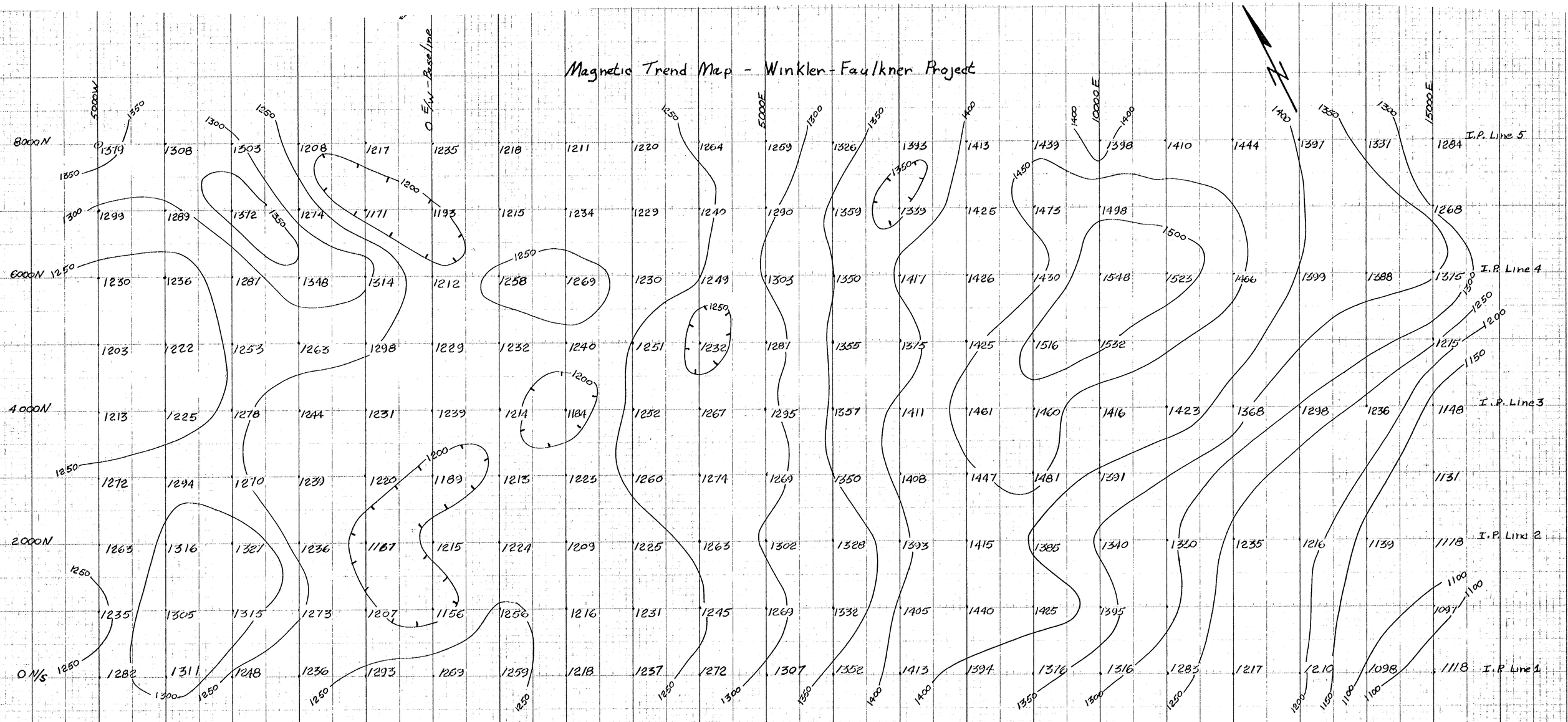
Magnetic Trend Map - Winkler-Faulkner Project



Scale 1" = 1000'
Contour Interval = 50 gammas

by Heinrichs Geoexploration Company
for
Newmont - Hecla Joint Venture
March 1965

R 26 E

T 6 S

WF · 12
WF · 5
WF · 3
WF · 4
WF-4
NH · 1
WF · 6
WF · 8 (9)
WF · 7
WF · 2
WF · 10
WF · 1

2000'
N 27° 30° E 2000'
BASE LINE 2000'
1000'

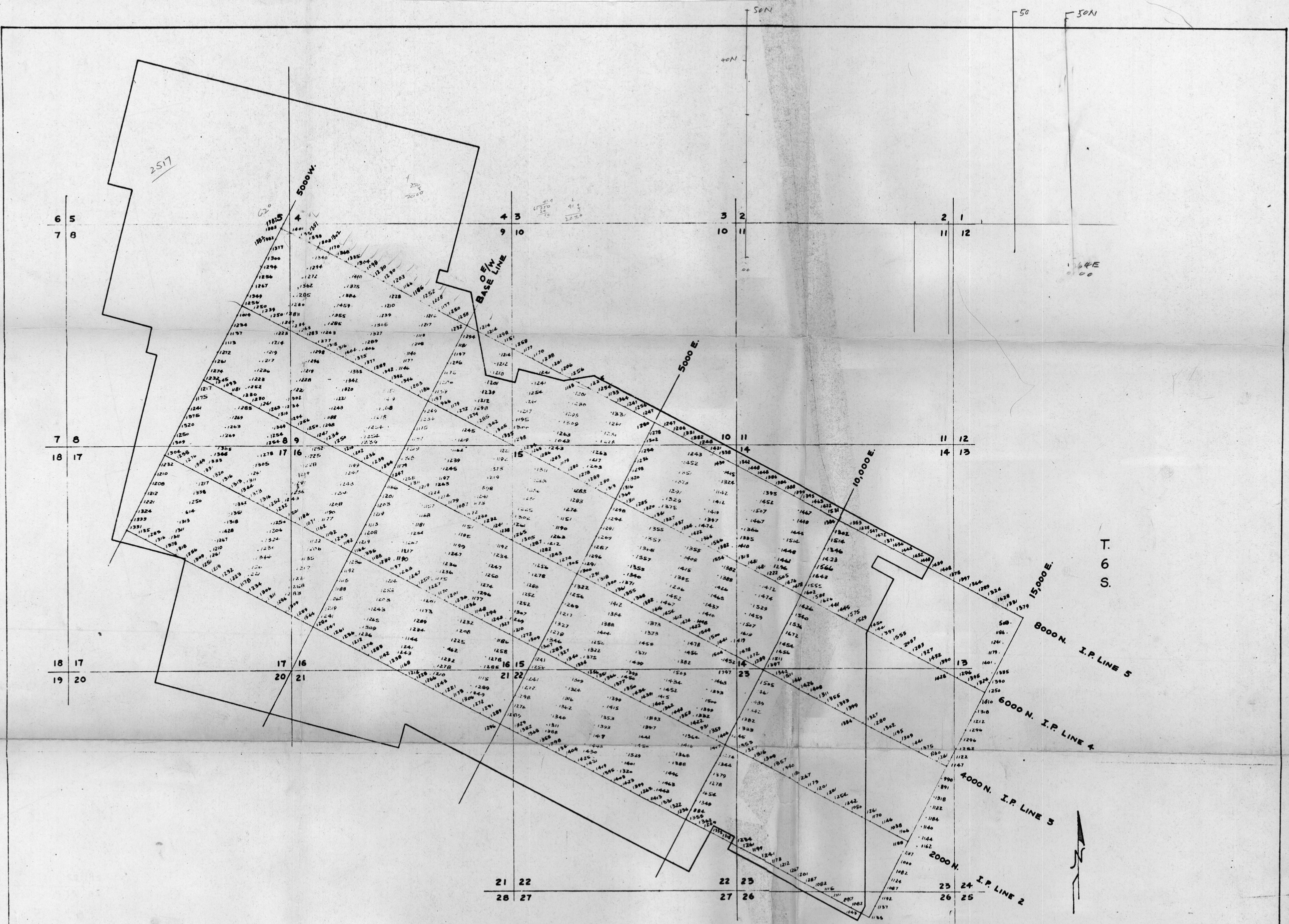
LINE 5
LINE 4
LINE 3
LINE 2
LINE 1

W – F PROSPECT

hecla · newmont joint venture

graham county, arizona

scale: 1" = 1200'



Prospect Boundary

Base map scale & info. from Hecla - Newmont.

INST.: ASKANIA GFZ TORSION (VERTICAL INTENSITY)
SCALE CONSTANT = 220 γ / SCALE DIV.
ARBITRARY MAGNETIC BASE.
ALL VALUES ARE CORRECTED FOR DIURNAL DRIFT & PLOTTED IN γ

HEINRICHS GEOEXPLORATION COMPANY
P.O. Box 5671 Tucson, Arizona

MAGNETIC SURVEY
W-F PROSPECT
FOR
HECLA-NEWMONT JOINT VENTURE

GRAHAM COUNTY, ARIZONA

SCALE: 1" = 1200	CONTOUR INTERVAL:	REVISIONS
	DATA BY: H M	
DATE: 3 5 65	SHEET OF	
DRAWN BY E G H	DRAWING NO.:	FILE:

(Big Bird, Bonita, Copper Chief + Copper Flat)

Sec 16
STATE SECTION
AT
COPPER
BONITA

Sec 15

Sec 14

Sec 17

Sec 18

Sec 21

Sec 22

Sec 23

Sec 24

Sec 25

Sec 26

Sec 27

Sec 28

Sec 29

Sec 30

Sec 31

Sec 32

Sec 33

Sec 34

Sec 35

Sec 36

T6S

R26E

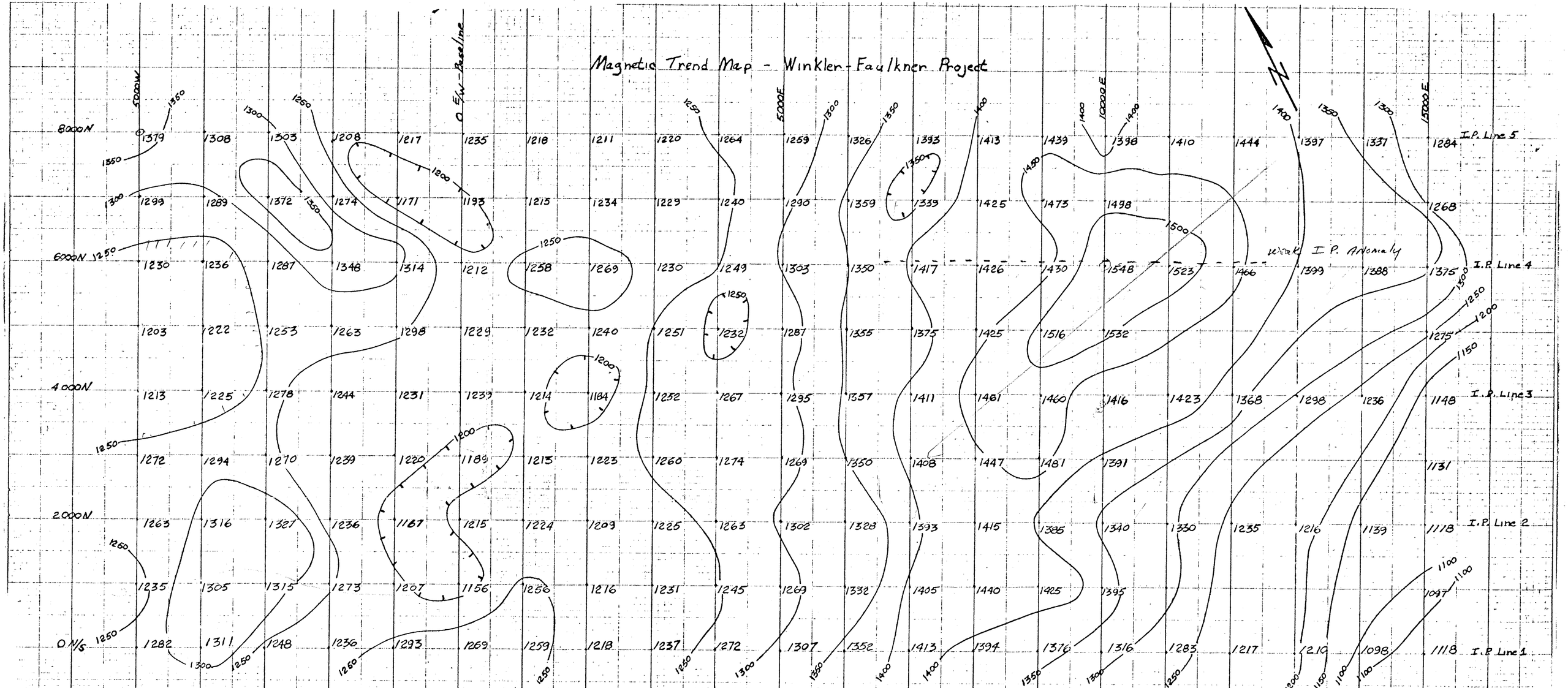
CoBre, Bonita, Big Bird, + Wash claims
T 6S, R 26E, G+SRB+M,
GRAHAM COUNTY, ARIZONA

Declination Approx 13°

FRA-148
AZ
TDN-871

BASE STATION
3899
1386
2519
1600γ
1500γ
1400γ
1300γ
1200γ
1100γ
5000 W
0 E/W
5000 E
10000 E
15000 E
LINE 5 (8000 N)
2000γ
1900γ
1800γ
1700γ
1600γ
1500γ
1400γ
1300γ
1200γ
1100γ
1000γ
900γ
LINE 4 (6000 N)
1500γ
1400γ
1300γ
1200γ
1100γ
1000γ
LINE 3 (4000 N)
1500γ
1400γ
1300γ
1200γ
1100γ
1000γ
900γ
LINE 2 (2000 N)
1400γ
1300γ
1200γ
1100γ
1000γ
LINE 1 (0 N/S)
SCALE
VERT. 1" = 100 GAMMAS
HORIZ. 1" = 1000 FT.
MAGNETIC PROFILES
W-F PROJECT
FOR
NEWMONT - HECLA
BY
HEINRICHS GEOEXPLORATION
MAR. 1965

Magnetic Trend Map - Winkler-Faulkner Project



Scale 1" = 1000'

Contour Interval = 50 gammas

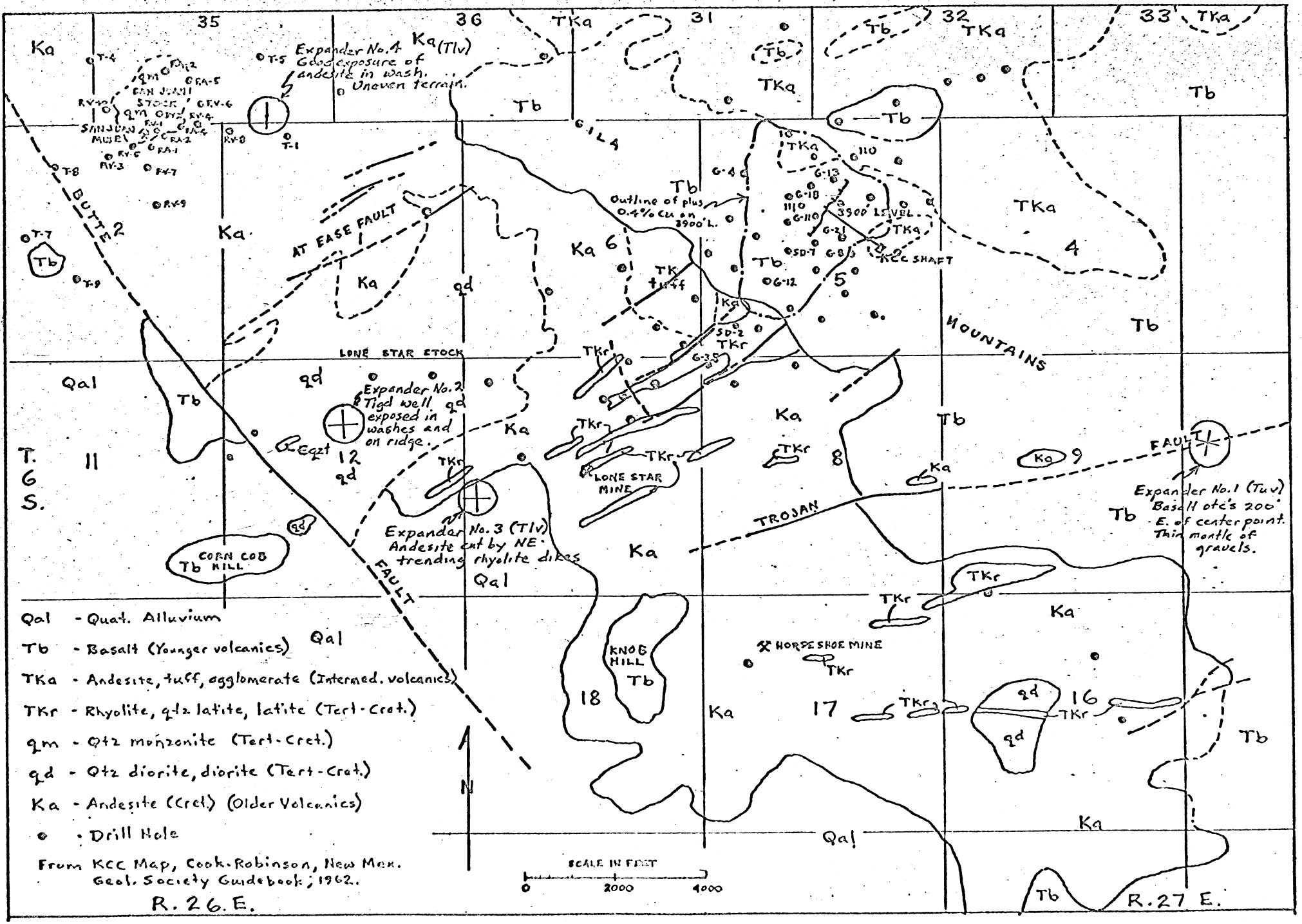
by Heinrichs Geoexploration Company

for

Newmont - Hecla Joint Venture

March 1965

PLATE 1



Qal - Quat. Alluvium

Tb - Basalt (Younger volcanics)

TKa - Andesite, tuff, agglomerate (Intermed. volcanics)

TKr - Rhyolite, qtz latite, latite (Tert-Cret.)

qm - Qtz monzonite (Tert-Cret.)

qd - Qtz diorite, diorite (Tert-Cret.)

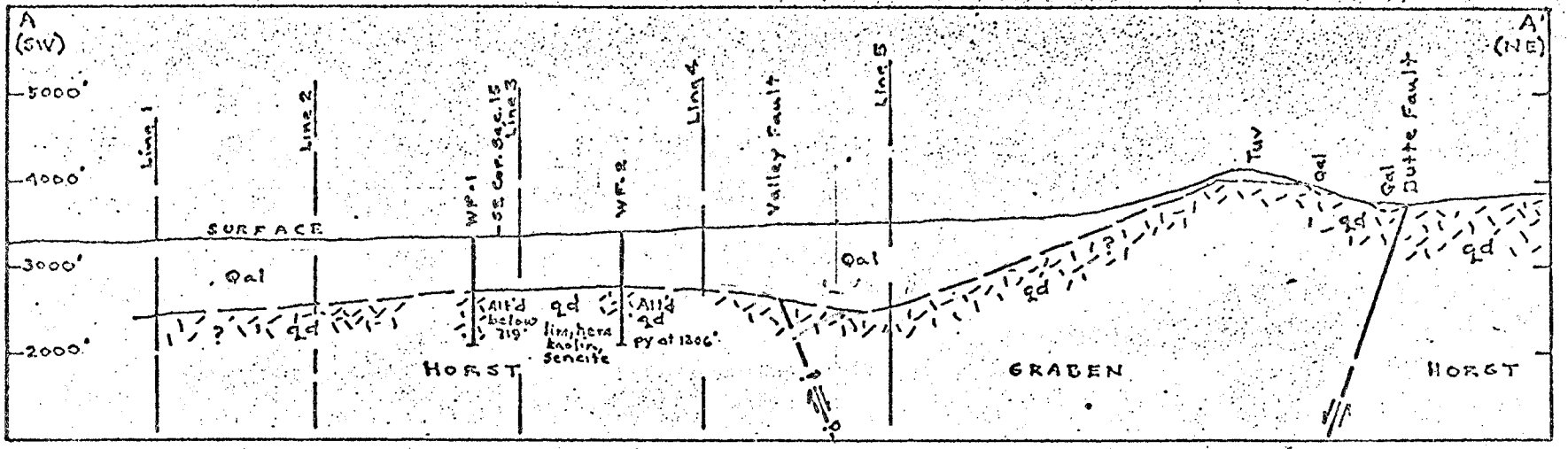
Ka - Andesite (Cret.) (Older Volcanics)

• - Drill Hole

From KCC Map, Cook-Robinson, New Mex. Geol. Society Guidebook; 1962.

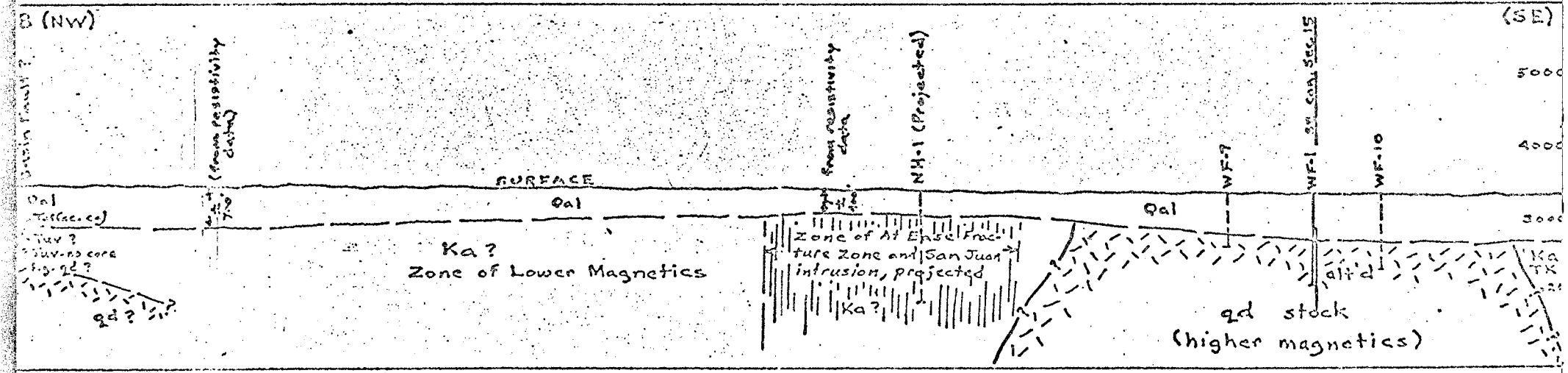
GENERALIZED GEOLOGICAL MAP, SAFFORD PROJECT AREA
SHOWING LOCATION OF EXPANDER RESISTIVITY SPREADS

Heinrichs
Feb. 5-6, 1965



SECTION A-A', LOOKING N45 W

SCALE: 1" = 2000'



SECTION B-B', LOOKING N40 E

SCALE: 1" = 2000'

SECTIONS TO ACCOMPANY PROPERTY-DRILLING MAP, WINKLER-FAULKNER

J. D. Bell
3-23-65

Standpipe
Casing

Started 3-30-65
Finished 5-29-65
Hole Size BXWL
Depth 1500
% Core Rec. 81.8

DIAMOND DRILL RECORD

Mine Winkler-Faulkner, Safford, Arizona
Location 1990' E. and 990' S. of NW Cor. Sec. 15, T 6 S, R 26 E, Graham Co., Arizona
Logged by Bell-Quinlan Date May, 1965
Drilled by Faulkner (Rotary), Boyles Bros. (DD)

Hole No. NH-1
Level Surface
Grid IP Line 4 - 4400 E
Latitude --
Departure --
Elevation 3465' Apx
Bearing --
Inclination Vertical

Depth Feet	Foot Core	Lithologic Description Summary Log	Sample Data No.	Interval Feet	Spls. Feet	Oz. -Ag-	% -Pb- Cu	% -Zn- Mo
0								
	Plug	Alluvium, difficult drilling, many boulders alternating with sections caving fine-grained sands.						
250								
	Plug	Alluvium, fairly uniform sand. Improved drilling. Water table at 350.						
500								
	Plug	Boulders, caving sand, difficult drilling. Bedrock at 572.						
572		Plug-bitted for assurance of bedrock and to						
	Plug	provide good seating for casing.						
595								
	5.4	Cored NX with rotary. Andesite agglomerate (Lower Volcanics), fine grained purplish ground mass, fragments, to 4" length, of lt gy-grn med grain porph. volcanic.						
601								
	Plug	To reach unfractured rock for start of diamond drilling.						
628								
	120.6	Andesite agglomerate as before, fragments to 7" length. Mild epidotization and chloritization. Rounded to sub-angular fragments of light grn-gy strongly porphyritic rock (andesite porphyry) and dark gy-purplish aphanitic rock with less numerous white fs phenos (porphyritic andesite). Thin fractures 10-20 to core, often lined with xtal. calcite. Specks fe ox and minor magnetite. Color banding and textural variations 60-90 to core, suggesting flow attitude. Rock moderately broken, but no pronounced faulting.	NH-1-1	875.7-877) 896-905)	10.3		(.08	NS
			NH-1-2	921-928.2	7.2		(.05	NS
764								
		Andesite porphyry, fine grained greenish groundmass, many ortho and plag. phenos,	NH-1-3	939.6-962	22.4	Jacobs	(.08	Tr
	45.2	few clots dark mafics, sparse magnetite and epidote. Fracturing 10-40 to core. Mod. broken.	NH-1-4	1119-1136	17.0		(.04	Tr
			NH-1-5	1230-1239	9.0		(.03	NS
811.5								
		Porphyritic andesite, dk gy-purplish sugary vfg ground mass, scattered white fs phenos. Epi-	NH-1-6	1298-1341	43.0		(.02	NS
	138.1	dote and sparse magnetite. Minor Mn Ox, fe ox, calcite on thin fracts. 10-30 to core. Andesite porphyry 861.9-862.1. Andesite is badly brkn, blchd yellowish, fe ox specks after py	NH-1-7	1453-1465	12.0	H & H	(.08	NS

(cont. next page)

Standpipe
Casing

Started
Finished
Hole Size
Depth
% Core Rec.

DIAMOND DRILL RECORD

Mine Winkler-Faulkner, Safford, Arizona
Location

Logged by Date
Drilled by

Hole No. NH-1
Level
Grid
Latitude
Departure
Elevation
Bearing
Inclination

Depth Feet	Feet Core	Lithologic Description Summary Log (continued)	Sample Data No.	Interval Feet	Splo. Feet	Oz. Ag	% Pb	% Zn
811.5	(cont.)	875.7-877, 896-905, and 921-935.5, 939.7-955.3. Partly blchd dull gy to yellowish gy from 935.5 to 939.7 and 971-975.5. 57% recovery 921-928, 44.75% recovery 934-955 (with some sericite), and 42.4% 975.5-984 (fractured, with a little andesite porphyry).					Cu	Mo
984		Andesite agglomerate, mostly gy to purplish gy, except in fract. zones 10-30 to core, where blchd to yellowish brn. Stronger epidote 1056-1067, sparse epidote below 1067 (decreased propylitic alteration). Weak orange-brn fe ox, black mn ox, xtal. calcite on open fracts. to						
	260.7	bottom. A few striated brown xtals (py?) 1241-1245, and scattered sparse magnetite and specular hematite. Rare textural variations 60-75 to core suggest flows tilted 15-30°. Badly brkn ggy fract. zones 1005-1019, 1105-1147, 1230-1239, and 1265-1280. No Cu noted. 29.2% recovery 1118-1130, and 53.8% recovery 1221-1280.						
1298		Andesite agglomerate, ± 1" sub-angular to rounded pebbles in porphyritic andesite ground mass, mostly purplish gray to dull gray, but bleached yellowish brown in fracture zone 1453-1465. Slight increase propylitic epidote-						
	148.4	chlorite 1338-1445, weak epidote, chlorite, Fe ox-Mn ox stains on fractures, very sparse magnetite and specularite to bottom. Increased MnOx and orange-red FeOx in gouge zones 1338-1351 and 1453- 1465. Moderately broken, except badly broken 1296-1351 and 1453-1465, with gg and bx. 44.2% recovery 1298-1351, 47.0% recovery 1378-1401, and 60.7% recovery 1452-1466.						
1500 End		Note: Core specimen at 796' identified by Newmont technical laboratory as andesite porphyry, and at 835' as andesite. Alteration minerals are chlorite, epidote, sericite, calcite, and secondary quartz. Magnetite, hematite, no sulfides.						

Standpipe
Casing 702'

Started
Finished
Hole Size 3¾"
Depth 1275
% Core Rec.

DIAMOND DRILL RECORD

Mine Winkler-Faulkner, Safford, Arizona
Location 190' W, 250' S of NE cor.
Sec. 22, T 6 S, R 26 E
Logged by Bell Date 10-20-64
Drilled by Faulkner, Rotary

Hole No. W-F - 1
Level Surface
Grid
Latitude
Departure
Elevation 3355' Apx
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description	Sample Data No.	Interval Feet	Spls. Feet	Oz. Ag	% Pb	% Zn
			Assays by P-D Laboratory					
						% Cu	% S	
0		Alluvium, sand, boulders, conglomerate, clay.		Sludge, rotary chips				
660		Rock bit. No core.						
706		Qtz diorite (?). Gray, med. grained, xtalline texture, lt gy-white partly euhedral fs;		736-1150	414	.064	.046	
				1150-1200	50	.650	.070	
	18.0	gy-grn mafics, softened outlines, gy interstitial qtz, some hematite stain. Brkn, stronger alteration, with fe ox and sericite 719-724.		1200-1275	75	.100	.050	
				Core				
724		Rock bit. No core.		702-724	22	.104	.095	
1275				Bit Sample				
End				1255	Spot	.225	.110	
		Note: Hole was deflected above 1150', and re-drilled through the 1150'-1200' interval. Hecla assay of cuttings from 40 feet of this 50' re-drilled interval assayed only 0.02% Cu. No copper visible in cuttings.						

16

DIAMOND DRILL RECORD

Standpipe
Casing

Started
Finished
Hole Size
Depth 1308'
% Core Rec.

Mine Winkler-Faulkner, Safford, Arizona
Location 975' N and 975' E of NE Cor. Sec. 22, T 6 S, R 26 E
Logged by Bell Date 10-20-64
Drilled by Faulkner, Rotary

Hole No. W-F - 2
Level Surface
Grid
Latitude
Departure
Elevation 3410' Apx.
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description	Sample Data No.	Interval Feet	Spls. Feet	Oz. Ag	% Pb	% Zn
0		Alluvium, sand, conglomerate.						
670		Rock bit, no core.						
680	10	Qtz diorite (?). Core is strongly altered, with Kaolin and limonite. Mafics gone. Ghosts of xtalline texture.						
690		Rock bit, no core. Cuttings show white fs, lesser qtz grains, dark mafics, minor epidote-chlorite, moderate to minor limonite and hematite stain. Classified as qtz diorite (?).						
900	3	Qtz diorite (?), altered, with faint relict euhedral fs, cube void after py, kaolin, orange limonite with some reddish specks indigenous hematite.		No visible copper.				
903		Rock bit, no core. Cuttings as in 690-900 interval, varying amounts limonite and hematite, some specks disseminated pyrite 945-960, sparse epidote-chlorite. Qtz diorite (?).						
1227		Rock bit, no core. Not logged. Harder rock reported in bottom.						
1308								
End								
		Note: Tool string in bottom.						

Standpipe
Casing

Started
Finished
Hole Size
Depth
% Core Rec.

DIAMOND DRILL RECORD

Mine Winkler-Faulkner, Safford, Arizona
Location See below

Logged by Date
Drilled by Faulkner, Rotary

Hole No. W-F - 3, 4, 5
Level Surface
Grid
Latitude
Departure
Elevation
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description	Sample Data					
			No.	Interval Feet	Sple. Feet	Oz. Ag	% Pb	% Zn
		W-F - 3: 1600' N, 180' W of SE Cor. Sec. 8, T 6 S, R 26 E. Lost hole at shallow depth in alluvium.						
		W-F - 4: 800' N, 1100' W of SE Cor. Sec. 10, T 6 S, R 26 E. 0-240' Alluvium 240-580' Crushed, ggy rock. No core.						
		W-F - 5: 2200' N, 1800' W of SE Cor. Sec. 8. 0-580' Alluvium. Stopped.						

DIAMOND DRILL RECORD

Standpipe
Casing 910'

Started
Finished
Hole Size
Depth 1232'
% Core Rec.

Mine Winkler-Faulkner, Safford, Arizona
Location 1500' N, 100' E of SW Cor, Sec. 16, T 6 S, R 26 E.
Logged by Bell Date 10-20-64
Drilled by Faulkner, Rotary

Hole No. W-F - 6
Level Surface
Grid
Latitude
Departure
Elevation 3285' Apx
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description	Sample Data					
			No.	Interval Feet	Spls. Feet	Oz. Ag	% Pb	% Zn
0		Alluvium, sand, conglomerate, 165' clay.						
800		Rock bit, no core.						
910		Alternating beds red-brn conglomerate, pinkish-gy sandstone, brn siltstone, and thin andesite flows 45 to core.		No visible copper.				
	322							
1044		Dense gray aphanitic andesite flows and thinner flows red vesicular basalt. Sparse chlorite, calcite, fe ox. Talcy bx at bottom.						
1232								
End								

DIAMOND DRILL RECORD

Standpipe 11'
Casing
Started
Finished
Hole Size
Depth 740'
% Core Rec.

Mine Winkler-Faulkner, Safford, Arizona
Location 400' N, 1200' W of NE Cor.
Sec. 22, T 6 S, R 26 E.
Logged by Bell Date 10-20-64
Drilled by Faulkner, Rotary

Hole No. W-F - 7
Level Surface
Grid
Latitude
Departure
Elevation 3360' Apx
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description	Sample Data No.	Interval Feet	Sple. Feet	Oz. Ag	% Pb	% Zn
0		Alluvium, sand, with many boulders.						
665		Rock bit, no core.						
710	10	Qtz diorite, medium grained, somewhat porphyritic xtalline texture, lt gy milky euhedral fs xtals with glistening surfaces, brn-blk biotite, gy interstitial qtz, a little orthoclase. Not strongly altered.	Spot assays to 0.04% Cu.					
720		Rock bit, no core.						
725	14	As in 710-720 interval, with some brn fe ox stains and sparse epidote. Qtz diorite.						
739		No core.						
740								
End								

20

Standpipe
Casing

Started
Finished
Hole Size
Depth 1063'
% Core Rec.

DIAMOND DRILL RECORD

Mine Winkler-Faulkner, Safford, Arizona
Location 1300' N, 550' E of SW Cor.
Sec. 16 T 6 S, R 26 E.
Logged by Bell Date 10-20-64
Drilled by Faulkner, Rotary

Hole No. W-F - 9
Level Surface
Grid
Latitude
Departure
Elevation 3290' Apx
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description	Sample Data No.	Interval Feet	Spls. Feet	Oz. Ag	% Pb	% Zn
0		Alluvium, sands, conglomerate, boulders						
970		Rock bit, no core. Cuttings suggest reddish andesite or basalt.				No visible copper. Spot spl by Faulkner reported to assay .01 oz. Ag, .02% Cu, Tr. Mo.		
1043	20	Andesite, dark gray dense aphanitic rock, flecks fe ox after py, 3' bx section, color banding 40 to core.						
1063								
End								

21

Standpipe
Casing

Started
Finished
Hole Size
Depth 1040'
% Core Rec.

DIAMOND DRILL RECORD

Mine Winkler-Faulkner, Safford, Arizona
Location 110' N, 1220' E of NE Cor. Sec. 22, T 6 S, R 26 E.
Logged by Bell Date 6-29-64
Drilled by Faulkner, Rotary

Hole No. W-F 10
Level Surface
Grid
Latitude
Departure
Elevation 3390' Apx
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description	Sample Data No.	Interval Feet	Spls. Feet	Oz. Ag	% Pb	% Zn
0		Alluvium, sand, conglomerate, clay						
675	10	Some core, not marked as to depth. Gray porphyritic rock, badly brkn, with calcite veinlets, considerable limonite. Qtz diorite	(?).	No visible copper.				
690		Rock bit, no core. Cuttings described as yellowish, limonitic, some brn fe ox.						
1040								
End		Note: 3 bit cones in bottom.						

22

DIAMOND DRILL RECORD

Standpipe
Casing

Started 7-11-64
Finished
Hole Size
Depth 1270'
% Core Rec.

Mine Winkler-Faulkner, Safford, Arizona
Location 900' N, 2250' E of SW Cor. Sec. 5, T 6 S, R 26 E.
Logged by Bell Date 10-20-64
Drilled by Faulkner, Rotary

Hole No. W-F - 12
Level Surface
Grid
Latitude
Departure
Elevation 3480' Apx
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description	Sample Data No.	Interval Feet	Sple. Feet	Oz. Ag	% Pb	% Zn
0		Alluvium, sand, gravel, conglomerate.						
550		Two boxes core, depth intervals not marked. In first, some tuffaceous conglomerate, succeeded by porph. andesite (?), a gray fine grained rock, faintly xtalline texture, consisting of partly euhedral fs, hornblende						
	20	lathes, biotite, and interstitial qtz. Specks magnetite, some fe ox specks after disseminated py, and a few yellowish py grains. Second box, same fine grain gray rock, faintly xtalline texture, biotite. Remainder rock bitted, no core.		No visible copper.				
1090		Gray fine grained rock, sugary ground mass,						
	10	with gray white fs, biotite, specks magnetite and pyrite, interstitial qtz. Porphyritic andesite (?).						
1100		Rock bit, no core.						
1270								
End								

DIAMOND DRILL RECORD

Standpipe
Casing 702'

Started
Finished
Hole Size 3¾"
Depth 1275
% Core Rec.

Mine Winkler-Faulkner, Safford, Arizona
Location 190' W, 250' S of NE cor.
Sec. 22, T 6 S, R 26 E
Logged by Bell Date 10-20-64
Drilled by Faulkner, Rotary

Hole No. W-F - 1
Level Surface
Grid
Latitude
Departure
Elevation 3355' Apx
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description
0		Alluvium, sand, boulders, conglomerate, clay.
660		Rock bit. No core.
706		Qtz diorite (?). Gray, med. grained, xtalline texture, lt gy-white partly euhedral fs;
	18.0	gy-grn mafics, softened outlines, gy interstitial qtz, some hematite stain. Brkn, stronger alteration, with fe ox and sericite 719-724.
724		Rock bit. No core.
1275		
End		

Note: Hole was deflected above 1150', and re-drilled through the 1150'-1200' interval. Hecla assay of cuttings from 40 feet of this 50' re-drilled interval assayed only 0.02% Cu. No copper visible in cuttings.

Sample Data

Assays by P-D Laboratory

No.	Interval Feet	Spls. Feet	Oz. Ag	% Pb	% Zn	% Cu	% S
	Sludge, rotary chips						
	736-1150	414	.064	.046			
	1150-1200	50	.650	.070			
	1200-1275	75	.100	.050			
	Core						
	702-724	22	.104	.095			
	Bit Sample						
	1255	Spot	.225	.110			

Standpipe
Casing
Started
Finished
Hole Size
Depth 1308'
% Core Rec.

DIAMOND DRILL RECORD

Mine Winkler-Faulkner, Safford, Arizona
Location 975' N and 975' E of NE Cor. Sec. 22, T 6 S, R 26 E
Logged by Bell Date 10-20-64
Drilled by Faulkner, Rotary

Hole No. W-F - 2
Level Surface
Grid
Latitude
Departure
Elevation 3410' Apx.
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description	Sample Data No.	Interval Feet	Spls. Feet	Oz. Ag	% Pb	% Zn
0		Alluvium, sand, conglomerate.						
670		Rock bit, no core.						
680	10	Qtz diorite (?). Core is strongly altered, with Kaolin and limonite. Mafics gone. Ghosts of xtalline texture.						
690		Rock bit, no core. Cuttings show white fs, as lesser qtz grains, dark mafics, minor epidote-chlorite, moderate to minor limonite and hematite stain. Classified as qtz diorite (?).						
900	3	Qtz diorite (?), altered, with faint relict euhedral fs, cube void after py, kaolin, orange limonite with some reddish specks indigenous hematite.		No visible copper.				
903		Rock bit, no core. Cuttings as in 690-900 interval, varying amounts limonite and hematite, some specks disseminated pyrite 945-960, sparse epidote-chlorite. Qtz diorite (?).						
1227		Rock bit, no core. Not logged. Harder rock reported in bottom.						
1308								
End		Note: Tool string in bottom.						

Standpipe
Casing

Started
Finished
Hole Size
Depth
% Core Rec.

DIAMOND DRILL RECORD

Mine Winkler-Faulkner, Safford, Arizona
Location See below

Logged by Date
Drilled by Faulkner, Rotary

Hole No. W-F - 3, 4, 5
Level Surface
Grid
Latitude
Departure
Elevation
Bearing
Inclination Vertical

Depth Feet	Foot Core	Lithologic Description	Sample Data					
			No.	Interval Feet	Sple. Feet	Oz. Ag	% Pb	% Zn
		W-F - 3: 1600' N, 180' W of SE Cor. Sec. 8, T 6 S, R 26 E. Lost hole at shallow depth in alluvium.						
		W-F - 4: 800' N, 1100' W of SE Cor. Sec. 10, T 6 S, R 26 E. 0-240' Alluvium 240-580' Crushed, ggy rock. No core.						
		W-F - 5: 2200' N, 1800' W of SE Cor. Sec. 8. 0-580' Alluvium. Stopped.						

Standpipe
Casing 910'

Started
Finished
Hole Size
Depth 1232'
% Core Rec.

DIAMOND DRILL RECORD

Mine Winkler-Faulkner, Safford, Arizona
Location 1500' N, 100' E of SW Cor, Sec. 16, T 6 S, R 26 E.
Logged by Bell Date 10-20-64
Drilled by Faulkner, Rotary

Hole No. W-F - 6
Level Surface
Grid
Latitude
Departure
Elevation 3285' Apx
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description	Sample Data No.	Interval Feet	Spls. Feet	Oz. Ag	% Pb	% Zn
0		Alluvium, sand, conglomerate, 165' clay.						
800		Rock bit, no core.						
910		Alternating beds red-brn conglomerate, pinkish-gy sandstone, brn siltstone, and thin andesite flows 45 to core.		No visible copper.				
	322							
1044		Dense gray aphanitic andesite flows and thinner flows red vesicular basalt. Sparse chlorite, calcite, fe ox. Talcy bx at bottom.						
1232								
End								

Standpipe 11'
Casing

Started
Finished
Hole Size
Depth 740'
% Core Rec.

DIAMOND DRILL RECORD

Mine Winkler-Faulkner, Safford, Arizona
Location 400' N, 1200' W of NE Cor.
Sec. 22, T 6 S, R 26 E.
Logged by Bell Date 10-20-64
Drilled by Faulkner, Rotary

Hole No. W-F - 7
Level Surface
Grid
Latitude
Departure
Elevation 3360' Apx
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description	Sample Data No.	Interval Feet	Sple. Feet	Oz. Ag	% Pb	% Zn
0		Alluvium, sand, with many boulders.						
665		Rock bit, no core.						
710	10	Qtz diorite, medium grained, somewhat porphyritic xtalline texture, lt gy milky euhedral fs xtals with glistening surfaces, brn-blk biotite, gy interstitial qtz, a little orthoclase. Not strongly altered.	Spot assays to 0.04% Cu.					
720		Rock bit, no core.						
725	14	As in 710-720 interval, with some brn fe ox stains and sparse epidote. Qtz diorite.						
739		No core.						
740								
End								

Standpipe
Casing

Started
Finished
Hole Size
Depth 1063'
% Core Rec.

DIAMOND DRILL RECORD

Mine Winkler-Faulkner, Safford, Arizona
Location 1300' N, 550' E of SW Cor. Sec. 16 T 6 S, R 26 E.
Logged by Bell Date 10-20-64
Drilled by Faulkner, Rotary

Hole No. W-F - 9
Level Surface
Grid
Latitude
Departure
Elevation 3290' Apx
Bearing
Inclination Vertical

Depth Foot	Foot Core	Lithologic Description	Sample Data No.	Interval Foot	Spec. Foot	Oz. Ag	% Pb	% Zn
0		Alluvium, sands, conglomerate, boulders						
970		Rock bit, no core. Cuttings suggest reddish andesite or basalt.						
1043		Andesite, dark gray dense, aphanitic rock, flecks fe ox after py, 3' bx section, color banding 40 to core.						
	20							
1063								
End								

No visible copper. Spot spl by Faulkner reported to assay .01 oz. Ag, .02% Cu, Tr. Mo

FORM 127 4M 7-64

21

Standpipe
Casing

Started
Finished
Hole Size
Depth 1040'
% Core Rec.

DIAMOND DRILL RECORD

Mine Winkler-Faulkner, Safford, Arizona
Location 110' N, 1220' E of NE Cor.
Sec. 22, T 6 S, R 26 E.
Logged by Bell Date 6-29-64
Drilled by Faulkner, Rotary

Hole No. W-F 10
Level Surface
Grid
Latitude
Departure
Elevation 3390' Apx
Bearing
Inclination Vertical

Depth Foot	Feet Core	Lithologic Description	Sample Data No.	Interval Foot	Spls. Foot	Oz. Ag	% Pb	% Zn
0		Alluvium, sand, conglomerate, clay						
675								
	10	Some core, not marked as to depth. Gray porphyritic rock; badly brkn, with calcite veinlets, considerable limonite. Qtz diorite	(?).					
690				No visible copper.				
		Rock bit, no core. Cuttings described as yellowish, limonitic, some brn fe ox.						
1040								
End		Note: 3 bit cones in bottom.						

DIAMOND DRILL RECORD

Standpipe
Casing

Started 7-11-64
Finished
Hole Size
Depth 1270'
% Core Rec.

Mine Winkler-Faulkner, Safford, Arizona
Location 900' N, 2250' E of SW Cor. Sec. 5, T 6 S, R 26 E.
Logged by Bell Date 10-20-64
Drilled by Faulkner, Rotary

Hole No. W-F - 12
Level Surface
Grid
Latitude
Departure
Elevation 3480' Apx
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description	Sample Data No.	Interval Feet	Spls. Feet	Oz. Ag	% Pb	% Zn
0		Alluvium, sand, gravel, conglomerate.						
550		Two boxes core, depth intervals not marked. In first, some tuffaceous conglomerate, succeeded by porph. andesite (?), a gray fine grained rock, faintly xtalline texture, consisting of partly euhedral fs, hornblende						
	20	lathes, biotite, and interstitial qtz. Specks magnetite, some fe ox specks after disseminated py, and a few yellowish py grains. Second box, same fine grain gray rock, faintly xtalline texture, biotite. Remainder rock bitted, no core.						
1090		Gray fine grained rock, sugary ground mass,						
	10	with gray white fs, biotite, specks magnetite and pyrite, interstitial qtz. Porphyritic andesite (?).						
1100		Rock bit, no core.						
1270								
End								

No visible copper.

FORM 127 4M 7-68

Exploration Summary Report
Winkler- Faulkner Poject
Lone Star mining District
Graham County, Arizona

J. D. Bell Hecla Mining Co. 6/6/65

EXPLORATION SUMMARY REPORT
WINKLER*FAULKNER PROJECT
Lone Star Mining District
Graham County, Arizona
June 6, 1965

Summary

The Winkler-Faulkner property, located in T 6 S, Range 26 E, Lone Star Mining District, approximately 6 miles north of Safford, Graham County, Arizona, was explored in a joint effort by Hecla Mining Company, Wallace, Idaho, and Newmont Exploration Limited, New York City, during January-June, 1965. The exploration program consisted of 59,000 feet of data coverage by induced polarization survey, a magnetometer survey ofthe property, and the drilling of one diamond drill hole to a depth of 1500 feet. The field program was accomplished under the direction of J. D. Bell, Hecla geologist, and Dr. A. A. Brant, Newmont Chief Geophysicist.

The Lone Star District has a history of minor copper-gold production prior to 1910; interest in the area as the possible site of large low-grade disseminated copper deposits began in 1949, and culminated in discoveries of such deposits by Phelps-Dodge and Kennecott in the mid-1950's.

The oldest formation exposed in the district is a series of andesite tuffs, flows, and agglomerates, Cretaceous or Early Tertiery in age. These rocks were strongly fracturedon NE-SW trends, followed by successive intrusive of Quartz diorite, quartz monzonite porphyry, and dikes and plugs of rhyolite and latite, hydrothermal alteration, and chalcopyrite-pyrite mineralization. After a period of erosion, oxidation, and enrichment, the region was covered by mid-Tertiary flows rhyolite and andesite, and then by later Tertiary flows of basaltic composition. Block faulting on NW-SE trends, with easterly tilting of the volcanics, then formed the Gila Mountains, succeeded by the long erosional period to the present.

The W-F property is situated on a gravel-covered pediment flanking the Gila Mountains on the Southwest; no outcrops are present, and the alluvial thickness ranges from 400 to 1000 feet. Magnetics and drill holes indicate the sub-surface to consist of a broad intrusive mass of quartz diorite trending S 40 W across the easterly part, a broader area of Lower Volcanics comprising the central and Northwest part of the property, and Upper Volcanics in the Southwesterly . Seven holes have been drilled on the property by the owners to depths in bedrock ranging from 740 to 1308 feet; one hole, WF-1, reportedly assays 0.1 to 0.65% Cu, although the latter assay could not be verfied. the remainder reveal only 0.01-0.041 Cu in spot samples.

Hecla-Newmont's induced polarization survey failed to yield definitive information below 800 feet depth, due to a low resistivity layer near the bed-rock surface and to low resistivity contrasts between the various rock types of the area; no significant anomolies were found. The magnetic survey yielded data enabling interpretation of broad areas of the rock types. Drill-hole NH-1 was sited to test a zone ofsuspected fracturing in the Lower Volcanic series flanking the SW-trending intrusive mass, a potential environment for ore. It encountered the Lower Volcanics andesite, andesite porphyry, and andesite agglomerate, little alteredexcept by weak clay-sericite, iron stain, and manganese stain confined to strong fractures. No copper minerals were observed; assays of split core ranged from0,02 to 0.08% Cu and a trace of molybdenum. Almost no pyrite is present, and the rock has none of the characteristics of a leached capping.

It is the conclusion of Hecla and Newmont personal that the weak alteration and lack of mineralization in Hole NH-1 indicatethe absence of ore grade mineralization laterally or in depth in its vicinity. Although the remainder of the property is not completely tested, there is no scientific methods of defining a target, and future exploration will involve blind drilling. Such speculative and expensive exploration does not warrant by the work accomplished to date on the property.

General

Hecla-Newmont interest in the Winkler-Faulkner property began in June, 1964, when the claims and surrounding area were examined by the writer in company with Paul Winkler and Ted Faulkner of Safford, Arizona, representing a group of fifty-Two participating owners. Subsequent examination by R. E. Fulton, of Newmont, and H. E. Harper and the writer, of Hecla, resulted in a decision to negotiate for exploration rights on the property. Agreement with the owners was reached in December, and a lease and option, dated January 15, 1965, was signed by the involved parties. Paramount terms of the lease and option are as follows: End price of $3,000,000, payable in 3 years and 5 months, including immediate payment of $1,000, 3 annual payments of $25,000 commencing June 15, 1965, payment of remainder on or before June 15, 1968, if option is exercised, and right of Hecla-Newmont to terminate option at any time after completetion of work required.

Location

The W-F property, encompassing approximately 4475 acres, is located principally within the northern half of T 6 S, R 26 E, G.& S. R. N., in Graham County, Arizona, about 6 miles due north of the City of Safford. It consists of 241 unpatented lode claims, part of which cover Section 16 of the above township; Section 16 is State land, held by Arizona State Prospect Permit No. 564, issued to P. Winkler and T. Faulkner on December 6, 1962.

The holdings are situated on a broad gravel-covered pediment which slopes shallowly southwest from the Gila Mountains toward the Gila River Valley; the topograghy is slightly rolling, with SW'ly trending shallow dry washes. No bedrock outcrops are present, although in Section 10, immediately north of the claims, a small hill of andesite and andesite porphyry is present.

Access to the property is via the airport highway and San Juan Mine road northerly from Safford; the latter road traverses the claims, and unimproved roads leading from it yield access to a fair part of the holdings.

Safford is the rail and supply point; Drilling water is obtained from a pumping point near the Gila River.

Mining History

Mining in the the Lone Star District commenced prior to 1910, with developement of a number of small gold and oxidized copper prospects and mines in the low SW'ly foothills of the Gila Mountains; the San Juan Mine yielded 110,000 lbs. of copper in 1907. In 1949-1952, American Metals and Consolidated Copper tested the NE'ly trend of mineralization indicated by surface showings at the Morton Mine, and in 1956-1959, this zone was further tested by Bear Creek Mining Company, culminating in the discovery by the latter company of a low grade disseminated copper deposit estimated at 100,000,000 tons, with a grade of minus 1% Cu, and at a depth of 800 feet. At about the same time of the Bear Creek exploration, Phelps Dodge optioned and later purchased a large block of claims north of the W-F property and west of the Bear Creek deposit, and reportedly has developed a similar large copper deposit of somewhat better grade and shallower depth than that of Bear Creek. Neither deposit is being worked at present, apparently constituting future reserves for the owning companies.

Duval, American Metals, Rare Metals, Charles Steen, Kerr-McGee Hecla-Newmont, and United Nuclear have conducted additional exploration in the district; United Nuclear is currently drilling the Sanches property about 5 miles SE of the Bear Creek deposit, and limited drilling has been continuing on the Phelps Dodge and Bear Creek properties.

Geology

Generalized geology of the Lone Star District is shown on the Safford Quadrangle topographic map, pocket. In this area of theGila Mountains, the lowest exposed formation is a series of andesite flows, agglomerates, and tuffs of Cretaceous or Early Tertiary age, termed here are the Lower Volcanics formation Tlv); these rocks outcrop on the lower NW'ly-trending Gila Range. The exposures exhibit several zones of strong NE-trending shears and fractures, which are considered to have localized later successive intrusions of quartz diorite (Lone Star Stock), quartz monzonite porphyry (San Juan Stock), and plugs and dikes of rhyolite and latite (Bear Creek area). Hydrothermal alteration and pyrite-chalcopyrite mineralization apparently accompanied the later intrusive phasas, following by renewed fracturing, ozidation, and enrichment of the protore. The region was then covered by volcanics of rhyolitic to andesitic intermediate composition (Tmv), and then by basaltic flows.(T

In later Tertiary time, the Gila Range was block-faulted on NW'ly trends, with uplift and easterly tilting of the volcanics. Erosion has continued from that time, exposing a belt of Lower Volcanics and intrusive bodies on the SW flank of the range, and leaving only rement of Upper Volcanics in the down-faulted foreland of the range. The long-continued erosion has filled the Safford Valley with a deep fill of semi-consolidated sand, gravel, and boulders, a younger mantle of slope wash on the upper flanks of the valley, and recent alluvium in its center.

The Kennecott ore body is described as a mixed oxzide-sulfide body in which the most abundant copper mineral is chrysacolla. The ore occurs in the Lower Volcanics section in andesite flows sheared on NE'ly trends and intruded by rhyolite and latite; the mineralization occurs in both the andesite and the intrusives. Sericite-silica alteration characterizes the ore zone, bordered by a biotite alteration phase, and then by propylitic chlorite-epidote. Broad pyritic envelopes are described at both the Bear Creek and San Juan deposits, and iron staining indicates its presence at the Phelps Dodge depesoit.

The W-F property is located on the pediment slope south and southwest of the Phelps Dodge and Kennecott ore deposits. Mapping by these companies indicates the presence of two major NW-trending faults, the Foothills-Butte Fault and the Valley Fault, intervening between the Kennecott-Phelps Dodge zones and the W-F property; opposing dips suggest the area between the two faults(assumed normal) is a graben block.

The W-F property is entirely covered by a mantle of sand, gravel, and boulders which, according to resistivity data and drill holes, ranges from about 400 feet in thickness in the NE'ly part of the group to over 1000 feet in the SW'ly part. Immediately north of the property in section 10, a small hill shows outcrops of andesite and andesite porphyry tentatively identified as Lower Volcanics.

Sub-surface geology on the W-F property, shown on the 2000-scale map, is derived from study of short core intervals obtained by Faulkner in the rotary drilling of 10 holes on the claims, 7 of which cut bed-rock and bottom at depths ranging from 740 to 1308 feet, and from interpretatation of a magnetic survey of the property. Summary logs of the cored intervals are included with this report. Magnetic profiles and contours indicate a broad magnetic high trending S 40 W through the easterly part of the property; core from Drill Holes W-F 1, 2, 7, and 10 show the bed-rock to be a medium grained, partly Kaolinized quartz diorite.

Bounding the magnetic high on the west is a broad magnetic low area covering the central and NW'ly part of the group; the magnetic susceptibility of core from NH-1, the andesite outcrop in Section 10, and drill core in W-F12 indicate that bed-rock here is Lower Volcanics. The SW'ly part of the group shows slightly higher magnetic readings, and drill core from holes WF-6 and WF-9 is basaltic in nature; this area is interpreted as Upper Volcanics. The Upper and Lower Volcanics may be separated by a N'ly trending fault; the alluvial thickness is consistent with the rest of the property, and occurrence of the Upper Volcanics as a topographically high remnant cap in the in the buried bed-rock surface does not appear probable.

Drill core from Holes WF-1, 2, and 10 reveals considerable Kaolinization and limonite staining; the crystalline intrusive in WF-7 does not appear altered, and the core from W-F-12 reveals chlorite-epidote alteration with a little pyrite. No copper mineralization is visible in any of the cores, although some weak assays have been obtained.

Hecla-Newmont Exploration

Predibated on the reasoning that the Phelps Dodge and Kennecott deposits are apparently localized within zones of NE-trending shears, that the W-F property lies athwart the SW'ly production of these trends, and that prior drilling indicates only moderate thicknesses of overburden, it was possible that an ore body might be found beneath th cover. The exploration project consisted of testing the area by induced polarization-resistivity and magnetic geophysical methods and by the drilling of one hole, NH-1 to a depth of 1500 feet.

Geophysical Exploration

This phase of the project was conducted by Heinrichs Geo Exploration, Tucson, Arizona, under the direction of Dr. A. A. Brant, Chief Geophysicist, Newmont Exploration Limited, who describes the results and interpretation in a separate report. Geophysical field work was accomplished during the period January 12-March 14, 1965, and consisted of: Induced Polarization-Resistivity Survey, dipole-dipole array, 460 stations, 59,000 feet data coverage, on Lines 1-5 (see 2000-scale map ,pocket); (2) Induced Polarization, Pole-Pole array, 40 data points, vicinity 5000' E of Base Line on Line 4; (3) Resistivity tests, rock outcrops of known age, Wehbner array, in locations shown on map, following page; (4) Magnetic survey of property, Askania tripod-mounted magnetometer, 881 stations, 44.7 miles; (5) Magnetic susceptibility tests of drill core from Hole WF-6, 33 determinations between 910 and 1223 feet depths.

Summarization the results, the frequency system induced polarization method proved ineffective in penetrating depths below 800 feet in this area, and no significant anomalies were determined. The magnetic survey yielded results of material assistance in interpreting broad areas of rock types in the buried bed-rock surface. Resistivity studies indicate a very low contrast between rocks mapped as quartz diorite, Upper Volcanics, and Lower Volcanics.

Drilling Exploration

Because of the wide electrode spacing required for effective interpretation, due to low resistivity contrasts of the rock types of the area, Dr. Brant concluded that an ore body 2500 x 2500 feet in area extent and containing 2% total sulfides by volume, similar to the low total sulfide ore bodies of Phelps Dodge and Kennecott, could not be detedted below a depth of 1000 feet by the IP method used.

The Magnetic survey indicates the presence of an elongated mass of quartz diorite trending S40 W in the easterly part of the property, in direct alighnment with the Lone Star quartz diorite stock outcropping NE of the Foothills-Butte Fault.

The alignment of the two intrusive masses is construed as indicating no strike-slip componenton the intervening post-intrusive faults, and tentatively permits projection of the SW-striking fracture and dike zones into the W-F property as shownon SectionsA-A' and B-B', and on the 2000-scale map, pocket.

Drilling by Kennecott in the Lone Star stock has not shown that intrusive body to be strongly minerized, and while Winker-Faulkner drilling of the intrusive mass on the W-F property reveals some kaolinization and iron stains in the fratured zones, little significant copper mineralization has been found in depths to 1308 feet. Geological considerations suggessted that the probably fractured Lower Volcanics flanking the intrusive mass on the west should provide a suitable environment for a possible ore body, and that one hole should be drilled to 1500 feet in depth to test for ore and alteration.

Hecla-Newmont Hole NH-1 was sited on March 22, 1965; road and site construction and rotary drilling to bed-rock were contracted to Winkler and Faulkner, who completed the rotary drilling at a depth of 628 feet on April 21. A Boyles truck-mounted diamond drill was moved on the hole the same day, and the hole, drilled BXWL, was completed at 1500 feet on May29, 1965.

The log of the core is included in this report; rocks encountered were andesite, andesite porphyry, and andesite agglomerate, strongly fractured, largely purplish-gray in color, but accasionally bleached and stained with iron and manganese oxides in the fractured zones. Epidote and chorite are the dominant alteration minerals, indicating only propylitic alteration. Analyses by the Newmont laboratory of core specimens confirm rock type and alteration identification, and magnetic scaceptibility tests indicate that the andesite is of the Lower Volcanic series.

No copper minerals were visible in the core. Overal recovery averaged 81.8%, but dropped to 40-50% in the fractured zones. Split core samples of these fractured intervals of low recovery were assayed for copper through a total hole interval of 120 feet, and for molybdenum through a total hole interval of 39 feet. Jacobs Laboratory and Hawley and Hawley, of Tucson were the assayers; copper assays ranged between 0,02 and 0.08% copper, and the molydenum assayed only a trace.

Cost of Project

Diredt cost of the project, spent during the period January 8-June 15, 1965, and including control survey for the geophysical work, the geophysical work itself, and the drilling, including road and site construction, rotary and diamond drilling, drilling water, and assaying, has totaled $27,741.42.

Conclusions

Although the Lower Volcanics andesite was encountered in hole NH-1, and the rocks were strongly fractured, clay and weak sericite alteration is confined to the stronger fractures, and the intervening core reveals only weak propylitic alteration. Pyrite is almost entirely lacking; the metalic iron minerals are magnetic and specularite. The weakly altered appearance of the core, the low pyrite, and the lack of any trace of visible copper mineralization are features evidencing the absence of a leached capping and preclude the possiblity of an underlying ore body; the trace assays of copper and molydenum are not regarded as significant. Similarly, the weak alteration does not suggest the presence laterally of a nearby ore body.

While it cannot be said that the W-F property has been completely tested, the Hecla-Newmont effort has shown that induced polarization surveys as a guide to ore have little or no value here, and that there are no other scientific guides pointing to defined target area. If further exploration of the W-F property is contemplated, it will probably entail blind drilling of a NW-SE trending fence of holes spaced one thousand feet apart, approximately along line b, and it will be a relatively expensive project.

Hecla and Newmont personnel concur that such speculative exploration is not warranted by the results of the work accomplished on the property.

Respectfully submitted,

J. D. Bell

J. Douglas Bell
Geologist, Exploration

Appended: Drill Logs

Pocket: Safford Quadrangle, General Geology
Claims and Drill Map

JDB:jan

APPENDIX.1.

HEINRICHS GEOEXPLORATION COMPANY

806 WEST GRANT ROAD, TUCSON, ARIZONA, 85703. P.O. BOX 5671. PHONE: (AREA CODE 602) 623-0576

APRIL 3, 1965

Newmont-Hecla Joint Venture

Re: Letter Report
Winkler-Faulkner Project

Gentlemen:

This is a brief letter report outlining the field work accomplished and results obtained for the Newmont-Hecla Joint Venture on the Winkler-Faulkner project from January 12 to March 14, 1965.

ELECTRICAL PHASE

	Data Coverage	Stations
I. P. Line 1 (0 N/S)	7000 ft.	54
I. P. Line 3 (4000 N)	19500 ft.	154
I. P. Line 4 (6000 N)	10000 ft.	76
I. P. Line 5 (8000 N)	22500 ft.	176

I. P. Pole-Pole depth probe #1: East & West legs: 40 data points total.
East leg a= 100 ft. to 2000 ft.
West leg a= 20 ft. to 3000 ft.

Wenner depth probes for rock property test on:

Long Star granite	12 stations	a= 10 to 200 ft.
Tuv	12 stations	a= 10 to 200 ft.
Tlv	18 stations	a= 10 to 200 ft.

MAGNETIC PHASE

Magnetic susceptibility log of Drill Hole #6 core from 910 to 1223 feet - 33 determinations.

Magnetic Survey	Coverage
5 - East-west lines	100,000 feet
17 - North-south lines	136,000 feet

Re: Letter Report
Winkler-Faulkner Project

Total coverage: 236,000 feet for a total of 44.7 miles and 881 stations.

RESULTS

ELECTRICAL PHASE

The induced polarization effects noticed were attributed mainly to low resistivity inductive coupling and the normal background response of the alluvium. The only zone of possible sulfide indication noticed is on Line 3 at about 100 E, although this zone is more likely just a zone of higher background effects.

The resistivity data, in general, shows a three layer case with the middle layer lower in resistivity than the others. A possible interpretation of this could be dry alluvium for the upper layer, water saturated alluvium for the middle layer and bedrock for the lower layer. Depths to bedrock indicated were from about 200 feet to the north to about 1000 feet to the south.

The induced polarization two array depth probe was centered at 50 + 00 E Line 4 and gave a two layer solution with the upper layer higher in resistivity and about 220 feet thick. This 220 foot interface is possibly the alluvial water table. The absence of the third layer may be the result of a lack of electrical contrast between bedrock and water saturated alluvium in this area. No frequency effects were noted that could not be attributed to inductive coupling interference.

The Wenner depth probe, rock property tests were made on outcrops of the three suspected bedrock types; Tuv, Tlv, and the Lone Star granite. This test shows these three rocks to have very similar resistivities (rho/2 pi from 115 to 160 ohm feet), thereby making it very difficult to distinguish between them electrically. The resistivity of these rocks is higher than was indicated at depth on the I.P. lines and two array probe and may be due to their being above the water table on the Wenner test and below on the I.P. and the I.P. generally nearer to the lower part of the valley (i.e. finer and more conductive constituents).

MAGNETIC PHASE

Drill Hole #6 was logged for magnetic susceptibility and a

change was noted at approximately 1050 feet, perhaps indicating the contact between Tuv and Tlv. The Tlv was somewhat higher in susceptibility and considerably more polarized than the Tuv.

The vertical intensity magnetic data was very erratic over the whole area due to the abundant volcanic boulders in the surface alluvium and, therefore, the plan and profile data had to be smoothed out before interpreting. The most obvious feature was a high zone centered at about 6000 N - 10000 E and trending NE-SW. On interpretation of the profiles of this high zone, it was estimated that the cause was a truncated wedge or tubular zone 2000 to 3000 feet thick and buried from 700 to 1200 feet below surface. This feature is likely the SW downfaulted block of the Lone Star granite and thereby indicates that the faulting only had a dip slip component since both the exposed block to the NE, and the downfaulted block, are on the same strike.

Sincerely,

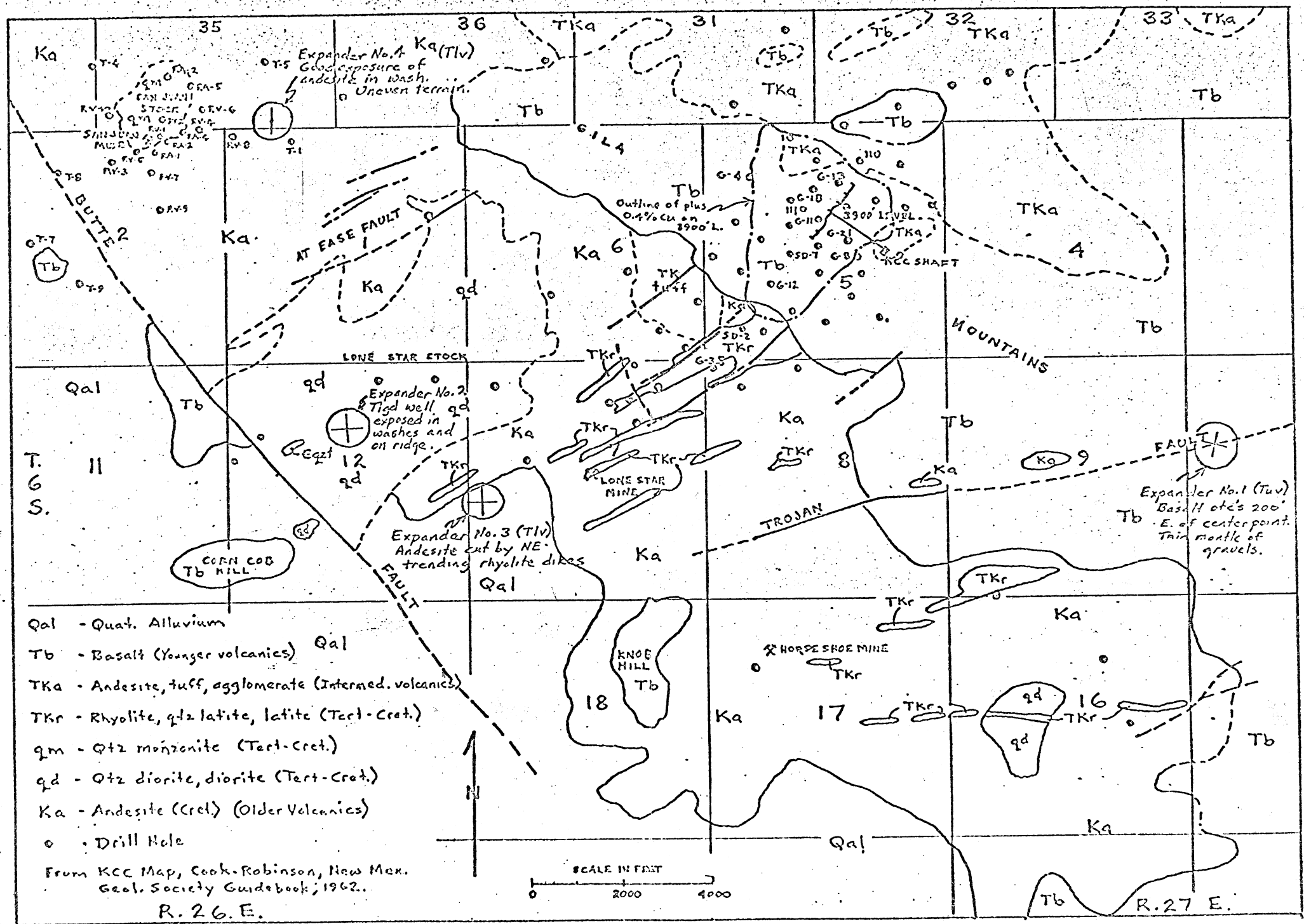
HEINRICHS GEOEXPLORATION COMPANY

Chris S. Ludwig

Chris S. Ludwig
Senior Geophysicist

pr

cc: Dr. A. A. Brant 5



Qal - Quat. Alluvium

Tb - Basalt (Younger volcanics)

TKa - Andesite, tuff, agglomerate (Intermed. volcanics)

TKr - Rhyolite, qtz latite, latite (Tert-Cret.)

qm - Qtz monzonite (Tert-Cret.)

qd - Qtz diorite, diorite (Tert-Cret.)

Ka - Andesite (Cret.) (Older Volcanics)

o - Drill Hole

From KCC Map, Cook-Robinson, New Mex. Geol. Society Guidebook; 1962.

GENERALIZED GEOLOGICAL MAP, SAFFORD PROJECT AREA

Heinrichs

DIAMOND DRILL RECORD

Standpipe
Casing

Started 3-30-65
Finished 5-29-65
Hole Size EXAL
Depth 1500
% Core Rec. 81.8

Mine Winkler-Faulkner, Safford, Arizona
Location 1990' E. and 990' S. of NW Cor. Sec. 15, T 6 S, R 26 E, Graham Co., Arizona
Logged by Bell-Quinlan Date May, 1965
Drilled by Faulkner (Rotary), Boyles Bros. (DD)

Hole No. NH-1
Level Surface
Grid IP Line 4 - 4400 E
Latitude --
Departure --
Elevation 3465' Apx
Bearing --
Inclination Vertical

Depth Feet	Foot Core	Lithologic Description Summary Log	Sample Data No.	Interval Feet	Splo. Feet	Oz. -Ag-	% -Pb- Cu	% -Zn- Mo
0		Alluvium, difficult drilling, many boulders						
	Plug	alternating with sections caving fine-grained sands.						
250		Alluvium, fairly uniform sand. Improved						
	Plug	drilling. Water table at 350.			Water at 350			
500		Boulders, caving sand, difficult drilling.						
	Plug	Bedrock at 572.						
572		Plug-bitted for assurance of bedrock and to						
	Plug	provide good seating for casing.						
595		Cored NX with rotary. Andesite agglomerate						
	5.4	(Lower Volcanics), fine grained purplish ground mass, fragments, to 4" length, of lt gy-grn med grain porph. volcanic.						
601		To reach unfractured rock for start of						
	Plug	diamond drilling.						
628		Andesite agglomerate as before, fragments to						
	120.6	7" length. Mild epidotization and chloritization. Rounded to sub-angular fragments of light grn-gy strongly porphyritic rock (andesite porphyry) and dark gy-purplish aphanitic rock with less numerous white fs phenos (porphyritic andesite). Thin fractures 10-20 to core, often lined with xtal. calcite. Specks fe ox and minor magnetite. Color banding and textural variations 60-90 to core, suggesting flow attitude. Rock moderately broken, but no pronounced faulting.	NH-1-1	875.7-877) 896-905)	10.3		(.08	NS
			NH-1-2	921-928.2	7.2		(.05	NS
764		Andesite porphyry, fine grained greenish	NH-1-3	939.6-962	22.4	Jacobs	(.08	Tr
	15.2	groundmass, many ortho and plag. phenos, few clots dark mafics, sparse magnetite and epidote. Fracturing 10-40 to core. Mod. broken.	NH-1-4	1119-1136	17.0		(.04	Tr
			NH-1-5	1230-1239	9.0		(.03	NS
811.5		Porphyritic andesite, dk gy-purplish sugary vfg						
		ground mass, scattered white fs phenos. Epidote and sparse magnetite. Minor Mn Ox, fe ox,	NH-1-6	1298-1311	43.0	H & H	(.02	NS
	138.1	calcite on thin fracts. 10-30 to core. Andesite porphyry 861.9-862.1. Andesite is badly	NH-1-7	1453-1465	12.0		(.08	NS
		brkn, blchd yellowish, fe ox specks after py						

(cont. next page)

Standpipe
Casing
Started
Finished
Hole Size
Depth
% Core Rec.

DIAMOND DRILL RECORD

Mine Winkler-Faulkner, Safford, Arizona
Location
Logged by Date
Drilled by

Hole No. NH-1
Level
Grid
Latitude
Departure
Elevation
Bearing
Inclination

Depth Feet	Feet Core	Lithologic Description Summary Log (continued)	Sample Data No.	Interval Feet	Spls. Feet	Oz. Ag	% Pb	% Zn
811.5	(cont.)	875.7-877, 896-905, and 921-935.5, 939.7-955.3. Partly blchd dull gy to yellowish gy from 935.5 to 939.7 and 971-975.5. 57% recovery 921-928, 44.75% recovery 934-955 (with some sericite), and 42.4% 975.5-984 (fractured, with a little andesite porphyry).					Cu	Mo
984		Andesite agglomerate, mostly gy to purplish gy, except in fract. zones 10-30 to core, where blchd to yellowish brn. Stronger epidote 1056-1067, sparse epidote below 1067 (decreased propylitic alteration). Weak orange-brn fe ox, black mn ox, xtal. calcite on open fracts. to bottom. A few striated brown xtals (py?) 1241-1245, and scattered sparse magnetite and specular hematite. Rare textural variations 60-75 to core suggest flows tilted 15-30°. Badly brkn ggy fract. zones 1005-1019, 1105-1147, 1230-1239, and 1265-1280. No Cu noted. 29.2% recovery 1118-1130, and 53.8% recovery 1221-1280.						
1298	260.7	Andesite agglomerate, ± 1" sub-angular to rounded pebbles in porphyritic andesite ground mass, mostly purplish gray to dull gray, but bleached yellowish brown in fracture zone 1453-1465. Slight increase propylitic epidote-chlorite 1338-1445, weak epidote, chlorite, Fe ox-Mn ox stains on fractures, very sparse magnetite and specularite to bottom. Increased MnOx and orange-red FeOx in gouge zones 1338-1351 and 1453- 1465. Moderately broken, except badly broken 1296-1351 and 1453-1465, with gg and bx. 44.2% recovery 1298-1351, 47.0% recovery 1378-1401, and 60.7% recovery 1452-1466.						
1500 End	118.4	Note: Core specimen at 796' identified by Newmont technical laboratory as andesite porphyry, and at 835' as andesite. Alteration minerals are chlorite, epidote, sericite, calcite, and secondary quartz. Magnetite, hematite, no sulfides.						

R 26 E

T 6 S

WF-12 WF-5 WF-3 WF-4 NH-1 WF-6 WF-8 WF-7 WF-2 WF-10 WF-1

N 27° 30° E 2000'

BASE LINE 2000'

2000' 2000' 1060.0'

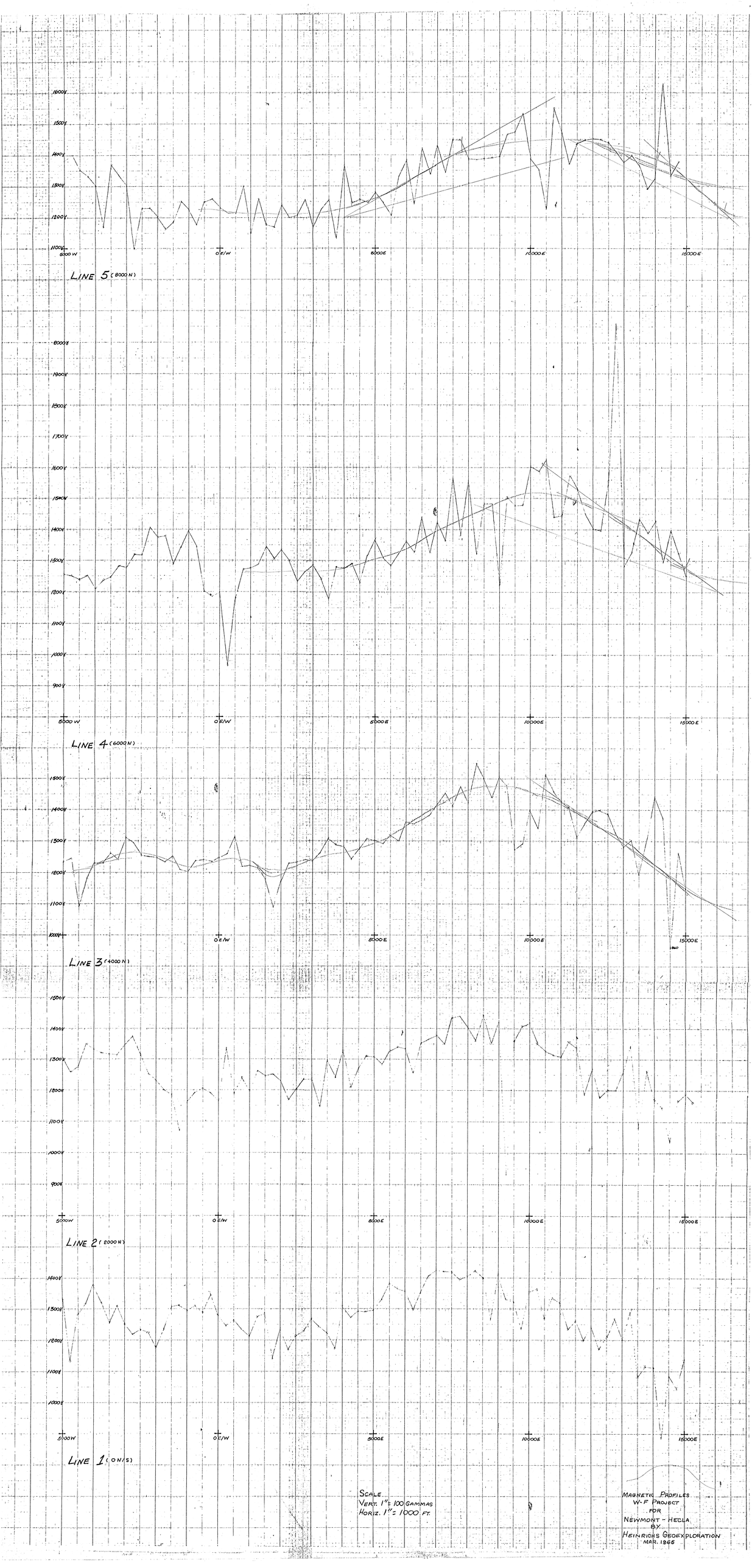
LINE 5 LINE 4 LINE 3 LINE 2 LINE 1

W-F PROSPECT

hecla · newmont joint venture

graham county, arizona

scale: 1" = 1200'


1600γ
1500γ
1400γ
1300γ
1200γ
1100γ
5000 W
0 E/W
5000 E
10000 E
15000 E
LINE 5 (8000 N)
2000γ
1900γ
1800γ
1700γ
1600γ
1500γ
1400γ
1300γ
1200γ
1100γ
1000γ
900γ
5000 W
0 E/W
5000 E
10000 E
15000 E
LINE 4 (6000 N)
1500γ
1400γ
1300γ
1200γ
1100γ
1000γ
0 E/W
5000 E
10000 E
15000 E
LINE 3 (4000 N)
1500γ
1400γ
1300γ
1200γ
1100γ
1000γ
900γ
5000W
0 E/W
5000E
10000E
15000E
LINE 2 (2000 N)
1400γ
1300γ
1200γ
1100γ
1000γ
5000W
0 E/W
5000E
10000E
15000E
LINE 1 (0 N/S)
SCALE
VERT. 1" = 100 GAMMAS
HORIZ. 1" = 1000 FT.
MAGNETIC PROFILES
W-F PROJECT
FOR
NEWMONT - HECLA
BY
HEINRICHS GEOEXPLORATION
MAR. 1966

POLE-POLE DEPTH PROBE #1 WEST LEG @ 50+00 EAST, LINE 4

WINKLER-FAULKNER PROJECT

NEWMONT-HECLA MARCH 1965

HEINRICHS GEOEXPLORATION COMPANY
P. O. BOX 5671, TUCSON, ARIZONA

SCALE DOWN

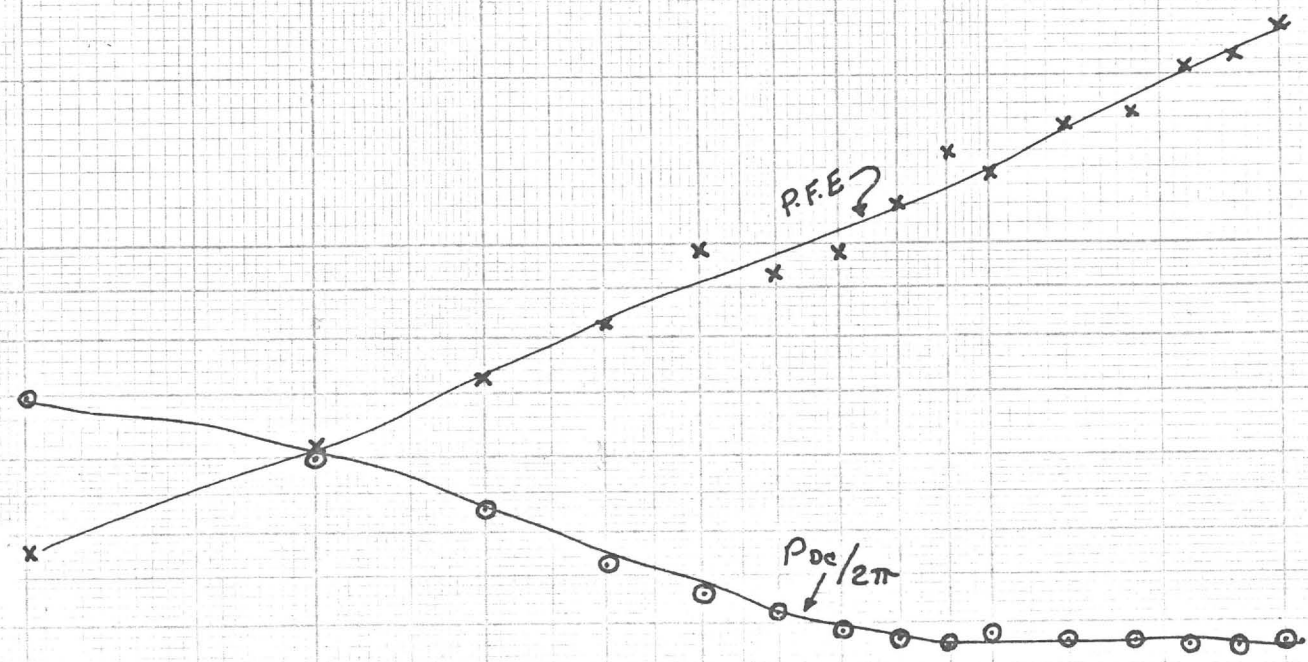
k = -0.4
$\rho_{1/2\pi}$ = 100 ohm feet
$\rho_{2/2\pi}$ = 43 ohm feet
d = 215 feet

POLE-POLE DEPTH PROBE #1 EAST LEG @ 50+00 EAST, LINE 4

WINKLER-FAULKNER PROJECT

NEWMONT-HECLA 3-4-65

HEINRICHS GEOEXPLORATION COMPANY
P. O. BOX 5671, TUCSON, ARIZONA



$k = -0.4$

$\rho_1/2\pi$ = 83 ohm ft

$\rho_2/2\pi$ = 36 ohm ft

d = 220 feet

$\rho_{DC}/2\pi$ ← in ohm-feet

a → in feet

HEINRICHS GEOEXPLORATION COMPANY

806 WEST GRANT ROAD. TUCSON. ARIZONA 85703. P.O. BOX 5964. PHONE: (602) 623-0578

January 25, 1972

Mr. E. Grover Heinrichs
Essex International Inc.
1704 W. Grant Road
Tucson, Arizona 85705

Dear Grover:

We received authorization today from Mr. Winkler to release the Newmont-Hecla Joint Venture data on the Winkler-Faulkner claim group. Following is an inventory of these data, one set of which is enclosed:

1. Letter report, three pages.
2. W - F Prospect Base Map.
3. Magnetic Survey Plan.
4. Magnetic Profiles, 1 sheet.
5. Magnetic Trend Map.
6. I. P. Sectional Data Sheets (4), Lines 1, 3, 4 and 5.
7. Pole-Pole Depth Probes (2) East Leg and West Leg.
8. Wenner Resistivity Tests (4), Tlv, 2 sheets, Tuv, 1 sheet Lone Star Granite, 1 sheet.
9. Magnetic susceptibility log of core from DD #6, 3 pages.

The magnetic high centered near 6,000N, 10,000 E is certainly of interest. I. P. Line 4 didn't go far enough east to cross this high but Lines 3 and 5 did cross the south and north flanks, respectively, and both lines show possible anomalous I. P. effects in that area.

If you have any questions regarding these data, please let us know.

Our statement is enclosed.

Sincerely,
Heinrichs GEOEXploration Company

Chris S. Ludwig
Senior Geophysicist

CSL:jh
Enclosures: as listed.

APRIL 3, 1965

Newmont-Hecla Joint Venture

Re: Letter Report
Winkler-Faulkner Project

Gentlemen:

This is a brief letter report outlining the field work accomplished and results obtained for the Newmont-Hecla Joint Venture on the Winkler-Faulkner project from January 12 to March 14, 1965.

ELECTRICAL PHASE

	Data Coverage	Stations
I. P. Line 1 (0 N/S)	7000 ft.	54
I. P. Line 3 (4000 N)	19500 ft.	154
I. P. Line 4 (6000 N)	10000 ft.	76
I. P. Line 5 (8000 N)	22500 ft.	176

I. P. Pole-Pole depth probe #1: East & West legs: 40 data points total.
East leg a= 100 ft. to 2000 ft.
West leg a= 20 ft. to 3000 ft.

Wenner depth probes for rock property test on:

Long Star granite	12 stations	a= 10 to 200 ft.
Tuv	12 stations	a= 10 to 200 ft.
Tlv	18 stations	a= 10 to 200 ft.

MAGNETIC PHASE

Magnetic susceptibility log of Drill Hole #6 core from 910 to 1223 feet - 33 determinations.

Magnetic Survey	Coverage
5 - East-west lines	100,000 feet
17 - North-south lines	136,000 feet

Re: Letter Report
Winkler-Faulkner Project

Total coverage: 236,000 feet for a total of 44.7 miles and 881 stations.

RESULTS
ELECTRICAL PHASE

The induced polarization effects noticed were attributed mainly to low resistivity inductive coupling and the normal background response of the alluvium. The only zone of possible sulfide indication noticed is on Line 3 at about 100 E, although this zone is more likely just a zone of higher background effects.

The resistivity data, in general, shows a three layer case with the middle layer lower in resistivity than the others. A possible interpretation of this could be dry alluvium for the upper layer, water saturated alluvium for the middle layer and bedrock for the lower layer. Depths to bedrock indicated were from about 200 feet to the north to about 1000 feet to the south.

The induced polarization two array depth probe was centered at 50 + 00 E Line 4 and gave a two layer solution with the upper layer higher in resistivity and about 220 feet thick. This 220 foot interface is possibly the alluvial water table. The absence of the third layer may be the result of a lack of electrical contrast between bedrock and water saturated alluvium in this area. No frequency effects were noted that could not be attributed to inductive coupling interference.

The Wenner depth probe, rock property tests were made on outcrops of the three suspected bedrock types; Tuv, Tlv, and the Lone Star granite. This test shows these three rocks to have very similar resistivities (rho/2 pi from 115 to 160 ohm feet), thereby making it very difficult to distinguish between them electrically. The resistivity of these rocks is higher than was indicated at depth on the I.P. lines and two array probe and may be due to their being above the water table on the Wenner test and below on the I.P. and the I.P. generally nearer to the lower part of the valley (i.e. finer and more conductive constituents).

MAGNETIC PHASE

Drill Hole #6 was logged for magnetic susceptibility and a

change was noted at approximately 1050 feet, perhaps indicating the contact between Tuv and Tlv. The Tlv was somewhat higher in susceptibility and considerably more polarized than the Tuv.

The vertical intensity magnetic data was very erratic over the whole area due to the abundant volcanic boulders in the surface alluvium and, therefore, the plan and profile data had to be smoothed out before interpreting. The most obvious feature was a high zone centered at about 6000 N - 10000 E and trending NE-SW. On interpretation of the profiles of this high zone, it was estimated that the cause was a truncated wedge or tubular zone 2000 to 3000 feet thick and buried from 700 to 1200 feet below surface. This feature is likely the SW downfaulted block of the Lone Star granite and thereby indicates that the faulting only had a dip slip component since both the exposed block to the NE, and the downfaulted block, are on the same strike.

Sincerely,

HEINRICHS GEOEXPLORATION COMPANY

Chris S. Ludwig

Chris S. Ludwig
Senior Geophysicist

pr

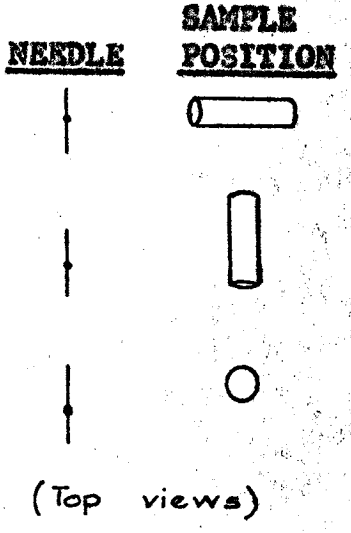
cc: Dr. A. A. Brant 5

NEWMONT-HECLA JOINT VENTURE, WINKLER-FAULKNER PROJECT
MAGNETIC SUSCEPTIBILITY LOG
DRILL HOLE #6 CORE
FEBRUARY 1965

MINIMUM K = 320 x 10^{-6} @ 950 feet MAXIMUM K = 4680 x 10^{-6} @ 1166 feet

Gray members with calcitic fractures are consistently polarized with consequent erratic susceptibility results, at least up to approximately 5000 x 10^{-6} along one axis.

NOTES: K listing under each sample were run as follows below and the values are listed in the following order:



Most samples were approximately 1" - 2" long.

BOX NO.	FOOTAGE	K= x10^{-6}	POLARIZED	REMARKS
1	910	500		
		605		
		Sample too long		
1	912	980		
		696		
		Sample too long		
1	913	605		
		1036		
		480		
1	914	1280		
		1620		
		1036		
1	915	405		
		845		
		540		
1	918	500		
		924		
		1280		

NEWMONT-HECLA JOINT VENTURE, WINKLER-FAULKNER PROJECT
MAGNETIC SUSCEPTIBILITY LOG
DRILL HOLE #6 CORE
FEBRUARY 1965

BOX NO.	FOOTAGE	K= $\times 10^{-6}$	POLARIZED	REMARKS
2	920	952		
		1125		
		845		
2	932	320		
		605		
		845		
3	935	1280		
		500		
		405		
3	950	405		
		320		
		605		
4	962	720		
		1036		
		672		
5	970	980		
		768		
		845		
6	980	1280		
		1125		
		1280		
7	990	1216		
		1066		
		1584		
8	1004	1280		
		1920		
		2205		
9	1006	924		
		1445		
		2080		
9	1012	1036		
		922		
		1548		
10	1016	768		
		952		
		1548		
11	1042	845		TAN
		768		
		1125		

NEWMONT-HECLA JOINT VENTURE, WINKLER-FAULKNER PROJECT
MAGNETIC SUSCEPTIBILITY LOG
DRILL HOLE #6 CORE
FEBRUARY 1965

BOX NO.	FOOTAGE	K=	x10^{-6}	POLARIZED	REMARKS
12	1058			P	VUGGY
12	1063			P	DARKEST
13	1066			P	FINE GRAINED
13	1072	5312		P	VUGGY
14	1086			P	GRAY, FINE GRAINED
15	1096	1280			
		1344			
		1216			
16	1110	2205			
		1920			
		2880			
17	1114			P	
18	1132	2000			REDDISH, FINE SANDY
		2500			
		1620			
21	1156	720			
		1216			
		2880			
21	1163				WHITE, DOES NOT AFFECT NEEDLE
22	1166	605			GRAY, FINE GRAINED
		1920			
		4680			
25	1205	180			
		180			
		320			
26	1223	4500		P	FINE GRAINED, GRAY & WHITE
		720			

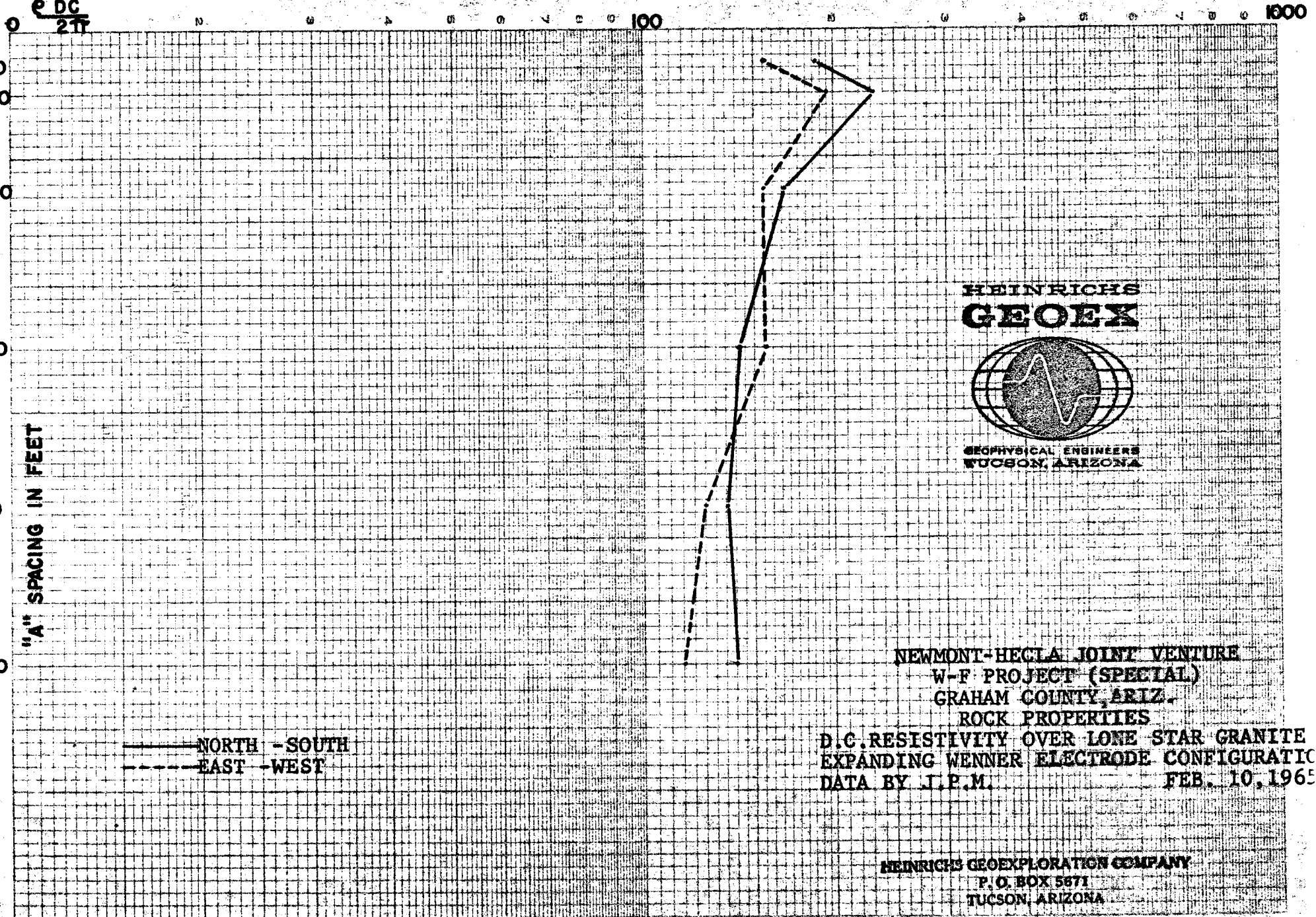
P. O. BOX 5671
TUCSON, ARIZONA

OBSERVERS: J. P. MATTHEWS JR.
H. R. MOULINET
W. E. HEINRICHS, JR.

FEBRUARY 17, 1965

NO. 340R-L210 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
2 CYCLES X 10 DIVISIONS PER INCH

EUGENE DIETZGEN CO.
MADE IN U. S. A.



HEINRICHS
GEOEX
GEOPHYSICAL ENGINEERS
TUCSON, ARIZONA

NEWMONT-HECLA JOINT VENTURE
W-F PROJECT (SPECIAL)
GRAHAM COUNTY, ARIZ.
ROCK PROPERTIES
D.C. RESISTIVITY OVER LONE STAR GRANITE
EXPANDING WENNER ELECTRODE CONFIGURATIO
DATA BY J.P.M. FEB. 10, 1965

HEINRICHS GEOEXPLORATION COMPANY
P. O. BOX 5671
TUCSON, ARIZONA

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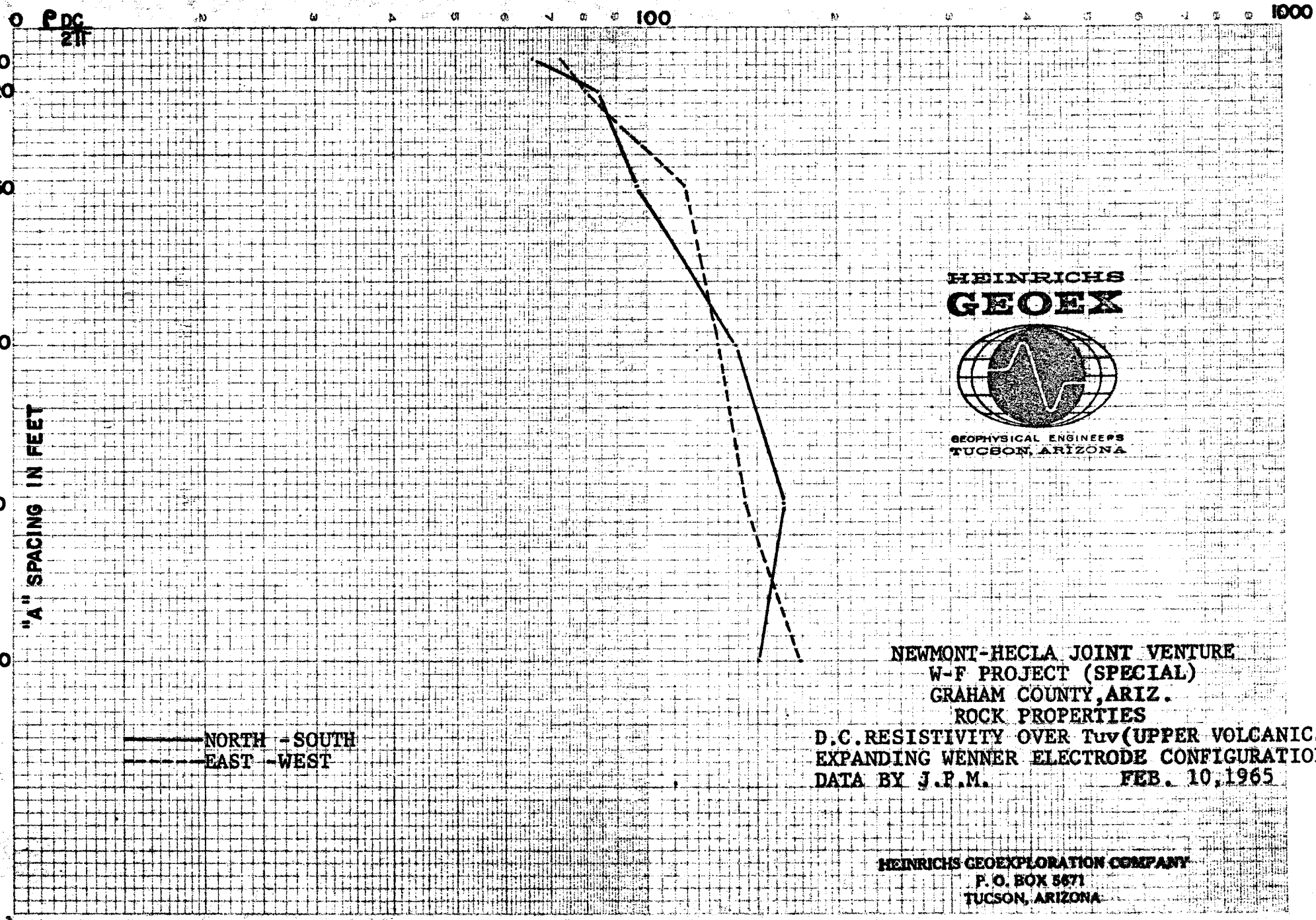

HEINRICHS
GEOEX

GEOPHYSICAL ENGINEERS
TUCSON, ARIZONA

NEWMONT-HECLA JOINT VENTURE
W-F PROJECT (SPECIAL)
GRAHAM COUNTY, ARIZ.
ROCK PROPERTIES
D.C. RESISTIVITY OVER Tuv (UPPER VOLCANICS)
EXPANDING WENNER ELECTRODE CONFIGURATION
DATA BY J.P.M. FEB. 10, 1965

HEINRICHS GEOEXPLORATION COMPANY
P. O. BOX 5671
TUCSON, ARIZONA

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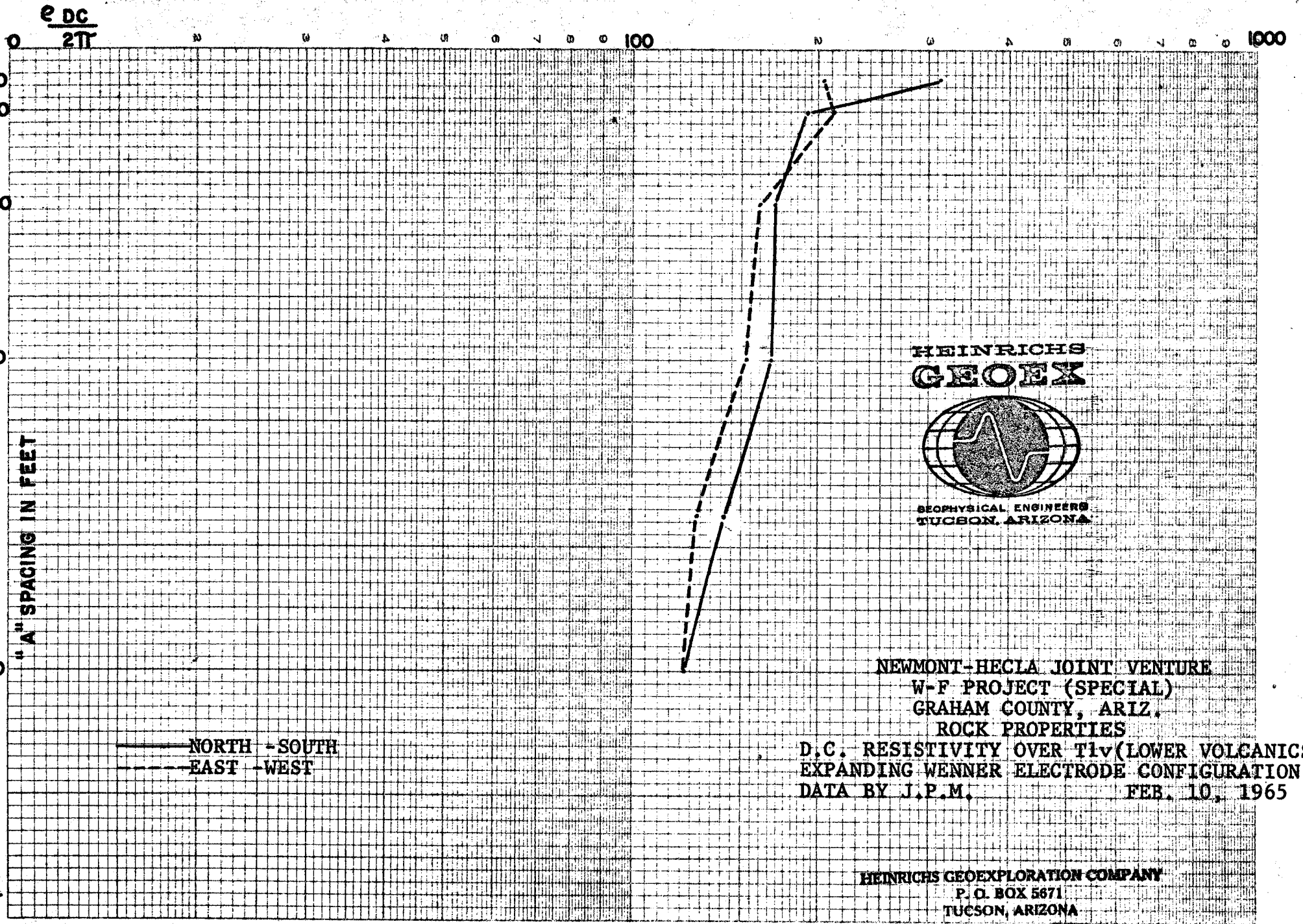

HEINRICHS
GEOEX
GEOPHYSICAL ENGINEERS
TUCSON, ARIZONA

NEWMONT-HECLA JOINT VENTURE
W-F PROJECT (SPECIAL)
GRAHAM COUNTY, ARIZ.
ROCK PROPERTIES
D.C. RESISTIVITY OVER Tlv(LOWER VOLCANICS)
EXPANDING WENNER ELECTRODE CONFIGURATION
DATA BY J.P.M. FEB. 10, 1965

HEINRICHS GEOEXPLORATION COMPANY
P. O. BOX 5671
TUCSON, ARIZONA

NO. 340R-L210 DIETZGEN GRAPH PAPER
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2 CYCLES X 10 DIVISIONS PER INCH

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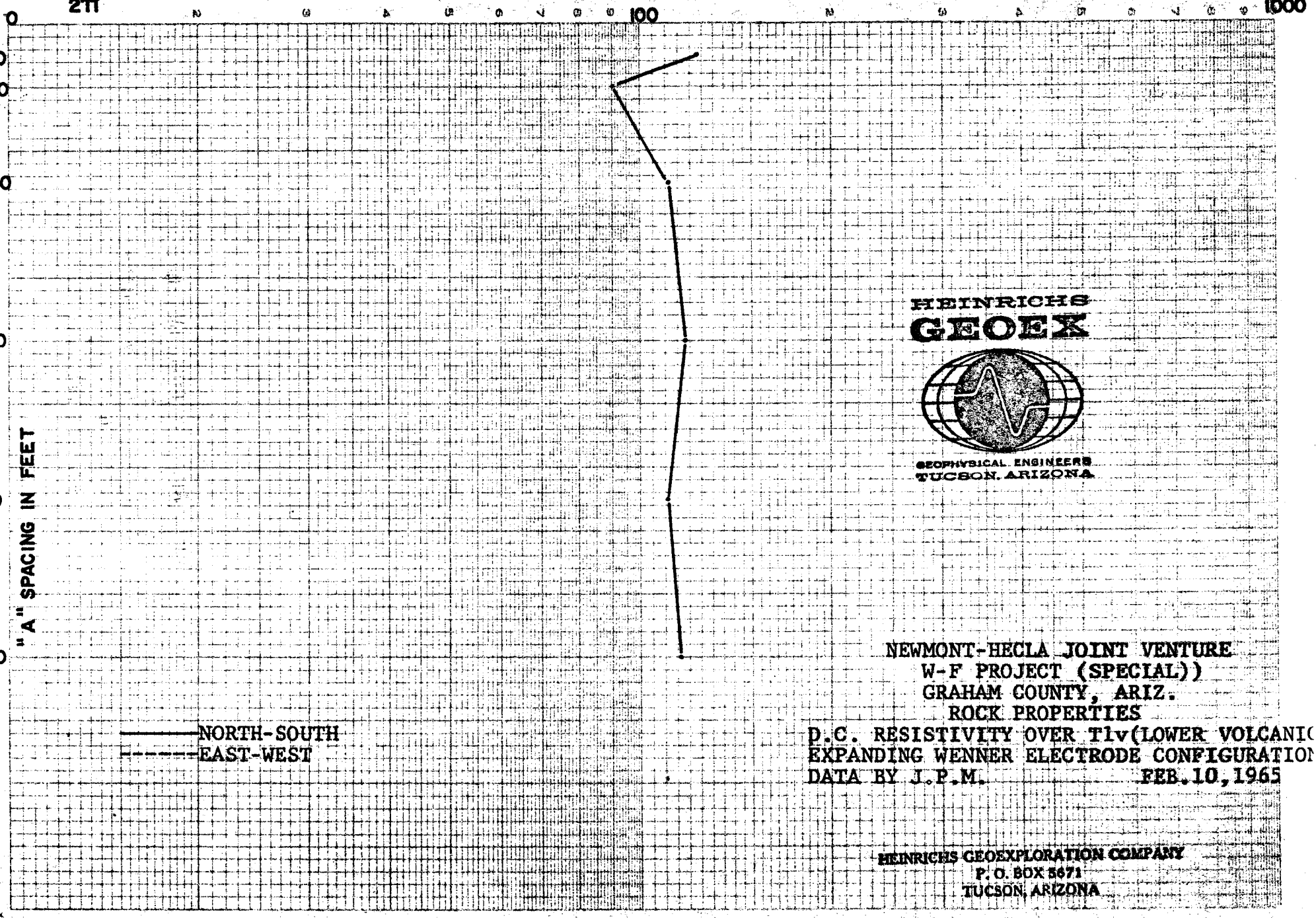
MADE IN U. S. A.

$\frac{\rho DC}{2\pi}$



HEINRICHS
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TUCSON, ARIZONA

NEWMONT-HECLA JOINT VENTURE
W-F PROJECT (SPECIAL))
GRAHAM COUNTY, ARIZ.
ROCK PROPERTIES
D.C. RESISTIVITY OVER Tlv(LOWER VOLCANIC
EXPANDING WENNER ELECTRODE CONFIGURATION
DATA BY J.P.M. FEB.10,1965

——— NORTH-SOUTH
- - - - - - EAST-WEST

HEINRICHS GEOEXPLORATION COMPANY
P. O. BOX 5671
TUCSON, ARIZONA

5000 W.

0 E/W BASE LINE

5000 E.

10,000 E.

15,000 E.

8000 N. I.P. LINE 5

6000 N. I.P. LINE 4

4000 N. I.P. LINE 3

2000 N. I.P. LINE 2

0 N/S I.P. LINE 1

T. 6 S.

R. 26 E.

Prospect Boundary

Base Map Scale & Info. From Hecla - Newmont.

INST.: ASKANIA. GFZ TORSION (VERTICAL INTENSITY)
SCALE CONSTANT = 220 γ / SCALE DIV.
ARBITRARY MAGNETIC BASE.
ALL VALUES ARE CORRECTED FOR DIURNAL DRIFT & PLOTTED IN γ.

HEINRICHS GEOEXPLORATION COMPANY
P.O. Box 5671 Tucson, Arizona

MAGNETIC SURVEY
W-F PROSPECT
FOR
HECLA-NEWMONT JOINT VENTURE

GRAHAM COUNTY, ARIZONA

SCALE: 1" = 1200	CONTOUR INTERVAL:	REVISIONS
	DATA BY: H. M.	
DATE: 3-15-65	SHEET OF	
DRAWN BY: G.H.	DRAWING NO.:	FILE:

APPENDIX.1.

HEINRICHS GEOEXPLORATION COMPANY

806 WEST GRANT ROAD, TUCSON, ARIZONA, 85703. P.O. BOX 5671. PHONE: (AREA CODE 602) 623-0578

APRIL 3, 1965

Newmont-Hecla Joint Venture

Re: Letter Report
Winkler-Faulkner Project

Gentlemen:

This is a brief letter report outlining the field work accomplished and results obtained for the Newmont-Hecla Joint Venture on the Winkler-Faulkner project from January 12 to March 14, 1965.

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	Data Coverage	Stations
I. P. Line 1 (0 N/S)	7000 ft.	54
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MAGNETIC PHASE

Magnetic susceptibility log of Drill Hole #6 core from 910 to 1223 feet - 33 determinations.

Magnetic Survey	Coverage
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Re: Letter Report
Winkler-Faulkner Project

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Sincerely,

HEINRICHS GEOEXPLORATION COMPANY

Chris S. Ludwig

Chris S. Ludwig
Senior Geophysicist

pr

cc: Dr. A. A. Brant 5

Winkler - Faulkner

P.O. Box 772
Safford, Arizona 85546

January 17, 1972

Heinrichs Geoexploration Co.
P.O. Box 5964
Tucson, Arizona 85703

Gentlemen:

This is authorization for Essex International, Inc. to obtain at their own reproduction expense the geological and geophysical data, including report, exhibits, and maps accompanying the report on a survey contracted to Heinrichs Geoex by Newmont-Hecla Joint Venture on a property owned by myself and partners and known as the Winkler-Faulkner claim group. Newmont-Hecla Joint Venture have authorized release of this data to me and it is my understanding that you have a letter on file to that effect.

Very truly yours,

Paul E. Winkler

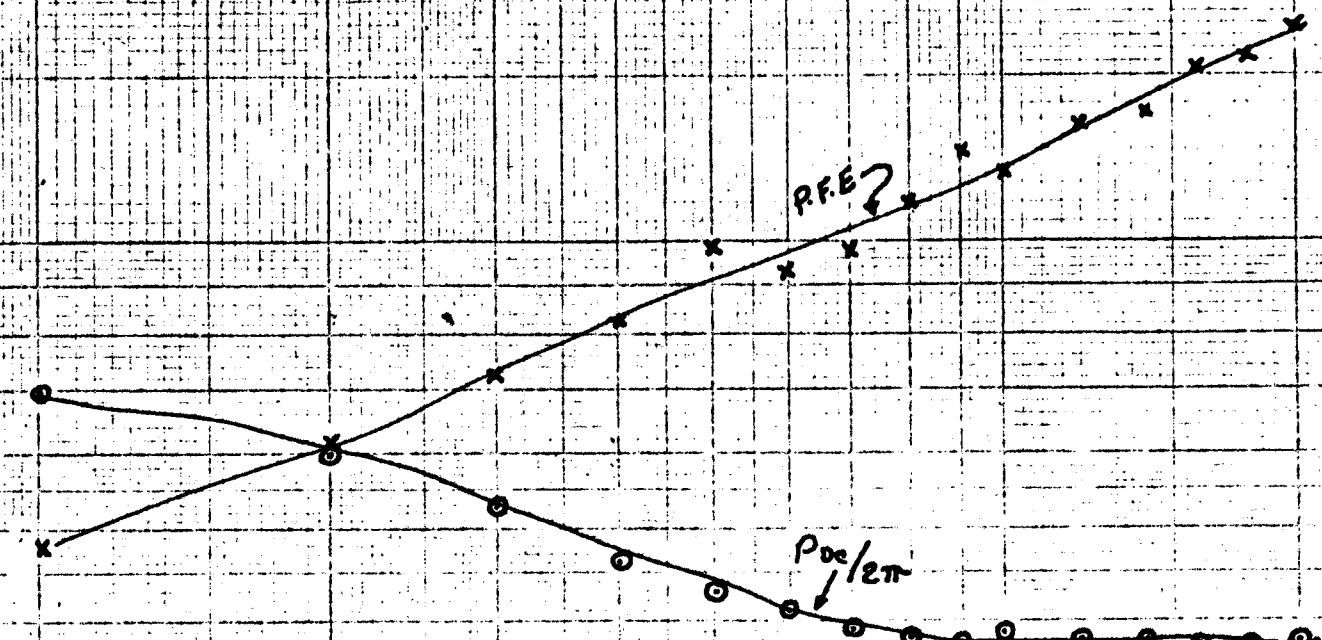
cc: E. Grover Heinrichs
Essex International, Inc.
1704 W. Grant Rd.
Tucson, Ariz. 85705

POLE-POLE DEPTH PROBE #1 EAST LEG @ 50+00 EAST, LINE 4

WINKLER-FAULKNER PROJECT

NEWMONT-HECLA 3-4-65

HEINRICHS GEOEXPLORATION COMPANY
P. O. BOX 5671, TUCSON, ARIZONA



$k = -0.4$

$\rho_1/2\pi = 83$ ohm-ft

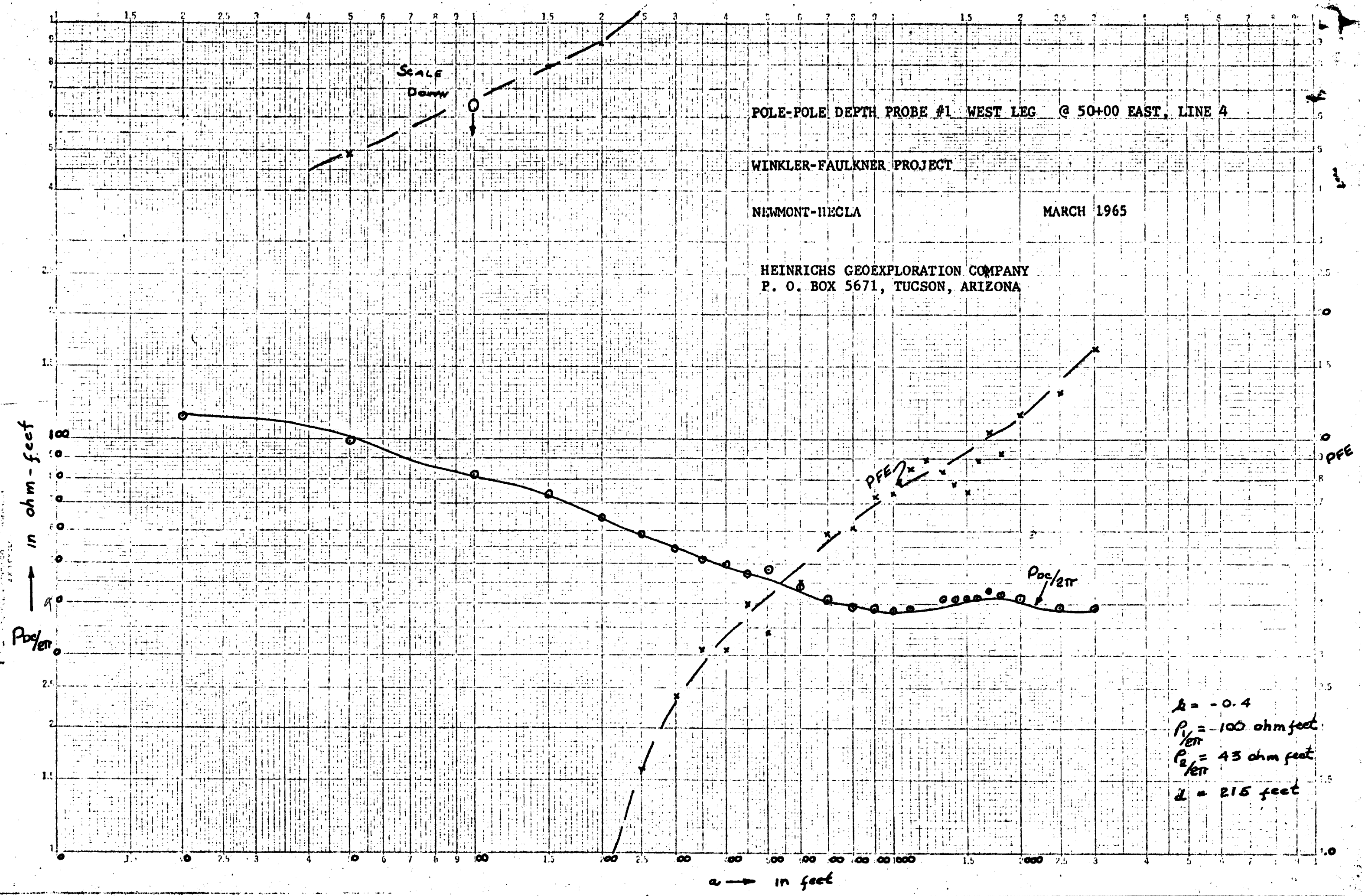
$\rho_2/2\pi = 86$ ohm-ft

$d = 220$ feet

$\rho_{pp}/2\pi$ ← in ohm-feet

a → in feet

250-112L



POLE-POLE DEPTH PROBE #1 WEST LEG @ 50+00 EAST, LINE 4
WINKLER-FAULKNER PROJECT
NEWMONT-HECLA
MARCH 1965
HEINRICHS GEOEXPLORATION COMPANY
P. O. BOX 5671, TUCSON, ARIZONA
SCALE DOWN
PFE
$\rho_{DC}/2\pi$
$\rho_{DC}/2\pi$ → in ohm-feet
a → in feet
k = -0.4
$\rho_1/2\pi$ = 100 ohm feet
$\rho_2/2\pi$ = 43 ohm feet
d = 215 feet

Geologic Map

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SAFFORD QUADRANGLE
ARIZONA–GRAHAM CO.
15 MINUTE SERIES (TOPOGRAPHIC)

(FORT THOMAS) (CLIFTON) (THATCHER) (MT. GRAHAM) (DURHRIE)

109°45' R. 25 E. 618000m E. 40' R. 26 E. 40' 35' R. 27 E. 700 000 FEET R. 28 E. 109°30'
33°00' 365 1000m N. T. 5 S. T. 6 S. T. 7 S. T. 8 S. 720 000 FEET 640 000 FEET 32°45' 50' 55'

Tav Ti Kav Qb Qs Lgr KENNECOTT PHELPS DODGE ANDERSON (In Litigation) WINKLER FAULKNER F. V. OWENS ET AL 300 claims ± KERMAC 1964 SANCHEZ (UNITED NUCLEAR) QTs-gc Qal

Area of Longest Rated PD drilling Core

Zone of Fe ox staining, trend N-ly

Rare Metals-Steen. Cook estimates 15 million tons 0.5 % Cu.

Nine P.D. drill holes reported around Periphery

PD drilling 24" churn drill hole 6-30-64

Intrusive dome cut by hole No. 7

Area of Trail Kennecott Ore Body

Numerous ruby dikes and plugs

Foothills Fault · Butler Fault · Lone Star Fault

Ben Hur Mine · Weber Peak · Lone Star Mtn · Boggs Ranch · Borton Mine · Sanchez Cem · Sanchez Monument · Buena Vista · Solomon (BM 2970) · Solomon Siding · San Jose · Gripe · Safford · Thatcher · Hollywood · Lone Star · Graham · Lebanon · Cactus Flat · Clay Knoll · Graveyard · Freeman Flat · Cook Res. · Dry Lake · Tidwell · Big Canyon · Bennett · Judia · Simon · San Simon · Foote · Stockton · Lone · Star · Peterson · Wilson · Bear Spring · Walnut Spring · Cottonwood Spr · Hackberry Spring · Red Knoll Canyon · Salt Trap Tank · Mark Tank · Boo Tank · Burro Saddle · Don Tank · Rock Tank · Rattlesnake Tank · Dry Canyon Tank · Spring Canyon Tank · Red Tanks Spring · Black Mtn · Turtle Mtn · Sycamore Canyon · Cottonwood Canyon · Cliff Dwellings · Upper Bee Trail Creek · Bonita Trail · Dry Canyon · Bear Canyon · Spring Canyon · Canyon · Wash · Creek · Valley · Draw · River

Rest Haven Memorial Gardens · Safford Cem · Solomonsville Cem · Lebanon Cem · Gaging Sta · Drive-in Theater · Lafe Nelson Sch · Radio Tower (KGLU) Arizona Hy Dept · Siphon · Pumping Sta · Water · Well · Wells · Ruins · Grain · Gravel Pit · County Fairgrounds · Aqueduct · Canal · Pipeline · Trail · Jeep Trail · Highline · Fournes Canal · Brown Canal · Lone Star Canal · Stockton Pass · Eastern Canal · Gaging Sta

Southern Pacific · Montezuma Pacific · Arizona Eastern

VABM 3106 Wick · VABM 3239 Lebanon · VABM 3120 · VABM 3425 · VABM 3496 Sol · VABM 3923 · VABM 3794 · VABM 3431 · BM 2951 · BM 2978 · BM 3158 · BM 3027 · BM 3097 · BM 3195 · BM 3295 · BM 3334 X · BM 3197 · BM 3035

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography from aerial photographs by photogrammetric methods and by planetable surveys 1960. Aerial photographs taken 1957

Polyconic projection. 1927 North American datum
10,000-foot grid based on Arizona coordinate system, east zone
1000-meter Universal Transverse Mercator grid ticks,
zone 12, shown in blue.

Red tint indicates area in which only landmark buildings are shown

Dashed land lines indicate approximate locations
Land lines unsurveyed in T. 5 S.–R. 28 E. and parts of T. 6 S.–Rs. 27 and 28 E.

13° TRUE NORTH · MAGNETIC NORTH
APPROXIMATE MEAN DECLINATION, 1960

SCALE 1:62500
1 0 1 2 3 4 MILES
3000 0 3000 6000 9000 12000 15000 18000 21000 FEET
1 5 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 80 FEET
DOTTED LINES REPRESENT 20 FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

1850 1500 1600 1650 .1449 Magnetometer Anomalies (Den Baars), Showing Intensity in Gammas

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER 25, COLORADO OR WASHINGTON 25, D. C.
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

ROAD CLASSIFICATION
Heavy-duty · Medium-duty · Light-duty · Unimproved dirt · U. S. Route

ARIZONA — QUADRANGLE LOCATION

28 MI. TO INTERSTATE 10 WILLCOX 39 MI.
21 MI. TO ARIZ. 75 CLIFTON 30 MI.
DUNCAN 27 MI. LORDSBURG (N. MEX.) 63 MI.
PIMA 73 MI. GLOBE 74 MI. PIMA 58 MI. TO U.S. 70

INTERIOR-GEOLOGICAL SURVEY, WASHINGTON, D. C.-1961-NS-T
M R-0956

LEGEND
Qal - Recent Valley Alluvium
Qs - Landslide debris, talus, gravels
QTs-gc - Gila Conglomerate
Qb - Basalt flows
Ti - Tert. intrusive plugs and dikes, rhyolitic
Ta - Tert. andesitic flows
Lgr - Laramides granitic intrusives
Kav - Cretaceous andesite flows

PIMA BLUEPRINT CO.
4655 E. BROADWAY
Phone EA 7-3421
TUCSON, ARIZONA

SAFFORD, ARIZ.
N3245—W10930/15
1960

by Den Baars
Copy

APRIL 3, 1965

Newmont-Hecla Joint Venture

Re: Letter Report
Winkler-Faulkner Project

Gentlemen:

This is a brief letter report outlining the field work accomplished and results obtained for the Newmont-Hecla Joint Venture on the Winkler-Faulkner project from January 12 to March 14, 1965.

ELECTRICAL PHASE

	Data Coverage	Stations
I. P. Line 1 (0 N/S)	7000 ft.	54
I. P. Line 3 (4000 N)	19500 ft.	154
I. P. Line 4 (6000 N)	10000 ft.	76
I. P. Line 5 (8000 N)	22500 ft.	176

I. P. Pole-Pole depth probe #1: East & West legs: 40 data points total.
East leg a= 100 ft. to 2000 ft.
West leg a= 20 ft. to 3000 ft.

Wenner depth probes for rock property test on:

Long Star granite	12 stations	a= 10 to 200 ft.
Tuv	12 stations	a= 10 to 200 ft.
Tlv	18 stations	a= 10 to 200 ft.

MAGNETIC PHASE

Magnetic susceptibility log of Drill Hole #6 core from 910 to 1223 feet - 33 determinations.

Magnetic Survey	Coverage
5 - East-west lines	100,000 feet
17 - North-south lines	136,000 feet

Re: Letter Report
Winkler-Faulkner Project

Total coverage: 236,000 feet for a total of 44.7 miles and 881 stations.

RESULTS

ELECTRICAL PHASE

The induced polarization effects noticed were attributed mainly to low resistivity inductive coupling and the normal background response of the alluvium. The only zone of possible sulfide indication noticed is on Line 3 at about 100 E, although this zone is more likely just a zone of higher background effects.

The resistivity data, in general, shows a three layer case with the middle layer lower in resistivity than the others. A possible interpretation of this could be dry alluvium for the upper layer, water saturated alluvium for the middle layer and bedrock for the lower layer. Depths to bedrock indicated were from about 200 feet to the north to about 1000 feet to the south.

The induced polarization two array depth probe was centered at 50 + 00 E Line 4 and gave a two layer solution with the upper layer higher in resistivity and about 220 feet thick. This 220 foot interface is possibly the alluvial water table. The absence of the third layer may be the result of a lack of electrical contrast between bedrock and water saturated alluvium in this area. No frequency effects were noted that could not be attributed to inductive coupling interference.

The Wenner depth probe, rock property tests were made on outcrops of the three suspected bedrock types; Tuv, Tlv, and the Lone Star granite. This test shows these three rocks to have very similar resistivities (rho/2 pi from 115 to 160 ohm feet), thereby making it very difficult to distinguish between them electrically. The resistivity of these rocks is higher than was indicated at depth on the I.P. lines and two array probe and may be due to their being above the water table on the Wenner test and below on the I.P. and the I.P. generally nearer to the lower part of the valley (i.e. finer and more conductive constituents).

MAGNETIC PHASE

Drill Hole #6 was logged for magnetic susceptibility and a

change was noted at approximately 1050 feet, perhaps indicating the contact between Tuv and Tlv. The Tlv was somewhat higher in susceptibility and considerably more polarized than the Tuv.

The vertical intensity magnetic data was very erratic over the whole area due to the abundant volcanic boulders in the surface alluvium and, therefore, the plan and profile data had to be smoothed out before interpreting. The most obvious feature was a high zone centered at about 6000 N - 10000 E and trending NE-SW. On interpretation of the profiles of this high zone, it was estimated that the cause was a truncated wedge or tabular zone 2000 to 3000 feet thick and buried from 700 to 1200 feet below surface. This feature is likely the SW downfaulted block of the Lone Star granite and thereby indicates that the faulting only had a dip slip component since both the exposed block to the NE, and the downfaulted block, are on the same strike.

Sincerely,

HEINRICHS GEOEXPLORATION COMPANY

Chris S. Ludwig

Chris S. Ludwig
Senior Geophysicist

pr

cc: Dr. A. A. Brant 5

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Chris S. Ludwig

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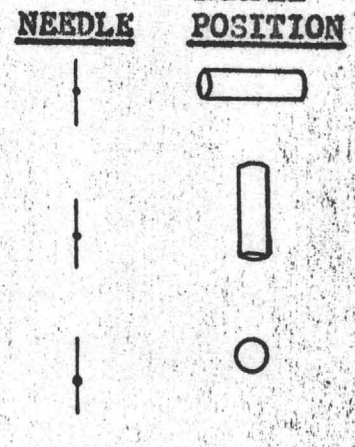
cc: Dr. A. A. Brant 5

NEWMONT-HECLA JOINT VENTURE, WINKLER-FAULKNER PROJECT
MAGNETIC SUSCEPTIBILITY LOG
DRILL HOLE #6 CORE
FEBRUARY 1965

MINIMUM K = 320 x 10^{-6} @ 950 feet MAXIMUM K = 4680 x 10^{-6} @ 1166 feet

Gray members with calcitic fractures are consistently polarized with consequent erratic susceptibility results, at least up to approximately 5000 x 10^{-6} along one axis.

NOTES: K listing under each sample were run as follows below and the values are listed in the following order:



Most samples were approximately 1" - 2" long.

BOX NO.	FOOTAGE	K- x10^{-6}	POLARIZED	REMARKS
1	910	500		
		605		
		Sample too long		
1	912	980		
		696		
		Sample too long		
1	913	605		
		1036		
		480		
1	914	1280		
		1620		
		1036		
1	915	405		
		845		
		540		
1	918	500		
		924		
		1280		

NEWMONT-HECLA JOINT VENTURE, WINKLER-FAULKNER PROJECT
MAGNETIC SUSCEPTIBILITY LOG
DRILL HOLE #6 CORE
FEBRUARY 1965

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2	920	952			
		1125			
		045			
2	932	320			
		605			
		845			
3	935	1280			
		500			
		405			
3	950	405			
		320			
		605			
4	962	720			
		1036			
		672			
5	970	980			
		768			
		845			
6	980	1280			
		1125			
		1280			
7	990	1216			
		1066			
		1584			
8	1004	1280			
		1920			
		2205			
9	1006	924			
		1445			
		2080			
9	1012	1036			
		922			
		1548			
10	1016	768			
		952			
		1548			
11	1042	845			TAN
		768			
		1125			

NEWMONT-HECLA JOINT VENTURE, WINKLER-FAULKNER PROJECT
MAGNETIC SUSCEPTIBILITY LOG
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FEBRUARY 1965

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12	1058			P	VUGGY
12	1063			P	DARKEST
13	1066			P	FINE GRAINED
13	1072	5312		P	VUGGY
14	1086			P	GRAY, FINE GRAINED
15	1096	1280			
		1344			
		1216			
16	1110	2205			
		1920			
		2880			
17	1114			P	
18	1132	2000			REDDISH, FINE SANDY
		2500			
		1620			
21	1156	720			
		1216			
		2880			
21	1163				WHITE, DOES NOT AFFECT NEEDLE
22	1166	605			GRAY, FINE GRAINED
		1920			
		4680			
25	1205	180			
		180			
		320			
26	1223	4500		P	FINE GRAINED, GRAY &
?		720			WHITE

P. O. BOX 5671
TUCSON, ARIZONA

OBSERVERS: J. P. MATTHEWS JR.
H. R. MOULINET
W. E. HEINRICHS, JR.

FEBRUARY 17, 1965

NEWMONT-HECLA JOINT VENTURE, WINKLER-FAULKNER PROJECT
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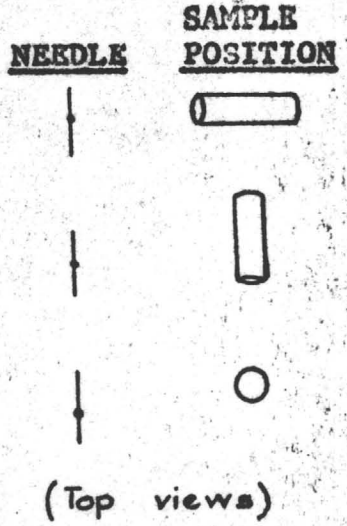

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		720			

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FEBRUARY 17, 1965

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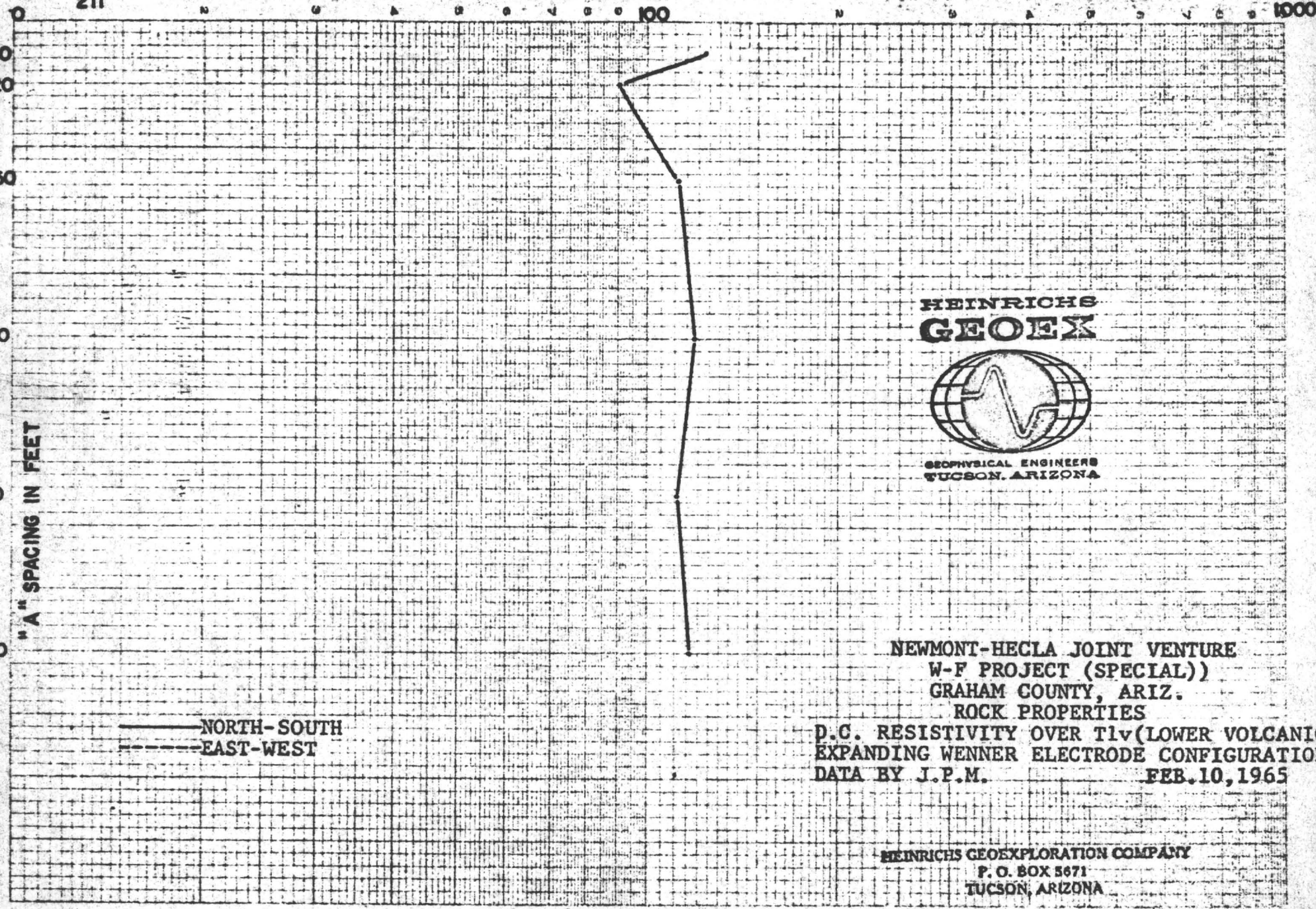

——NORTH-SOUTH
- - - - - -EAST-WEST

HEINRICHS
GEOEX
GEOPHYSICAL ENGINEERS
TUCSON, ARIZONA

NEWMONT-HECLA JOINT VENTURE
W-F PROJECT (SPECIAL))
GRAHAM COUNTY, ARIZ.
ROCK PROPERTIES
D.C. RESISTIVITY OVER Tlv(LOWER VOLCANIC
EXPANDING WENNER ELECTRODE CONFIGURATION
DATA BY J.P.M. FEB.10,1965

HEINRICHS GEOEXPLORATION COMPANY
P. O. BOX 5671
TUCSON, ARIZONA

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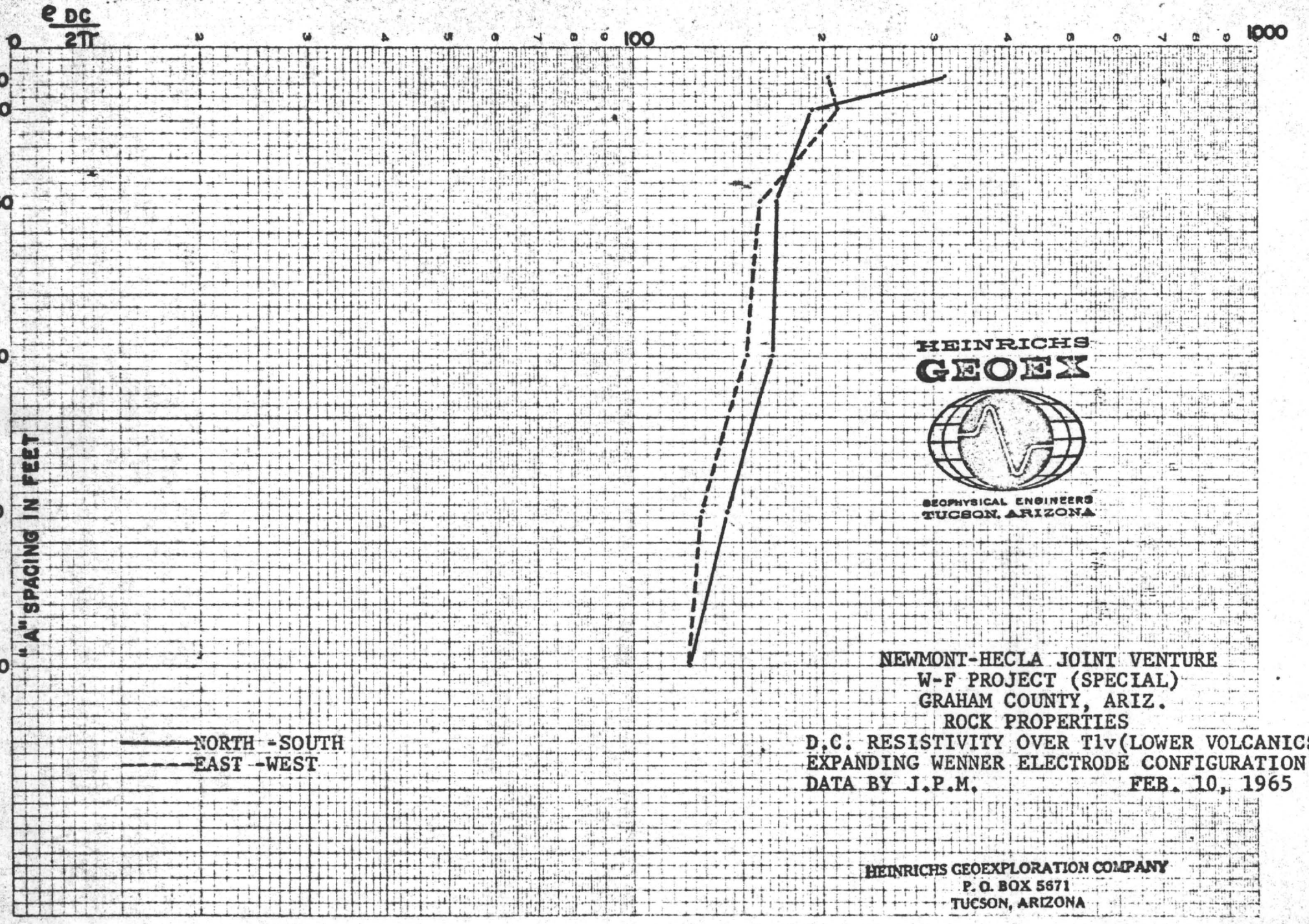

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TUCSON, ARIZONA

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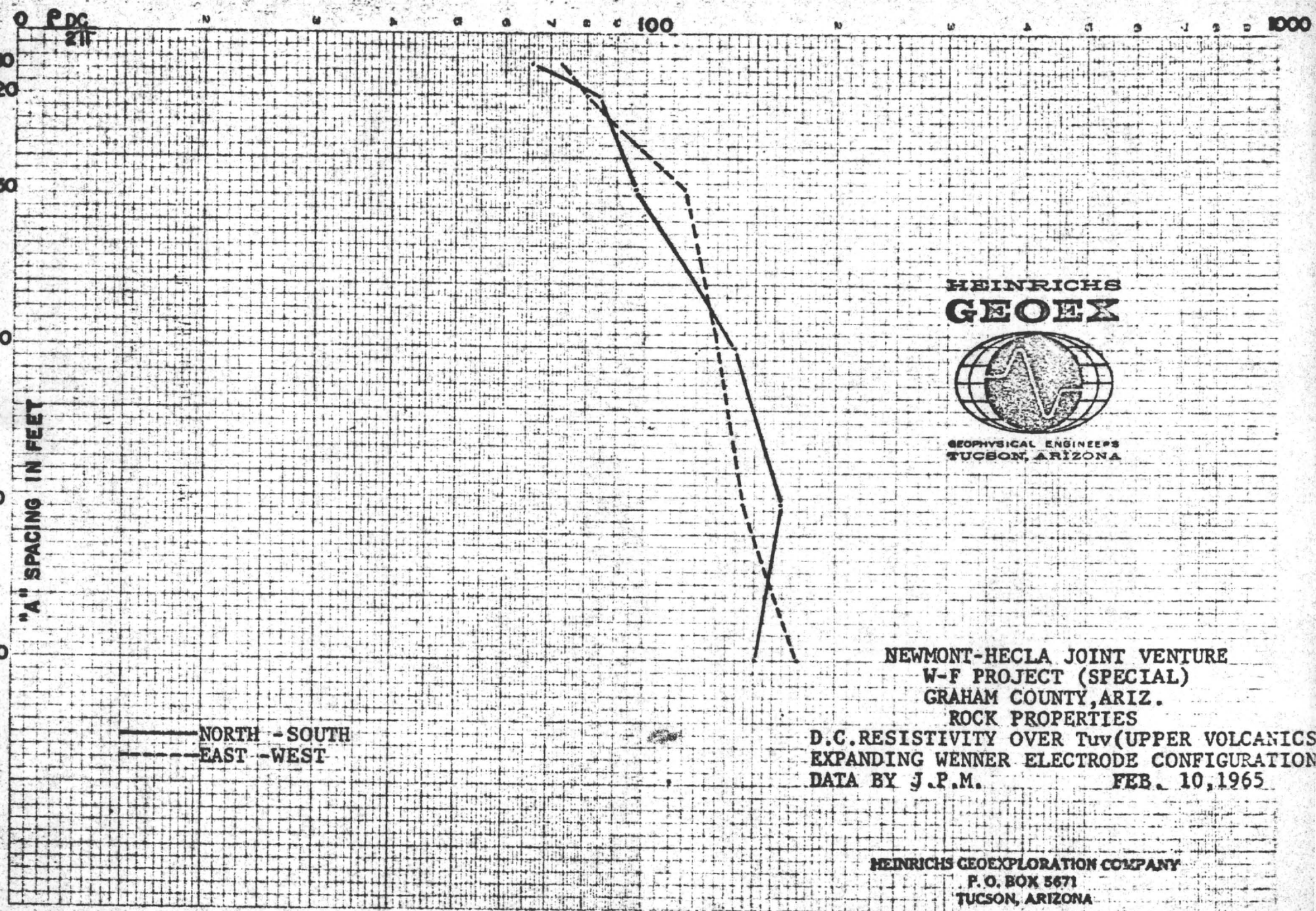

HEINRICHS
GEOEX

GEOPHYSICAL ENGINEERS
TUCSON, ARIZONA

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EUGENE DIETZGEN CO.
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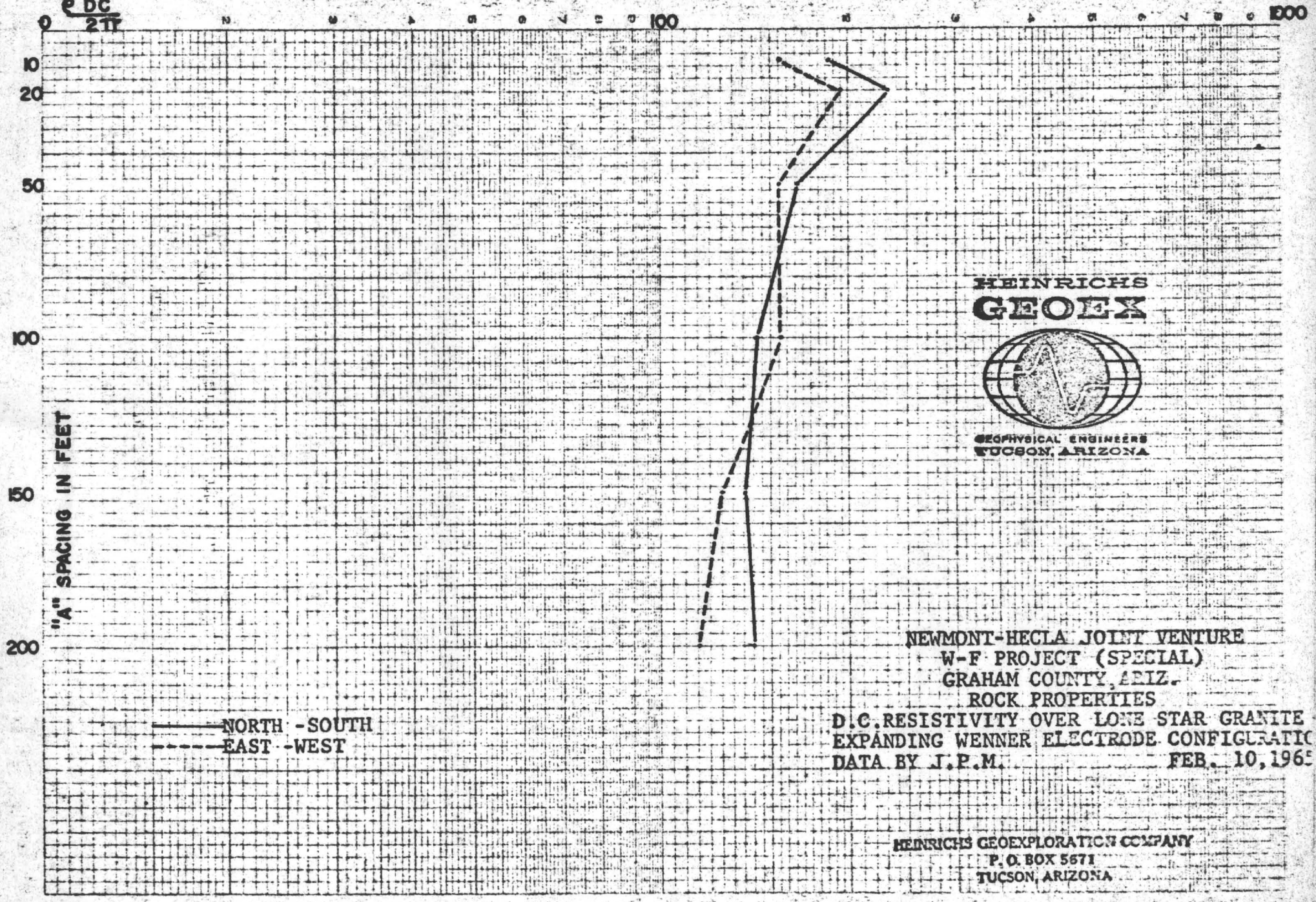

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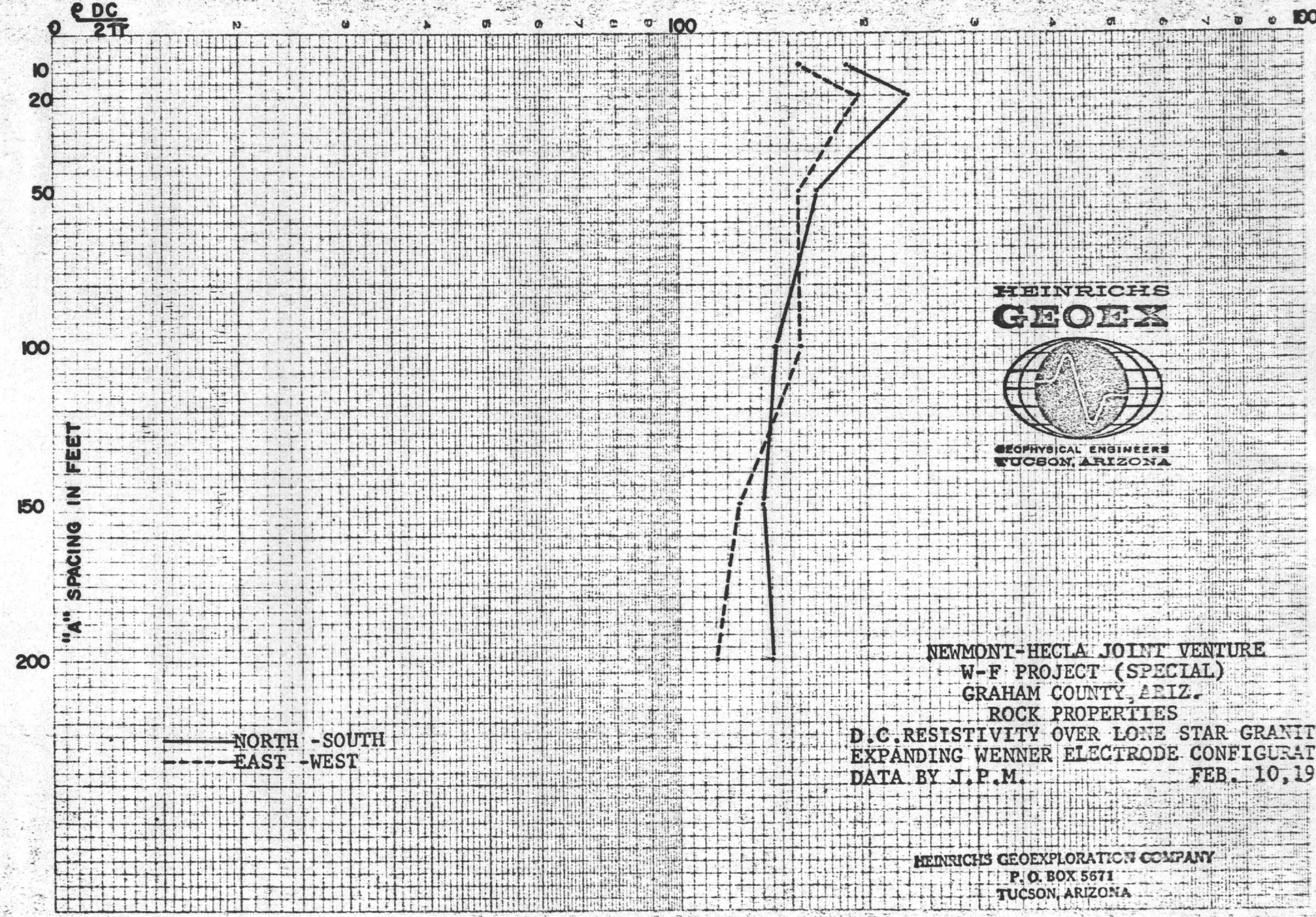

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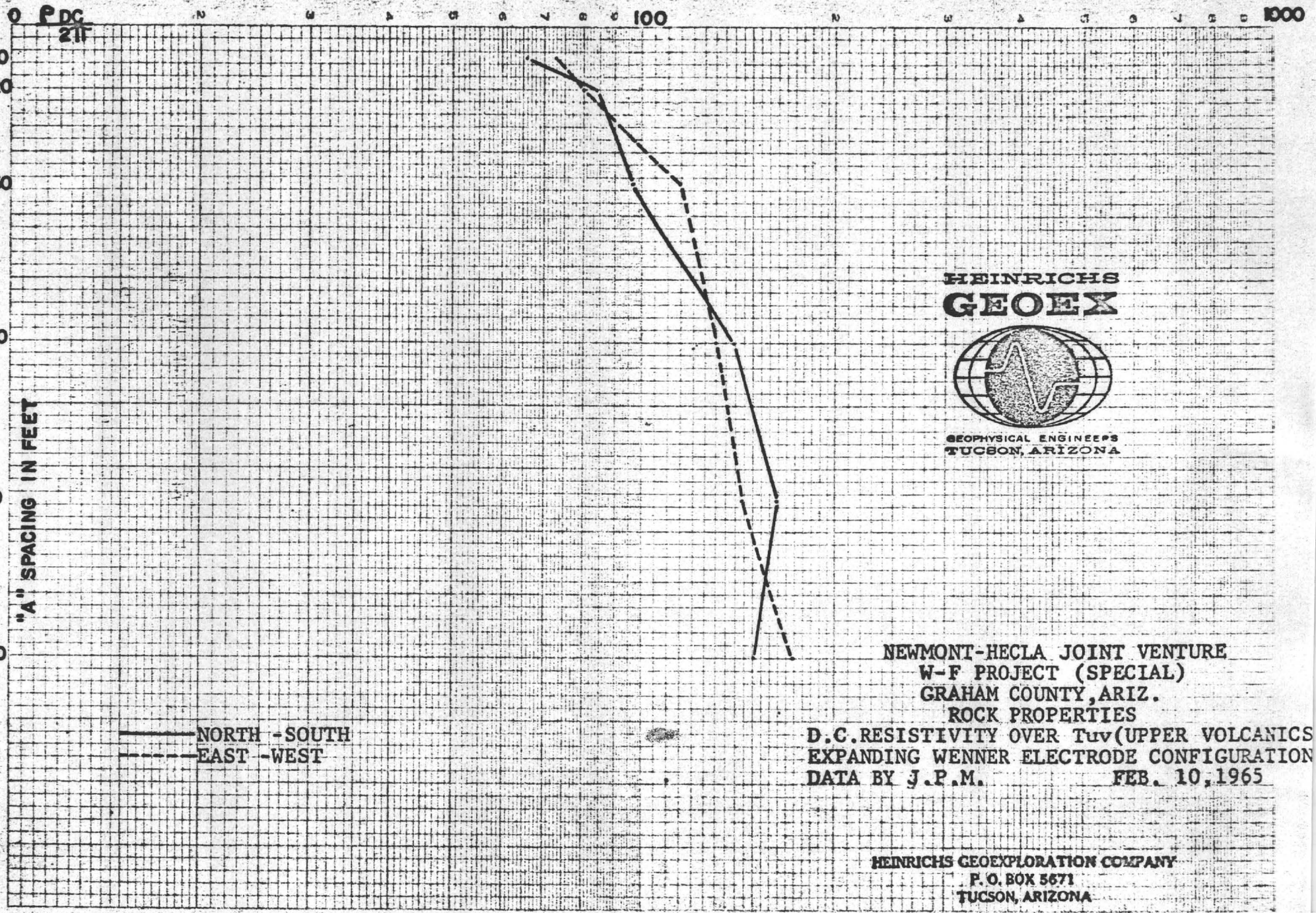

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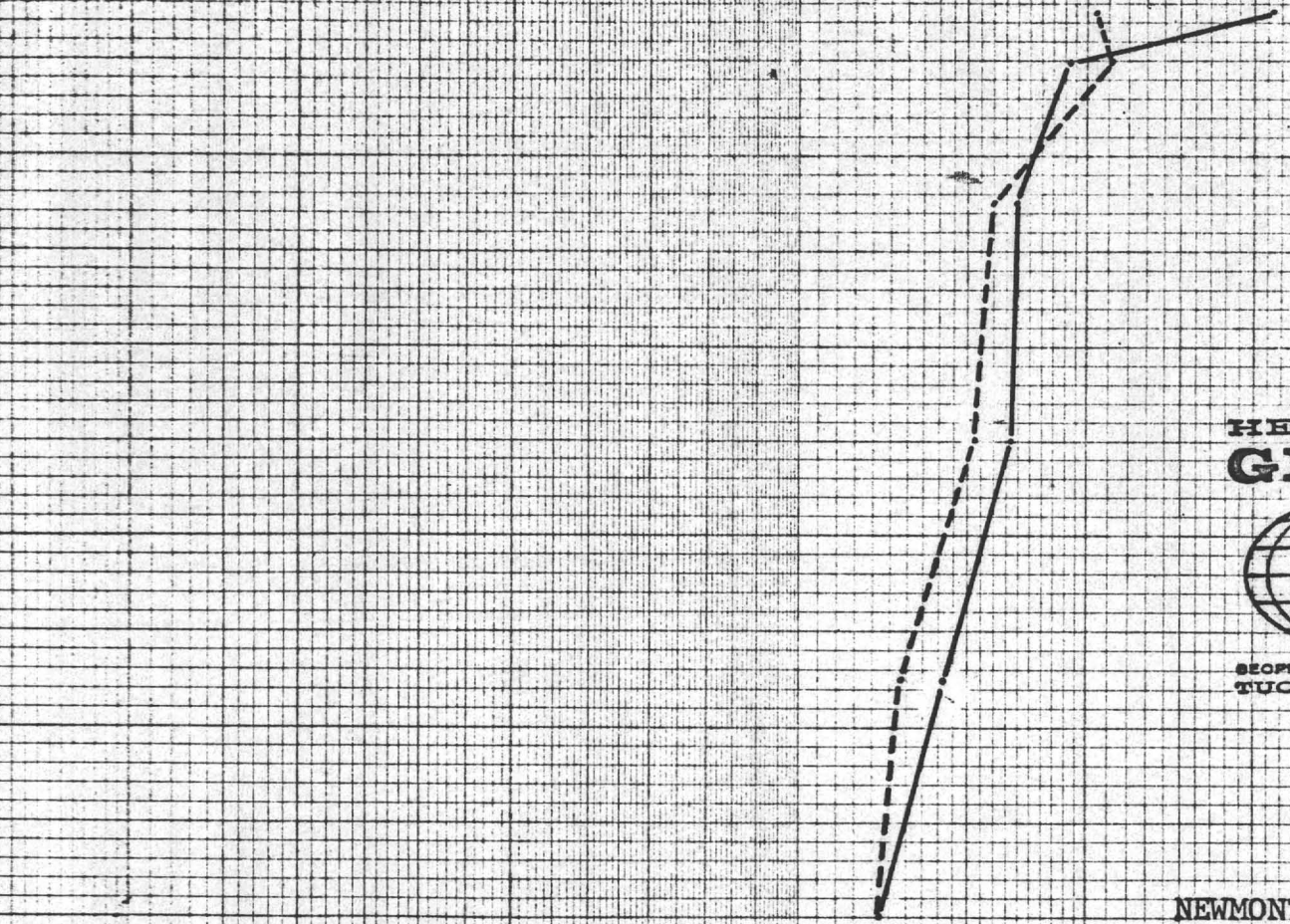

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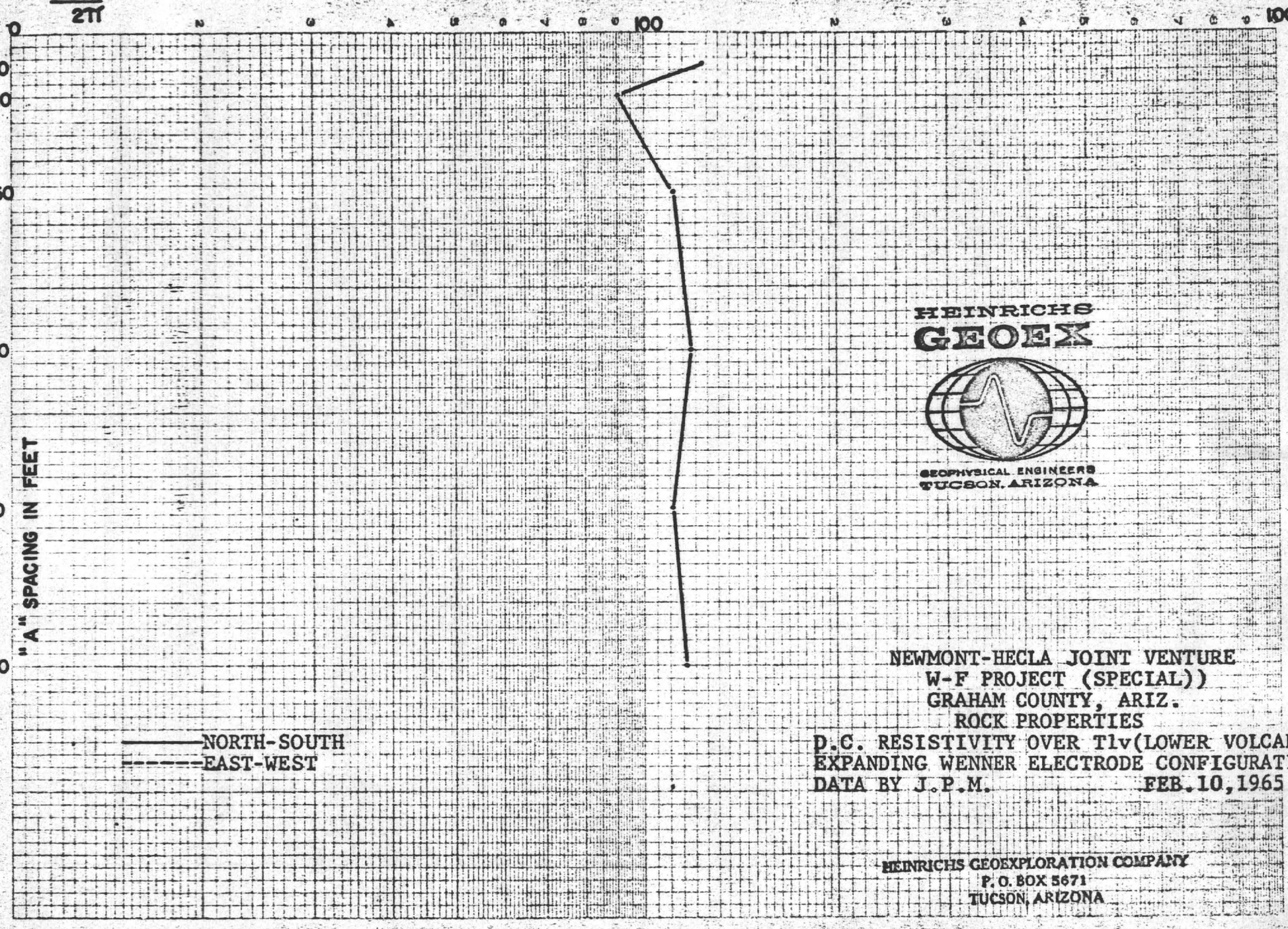

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