) FA30 OPT | Au(RZ) FA30 OPT | Ag(OZ) D210 OPT |
|---|---|---|---|
| RS-441 250-260 | <0.001 | | <0.02 |
| RS-441 260-270 | <0.001 | | 0.04 |
| RS-441 270-280 | 0.003 | 0.003 | 0.10 |
| RS-441 280-290 | <0.001 | | <0.02 |
| RS-441 290-300 | <0.001 | | <0.02 |
| RS-441 300-310 | <0.001 | | <0.02 |
| RS-441 310-320 | 0.002 | | 0.19 |
| RS-441 320-330 | <0.001 | | 0.03 |
| RS-441 330-340 | <0.001 | <0.001 | <0.02 |
| RS-441 340-350 | <0.001 | | 0.02 |
| RS-441 350-360 | 0.001 | | 0.04 |
| RS-441 360-370 | 0.004 | | 0.12 |
| RS-441 370-380 | 0.005 | | 0.09 |
| RS-441 380-390 | 0.003 | | 0.05 |
| RS-441 390-400 | <0.001 | | 0.03 |
| RS-441 400-410 | 0.002 | | 0.05 |
| RS-441 410-420 | 0.013 | | 0.11 |
| RS-441 420-430 | 0.006 | | 0.09 |
| RS-441 430-440 | 0.002 | | 0.03 |
| RS-441 440-450 | 0.004 | | 0.34 |
| RS-441 450-460 | 0.004 | | 0.04 |
| RS-441 460-470 | <0.001 | | 0.02 |
| RS-441 470-480 | 0.002 | 0.001 | 0.07 |
| RS-441 480-490 | 0.005 | | 0.06 |
| RS-441 490-500 | 0.003 | | 0.07 |

AMERICAN ASSAY LABORATORIES

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| SAMPLES | Au(OZ) FA30 OPT | Au(RZ) FA30 OPT | Ag(OZ) D210 OPT |
|---|---|---|---|
| RS-441 500-510 | 0.001 | | 0.04 |
| RS-441 510-520 | 0.001 | | 0.15 |
| RS-441 520-530 | 0.003 | | 0.05 |
| RS-441 530-540 | 0.004 | | 0.09 |
| RS-441 540-550 | 0.005 | | 0.07 |
| RS-441 550-560 | 0.004 | | 0.05 |
| RS-441 560-570 | 0.020 | | 0.05 |
| RS-441 570-580 | 0.003 | | 0.04 |
| RS-441 580-590 | 0.005 | | 0.04 |
| RS-441 590-600 | 0.014 | | 0.06 |
| RS-441 600-610 | 0.021 | 0.017 | 0.03 |
| RS-441 610-620 | 0.007 | | 0.03 |
| RS-441 620-630 | 0.005 | | 1.24 |
| RS-441 630-640 | 0.004 | | 0.39 |
| RS-441 640-650 | 0.006 | | 0.05 |

xAMERICAN ASSAY LABORATORIES

# ANALYSIS REPORT SP048576

American Assay Laboratories

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

## HECLA MINING COMPANY

COPIES TO : KURT ALLEN

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CLIENT REFERENCE No: RS-441 RECEIVED : 20 APR 1998

No. SAMPLES : 65 REPORTED : 28 APR 1998

MAIN SAMPLE TYPE : DRILL CUTTINGS

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SIGNATORY : Susan King M.S.

AMERICAN ASSAY LABORATORIES

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|---|---|---|---|
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| RS-441 010-020 | <0.001 | <0.001 | <0.02 |
| RS-441 020-030 | <0.001 | | <0.02 |
| RS-441 030-040 | 0.001 | | <0.02 |
| RS-441 040-050 | <0.001 | | <0.02 |
| RS-441 050-060 | <0.001 | | <0.02 |
| RS-441 060-070 | 0.001 | | 0.08 |
| RS-441 070-080 | 0.006 | | 0.12 |
| RS-441 080-090 | 0.007 | | 1.49 |
| RS-441 090-100 | 0.004 | | 0.50 |
| RS-441 100-110 | 0.001 | | 0.10 |
| RS-441 110-120 | <0.001 | | 0.02 |
| RS-441 120-130 | 0.003 | | 0.06 |
| RS-441 130-140 | 0.001 | | 0.06 |
| RS-441 140-150 | <0.001 | | 0.04 |
| RS-441 150-160 | 0.003 | 0.005 | 0.03 |
| RS-441 160-170 | <0.001 | | 0.02 |
| RS-441 170-180 | 0.001 | | 0.04 |
| RS-441 180-190 | <0.001 | | 0.02 |
| RS-441 190-200 | 0.003 | | 0.04 |
| RS-441 200-210 | 0.003 | | 0.09 |
| RS-441 210-220 | 0.004 | | 0.13 |
| RS-441 220-230 | 0.002 | | 0.10 |
| RS-441 230-240 | 0.003 | | <0.02 |
| RS-441 240-250 | <0.001 | | <0.02 |

AMERICAN ASSAY LABORATORIES

# ANALYSIS REPORT SP048576

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CLIENT : HECLA MINING COMPANY
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| SAMPLES | Au(OZ) FA30 OPT | Au(RZ) FA30 OPT | Ag(OZ) D210 OPT |
|---|---|---|---|
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| RS-441 260-270 | <0.001 | | 0.04 |
| RS-441 270-280 | 0.003 | 0.003 | 0.10 |
| RS-441 280-290 | <0.001 | | <0.02 |
| RS-441 290-300 | <0.001 | | <0.02 |
| RS-441 300-310 | <0.001 | | <0.02 |
| RS-441 310-320 | 0.002 | | 0.19 |
| RS-441 320-330 | <0.001 | | 0.03 |
| RS-441 330-340 | <0.001 | <0.001 | <0.02 |
| RS-441 340-350 | <0.001 | | 0.02 |
| RS-441 350-360 | 0.001 | | 0.04 |
| RS-441 360-370 | 0.004 | | 0.12 |
| RS-441 370-380 | 0.005 | | 0.09 |
| RS-441 380-390 | 0.003 | | 0.05 |
| RS-441 390-400 | <0.001 | | 0.03 |
| RS-441 400-410 | 0.002 | | 0.05 |
| RS-441 410-420 | 0.013 | | 0.11 |
| RS-441 420-430 | 0.006 | | 0.09 |
| RS-441 430-440 | 0.002 | | 0.03 |
| RS-441 440-450 | 0.004 | | 0.34 |
| RS-441 450-460 | 0.004 | | 0.04 |
| RS-441 460-470 | <0.001 | | 0.02 |
| RS-441 470-480 | 0.002 | 0.001 | 0.07 |
| RS-441 480-490 | 0.005 | | 0.06 |
| RS-441 490-500 | 0.003 | | 0.07 |

AMERICAN ASSAY LABORATORIES

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American Assay Laboratories

CLIENT : HECLA MINING COMPANY
PROJECT : ROSEBUD DEVELOPMENT
REFERENCE : RS-441

REPORTED : 28 APR 1998

| SAMPLES | Au(OZ) FA30 OPT | Au(RZ) FA30 OPT | Ag(OZ) D210 OPT |
|---|---|---|---|
| RS-441 500-510 | 0.001 | | 0.04 |
| RS-441 510-520 | 0.001 | | 0.15 |
| RS-441 520-530 | 0.003 | | 0.05 |
| RS-441 530-540 | 0.004 | | 0.09 |
| RS-441 540-550 | 0.005 | | 0.07 |
| RS-441 550-560 | 0.004 | | 0.05 |
| RS-441 560-570 | 0.020 | | 0.05 |
| RS-441 570-580 | 0.003 | | 0.04 |
| RS-441 580-590 | 0.005 | | 0.04 |
| RS-441 590-600 | 0.014 | | 0.06 |
| RS-441 600-610 | 0.021 | 0.017 | 0.03 |
| RS-441 610-620 | 0.007 | | 0.03 |
| RS-441 620-630 | 0.005 | | 1.24 |
| RS-441 630-640 | 0.004 | | 0.39 |
| RS-441 640-650 | 0.006 | | 0.05 |

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

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

JOB NUMBER: 29-0588-311

WELL NAME: RS-441

LOCATION: ROSEBUD MINE

SURVEY DATE: 04/23/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

WELNAV

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

COMMENTS: ** BOART LONGYEAR **
** RICHARD SCHMIDT **

**********
**********
*** 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-441

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 | -0.10 | -0.220 | -89.45 | 185.75 | 0.24 S | 0.02 W | 1.10 | 0.55 | 0.24 | AT 185.75 |
| 100.0 | 100.00 | -0.37 | -0.656 | -89.36 | 170.30 | 0.75 S | 0.00 W | 0.37 | 0.18 | 0.75 | AT 180.08 |
| 150.0 | 149.99 | -0.60 | -1.019 | -89.64 | 188.38 | 1.18 S | 0.02 E | 0.64 | 0.32 | 1.18 | AT 178.88 |
| 200.0 | 199.99 | -0.74 | -1.312 | -89.62 | 181.71 | 1.50 S | 0.00 W | 0.09 | 0.05 | 1.50 | AT 180.18 |
| 250.0 | 249.99 | -0.95 | -1.629 | -89.50 | 170.45 | 1.89 S | 0.03 E | 0.29 | 0.15 | 1.89 | AT 179.19 |
| 300.0 | 299.99 | -1.07 | -1.963 | -89.62 | 215.12 | 2.24 S | 0.03 W | 0.70 | 0.35 | 2.24 | AT 180.84 |
| 350.0 | 349.99 | -0.99 | -2.354 | -89.46 | 225.75 | 2.54 S | 0.30 W | 0.36 | 0.18 | 2.55 | AT 186.68 |
| 400.0 | 399.99 | -0.55 | -2.630 | -89.15 | 291.77 | 2.56 S | 0.81 W | 1.60 | 0.80 | 2.69 | AT 197.54 |
| 450.0 | 449.96 | 1.02 | -2.616 | -87.23 | 302.47 | 1.78 S | 2.17 W | 3.88 | 1.94 | 2.81 | AT 230.74 |
| 500.0 | 499.88 | 3.73 | -2.395 | -86.54 | 305.44 | 0.25 S | 4.42 W | 1.42 | 0.71 | 4.43 | AT 266.72 |
| 550.0 | 549.78 | 6.87 | -2.099 | -86.21 | 304.26 | 1.55 N | 7.02 W | 0.68 | 0.34 | 7.19 | AT 282.47 |
| 600.0 | 599.64 | 10.61 | -1.774 | -85.18 | 304.53 | 3.67 N | 10.11 W | 2.06 | 1.03 | 10.76 | AT 289.96 |
| 650.0 | 649.47 | 14.70 | -1.367 | -85.39 | 305.79 | 6.04 N | 13.47 W | 0.47 | 0.23 | 14.77 | AT 294.14 |
| 700.0 | 699.31 | 18.68 | -1.082 | -85.45 | 301.26 | 8.24 N | 16.80 W | 0.73 | 0.37 | 18.71 | AT 296.14 |
| 750.0 | 749.16 | 22.61 | -0.813 | -85.50 | 305.49 | 10.41 N | 20.09 W | 0.67 | 0.34 | 22.63 | AT 297.39 |
| 800.0 | 799.01 | 26.42 | -0.470 | -85.73 | 303.65 | 12.58 N | 23.24 W | 0.54 | 0.27 | 26.43 | AT 298.43 |
| 850.0 | 848.87 | 30.12 | -0.003 | -85.70 | 309.63 | 14.81 N | 26.23 W | 0.90 | 0.45 | 30.12 | AT 299.45 |

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*************************************************************
*                          ********                         *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                          ********                         *
*   850.0 FEET EQUALS     30.12    FEET AT   299.45         *
*                          ********                         *
*************************************************************
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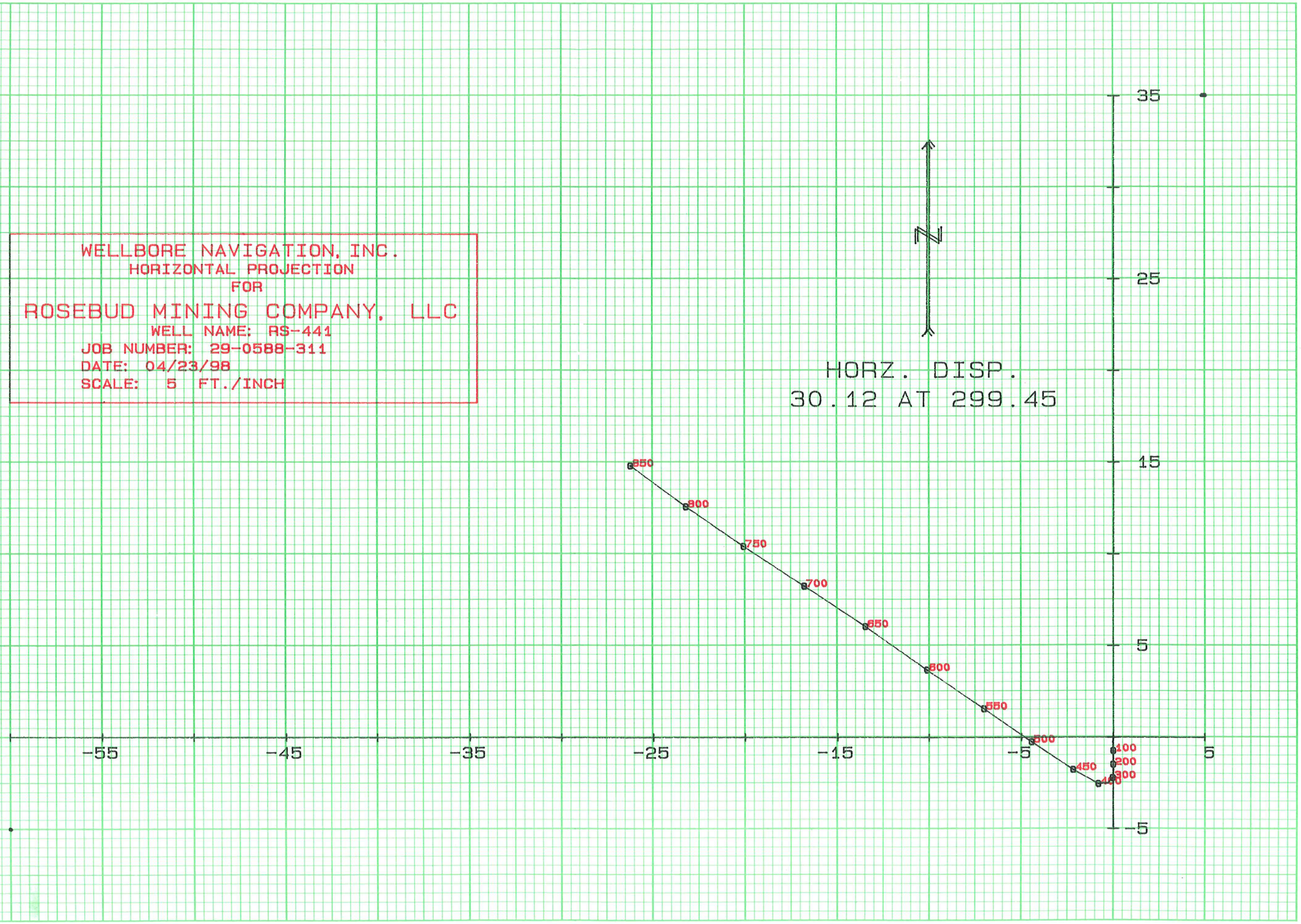
WELLBORE NAVIGATION, INC.
HORIZONTAL PROJECTION
FOR
ROSEBUD MINING COMPANY, LLC
WELL NAME: RS-441
JOB NUMBER: 29-0588-311
DATE: 04/23/98
SCALE: 5 FT./INCH




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-441 / VS 305.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 04/23/98

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 **
** RICHARD SCHMIDT **

**********
**********
*** 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-441 / 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 | -0.21 | 0.117 | -89.45 | 185.75 | 0.24 S | 0.02 W | 1.10 | 0.55 | 0.24 | AT 185.75 |
| 100.0 | 100.00 | -0.62 | 0.431 | -89.36 | 170.30 | 0.75 S | 0.00 W | 0.37 | 0.18 | 0.75 | AT 180.08 |
| 150.0 | 149.99 | -0.96 | 0.698 | -89.64 | 188.38 | 1.18 S | 0.02 E | 0.64 | 0.32 | 1.18 | AT 178.88 |
| 200.0 | 199.99 | -1.24 | 0.859 | -89.62 | 181.71 | 1.50 S | 0.00 W | 0.09 | 0.05 | 1.50 | AT 180.18 |
| 250.0 | 249.99 | -1.53 | 1.103 | -89.50 | 170.45 | 1.89 S | 0.03 E | 0.29 | 0.15 | 1.89 | AT 179.19 |
| 300.0 | 299.99 | -1.85 | 1.256 | -89.62 | 215.12 | 2.24 S | 0.03 W | 0.70 | 0.35 | 2.24 | AT 180.84 |
| 350.0 | 349.99 | -2.25 | 1.212 | -89.46 | 225.75 | 2.54 S | 0.30 W | 0.36 | 0.18 | 2.55 | AT 186.68 |
| 400.0 | 399.99 | -2.56 | 0.807 | -89.15 | 291.77 | 2.56 S | 0.81 W | 1.60 | 0.80 | 2.69 | AT 197.54 |
| 450.0 | 449.96 | -2.70 | -0.762 | -87.23 | 302.47 | 1.78 S | 2.17 W | 3.88 | 1.94 | 2.81 | AT 230.74 |
| 500.0 | 499.88 | -2.74 | -3.477 | -86.54 | 305.44 | 0.25 S | 4.42 W | 1.42 | 0.71 | 4.43 | AT 266.72 |
| 550.0 | 549.78 | -2.75 | -6.638 | -86.21 | 304.26 | 1.55 N | 7.02 W | 0.68 | 0.34 | 7.19 | AT 282.47 |
| 600.0 | 599.64 | -2.79 | -10.391 | -85.18 | 304.53 | 3.67 N | 10.11 W | 2.06 | 1.03 | 10.76 | AT 289.96 |
| 650.0 | 649.47 | -2.78 | -14.501 | -85.39 | 305.79 | 6.04 N | 13.47 W | 0.47 | 0.23 | 14.77 | AT 294.14 |
| 700.0 | 699.31 | -2.88 | -18.489 | -85.45 | 301.26 | 8.24 N | 16.80 W | 0.73 | 0.37 | 18.71 | AT 296.14 |
| 750.0 | 749.16 | -3.00 | -22.430 | -85.50 | 305.49 | 10.41 N | 20.09 W | 0.67 | 0.34 | 22.63 | AT 297.39 |
| 800.0 | 799.01 | -3.02 | -26.252 | -85.73 | 303.65 | 12.58 N | 23.24 W | 0.54 | 0.27 | 26.43 | AT 298.43 |
| 850.0 | 848.87 | -2.92 | -29.981 | -85.70 | 309.63 | 14.81 N | 26.23 W | 0.90 | 0.45 | 30.12 | AT 299.45 |

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*************************************************************
*                         ********                          *
*     THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF           *
*                         ********                          *
*   850.0 FEET EQUALS     30.12    FEET AT   299.45         *
*                         ********                          *
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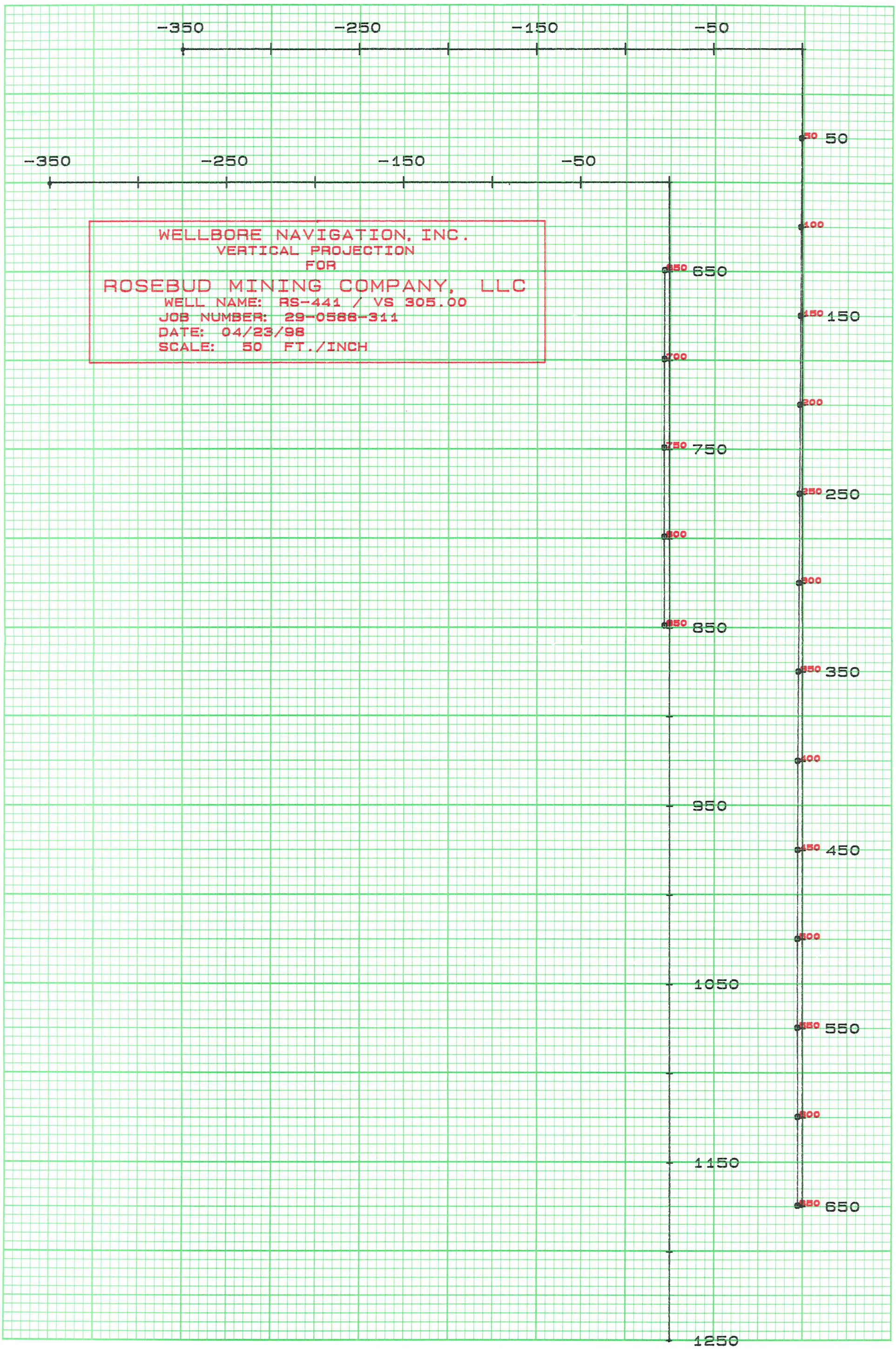
STARLIGHT PRINTING (801) 467-2841



WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

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

JOB NUMBER: 29-0588-311

WELL NAME: RS-441 / VS 035.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 04/23/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

WELNAV

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 125.00

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

COMMENTS: ** BOART LONGYEAR **
** RICHARD SCHMIDT **

**********
**********
*** 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-441 / 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 | 0.12 | 0.209 | -89.45 | 185.75 | 0.24 S | 0.02 W | 1.10 | 0.55 | 0.24 | AT 185.75 |
| 100.0 | 100.00 | 0.43 | 0.617 | -89.36 | 170.30 | 0.75 S | 0.00 W | 0.37 | 0.18 | 0.75 | AT 180.08 |
| 150.0 | 149.99 | 0.70 | 0.956 | -89.64 | 188.38 | 1.18 S | 0.02 E | 0.64 | 0.32 | 1.18 | AT 178.88 |
| 200.0 | 199.99 | 0.86 | 1.235 | -89.62 | 181.71 | 1.50 S | 0.00 W | 0.09 | 0.05 | 1.50 | AT 180.18 |
| 250.0 | 249.99 | 1.10 | 1.529 | -89.50 | 170.45 | 1.89 S | 0.03 E | 0.29 | 0.15 | 1.89 | AT 179.19 |
| 300.0 | 299.99 | 1.26 | 1.851 | -89.62 | 215.12 | 2.24 S | 0.03 W | 0.70 | 0.35 | 2.24 | AT 180.84 |
| 350.0 | 349.99 | 1.21 | 2.248 | -89.46 | 225.75 | 2.54 S | 0.30 W | 0.36 | 0.18 | 2.55 | AT 186.68 |
| 400.0 | 399.99 | 0.81 | 2.564 | -89.15 | 291.77 | 2.56 S | 0.81 W | 1.60 | 0.80 | 2.69 | AT 197.54 |
| 450.0 | 449.96 | -0.76 | 2.702 | -87.23 | 302.47 | 1.78 S | 2.17 W | 3.88 | 1.94 | 2.81 | AT 230.74 |
| 500.0 | 499.88 | -3.48 | 2.744 | -86.54 | 305.44 | 0.25 S | 4.42 W | 1.42 | 0.71 | 4.43 | AT 266.72 |
| 550.0 | 549.78 | -6.64 | 2.754 | -86.21 | 304.26 | 1.55 N | 7.02 W | 0.68 | 0.34 | 7.19 | AT 282.47 |
| 600.0 | 599.64 | -10.39 | 2.792 | -85.18 | 304.53 | 3.67 N | 10.11 W | 2.06 | 1.03 | 10.76 | AT 289.96 |
| 650.0 | 649.47 | -14.50 | 2.782 | -85.39 | 305.79 | 6.04 N | 13.47 W | 0.47 | 0.23 | 14.77 | AT 294.14 |
| 700.0 | 699.31 | -18.49 | 2.884 | -85.45 | 301.26 | 8.24 N | 16.80 W | 0.73 | 0.37 | 18.71 | AT 296.14 |
| 750.0 | 749.16 | -22.43 | 2.996 | -85.50 | 305.49 | 10.41 N | 20.09 W | 0.67 | 0.34 | 22.63 | AT 297.39 |
| 800.0 | 799.01 | -26.25 | 3.023 | -85.73 | 303.65 | 12.58 N | 23.24 W | 0.54 | 0.27 | 26.43 | AT 298.43 |
| 850.0 | 848.87 | -29.98 | 2.916 | -85.70 | 309.63 | 14.81 N | 26.23 W | 0.90 | 0.45 | 30.12 | AT 299.45 |

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*************************************************************
*                         ********                          *
*     THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF           *
*                         ********                          *
*   850.0 FEET EQUALS    30.12   FEET AT  299.45            *
*                         ********                          *
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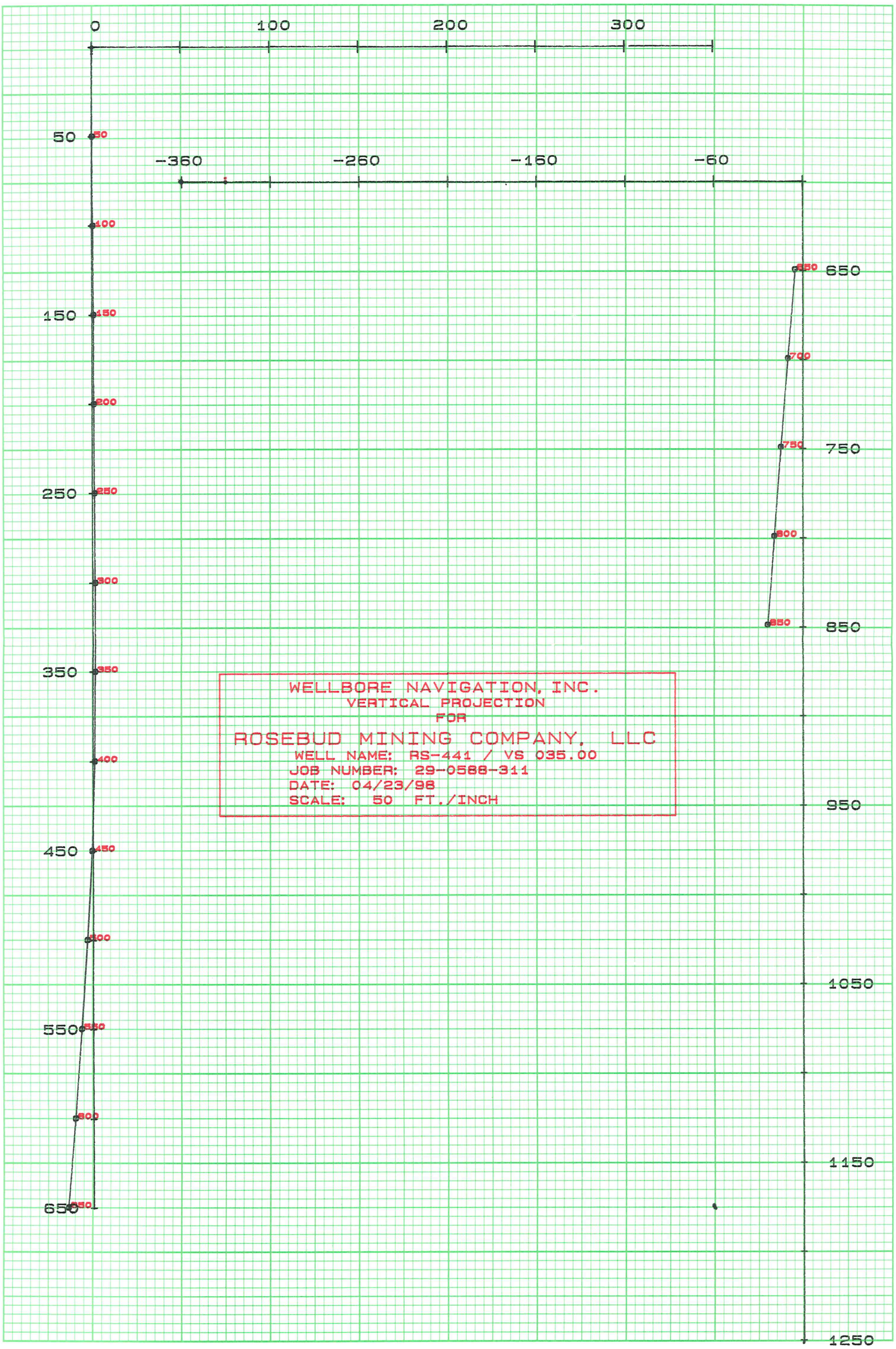

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

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

JOB NUMBER: 29-0588-311

WELL NAME: RS-441

LOCATION: ROSEBUD MINE

SURVEY DATE: 04/16/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

WATER CONTACT= 587'

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-441

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 | -0.08 | -0.228 | -89.45 | 185.75 | 0.24 S | 0.02 W | 1.10 | 0.55 | 0.24 | AT 185.75 | 068.92 |
| 100.0 | 100.00 | -0.31 | -0.687 | -89.36 | 170.30 | 0.75 S | 0.00 W | 0.37 | 0.18 | 0.75 | AT 180.08 | 069.58 |
| 150.0 | 149.99 | -0.51 | -1.070 | -89.64 | 188.38 | 1.18 S | 0.02 E | 0.64 | 0.32 | 1.18 | AT 178.88 | 069.42 |
| 200.0 | 199.99 | -0.61 | -1.375 | -89.62 | 181.71 | 1.50 S | 0.00 W | 0.09 | 0.05 | 1.50 | AT 180.18 | 069.21 |
| 250.0 | 249.99 | -0.80 | -1.710 | -89.50 | 170.45 | 1.89 S | 0.03 E | 0.29 | 0.15 | 1.89 | AT 179.19 | 067.49 |
| 300.0 | 299.99 | -0.88 | -2.054 | -89.62 | 215.12 | 2.24 S | 0.03 W | 0.70 | 0.35 | 2.24 | AT 180.84 | 066.64 |
| 350.0 | 349.99 | -0.77 | -2.436 | -89.46 | 225.75 | 2.54 S | 0.30 W | 0.36 | 0.18 | 2.55 | AT 186.67 | 066.18 |
| 400.0 | 399.99 | -0.31 | -2.670 | -89.15 | 291.77 | 2.56 S | 0.81 W | 1.60 | 0.80 | 2.69 | AT 197.54 | 065.59 |
| 450.0 | 449.96 | 1.26 | -2.511 | -87.23 | 302.47 | 1.78 S | 2.17 W | 3.88 | 1.94 | 2.81 | AT 230.74 | 065.48 |
| 500.0 | 499.88 | 3.93 | -2.040 | -86.54 | 305.44 | 0.25 S | 4.42 W | 1.42 | 0.71 | 4.43 | AT 266.72 | 065.35 |
| 550.0 | 549.78 | 7.04 | -1.454 | -86.21 | 304.26 | 1.55 N | 7.02 W | 0.68 | 0.34 | 7.19 | AT 282.47 | 065.02 |
| 600.0 | 599.64 | 10.73 | -0.785 | -85.18 | 304.53 | 3.67 N | 10.11 W | 2.06 | 1.03 | 10.76 | AT 289.96 | 064.92 |
| 650.0 | 649.47 | 14.77 | -0.000 | -85.39 | 305.79 | 6.04 N | 13.47 W | 0.47 | 0.23 | 14.77 | AT 294.14 | 066.33 |

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*************************************************************
*                         ********                          *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                         ********                          *
*   650.0 FEET EQUALS     14.77    FEET AT   294.14         *
*                         ********                          *
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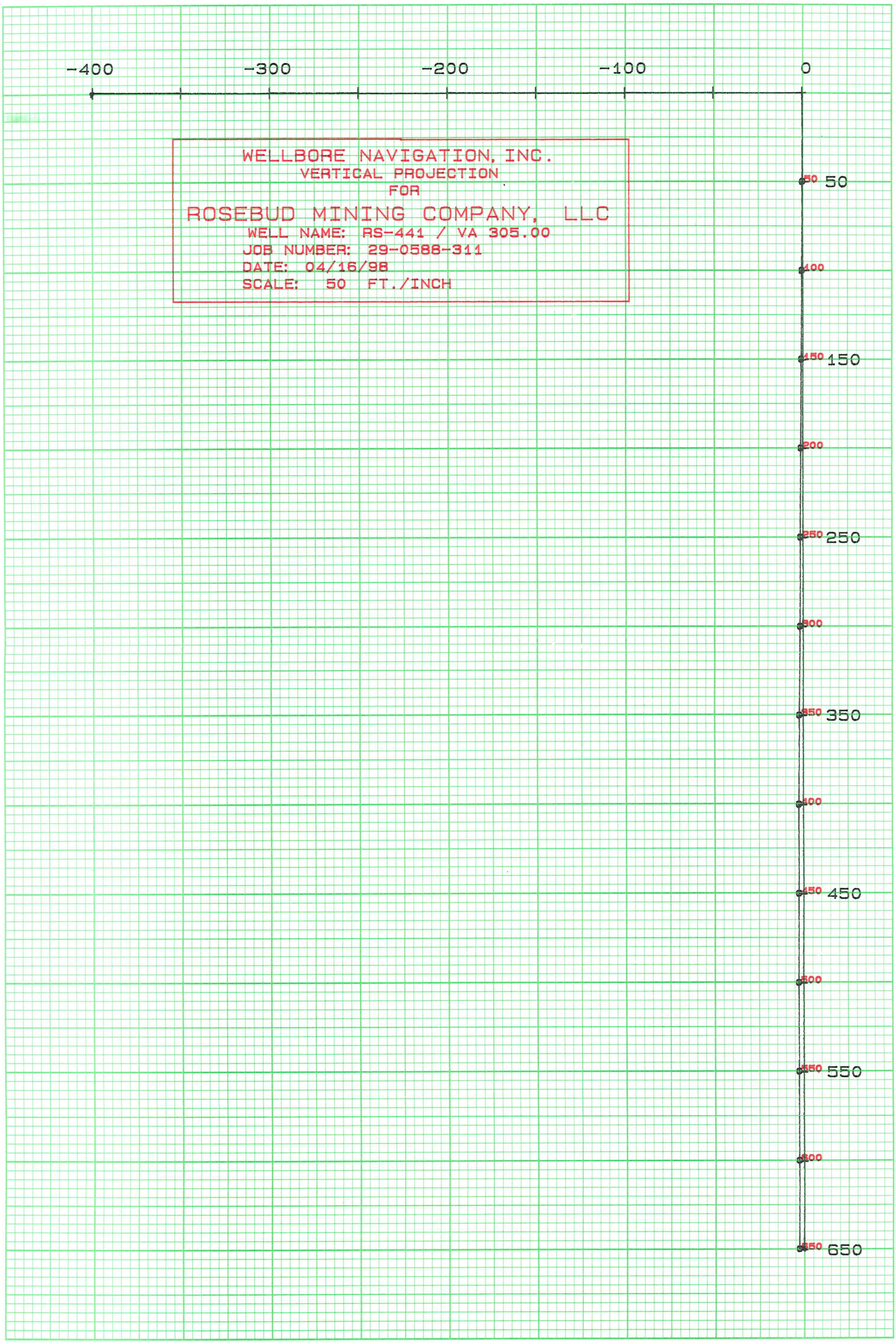
STARLIGHT PRINTING (801) 467-2841



WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

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

JOB NUMBER: 29-0588-311

WELL NAME: RS-441 / VA 305.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 04/16/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

WELNAV

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 035.00
WATER CONTACT= 587'

**********
****** 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-441 / VA 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 | -0.21 | 0.117 | -89.45 | 185.75 | 0.24 S | 0.02 W | 1.10 | 0.55 | 0.24 | AT 185.75 | 068.92 |
| 100.0 | 100.00 | -0.62 | 0.431 | -89.36 | 170.30 | 0.75 S | 0.00 W | 0.37 | 0.18 | 0.75 | AT 180.08 | 069.58 |
| 150.0 | 149.99 | -0.96 | 0.698 | -89.64 | 188.38 | 1.18 S | 0.02 E | 0.64 | 0.32 | 1.18 | AT 178.88 | 069.42 |
| 200.0 | 199.99 | -1.24 | 0.859 | -89.62 | 181.71 | 1.50 S | 0.00 W | 0.09 | 0.05 | 1.50 | AT 180.18 | 069.21 |
| 250.0 | 249.99 | -1.53 | 1.103 | -89.50 | 170.45 | 1.89 S | 0.03 E | 0.29 | 0.15 | 1.89 | AT 179.19 | 067.49 |
| 300.0 | 299.99 | -1.85 | 1.256 | -89.62 | 215.12 | 2.24 S | 0.03 W | 0.70 | 0.35 | 2.24 | AT 180.84 | 066.64 |
| 350.0 | 349.99 | -2.25 | 1.212 | -89.46 | 225.75 | 2.54 S | 0.30 W | 0.36 | 0.18 | 2.55 | AT 186.67 | 066.18 |
| 400.0 | 399.99 | -2.56 | 0.807 | -89.15 | 291.77 | 2.56 S | 0.81 W | 1.60 | 0.80 | 2.69 | AT 197.54 | 065.59 |
| 450.0 | 449.96 | -2.70 | -0.762 | -87.23 | 302.47 | 1.78 S | 2.17 W | 3.88 | 1.94 | 2.81 | AT 230.74 | 065.48 |
| 500.0 | 499.88 | -2.74 | -3.477 | -86.54 | 305.44 | 0.25 S | 4.42 W | 1.42 | 0.71 | 4.43 | AT 266.72 | 065.35 |
| 550.0 | 549.78 | -2.75 | -6.638 | -86.21 | 304.26 | 1.55 N | 7.02 W | 0.68 | 0.34 | 7.19 | AT 282.47 | 065.02 |
| 600.0 | 599.64 | -2.79 | -10.391 | -85.18 | 304.53 | 3.67 N | 10.11 W | 2.06 | 1.03 | 10.76 | AT 289.96 | 064.92 |
| 650.0 | 649.47 | -2.78 | -14.501 | -85.39 | 305.79 | 6.04 N | 13.47 W | 0.47 | 0.23 | 14.77 | AT 294.14 | 066.33 |

```
*************************************************************
*                          ********                         *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                          ********                         *
*   650.0 FEET EQUALS     14.77    FEET AT   294.14         *
*                          ********                         *
*************************************************************
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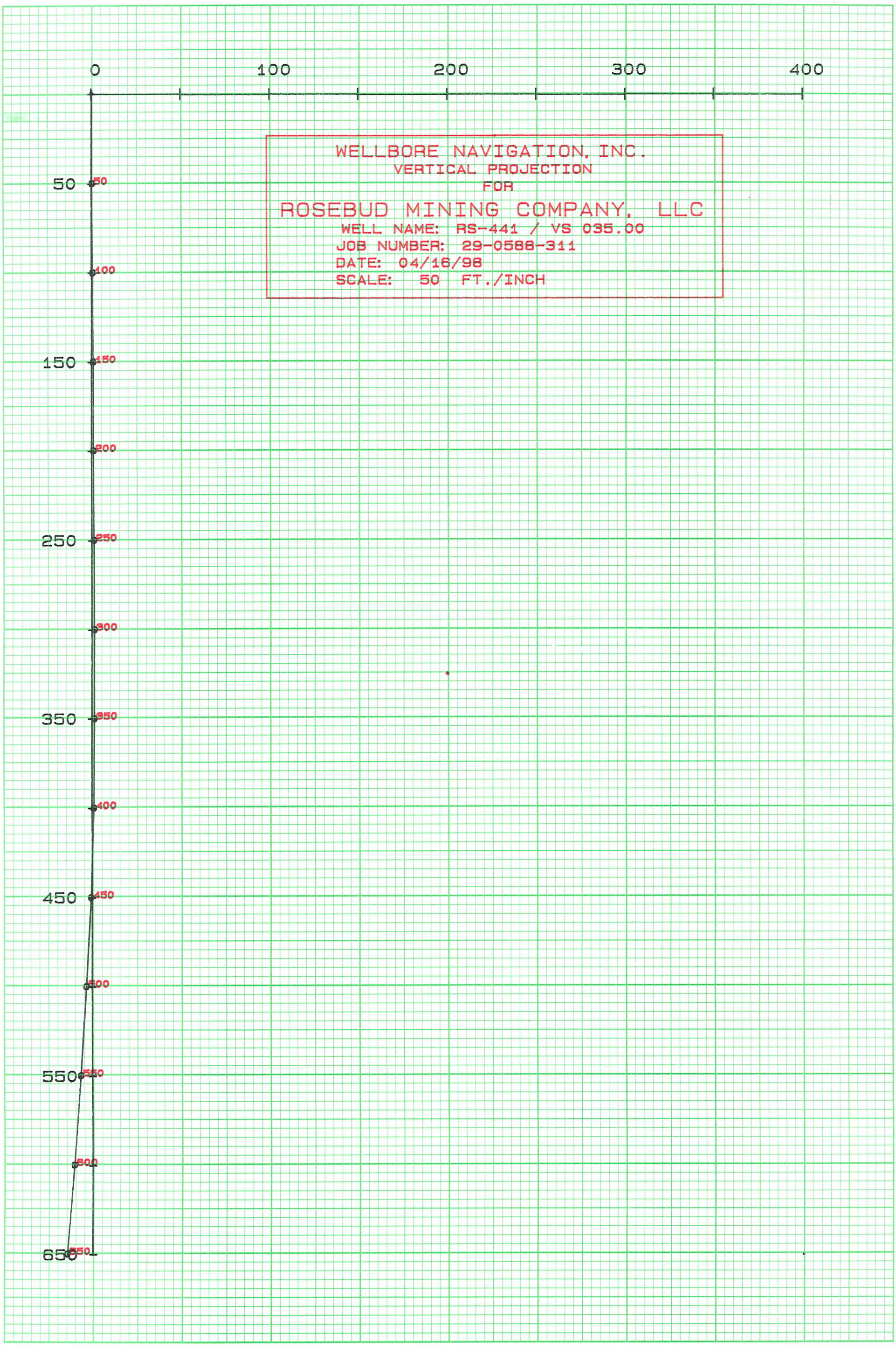


WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

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

JOB NUMBER: 29-0588-311

WELL NAME: RS-441 / VS 035.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 04/16/98

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: TRUE NORTH

WELNAV

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 125.00
WATER CONTACT= 587'

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

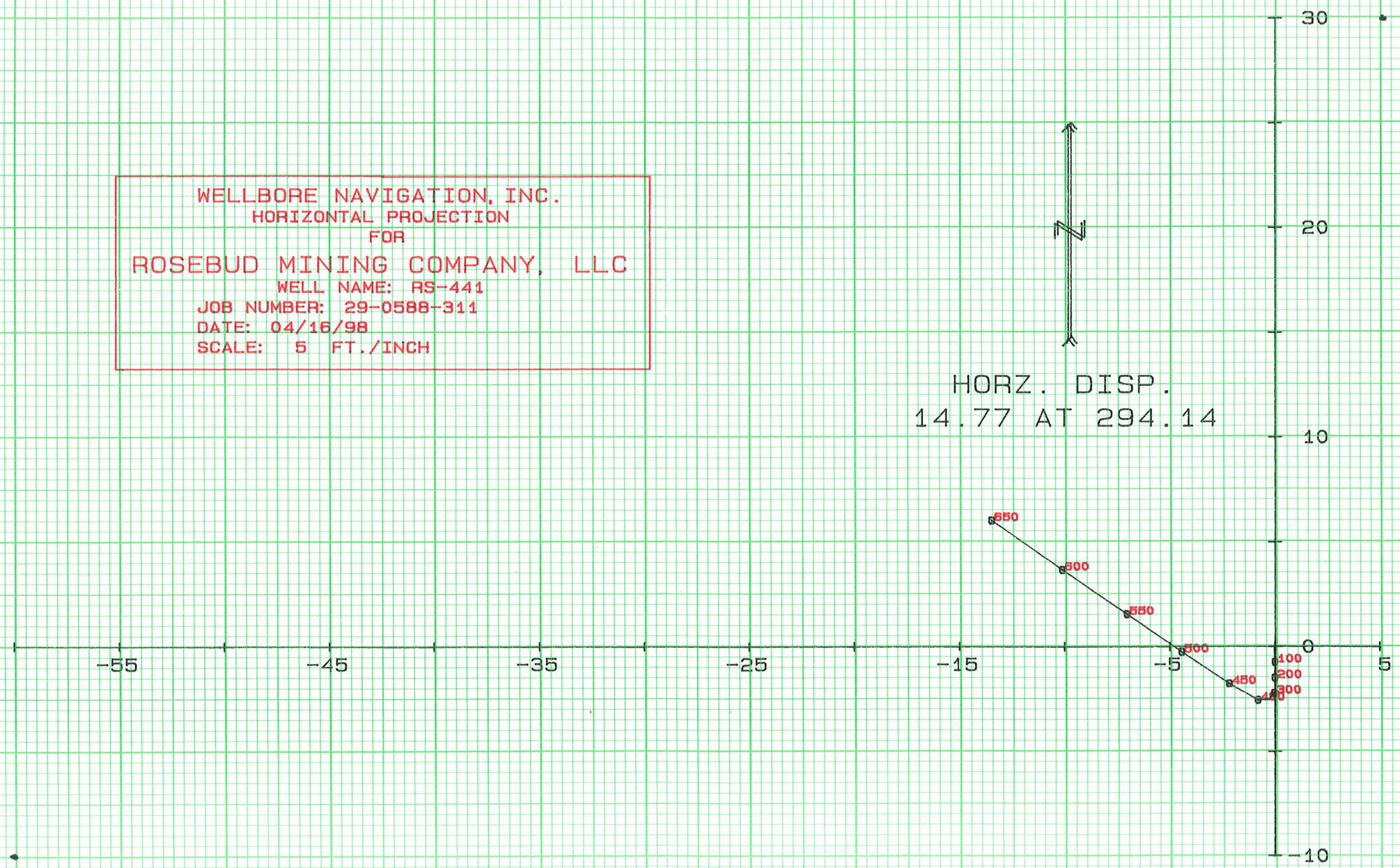
JOB NUMBER: 29-0588-311 WELL NAME: RS-441 / VS 035.00

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 | 0.12 | 0.209 | -89.45 | 185.75 | 0.24 S | 0.02 W | 1.10 | 0.55 | 0.24 | AT 185.75 | 068.92 |
| 100.0 | 100.00 | 0.43 | 0.617 | -89.36 | 170.30 | 0.75 S | 0.00 W | 0.37 | 0.18 | 0.75 | AT 180.08 | 069.58 |
| 150.0 | 149.99 | 0.70 | 0.956 | -89.64 | 188.38 | 1.18 S | 0.02 E | 0.64 | 0.32 | 1.18 | AT 178.88 | 069.42 |
| 200.0 | 199.99 | 0.86 | 1.235 | -89.62 | 181.71 | 1.50 S | 0.00 W | 0.09 | 0.05 | 1.50 | AT 180.18 | 069.21 |
| 250.0 | 249.99 | 1.10 | 1.529 | -89.50 | 170.45 | 1.89 S | 0.03 E | 0.29 | 0.15 | 1.89 | AT 179.19 | 067.49 |
| 300.0 | 299.99 | 1.26 | 1.851 | -89.62 | 215.12 | 2.24 S | 0.03 W | 0.70 | 0.35 | 2.24 | AT 180.84 | 066.64 |
| 350.0 | 349.99 | 1.21 | 2.248 | -89.46 | 225.75 | 2.54 S | 0.30 W | 0.36 | 0.18 | 2.55 | AT 186.67 | 066.18 |
| 400.0 | 399.99 | 0.81 | 2.564 | -89.15 | 291.77 | 2.56 S | 0.81 W | 1.60 | 0.80 | 2.69 | AT 197.54 | 065.59 |
| 450.0 | 449.96 | -0.76 | 2.702 | -87.23 | 302.47 | 1.78 S | 2.17 W | 3.88 | 1.94 | 2.81 | AT 230.74 | 065.48 |
| 500.0 | 499.88 | -3.48 | 2.744 | -86.54 | 305.44 | 0.25 S | 4.42 W | 1.42 | 0.71 | 4.43 | AT 266.72 | 065.35 |
| 550.0 | 549.78 | -6.64 | 2.754 | -86.21 | 304.26 | 1.55 N | 7.02 W | 0.68 | 0.34 | 7.19 | AT 282.47 | 065.02 |
| 600.0 | 599.64 | -10.39 | 2.793 | -85.18 | 304.53 | 3.67 N | 10.11 W | 2.06 | 1.03 | 10.76 | AT 289.96 | 064.92 |
| 650.0 | 649.47 | -14.50 | 2.782 | -85.39 | 305.79 | 6.04 N | 13.47 W | 0.47 | 0.23 | 14.77 | AT 294.14 | 066.33 |

```
*************************************************************
*                          ********                         *
*      THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF          *
*                          ********                         *
*   650.0 FEET EQUALS     14.77    FEET AT   294.14         *
*                          ********                         *
*************************************************************
```

WELLBORE NAVIGATION, INC.
HORIZONTAL PROJECTION
FOR
ROSEBUD MINING COMPANY, LLC
WELL NAME: RS-441
JOB NUMBER: 29-0588-311
DATE: 04/16/98
SCALE: 5 FT./INCH

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# SUBMITTAL FORM


**American Assay Laboratories**

**Geochemical • Environmental • Metallurgical**

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(702) 356-0606
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(520) 294-6352

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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: 05/09/98 Number of Samples: 45

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

| RS-441 SAMPLE IDENTIFICATION | | TYPE | ELEMENTS REQUIRED | |
|---|---|---|---|---|
| 650.0-655.0 | 711.9-715.4 | CORE | AU-AG ROSEBUD MINING PROTOCOLS | |
| 655.0-660.6 | 715.4-719.0 | | | |
| 660.6-666.0 | ~~719.0-~~ | | 780.0-785.1 | 838.1-842.6 |
| 666.0-670.7 | 720.0-725.0 | | 785.1-790.3 | 842.6-846.7 |
| 670.7-675.0 | 725.0-730.0 | | 790.3-795.3 | 846.7-850.0 |
| 675.0-680.0 | 730.0-735.0 | | 795.3-799.1 | |
| 680.0-685.0 | 735.0-740.0 | | 799.1-800.9 | |
| 685.0-690.0 | 740.0-744.9 | | 800.9-804.9 | |
| 690.0-692.8 | 744.9-750.0 | | 804.9-810.0 | |
| 692.8-696.6 | 750.0-755.0 | | 810.0-814.2 | |
| 696.6-700.0 | 755.0-760.0 | | 814.2-818.4 | |
| 700.0-702.0 | 760.0-764.7 | | 818.4-823.5 | |
| 702.0-705.0 | 764.7-770.0 | | 823.5-828.5 | |
| 705.0-708.6 | 770.0-775.1 | | 828.5-833.6 | |
| 708.6-711.9 | 775.1-780.0 | | 833.6-838.1 | |

**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:**

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SP

# SUBMITTAL FORM


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Lima, Peru
Santiago, Chile
Mendoza, Argentina


Company: ROSEBUD MINING CO LLT

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: 05/11/98 Number of Samples: 62

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

| RS-442 SAMPLE IDENTIFICATION | | TYPE | ELEMENTS REQUIRED | |
|---|---|---|---|---|
| 651.0-655.1 | 706.2-708.4 | CORE | AU-AG ACCORDING TO | |
| 655.1-660.0 | 708.4-711.8 | | ROSEBUD MINE | |
| 660.0-665.2 | 711.8-715.3 | | PROTOCOLS | |
| 665.2-670.0 | 715.3-717.0 | | 752.3-757.0 | 805.9-810.8 |
| 670.0-673.7 | 717.0-718.8 | | 757.0-761.9 | 810.8-815.0 |
| 673.7-678.0 | ~~718.8~~ | | 761.9-767.1 | 815.0-820.0 |
| 678.0-681.1 | 720.0-722.0 | | 767.1-771.7 | 820.0-825.1 |
| 681.1-684.8 | 722.0-723.3 | | 771.7-775.5 | 825.1-830.1 |
| 684.8-690.0 | 723.3-724.8 | | 775.5-782.3 | 830.1-835.2 |
| 690.0-693.8 | 724.8-730.0 | | 782.3-783.1 | 835.2-839.7 |
| 693.8-696.6 | 730.0-734.5 | | 783.1-787.8 | 839.7-843.0 |
| 696.6-700.0 | 734.5-738.5 | | 787.8-793.4 | 843.0-848.0 |
| 700.0-703.2 | 738.5-742.8 | | 793.4-798.1 | 848.0-853.2 |
| 703.2-705.0 | 742.8-746.9 | | 798.1-801.9 | 853.2-858.1 |
| 705.0-706.2 | 746.9-752.3 | | 801.9-805.9 | 858.1-863.1 |

**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:**

PAGE 1 OF 2

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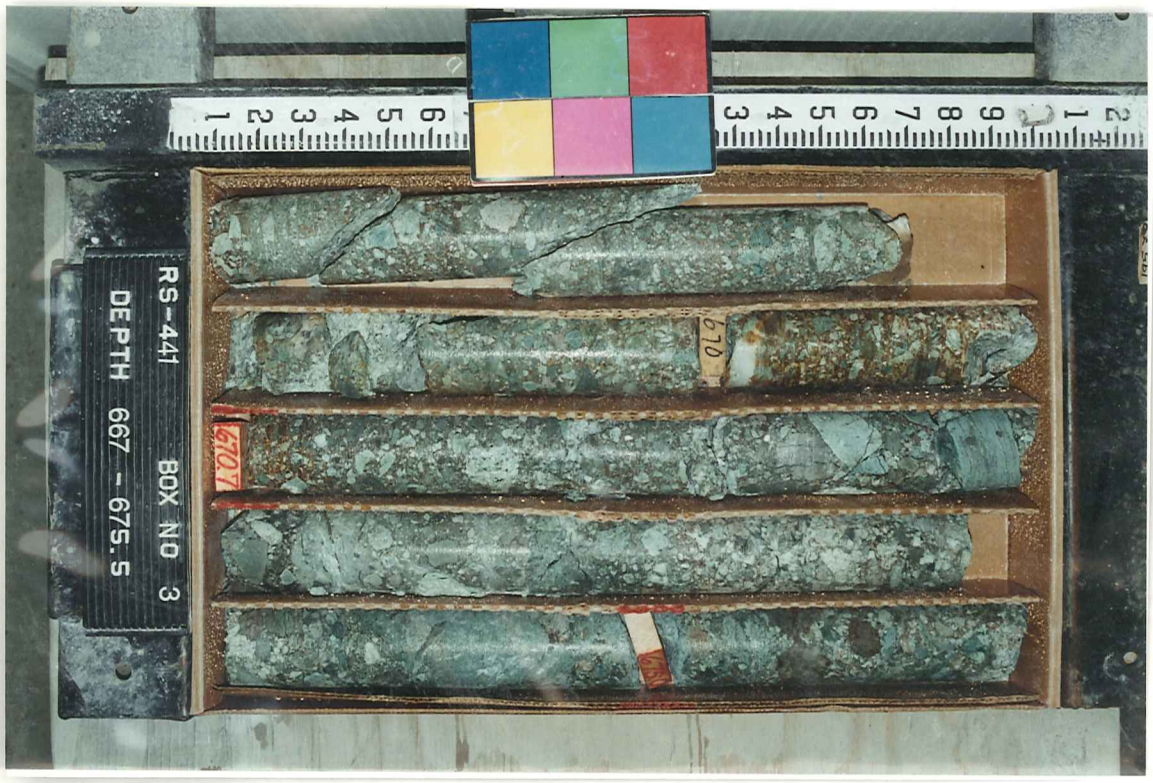
RS-441 BOX NO 2
DEPTH 659 - 667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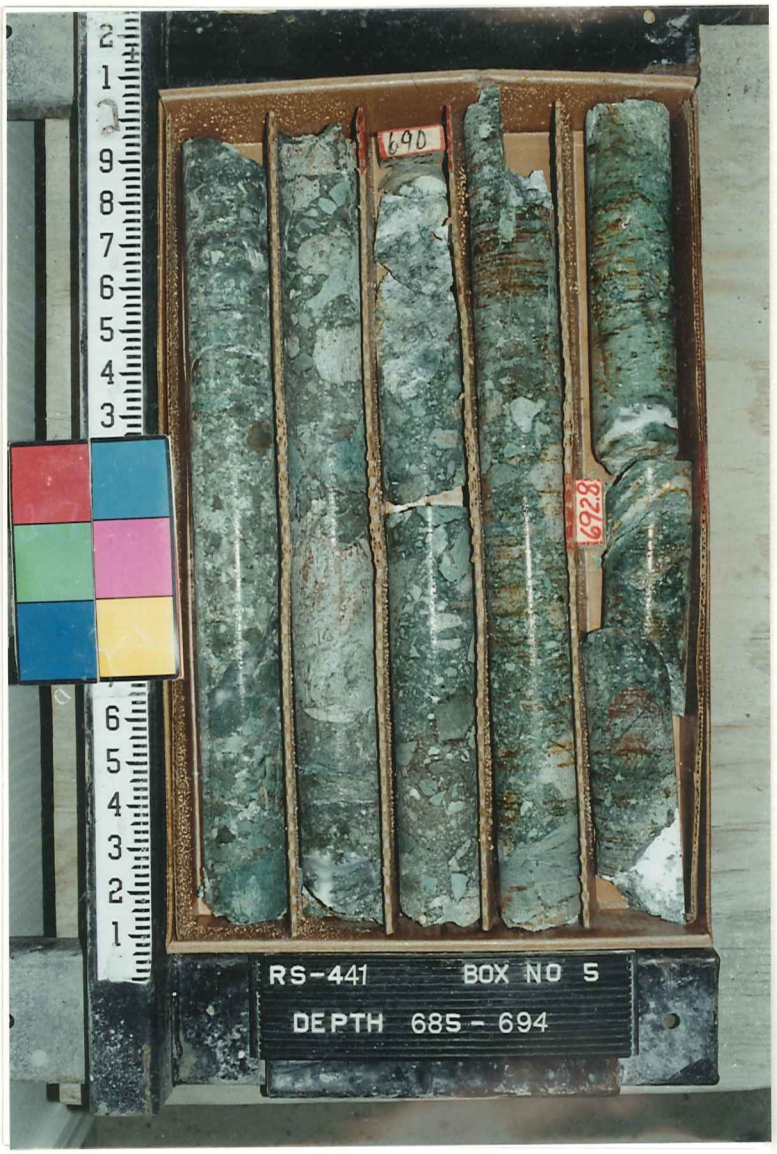
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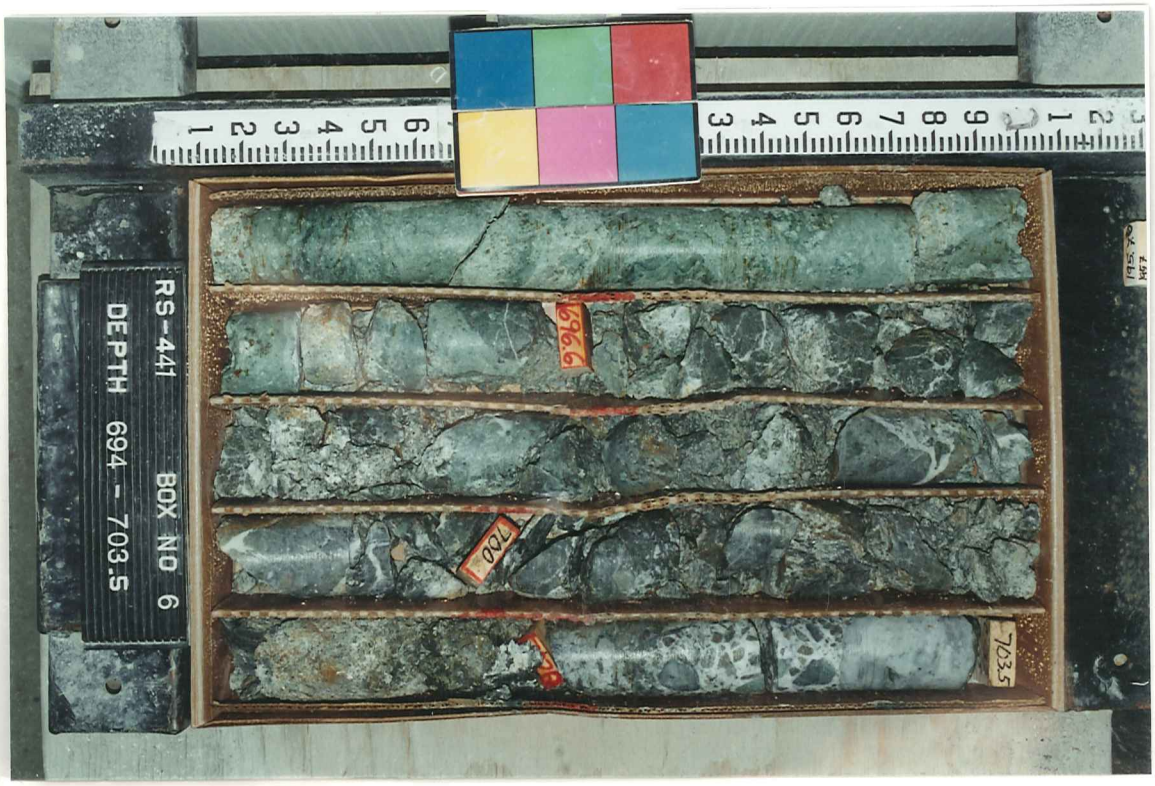
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705.3
710.2

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LOSS
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715.4
711.9
720

RS-441 BOX NO 9
DEPTH 722 - 731
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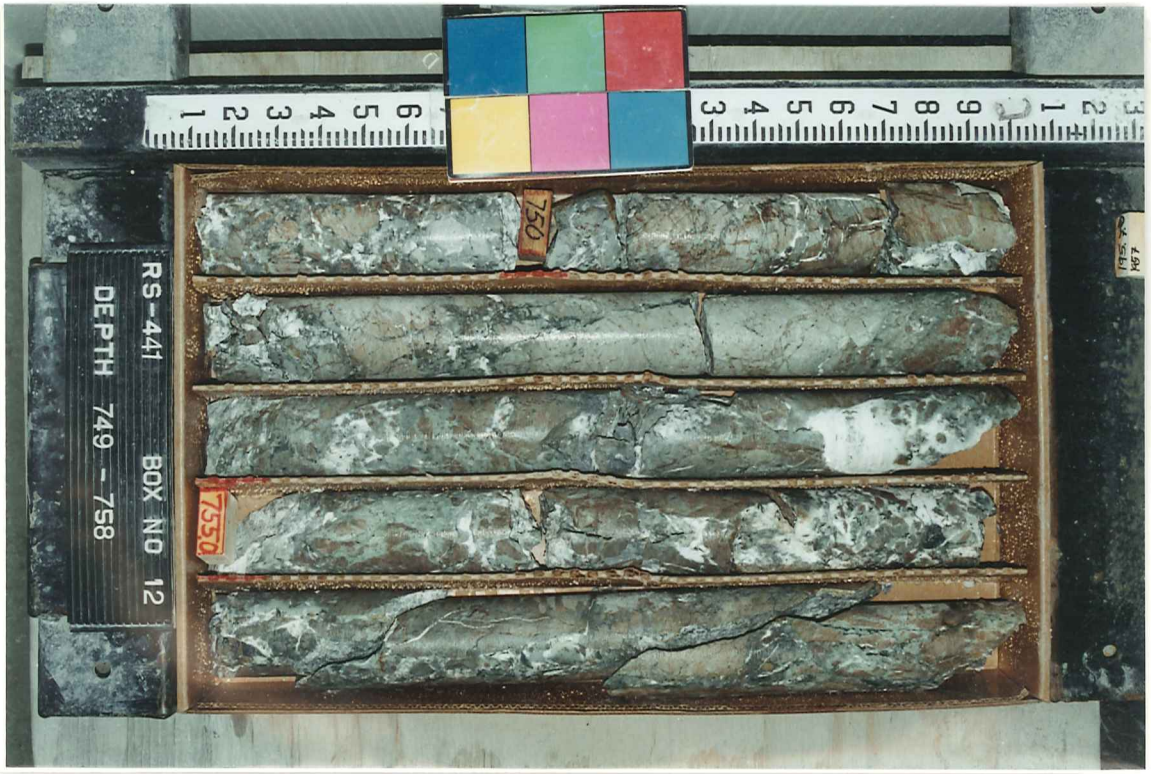
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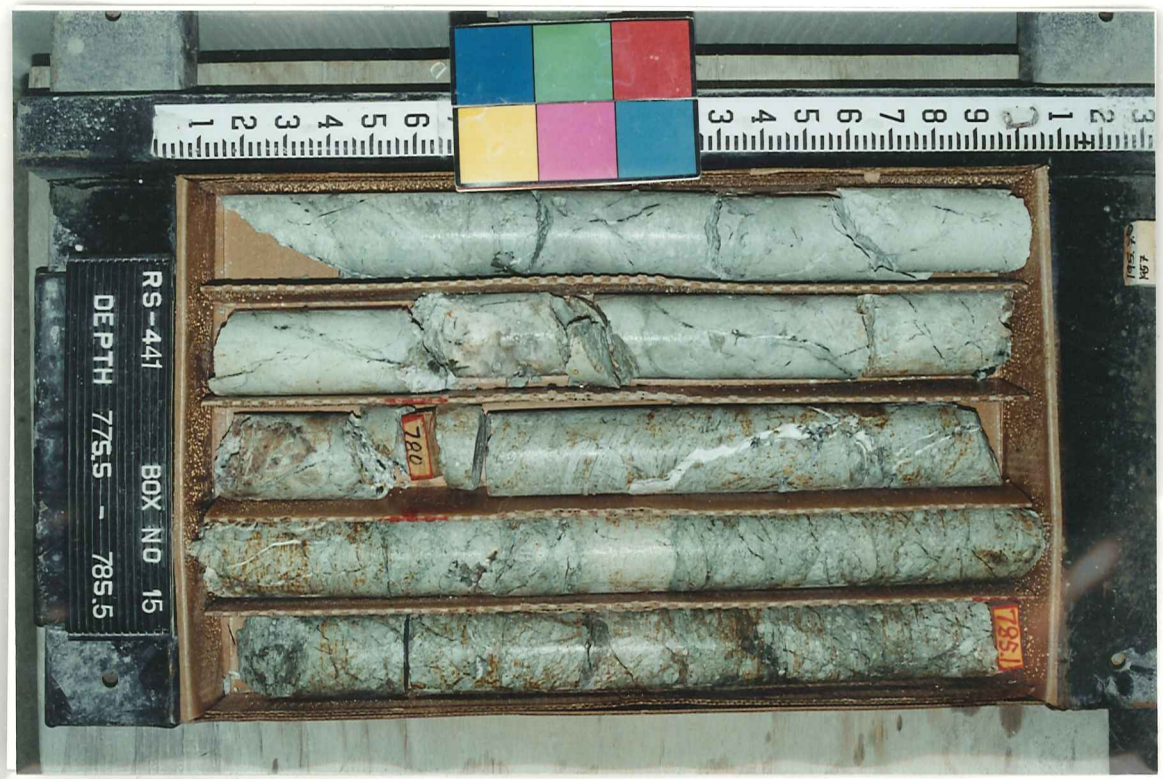
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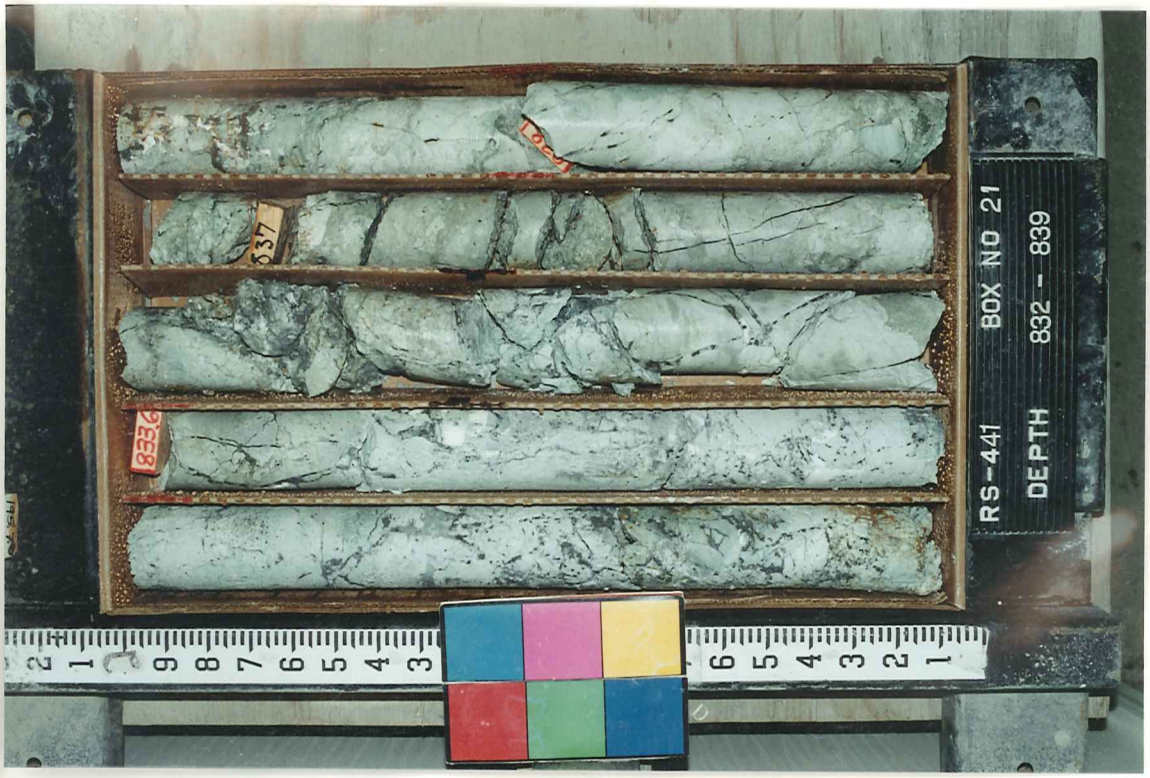
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