60000514

Mining District File Summary Sheet

DISTRICT	Rosebud
DIST_NO	4010
COUNTY If different from written on document	Pershing
TITLE If not obvious	Rosebud Drill Hole File – Hole No. RS 409
AUTHOR	G. Langstaff; C. Ballew; R. Lisle; R. Vance; K. Allen; S. King
DATE OF DOC(S)	1997
MULTI_DIST Y / (N?) Additional Dist_Nos:	
QUAD_NAME	Sulphur 7.5'
P_M_C_NAME (mine, claim & company names)	Rosebud Mine; Newmont Gold Co.; Hecla Mining Co.
COMMODITY If not obvious	gold; silver
NOTES	drill logs; assay; geology; photographs; geochemistry; total depth 700'; handwritten note 40p.

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)

	Initials	Date
SS:	DD	3/18/08
DB:		
SCANNED:		

Revised: 1/22/08

RS-409

60000514
4010

RS-409

no core assays

no collar survey

NEWMONT EXPLORATION LIMITED — DRILL HOLE SUMMARY

Project: Rosebud Location: Hecla's East Zone Drill Hole No.: RS-409

State: NV Co.: Pershing T.: R.: S.:

Purpose: Mine Geology Infill Results:

Date Started: Date Finished: 10/5/97-10/6/97 rc; 10/8/97 - 10/15/97 core

Grid System: Northing: Easting: Elevation:

Collar Az/Inc.: / -90 Drill Site: Total Depth: 700'

Geologist(s): Log Date(s): Laboratory:

HOLE CONSTRUCTION AND HISTORY CASING (INTERVAL):

From	To	Hole Type/Size	Started	Completed	Contractor
0	500	rc /			Eklund
500	700	core / HQ			Boart-Longyear
		/			
		/			

LITHOLOGIC SUMMARY				ALTERATION/ MINERALIZATION	SIGNIFICANT ASSAYS				
From	To	Formation	Rock Type		From	To	Width	Au oz/st	Cutoff

DOWNHOLE SURVEYS

Directional Date:

Other

Depth (ft)	Azimuth	Inclination
700	5.6' @ 139°	-89.7

Water Table Depth:

Water Flow Rate:

COMMENTS

see Welnav survey

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-409	Page 1 of 10
Log'd by: G. Langstaff Date: 10/6/97	County: Pershing	Easting:	Azimuth:	Elevation:	Core/Chips(Intervals): chips 0 – 500 ft	

Depth (ft.)	GRAPHIC Rock	GRAPHIC Alt/Vn	ROCK Color	ROCK Rock Type	ROCK Grain Size	ROCK Structure (Sed.,Vol.)	PHENOS/LAPILLI/CLASTS %	PHENOS/LAPILLI/CLASTS Size	PHENOS/LAPILLI/CLASTS Shape	PHENOS/LAPILLI/CLASTS Color	PHENOS/LAPILLI/CLASTS Mineral/ Type	ALTERATION Int.	ALTERATION Distrib.	ALTERATION Type	ALTERATION Minerals	VEINS Thick.	VEINS Abund.	VEINS Selvedge	VEINS Minerals	INTERPRETATION Rock Name/ Composition	INTERPRETATION Formation	Comments	Recovery	Assay
5			10R 4/2 brown some pale	Volc	aph	massive	<1 <1	<.5mm <.5mm	subh euh	white black	feldspar hornblende		some pale chips some chips with some green chips w/chlorite		w/pyrite limonite	rare	chips	w/vein	quartz	colluvium		probably colluvium to 8-10' some brown clay, range of clast types calcareous dirt to 15'		
10			10R 3/2 dk brn some grn, some pale	Volc	aph	massive							some white chips some green chips w/chl		w/clay	chips	w/hairline		qtz veinlets			breccia chip with white clasts, redmetric		
15			5Y 7/2 pale grey	Volc	vfg	massive, granular	<1 <1	<1mm <1mm	euh round	green vit. grey	hbl→chl? qtz/feld?	w w ?	patchy/phenos? phenos fract.?	arg chl Fe ox	white clay green chl limonite	<1mm	?	brown	limonite		TcFG w/feldspar	some dk brn chips from above?		
20			5GY 8/1 pale grey > 5Y 7/4 grey-yel.	Volc	vfg	massive, granular	0-2 <1	<.2mm <1mm	irreg dendr. prt? euh	black vit. grey	? feldspar?	w	patchy/fract?	arg	white-orange clay	hair-line	rare	none	qtz			chips with black specks whiter - more altered?		
25			5GY 7/1 pale grey > 10YR 7/6 pale orange				0-2 <1	<.2mm <1mm	irreg, equant oblong	red-black vit. grey	? feldspar?	w	patchy/fract	arg	white-orange clay	<1.5mm hair-line	5% rare	? none	qtz, lim white clay			still some dark brown chips, from above?; fewer pale chips w/black specks but more limonite-stained chips slightly calcareous		
30			10GY 7/1 pale grey > 10YR 5/6 orange	Volc	vfg	massive, granular	<1	<1mm	pris	grn-blk	hbl→py→lim?	w	dis. specks	arg	white clay ± black specks	<1mm	?	?	qtz, lim			~7% of chips are limonite stained		
35							<1	1mm	glom.? pris	vit-grn	feld.? hbl?	w w	phenos? dis. specks	chl arg	chlorite white clay							black specks rare still 5-10% limonite staining		
40																					TcFG (hbl only?)	>10% limonite staining black specks rare		
45			10YR 6/6 orange brown										arg hard to see but probably as above			<2mm hair-line	? ?	? limonite	lim (qtz?) black Fe/ Mn ok			could be same rock as above but more pervasively limonitic		
50																						still mostly limonite stained		

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-409	Page 2 of 10
Log'd by: G. Langstaff Date: 10/6/97	County: Pershing	Easting:	Azimuth:	Elevation:	Core/Chips(Intervals): chips 0-500 ft	

Depth (ft.)	GRAPHIC Rock	GRAPHIC Alt/Vn	ROCK Color	ROCK Rock Type	ROCK Grain Size	ROCK Structure (Sed.,Vol.)	PHENOS/LAPILLI/CLASTS %	Size	Shape	Color	Mineral/ Type	ALTERATION Int.	Distrib.	Type	Minerals	VEINS Thick.	Abund.	Selvedge	Minerals	INTERPRETATION Rock Name/ Composition	Formation	Comments	Recovery	Assay
55			10YR 6/6 orange brown ≈ 5YR 7/1 pale grey	Volc	vfg	massive, granular	<1	<.5mm	round	vit. grey	feldspar?	W	dis. specks	arg	white clay	hair-line hair-line	rare ?	none limonite	qtz black Fe-Mn ox		TcFG	~½ limonitic and ½ pale grey chips argillic alteration still hard to see because of limonite but probably hasn't changed much		29
60							<1	<1mm	oblong	grn-blk	hbl→chl?											less limonite		100
65																						~30% limonite stained chips		32
70			5GY 8/1 pale grey 10YR 6/6 orange brown									W W	phenos? dis. specks	chl arg	green chl white clay	<1mm	rare	brown	limonite			<10% limonite stained chips a few chips > 1cm		
75																								
80												W W	dis. specks dissem.	arg pyrite	white clay vf pyrite							first appearance of pyrite some chips with >30% vf euhedral pyrite		
85			5G 8/1 pale grn-grey									m m	dissem dissem	arg pyrite	white clay euh. pyrite	<1mm ?	rare ?	none ?	vf drusy qtz + clay pyrite			only minor limonite staining chips with <1% to >50% pyrite		
90																								
95			5G7/1 pale grey									W W W	dissem dissem phenos	arg pyrite chl?	 green chl?							less pyrite than 80-90'		
100																								

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-409	Page 3 of 10
Log'd by: G. Langstaff Date: 10/6/97	County: Pershing	Easting:	Azimuth:	Elevation:	Core/Chips(Intervals): chips 0-500ft	

Depth (ft.)	GRAPHIC Rock	GRAPHIC Alt/Vn	ROCK Color	ROCK Rock Type	ROCK Grain Size	ROCK Structure (Sed.,Vol.)	PHENOS/LAPILLI/CLASTS %	PHENOS/LAPILLI/CLASTS Size	PHENOS/LAPILLI/CLASTS Shape	PHENOS/LAPILLI/CLASTS Color	PHENOS/LAPILLI/CLASTS Mineral/ Type	ALTERATION Int.	ALTERATION Distrib.	ALTERATION Type	ALTERATION Minerals	VEINS Thick.	VEINS Abund.	VEINS Selvedge	VEINS Minerals	INTERPRETATION Rock Name/ Composition	INTERPRETATION Formation	Comments	Recovery	Assay
105			5B7/1 – 5G7/1 pale grey	Vole	vfg	massive, granular						w m	dissem dissem	arg pyrite	white clay pyrite	<2mm	rare	?	vfqtz, py		TcFG	pyrite in scattered and clustered grains		7
110																								160
115																						weakly calcareous to 120' chips of monomict matrix-supported breccia to 130'		500
120																								25
125																								
130																						slightly calcareous		
135																Thin-line	rare	none	white clay			weakly calcareous		
140																								
145																								
150																								

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-409	Page 4 of 10
Log'd by: G. Langstaff Date: 10/6/97	County: Pershing	Easting:	Azimuth:	Elevation:	Core/Chips(Intervals): chips 0-500ft.	

Depth (ft.)	GRAPHIC Rock	GRAPHIC Alt/Vn	ROCK Color	ROCK Rock Type	ROCK Grain Size	ROCK Structure (Sed.,Vol.)	PHENOS/LAPILLI/CLASTS %	PHENOS/LAPILLI/CLASTS Size	PHENOS/LAPILLI/CLASTS Shape	PHENOS/LAPILLI/CLASTS Color	PHENOS/LAPILLI/CLASTS Mineral/ Type	ALTERATION Int.	ALTERATION Distrib.	ALTERATION Type	ALTERATION Minerals	VEINS Thick.	VEINS Abund.	VEINS Selvedge	VEINS Minerals	INTERPRETATION Rock Name/ Composition	INTERPRETATION Formation	Comments	Recovery	Assay
155			5G 7/1 pale grey	Volc.	vfg	massive, granular		none	seen			w m	dissem dissem	arg pyrite	white clay pyrite	>2mm hair-line .5mm	rare rare rare	? none ?	qtz clay bladed py or marc. py ± qtz brn qtz		Tc FG			22
160																<2mm	rare	?	py ± qtz			>1cm chunk		370
165																								257
170																								120
175																								357
180	A		(rare 10R5/2 grey-red)													(1mm	rare	qtz	pyrite)		Tc FG?	more veinlet pyrite, less dissem pyrite? uncommon mottled white and grey-red grains may be different kind of alteration — probably brecciation		656
185	A		(rare 10R5/2)																					932 993
190	A		(rare 10R5/2)													(hair-line	rare	?	qtz)			>1cm chunk		2298
195	A		(rare 10R5/2)																					260 256
200																					Tc FG	pyrite cubes on metallic grey sulfosalt? back to more dissem, less vein pyrite >1cm chunks		337

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-409	Page 5 of 10
Log'd by: G. Langstaff Date: 10/6/97	County: Pershing	Easting:	Azimuth:	Elevation:	Core/Chips(Intervals): chips 0-500 ft.	

Depth (ft.)	GRAPHIC Rock	GRAPHIC Alt/Vn	ROCK Color	ROCK Rock Type	ROCK Grain Size	ROCK Structure (Sed.,Vol.)	PHENOS/LAPILLI/CLASTS %	Size	Shape	Color	Mineral/ Type	ALTERATION Int.	Distrib.	Type	Minerals	VEINS Thick.	Abund.	Selvedge	Minerals	INTERPRETATION Rock Name/ Composition	Formation	Comments	Recovery	Assay
205			5G 7/1 pale grey	Volc	vfg	massive, granular						W W	dissem. dissem	arg pyrite	white clay euh pyrite	<1mm <3mm	rare rare	quartz ?	pyrite py±qtz		Tc FG	some black and reddish-black specks weakly calcareous to 210'		24
210																								24
215																						3mm vein frag w/bladed marc/py in drusy qtz		242
220																								16
225																						vein frag w/bladed marc/py in qtz		91
230																						vein frag w/bladed marc/py in qtz		153
235																						slightly calcareous to 245'		27
240																						some dark red specks not as much pyrite as above and mostly in veinlets		
245																								
250																						weakly calcareous		

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-409	Page 6 of 10
Log'd by: G. Langstaff Date: 10/6/97	County: Pershing	Easting:	Azimuth:	Elevation:	Core/Chips(Intervals): Chips 0-500ft	

Depth (ft.)	GRAPHIC Rock	GRAPHIC Alt/Vn	ROCK Color	ROCK Rock Type	ROCK Grain Size	ROCK Structure (Sed.,Vol.)	PHENOS/LAPILLI/CLASTS %	PHENOS/LAPILLI/CLASTS Size	PHENOS/LAPILLI/CLASTS Shape	PHENOS/LAPILLI/CLASTS Color	PHENOS/LAPILLI/CLASTS Mineral/ Type	ALTERATION Int.	ALTERATION Distrib.	ALTERATION Type	ALTERATION Minerals	VEINS Thick.	VEINS Abund.	VEINS Selvedge	VEINS Minerals	INTERPRETATION Rock Name/ Composition	INTERPRETATION Formation	Comments	Recovery	Assay
																						weakly calcareous to 265'		
255			5B 7/1 - 5G 7/1 pale grey	Volc.	vf	massive, granular	<1	<.5mm	oblong	clear vit.	feldspar?	w w	dissem irregular	pyrite arg?	 white clay	<2mm	rare	?	qtz+py		TcFG	argillic alt seems to have decreased or is almost imperceptible, less pyrite too; granular texture more pronounced rare black or dark red specks		
260							<1	2mm	pris	green	hbl→chl?											looks almost like sandstone		
265																								
270																						very little dissem. pyrite but some qtz-pyrite veinlets > 2mm slightly calcareous		
275							<1	<.5mm	round	vit. grey	feldspar?													
280			5G 8/1 - 5G 7/1																			rare chips of red matrix breccia w/ clasts <3mm		
285			pale grey				<1	<.5mm	pris	green	hbl→chl?													22
290																								90
295																						more pyrite veinlet material but dissem. pyrite still very rare slightly calcareous to 300'		195
300																								7

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-409	Page 7 of 10
Log'd by: G. Langstaff Date: 10/6/97	County: Pershing	Easting:	Azimuth:	Elevation:	Core/Chips(Intervals): Chips 0-500 ft	

Depth (ft.)	GRAPHIC Rock	GRAPHIC Alt/Vn	ROCK Color	ROCK Rock Type	ROCK Grain Size	ROCK Structure (Sed.,Vol.)	PHENOS/LAPILLI/CLASTS %	PHENOS/LAPILLI/CLASTS Size	PHENOS/LAPILLI/CLASTS Shape	PHENOS/LAPILLI/CLASTS Color	PHENOS/LAPILLI/CLASTS Mineral/ Type	ALTERATION Int.	ALTERATION Distrib.	ALTERATION Type	ALTERATION Minerals	VEINS Thick.	VEINS Abund.	VEINS Selvedge	VEINS Minerals	INTERPRETATION Rock Name/ Composition	INTERPRETATION Formation	Comments	Recovery	Assay
305			5G8/1	Volc	vf	massive,						W	dissem	arg	whiteclay	<1mm	rare	qtz	pyrite		Tc Fg	as above dissem pyrite < vein pyrite		98
			5G7/1			granular						W	dissem	pyrite	euh pyrite	<3mm	rare	?	py+qtz					
			pale grey													<1mm	rare	?	vf drusy qtz					
310																						vein frag w/bladed pyl marc in qtz		37
315																<3mm	rare	?	py+qtz					85
320																								66
325																						vein frag w/bladed pyl marc in qtz		109
330							<1	1mm	pris	green	hbl→chl?													330
335																								36
340			(some 5G6/1-5B6/1 grey)				<1	1.5mm	pris	grn blk	hbl?													0
345			5G7/1-5G6/1 pale grey				<1	1.5mm	pris	grn	hbl→chl?	W	dissem	arg	white clay							almost all pyrite is in veinlets		102
350																						negligible dissem pyrite		33

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-409	Page 8 of 10
Log'd by: G. Langstaff Date: 10/6/97	County: Pershing	Easting:	Azimuth:	Elevation:	Core/Chips(Intervals): Chips 0-500 ft	

Depth (ft.)	GRAPHIC Rock	GRAPHIC Alt/Vn	ROCK Color	ROCK Rock Type	ROCK Grain Size	ROCK Structure (Sed.,Vol.)	PHENOS/LAPILLI/CLASTS %	PHENOS/LAPILLI/CLASTS Size	PHENOS/LAPILLI/CLASTS Shape	PHENOS/LAPILLI/CLASTS Color	PHENOS/LAPILLI/CLASTS Mineral/ Type	ALTERATION Int.	ALTERATION Distrib.	ALTERATION Type	ALTERATION Minerals	VEINS Thick.	VEINS Abund.	VEINS Selvedge	VEINS Minerals	INTERPRETATION Rock Name/ Composition	INTERPRETATION Formation	Comments	Recovery	Assay
355			5G7/1 pale grey	Volc	vf	massive, granular	<1	1mm	prms	grn-blk	hbl?	w	dissem	arg	white clay	<3mm	rare	?	py ± qtz		T. FG	only rare pyrite, scattered and in veins slightly calcareous		
360																						slightly more vein pyrite than 355 weakly calcareous		
365			5G8/1-5G7/1 paler																			slightly calcareous		
370																						vein frag w/bladed py/marc in qtz		
375																						vein frag w/bladed py/marc in qtz very rare dissem pyrite		25
380			5G7/1-5G6/1 darker													(hair-line	rare	none	qtz)					146
385							<1	<1mm	oblong	green	feld→chl?											sparse white calcite chips weakly calcareous to 400'		78
390																								11
395			5G8/1-5G7/1 paler grey																					92
400							<1	<1mm	rect.	grn blk	hbl→chl?											white calcite chip		9

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-409	Page 9 of 10
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405			5G7/1 pale grey	Volc	vf	massive, granular	<1	<1mm	oblong	green	hbl→chl?	W	dissem	arg	white clay	<1mm	rare	?	py ± qtz		TcFG	weakly calcareous to 450'		89
410																						pyrite mostly in veins		0
415																						rare white calcite chips		
420							<1	<.4	rect.	green	fell→chl?													
425																								
430																(<1mm	rare	?	cal+py)					
435																						Fe-staining negligible pyrite		
440			5RP4/2 grey-purpl	Volc	aph	massive porphyr.	3	<.2mm	pris.	black	hbl ?										unaltered TcFG? (hbl only)	mottled grey and dark red no pyrite		
445			5GY7/1 pale grey	Volc	vf	massive, granular						W	dissem	arg	white clay						TcFG	only trace pyrite		
450																<1mm	rare	?	py ± qtz			white calcite chip		

Project: ROSEBUD JV	State: Nevada	Northing:	Inclination:	Total Depth:	Hole No. RS-409	Page 10 of 10
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			see above																			weakly calcareous to 480'		
			5RP 4/2	Volc	aph	massive	2-3	<.2mm	pris	black	hbl?										unaltered	mottled grey and dark red, more		
			grey-pupl			porphyr.															TcFG?	grey and less red than at		
455																					(hbl only)	434-440'		
460																								
465			5GY7/1 pale	Volc	vf	massive						w	dissem	arg	whiteclay	<2mm	rare	?	py ± qtz		TcFG	not as distinctly granular as rock above		
470			grey				<1	<1mm	oblong	green	hbl→chl?											rare vein pyrite		
475																								
480																(<1mm	rare	?	py+calc)			calcite chips some dissem as well as vein pyrite		
485																						vein frag w/bladed pylmarc in qtz calcite chip brown chert? vein slightly calcareous		
490			may be paler than above																			vein frags w/bladed pylmarc in qtz brown chert vein?		
495							<1	<.5mm	pris	green	hbl→chl?											brown chert? vein		
500																						vein frags w/bladed pylmarc in qtz		

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

Hecla MINING COMPANY

ROSEBUD PROJECT DIAMOND DRILL LOG

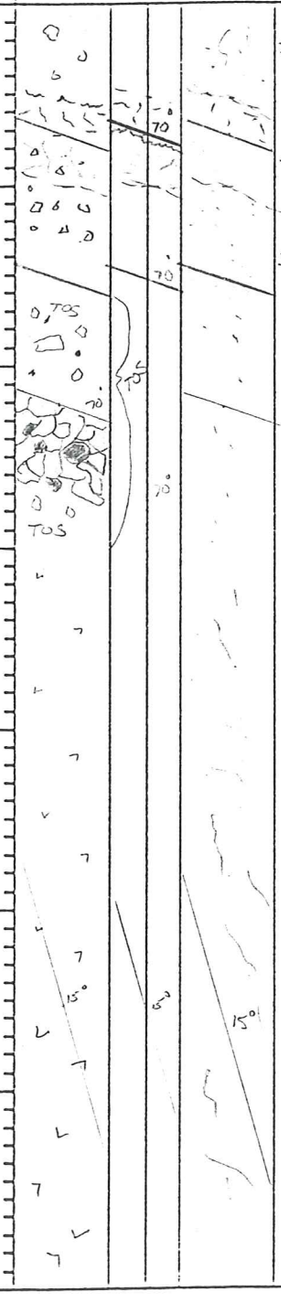
HOLE NUMBER	RS-409	LOCATION	EAST ZONE
PAGE	1 OF 4	NORTHING	
DATE	10/9/97	EASTING	
LOGGED BY	DA,	ELEVATION	
SCALE	1" = 10'	AZIMUTH	
TOTAL DEPTH	498-700'	INCLINATION	-90°

REMARKS: RUC PRE-COLLAR 0-498'; CORE HQ 498-

REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		498-524.4': LT TAN TO LT. BROWN, MODERATELY SOFT, FINE-GRAINED TO SLIGHTLY PORPHYRITIC, LATITIC-ANDESITIC? BLEACHED VOLCANIC AUTO-BRECCIA? TC-LLT? CLASTS APPEAR TO HAVE THE SAME COMPOSITION AS THE MATRIX. CLASTS ARE MODERATELY RARE, AND MATRIX APPEARS COMMONLY FLOW LAMINATED. INTERVAL HAS MINOR TO MODERATE BLEACHING 524.4-524.5' - PYRITIC CLAY GOUGE FAULT 524.5-545.2' - LT BROWN TO LT GREEN MODERATELY SOFT TO SOFT, FINE-GRAINED TO SLIGHTLY PORPHYRITIC LATITIC-ANDESITIC?, BLEACHED TO PROPYLITIZED VOLCANIC AUTO-BRECCIA - TC-LLT. CLASTS up to 0.2 feet AND APPEAR TO BE COMPOSITIONALLY SIMILAR TO THE MATRIX 524.5-530.4' - HEMATITIC MATRIX w/ BLEACHED CLASTS 530.4-535.2 - LT GREEN - PROPYLITIZED + 535.2-545.2' - HEMATITIC MATRIX w/ BLEACHED CLASTS	500 510 520 530 540	RUC 85 85 GRADATIONAL GRADATIONAL	524.4-524.5' - PYRITIC CLAY GOUGE FAULT - 0.1" THICK @ ≈ 80-85°	498-504.1' - COMMON PYRITE FRACTURE FILL + STOCKWORKS SOME DENDRITIC. 509.8-522: COMMON $CaCO_3$ FRACTURE FILL + LT GREEN CHLORITIC? CLAY. 498-524.4 - BLEACHING/ ARGILIZATION +/-, CHLORITIC? CLAY +/-, DISSEMINATED PYRITE +/- 524.5-530.4 - HEMATITIC (UN-ALTERED) W MINOR BLEACHING/PROPYLITIC. 530.4-535.2' - MODERATE PROPYLITIC ALTERATION CHLORITIC? 535.2-545.2' - Hematitic w/minor to moderate Propylitic chloritic clays along fractures $CaCO_3$ common (stockworked) ± DISSEMINATED PYRITE PYRITIC FRACTURE ≈ 1/4" thick @ 537' @ 60° to CA.

ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	A
498	504.1		<	.03		
504.1	509.8		<	<		
509.8	514.9		<	<		
514.9	520		<	<		
520	522		<	<		
522	524.4		<	<		
524.4	530.4		<	.03		
530.4	535.2		<	<		
535.2	540.2		.004	1.40		

HOLE NUMBER RS-409 PAGE 2 OF 4

REC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		545.2 – 550' – Gouge Fault Breccia Zone. Probably upper part of South Ridge Fault Zone, clasts are silicified in a cream to lt gray clay matrix. 550 – 553.8' – Silicified Fault Breccia w/ clasts up to 0.2 feet in diameter. Clasts are sub-rounded to sub-angular and appear to be composed of silicified TC LLT? and TOS. 553.8 – 556.2' – Massive silica surrounding probable South Ridge Fault Plane. 556.2 – 561.1' – Moderately soft to moderately hard lt to dk green, matrix supported, heterolithic, lapilli w/rare block sized, volcanic breccia. Clasts are composed of rare and lang syne phyllites (black in color) and fine-grained latitic? to rhyolitic clasts. This is part of TOS 561.1 – 567.1' – Moderately hard to hard stgreen to tan clast supported, heterolithic, lapilli volcanic breccia. Clasts are composed of black and lang syne phyllites and fine-grained hyalitic rhyolite? clasts of Dozer Fm? Also part of TOS Fm. 567.1 – 570.2' – Hard, silica matrix fault? breccia w/ clasts of sub-rounded TOS Fm & Dozer rhyolite? 570.2 – 634.5' – Moderately hard to hard, porphyritic, rhyolite flow/intrusive sill? Contains up to 3-10% phenocrysts of plagioclase? (Feldspar) laths presently replaced by white clay and pyrite + marcasite. Laths are up to ¼" long. This is a "BMB" type porphyritic unit 570.2'-595.5' – Phenocrysts are small & ≈ 3% 595.5 - 634.5' – Phenocrysts are larger & up to 10% – These are the same rock but the 570.2-595.5 interval could be a more "chilled margin"?	550 560 570 580 590 600 610		547.3 – Fault plane @ 70° to CA w/ slicks indicating dip slip movement. 547.3-547.8 – Clay Gouge 555.2' – Fault plane @ 70° to CA w/ slicks indicating oblique slip movement. [Probably main shear plane of South Ridge Fault. 545.2 – 556.2' – South Ridge Fault Zone could include through to 570.7'? @616' – 0-20° SiO2 fractures offset & cut by 40-50° set of SiO2 fractures.	550-553.8' – Silicified Fault Breccia. 553.8-556.2' – Massive silica associated w/ probable South Ridge Fault Plane @ 555.2'. Minor open space w/ minor marcasite blades ± pyrite. Silica is white at the fault plane and gray in color (due to fg sulfides) away from fault plane. 556.2 – 567.1' – Prop + SiO2 ± Minor open space fractures w/ SiO2 I pyrite @ 60-70° to CA. 567.1-570.2' – 570.2' - 595.5' – Prop + Contains moderately strong SiO2 ++ stockwork & veinlets containing fg-pyrite. Stockwork & veinlets dominated by 0-20° and 40-50° to CA fractures. Minor to moderate open space fractures. 595.5' – 634.5' – Prop ±/– Bleaching + Increased bleaching/arg decreased propylitic alt. Moderately strong stockwork & veinlets of SiO2 ++ containing pyrite + marcasite blades ± barite. Pyrite blebs up to 1" noticeably common.

ANALYTICAL DATA						
FROM	TO	W	Au	Ag	Au2	Ag2
540.2	545.2		.005	.13	.004	
545.2	550		.018	2.13		
550	553.8		.016	.26		
553.8	555.2		.001	.07		
555.2	556.2		.003	.02		
556.2	561.1		<	.02		
561.1	567.1		.207	.04	.292	
567.1	570.2		.006	<		
570.2	575		.002	.04		
575	580		.003	.03		
580	585		.013	.03		
585	590		.008	<		
590	595.5		.022	.03		
595.5	600		.040	.05		
600	605		.040	.11		
605	610		.041	.06		

HOLE NUMBER RS-409 PAGE 3 OF 4

CC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
		634.5-700' - DOZER FORMATION? ROCK IS A FINE-GRAINED to APHANITIC moderately soft RHYOLITE? BRECCIA. CLASTS ARE SUB-ROUNDED to SUB-ANGULAR, MATRIX to CLAST SUPPORTED, AND APPEAR TO BE COMPOSED OF THE SAME MATERIAL AS THE MATRIX. THIS WOULD BE AN AUTO-BRECCIA. THE BRECCIA TEXTURE MAY BE THE RESULT OF ALTERATION DIFFERENCES BETWEEN THE MATRIX & CLASTS. THIS UNIT CONTAINS TEXTURAL SIMILARITIES to PORTIONS OF THE SOUTH ZONE ORE HOST (PMBX, LSTWB).	620 630 640 650 660 670 680	30° 50° 50° 30° 50°	S1O2+ BARITE ± MARC + PYRITE 634.3-634.5' - ≈ 0.2' FAULT GOUGE consisting of a crushed rock & GREEN CLAY. @ 50° to CA. 687.6-688.7' - FAULT @ 40-50° to CA. CA WALLROCK	625.4-627' - S1O2+ BARITE + MARC + PYRITE ZONE ALONG 20-30° FRACTURE SET. BARITE IS CRYSTALLINE. NO OPEN SPACE. 634.5-641' - MODERATELY SOFT PROP+, W/ MINOR S1O2 + MARC + BARITE + PYRITE FRACTURES @ 20-30° to CA. 641-649' - MODERATELY HARD, S1O2+, W/ MODERATE S1O2+ MARC + PYRITE ± BARITE FRACTURING @ 50-60 & 20-30° to CA. 50-60° SET APPEARS to CUT & offset the 20-30° SET. 649-656' - MODERATELY HARD S1O2 +/-, WITH RARE-THIN PYRITE + S1O2 FRACTURES. 656-666' - MODERATELY HARD S1O2+, TO HARD. HYDROTHERMAL BRECCIA W/ S1O2 + MARC + PY + BARITE STOCKWORK & BRECCIA FILL. 666-675.3' - HARD, STRONG HYDROTHERMAL BRECCIA, S1O2++, W/ S1O2 + CRYSTALLINE BARITE, + MARCASITE ALTERED PY BRECCIA & FRACTURE FILL. 675.3-687.6' - MODERATELY HARD S1O2+, WITH MINOR to MODERATE S1O2 + MARC + PY ± BARITE FRACTURE @ 70-80° & 20-30° to CA. 687.6-688.7' - FAULT W/ CLAY GOUGE + MARC ± S1O2 ± BARITE. 688.7-700' - MODERATELY HARD S1O2+, WITH MODERATE to MINOR S1O2+ MARC + PY ± BARITE FRACTURE @ 20-30 & 50-60° to CA

FROM	TO	W	Au	Ag	Au2	Ag2
610	615		.010	.05		
615	620		.024	.33		
620	625.4		.029	.09		
625.4	627		.034	.04		
627	630		.009	.04		
630	634.5		.007	.05		
634.5	639		.016	.11		
639	641		.014	.04		
641	645.5		.011	.06		
645.5	649.7		.006	.04		
649.7	656		.005	.04		
656	661		.008	.04		
661	666		.006	.06		
666	670		.010	.05		
670	675.3		.039	.06		
675.3	680		.009	.05		

HOLE NUMBER RS-409 PAGE 4 OF 4

EC	RQD	LITHOLOGY	FT	GRAPHIC LOG	STRUCTURE	ALTERATION AND MINERALIZATION
			690	40-50°		
			700			
		TD = 700'	TD			

ANALYTICAL DATA

FROM	TO	W	Au	Ag	Au2	Ag2
680	683		.006	.03		
683	687.6		.009	.03		
687.6	688.7		.022	.11		
688.7	694.5		.039	.04		
694.5	700		.013	.04		

xAMERICAN ASSAY LABORATORIES
ANALYSIS REPORT SP046713

American Assay Laboratories

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

NEWMONT GOLD COMPANY

COPIES TO : CHARLOTTE BALLEW
: RICK LISLE
: RANDY VANCE
: KURT ALLEN

CLIENT REFERENCE No: RS-409 RECEIVED : 10 OCT 1997

No. SAMPLES : 103 REPORTED : 21 OCT 1997

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	FA30	15%	ppb	5
Au(R)	FA30	15%	ppb	5
Au(OZ)	FA30	15%	OPT	0.001
Au(RZ)	FA30	15%	OPT	0.001
Ag	D210	10%	ppm	0.5
Ag(OZ)	D210	10%	OPT	0.02

SIGNATORY : Susan King M.S.

AMERICAN ASSAY LABORATORIES

ANALYSIS REPORT SP046713

American Assay Laboratories

CLIENT : NEWMONT GOLD COMPANY
PROJECT : ROSEBUD
REFERENCE : RS-409

REPORTED : 21 OCT 1997

SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-409 000-005	<5		<0.001		<0.5	<0.02
RS-409 005-010	<5		<0.001		<0.5	<0.02
RS-409 010-015	<5		<0.001		<0.5	<0.02
RS-409 015-020	62		0.002		<0.5	<0.02
RS-409 020-025	7	6	<0.001	<0.001	<0.5	<0.02
RS-409 025-030	<5		<0.001		<0.5	<0.02
RS-409 030-035	<5		<0.001		<0.5	<0.02
RS-409 035-040	<5		<0.001		<0.5	<0.02
RS-409 040-045	<5		<0.001		1.1	0.03
RS-409 045-050	57		0.002		<0.5	<0.02
RS-409 050-055	29		<0.001		1.2	0.04
RS-409 055-060	100		0.003		1.7	0.05
RS-409 060-065	32		<0.001		<0.5	<0.02
RS-409 065-070	<5		<0.001		<0.5	<0.02
RS-409 070-075	<5		<0.001		<0.5	<0.02
RS-409 075-080	17		<0.001		0.7	0.02
RS-409 080-085	20		<0.001		1.3	0.04
RS-409 085-090	80		0.002		2.5	0.07
RS-409 090-095	8		<0.001		0.8	0.02
RS-409 095-100	<5		<0.001		0.7	0.02
RS-409 100-105	7		<0.001		0.7	0.02
RS-409 105-110	160		0.005		2.7	0.08
RS-409 110-115A	500		0.015		1.4	0.04
RS-409 110-115B	142	140	0.004	0.004	<0.5	<0.02
RS-409 115-120	25		<0.001		1.1	0.03

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SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-409 120-125	47		0.001		1.4	0.04
RS-409 125-130	52		0.002		0.9	0.03
RS-409 130-135	50		0.001		0.7	0.02
RS-409 135-140	<5		<0.001		<0.5	<0.02
RS-409 140-145	51		0.001		3.3	0.10
RS-409 145-150	76		0.002		8.0	0.23
RS-409 150-155	22		<0.001		2.3	0.07
RS-409 155-160	370		0.011		2.5	0.07
RS-409 160-165	257		0.007		2.0	0.06
RS-409 165-170	120		0.004		0.9	0.03
RS-409 170-175	397		0.012		2.7	0.08
RS-409 175-180	656		0.019		8.1	0.24
RS-409 180-185	993	932	0.029	0.027	2.8	0.08
RS-409 185-190	2298		0.067		2.3	0.07
RS-409 190-195	256	260	0.007	0.008	3.1	0.09
RS-409 195-200	337		0.010		1.9	0.06
RS-409 200-205	24		<0.001		<0.5	<0.02
RS-409 205-210	24		<0.001		<0.5	<0.02
RS-409 210-215	242		0.007		2.0	0.06
RS-409 215-220	16		<0.001		0.7	0.02
RS-409 220-225	91		0.003		2.1	0.06
RS-409 225-230	153		0.004		2.4	0.07
RS-409 230-235	27		<0.001		1.2	0.04
RS-409 235-240	11		<0.001		<0.5	<0.02
RS-409 240-245	<5		<0.001		<0.5	<0.02

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SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-409 245-250	<5		<0.001		<0.5	<0.02
RS-409 250-255	<5		<0.001		<0.5	<0.02
RS-409 255-260	<5		<0.001		<0.5	<0.02
RS-409 260-265	<5		<0.001		<0.5	<0.02
RS-409 265-270	<5	<5	<0.001	<0.001	<0.5	<0.02
RS-409 270-275	10		<0.001		<0.5	<0.02
RS-409 275-280	6		<0.001		<0.5	<0.02
RS-409 280-285	22		<0.001		<0.5	<0.02
RS-409 285-290	90		0.003		<0.5	<0.02
RS-409 290-295	195		0.006		1.0	0.03
RS-409 295-300	7		<0.001		0.6	<0.02
RS-409 300-305	98		0.003		2.1	0.06
RS-409 305-310	37		0.001		1.4	0.04
RS-409 310-315	85		0.002		2.4	0.07
RS-409 315-320	66		0.002		1.9	0.06
RS-409 320-325	109		0.003		1.6	0.05
RS-409 325-330	330		0.010		1.5	0.04
RS-409 330-335	36		0.001		0.7	0.02
RS-409 335-340	<5		<0.001		<0.5	<0.02
RS-409 340-345	102		0.003		1.8	0.05
RS-409 345-350	33		<0.001		1.1	0.03
RS-409 350-355	60		0.002		0.9	0.03
RS-409 355-360	<5		<0.001		<0.5	<0.02
RS-409 360-365	<5		<0.001		<0.5	<0.02
RS-409 365-370	49		0.001		0.8	0.02

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SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-409 370-375	25		<0.001		1.5	0.04
RS-409 375-380	146		0.004		2.6	0.08
RS-409 380-385	78		0.002		1.2	0.04
RS-409 385-390A	11		<0.001		<0.5	<0.02
RS-409 385-390B	92		0.003		<0.5	<0.02
RS-409 390-395	9		<0.001		<0.5	<0.02
RS-409 395-400	89		0.003		<0.5	<0.02
RS-409 400-405	<5	<5	<0.001	<0.001	<0.5	<0.02
RS-409 405-410	5		<0.001		0.8	0.02
RS-409 410-415	9		<0.001		0.7	0.02
RS-409 415-420	<5		<0.001		<0.5	<0.02
RS-409 420-425	54		0.002		<0.5	<0.02
RS-409 425-430	40		0.001		<0.5	<0.02
RS-409 430-435	72		0.002		<0.5	<0.02
RS-409 435-440	<5		<0.001		<0.5	<0.02
RS-409 440-445A	<5		<0.001		<0.5	<0.02
RS-409 440-445B	152		0.004		<0.5	<0.02
RS-409 445-450	<5		<0.001		<0.5	<0.02
RS-409 450-455	5		<0.001		<0.5	<0.02
RS-409 455-460	<5	<5	<0.001	<0.001	<0.5	<0.02
RS-409 460-465	<5		<0.001		<0.5	<0.02
RS-409 465-470	<5		<0.001		<0.5	<0.02
RS-409 470-475	<5		<0.001		<0.5	<0.02
RS-409 475-480	48		0.001		1.7	0.05
RS-409 480-485	70		0.002		2.1	0.06

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REFERENCE : RS-409

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SAMPLES	Au FA30 ppb	Au(R) FA30 ppb	Au(OZ) FA30 OPT	Au(RZ) FA30 OPT	Ag D210 ppm	Ag(OZ) D210 OPT
RS-409 485-490	50		0.001		2.6	0.08
RS-409 490-495	13		<0.001		1.6	0.05
RS-409 495-500	17		<0.001		1.5	0.04

CENTRAL BUSINESS FORMS • RENO • (702) 329-6405

SP

SUBMITTAL FORM

American Assay Laboratories

Geochemical • Environmental • Metallurgical

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Other Offices
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Santiago, Chile
Mendoza, Argentina

Company: Newmont Exploration - Rosebud Mine

Address: P.O. Box 2610

City Winnemucca State NV Zip 89446

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

Project Name: Rosebud Exploration Purchase Order Number:

Date Submitted: 10/9/97 Number of Samples: 103

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

SAMPLE IDENTIFICATION	TYPE	ELEMENTS REQUIRED
RS-409	RC	Au/Ag FA/AA each sample (5')
0-500' T.D. (100 samples)		
+ 115B		
+ 390B		
+ 445B		
390B MS-1 (RMG1)		
445B MS-2 MS-2		PEEL HERE 115B MS-2 MS-2

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:

Bob Kastelic/Randy Vance
Rosebud Mine

Results to:

Rick Lisle - Newmont Exploration
Winnemucca
Randy Vance } Rosebud Mine
Kurt Allen }

Comments:

CORE

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* NEWMONT GOLD COMPANY *
****

JOB NUMBER: 29-0521-311

WELL NAME: RS-409-CORE / VERTICAL

LOCATION: ROSEBUD MINE

SURVEY DATE: 10/14/97

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: 004.50

WELNAV

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

COMMENTS: ** BOART LONGYEAR **
***** MIKE JEX *****

PROJECTED F/650' T/700'.

****
****
*** 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: 29-0521-311 WELL NAME: RS-409-CORE / VERTICAL

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	0.02	-0.173	-89.60	055.42	0.10 N	0.14 E	0.80	0.40	0.17	AT 055.42	073.77
100.0	100.00	-0.14	-0.658	-89.17	018.08	0.54 N	0.40 E	1.13	0.57	0.67	AT 036.39	072.84
150.0	149.99	-0.51	-1.143	-89.43	003.05	1.13 N	0.53 E	0.63	0.32	1.25	AT 024.84	072.26
200.0	199.99	-0.73	-1.418	-89.75	027.13	1.48 N	0.59 E	0.71	0.36	1.59	AT 021.68	071.97
250.0	249.99	-0.24	-1.291	-88.69	162.33	1.03 N	0.81 E	3.00	1.50	1.31	AT 038.16	071.54
300.0	299.97	0.85	-0.712	-88.47	170.48	0.17 S	1.10 E	0.60	0.30	1.11	AT 098.83	070.96
350.0	349.95	2.16	-0.190	-88.26	151.87	1.50 S	1.56 E	1.14	0.57	2.17	AT 133.77	070.82
400.0	399.93	3.46	0.027	-88.71	143.43	2.62 S	2.26 E	1.00	0.50	3.46	AT 139.25	070.53
450.0	449.93	4.33	0.096	-89.29	143.23	3.32 S	2.78 E	1.16	0.58	4.33	AT 140.08	070.46
500.0	499.93	4.72	0.240	-89.66	193.03	3.71 S	2.93 E	1.11	0.56	4.73	AT 141.72	065.21
550.0	549.92	4.98	0.327	-89.60	127.73	3.96 S	3.03 E	0.80	0.40	4.99	AT 142.57	065.35
600.0	599.92	5.14	0.146	-89.66	044.28	3.96 S	3.28 E	0.99	0.49	5.14	AT 140.43	065.92
650.0	649.92	5.27	-0.011	-89.67	135.37	3.96 S	3.48 E	0.96	0.48	5.27	AT 138.69	066.36
700.0	699.92	5.56	0.000	-89.66	146.52	4.19 S	3.66 E	0.13	0.07	5.56	AT 138.81	066.28

****
* ******** *
* THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF *
* ******** *
* 700.0 FEET EQUALS 5.56 FEET AT 138.81 *
* ******** *
****

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* NEWMONT GOLD COMPANY *
****

JOB NUMBER: 29-0521-311

WELL NAME: RS-409-CORE / VS 305.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 10/14/97

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: 004.50

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 035.00

WELNAV

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

COMMENTS: ** BOART LONGYEAR **
***** MIKE JEX *****

PROJECTED F/650' T/700'.

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****
*** THIS DIRECTIONAL SURVEY REPORT IS ****
** CORRECT TO THE BEST OF MY KNOWLEDGE ***
* AND IS SUPPORTED BY ACTUAL FIELD DATA! *
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WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

JOB NUMBER: 29-0521-311 WELL NAME: RS-409-CORE / 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	0.16	0.061	-89.60	055.42	0.10 N	0.14 E	0.80	0.40	0.17	AT 055.42	073.77
100.0	100.00	0.67	0.016	-89.17	018.08	0.54 N	0.40 E	1.13	0.57	0.67	AT 036.39	072.84
150.0	149.99	1.23	-0.221	-89.43	003.05	1.13 N	0.53 E	0.63	0.32	1.25	AT 024.84	072.26
200.0	199.99	1.55	-0.367	-89.75	027.13	1.48 N	0.59 E	0.71	0.36	1.59	AT 021.68	071.97
250.0	249.99	1.31	0.072	-88.69	162.35	1.03 N	0.81 E	3.00	1.50	1.31	AT 038.16	071.54
300.0	299.97	0.49	0.995	-88.47	170.48	0.17 S	1.10 E	0.60	0.30	1.11	AT 098.83	070.96
350.0	349.95	-0.33	2.140	-88.26	151.87	1.50 S	1.56 E	1.14	0.57	2.17	AT 133.77	070.82
400.0	399.93	-0.85	3.351	-88.71	143.43	2.62 S	2.26 E	1.00	0.50	3.46	AT 139.25	070.53
450.0	449.93	-1.13	4.179	-89.29	143.23	3.32 S	2.78 E	1.16	0.58	4.33	AT 140.08	070.46
500.0	499.93	-1.36	4.529	-89.66	193.03	3.71 S	2.93 E	1.11	0.56	4.73	AT 141.72	065.21
550.0	549.92	-1.51	4.759	-89.60	127.73	3.96 S	3.03 E	0.80	0.40	4.99	AT 142.57	065.35
600.0	599.92	-1.37	4.957	-89.66	044.28	3.96 S	3.28 E	0.99	0.49	5.14	AT 140.43	065.92
650.0	649.92	-1.25	5.123	-89.67	135.37	3.96 S	3.48 E	0.96	0.48	5.27	AT 138.69	066.36
700.0	699.92	-1.33	5.402	-89.66	146.52	4.19 S	3.66 E	0.13	0.07	5.56	AT 138.81	066.28

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*                         ********                          *
*     THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF           *
*                         ********                          *
*  700.0 FEET EQUALS      5.56    FEET AT   138.81          *
*                         ********                          *
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WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

GYROSCOPIC DIRECTIONAL SURVEY
BY MINIMUM CURVATURE

FOR

****
* NEWMONT GOLD COMPANY *
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JOB NUMBER: 29-0521-311

WELL NAME: RS-409-CORE / VS 035.00

LOCATION: ROSEBUD MINE

SURVEY DATE: 10/14/97

SURVEY ENGINEER: VERN REID

GYRO REFERENCE BEARING: 004.50

VERTICAL SECTION CALCULATED IN A
PROPOSAL DIRECTION OF: 125.00

WELNAV

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

COMMENTS: ** BOART LONGYEAR **
***** MIKE JEX *****

PROJECTED F/650' T/700'.

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

WELLBORE NAVIGATION, INC.
WINNEMUCCA, NEVADA

JOB NUMBER: 29-0521-311 WELL NAME: RS-409-CORE / 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	0.06	-0.164	-89.60	055.42	0.10 N	0.14 E	0.80	0.40	0.17	AT 055.42	073.77
100.0	100.00	0.02	-0.674	-89.17	018.08	0.54 N	0.40 E	1.13	0.57	0.67	AT 036.39	072.84
150.0	149.99	-0.22	-1.231	-89.43	003.05	1.13 N	0.53 E	0.63	0.32	1.25	AT 024.84	072.26
200.0	199.99	-0.37	-1.550	-89.75	027.13	1.48 N	0.59 E	0.71	0.36	1.59	AT 021.68	071.97
250.0	249.99	0.07	-1.311	-88.69	162.35	1.03 N	0.81 E	3.00	1.50	1.31	AT 038.16	071.54
300.0	299.97	0.99	-0.489	-88.47	170.48	0.17 S	1.10 E	0.60	0.30	1.11	AT 098.83	070.96
350.0	349.95	2.14	0.330	-88.26	151.87	1.50 S	1.56 E	1.14	0.57	2.17	AT 133.77	070.82
400.0	399.93	3.35	0.851	-88.71	143.43	2.62 S	2.26 E	1.00	0.50	3.46	AT 139.25	070.53
450.0	449.93	4.18	1.126	-89.29	143.23	3.32 S	2.78 E	1.16	0.58	4.33	AT 140.08	070.46
500.0	499.93	4.53	1.361	-89.66	193.03	3.71 S	2.93 E	1.11	0.56	4.73	AT 141.72	065.21
550.0	549.92	4.76	1.507	-89.60	127.73	3.96 S	3.03 E	0.80	0.40	4.99	AT 142.57	065.35
600.0	599.92	4.96	1.368	-89.66	044.28	3.96 S	3.28 E	0.99	0.49	5.14	AT 140.43	065.92
650.0	649.92	5.12	1.248	-89.67	135.37	3.96 S	3.48 E	0.96	0.48	5.27	AT 138.69	066.36
700.0	699.92	5.40	1.328	-89.66	146.52	4.19 S	3.66 E	0.13	0.07	5.56	AT 138.81	066.28

```
*************************************************************
*                         ********                          *
*     THE HORIZONTAL DISPLACEMENT AT THE DEPTH OF           *
*                         ********                          *
*  700.0 FEET EQUALS      5.56   FEET AT  138.81            *
*                         ********                          *
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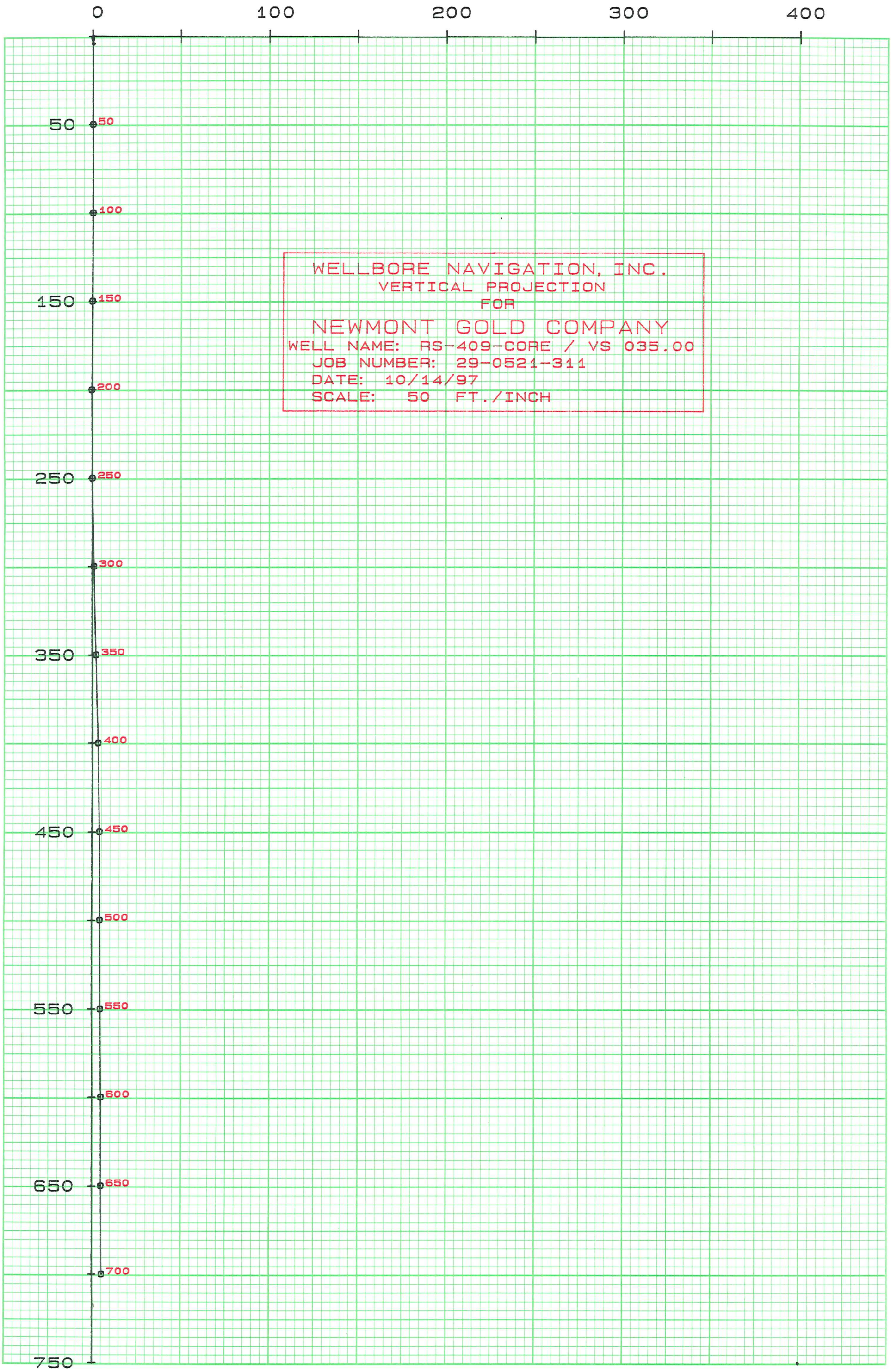

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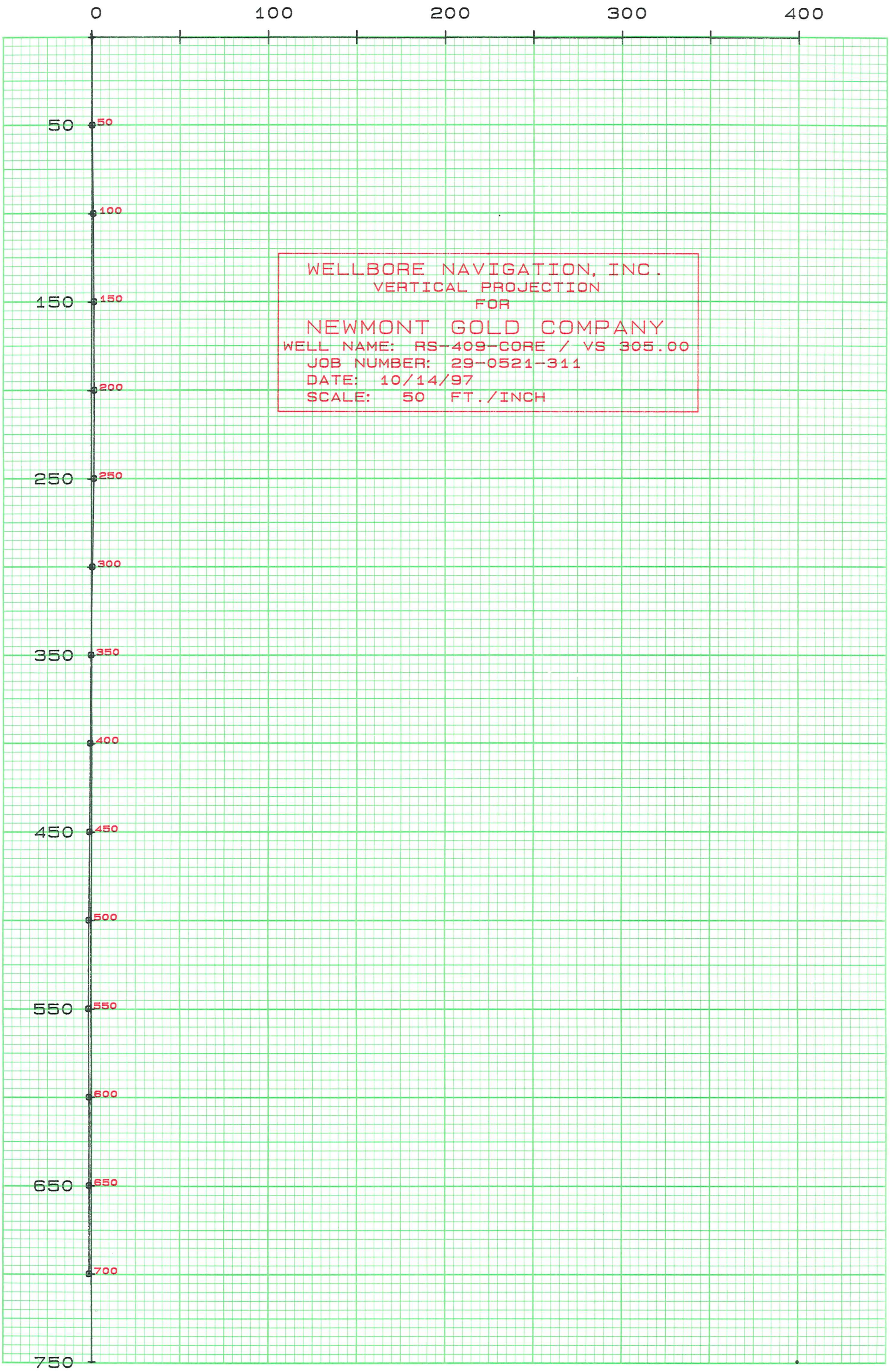

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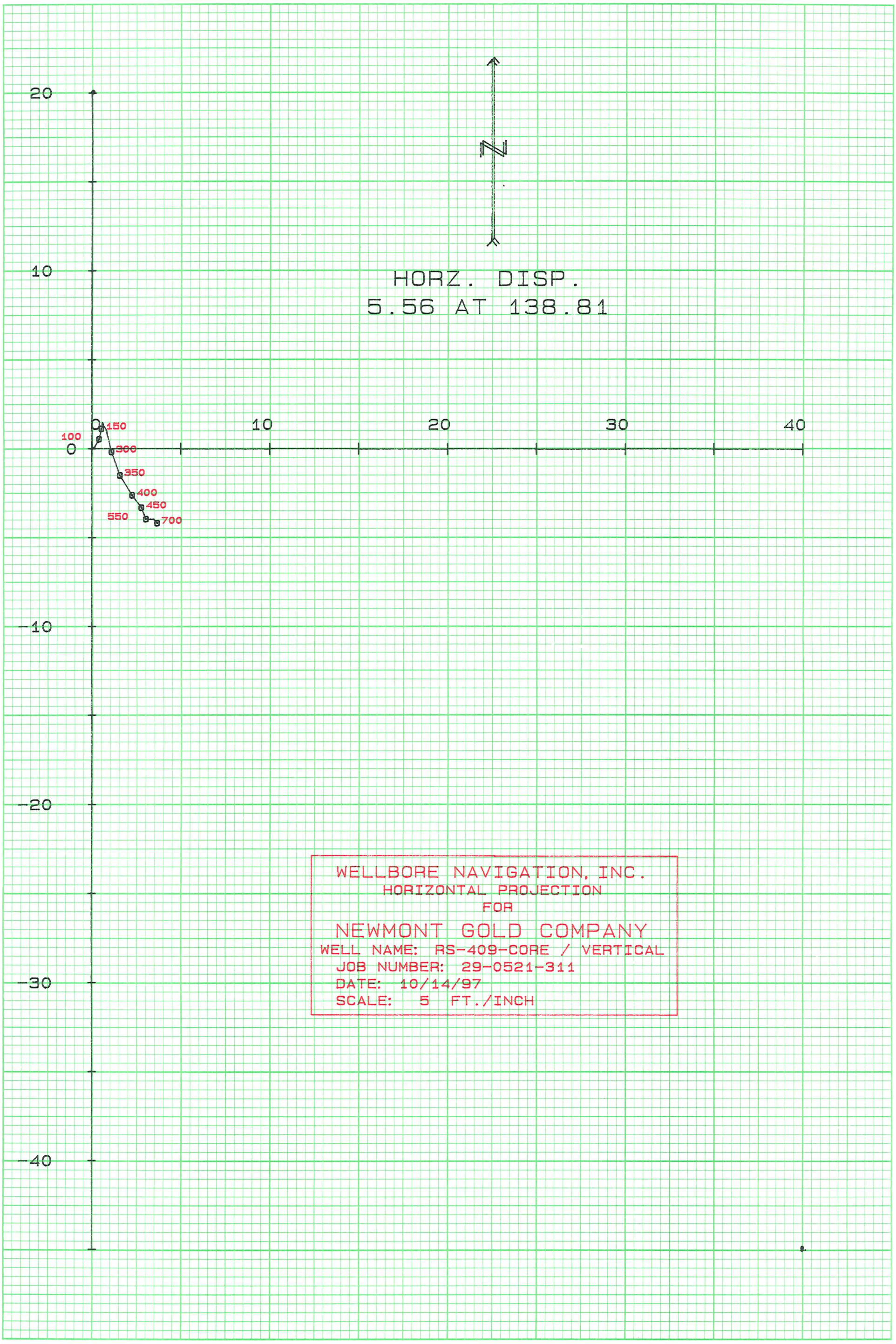

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DEPTH 498 — 507

RS-409 BOX NO 0
DEPTH 507 — 517

RS-409 BOX NO 3
DEPTH 517 — 526

530
RS-409 BOX NO 4
DEPTH 526-535

535
RS-409 BOX NO 5
DEPTH 535-543

546
RS-409 BOX NO 6
DEPTH 543-551

RS-409 BOX NO 7
DEPTH 551-559

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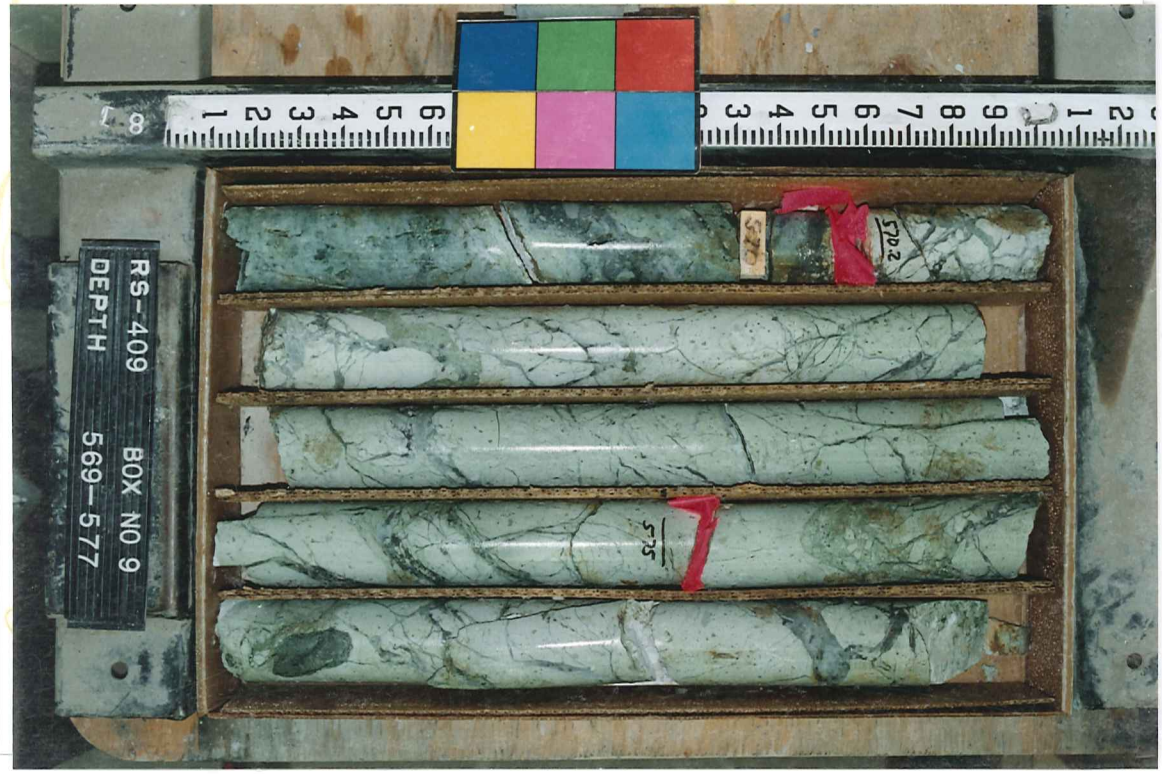
DEPTH 559-569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DEPTH 577-587

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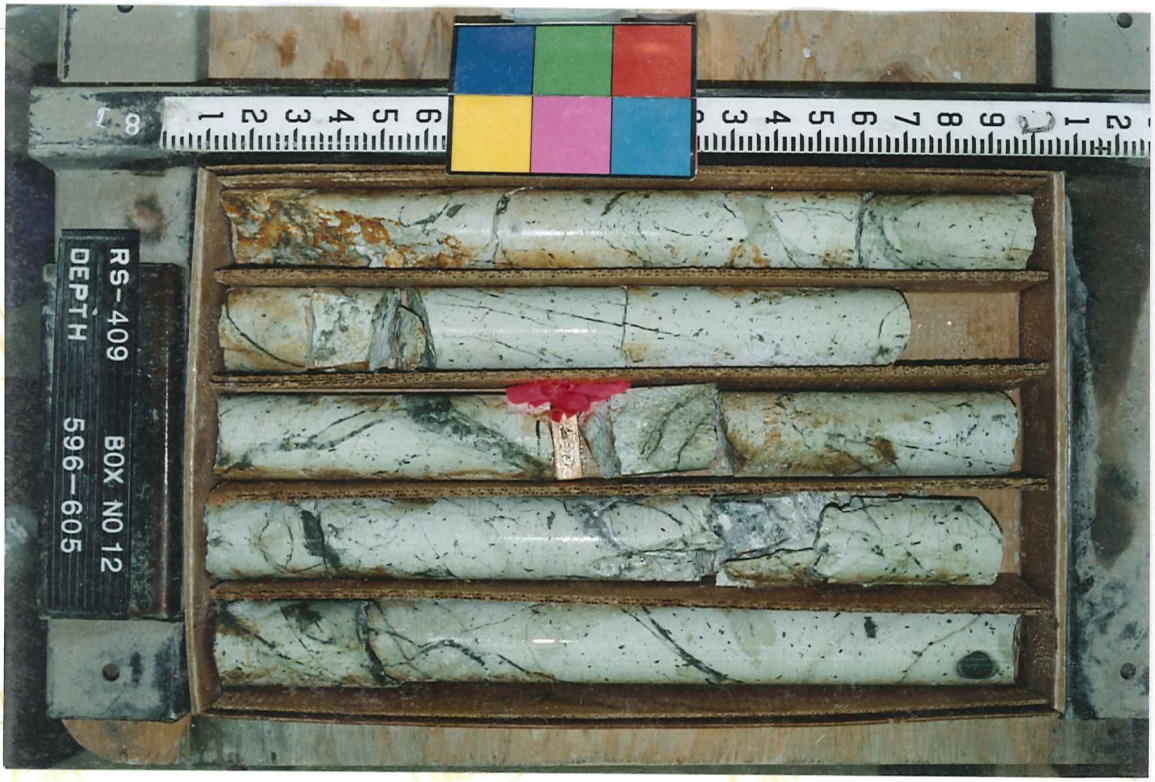
DEPTH 587-596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RS-409 BOX NO 13
DEPTH 605 — 613
605
610

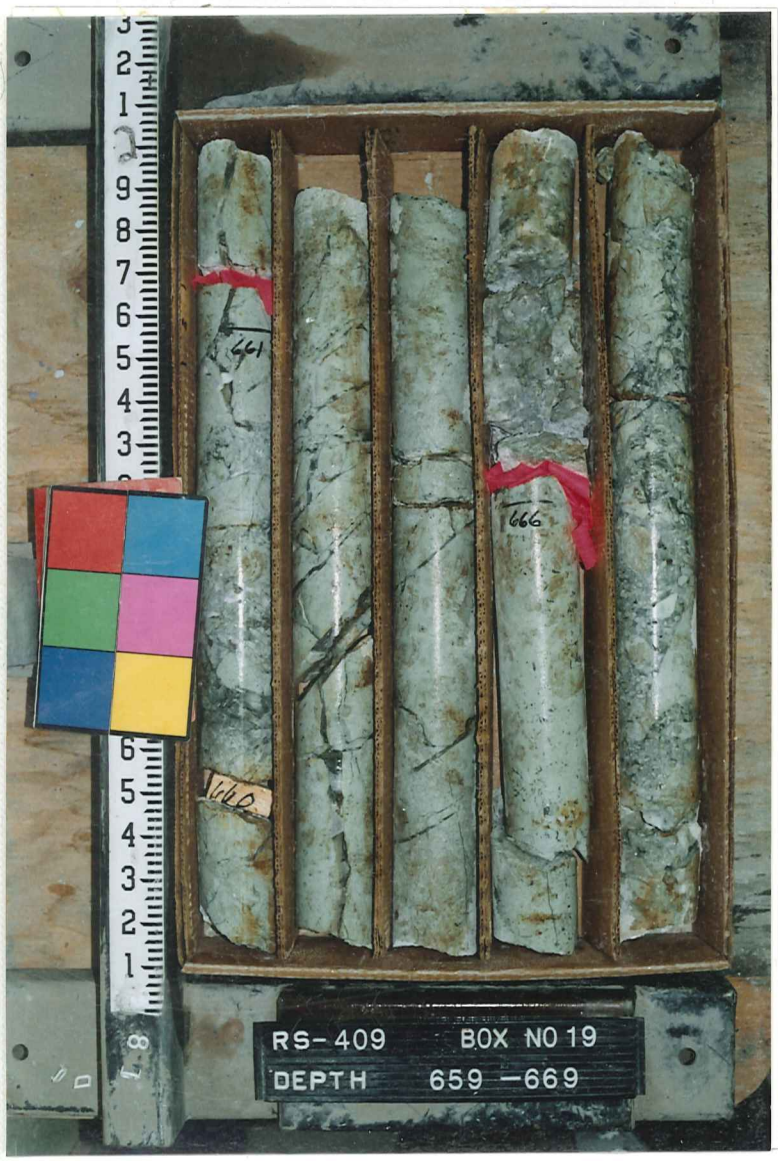
RS-409 BOX NO 14
DEPTH 613 —622
605

RS-409 BOX NO 15
DEPTH 622 —632
630

RS-409 BOX NO 16
DEPTH 632 -641

RS-409 BOX NO 17
DEPTH 641 -650

RS-409 BOX NO 18
DEPTH 650 -659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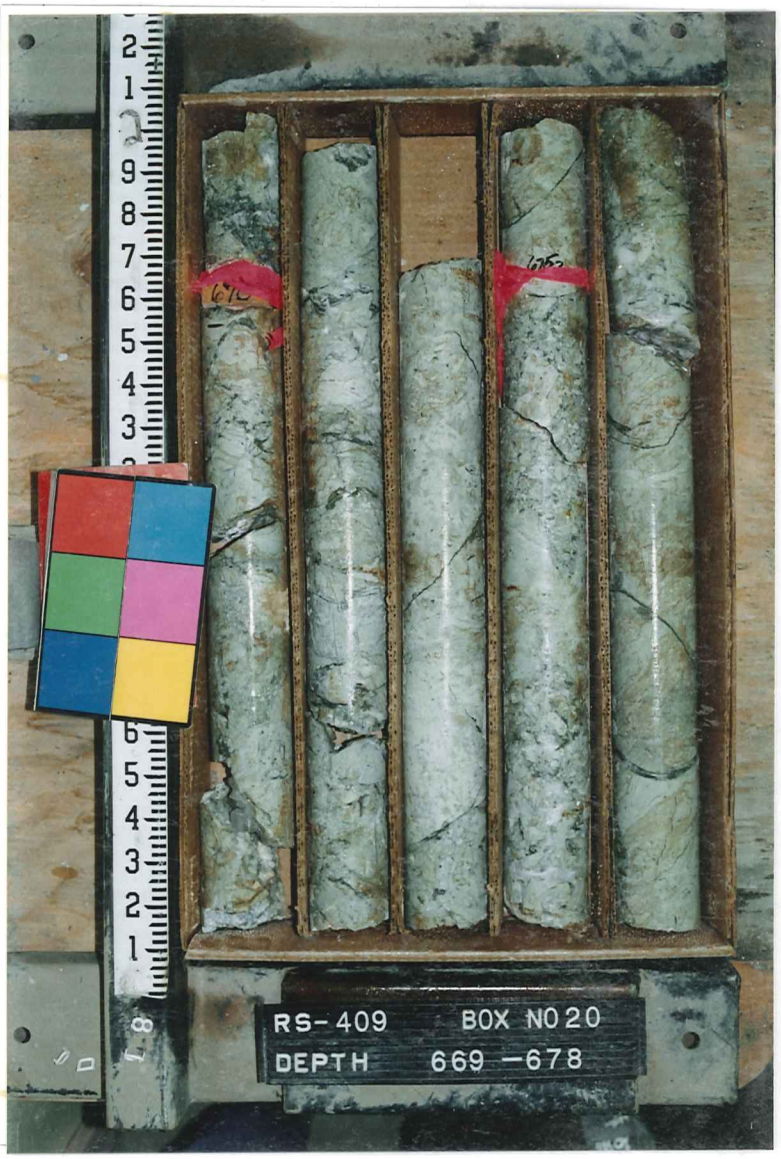
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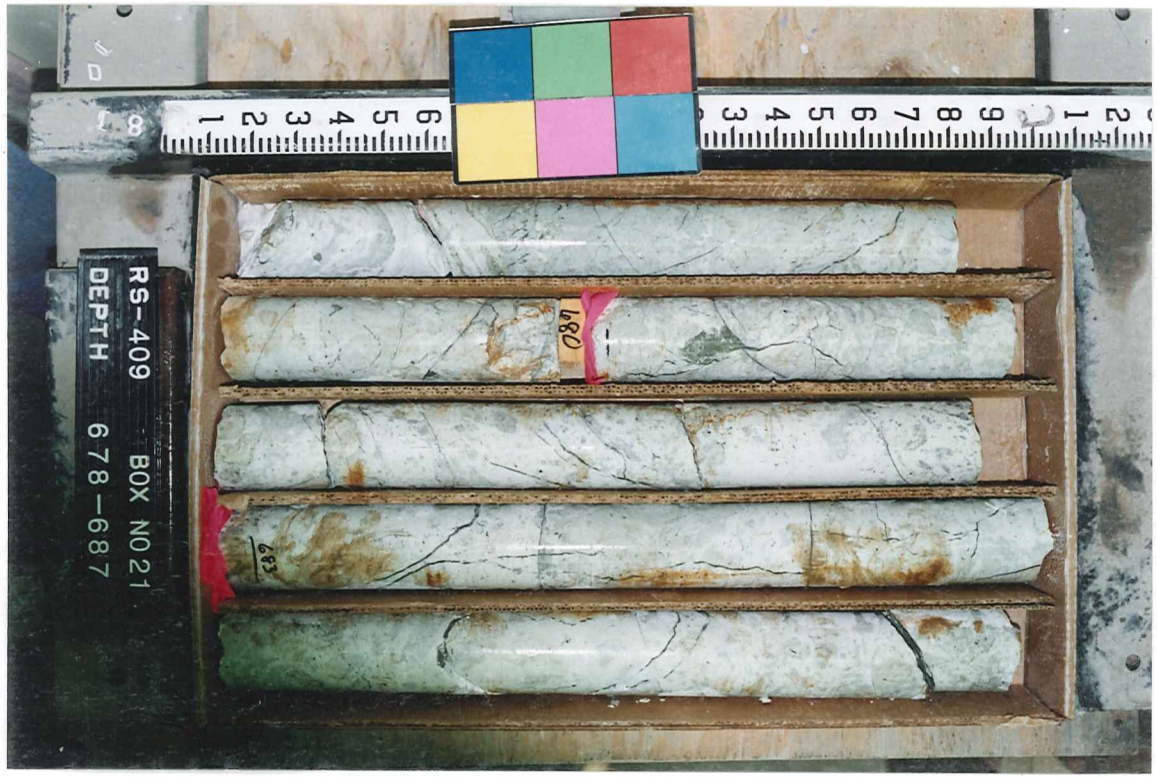
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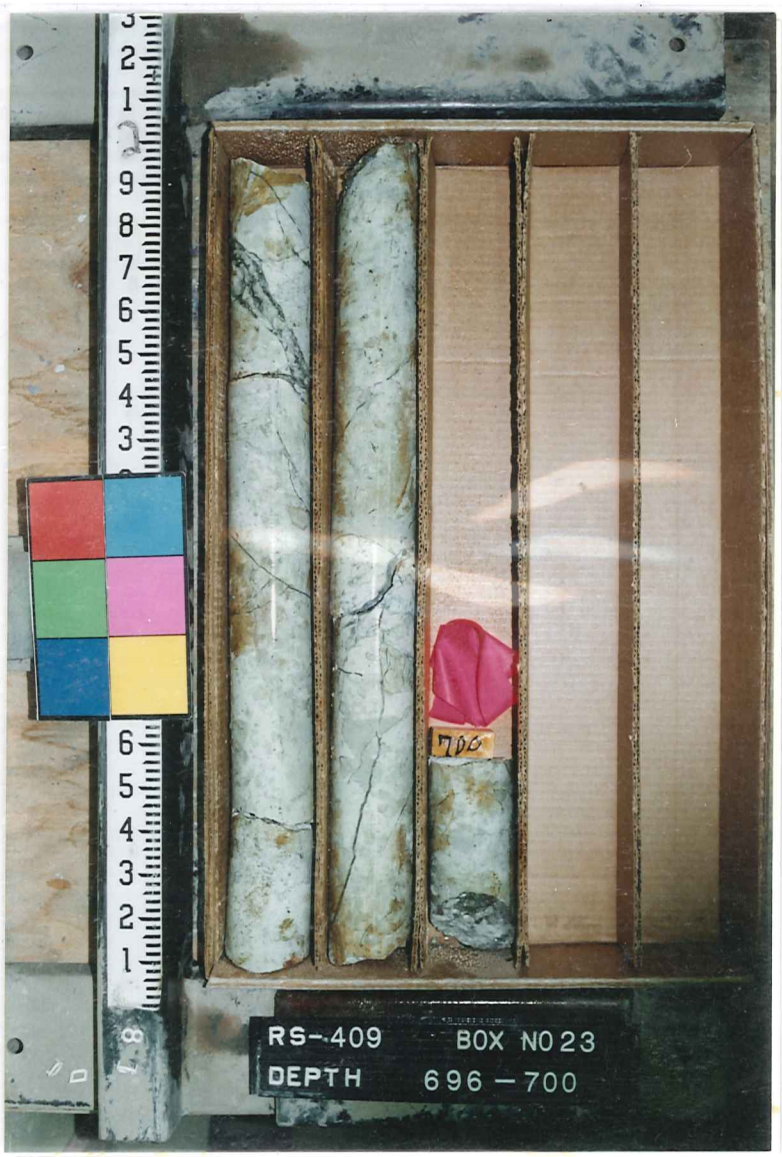
690
687.6
687.7
695.5
RS-409 BOX N022
DEPTH 687 -696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