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SCHLUMBERGER DEPTH SOUNDINGS
IN THE
SPRINGERVILLE AREA
APACHE COUNTY, ARIZONA
FOR
TUCSON GAS & ELECTRIC COMPANY

PHOENIX GEOPHYSICS INC.
818 WEST MIRACLE MILE

PHOENIX

SCHLUMBERGER DEPTH SOUNDINGS

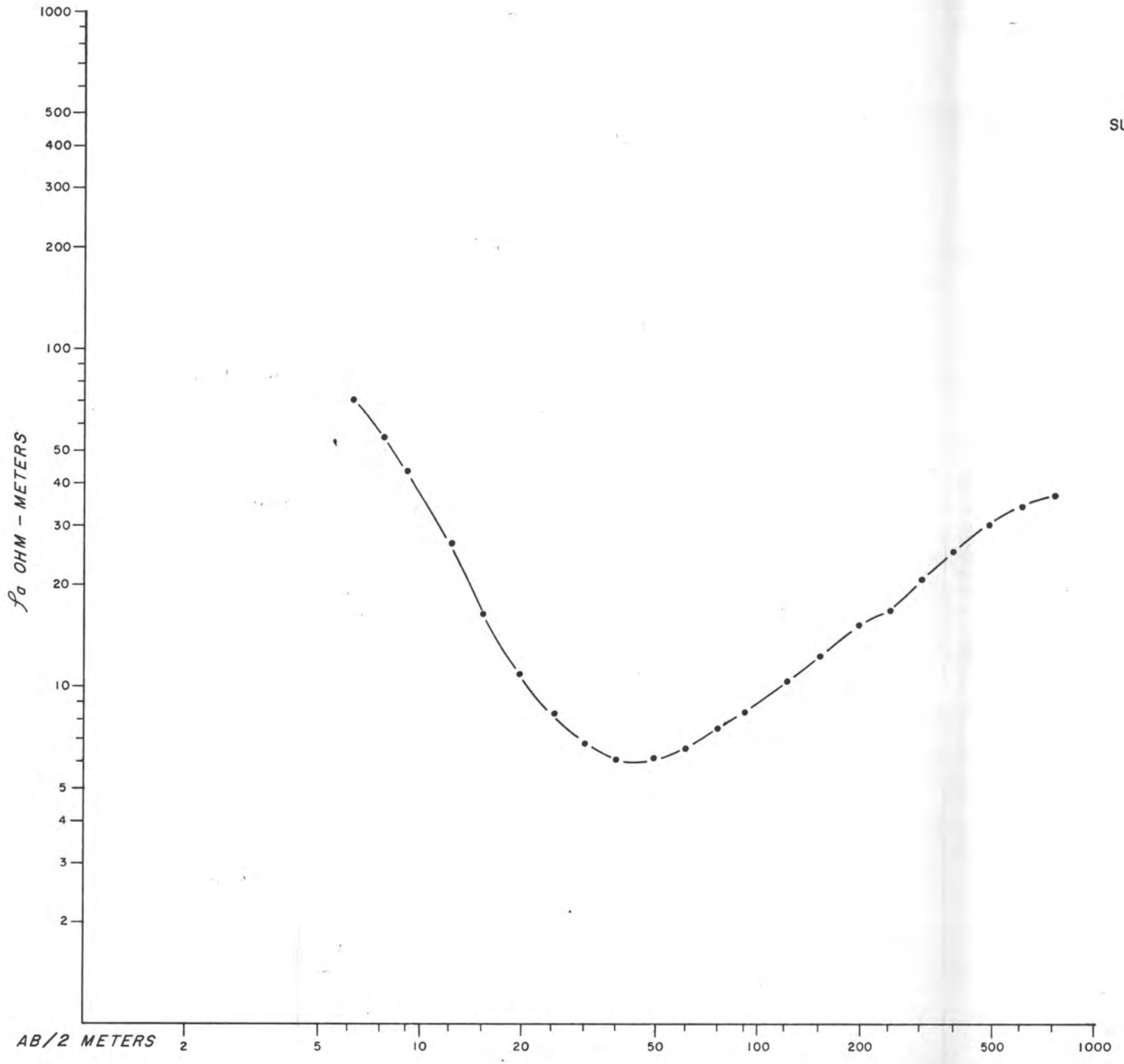
IN THE

SPRINGERVILLE AREA

APACHE COUNTY, ARIZONA

FOR

TUCSON GAS & ELECTRIC COMPANY



CALCULATED THICKNESS AND RESISTIVITY

SURFACE ELEVATION 5855'

THICKNESS IN METERS	RESISTIVITY ρ-OHM METERS
4.4 (14.5')	105
66 (216')	5.6
	105

Top of Kaibab Ls. at 5624'

TUCSON GAS & ELECTRIC COMPANY

SPRINGERVILLE AREA, APACHE COUNTY
ARIZONA

DEPTH SOUNDING E-5

FREQUENCY: 0.125 HZ.

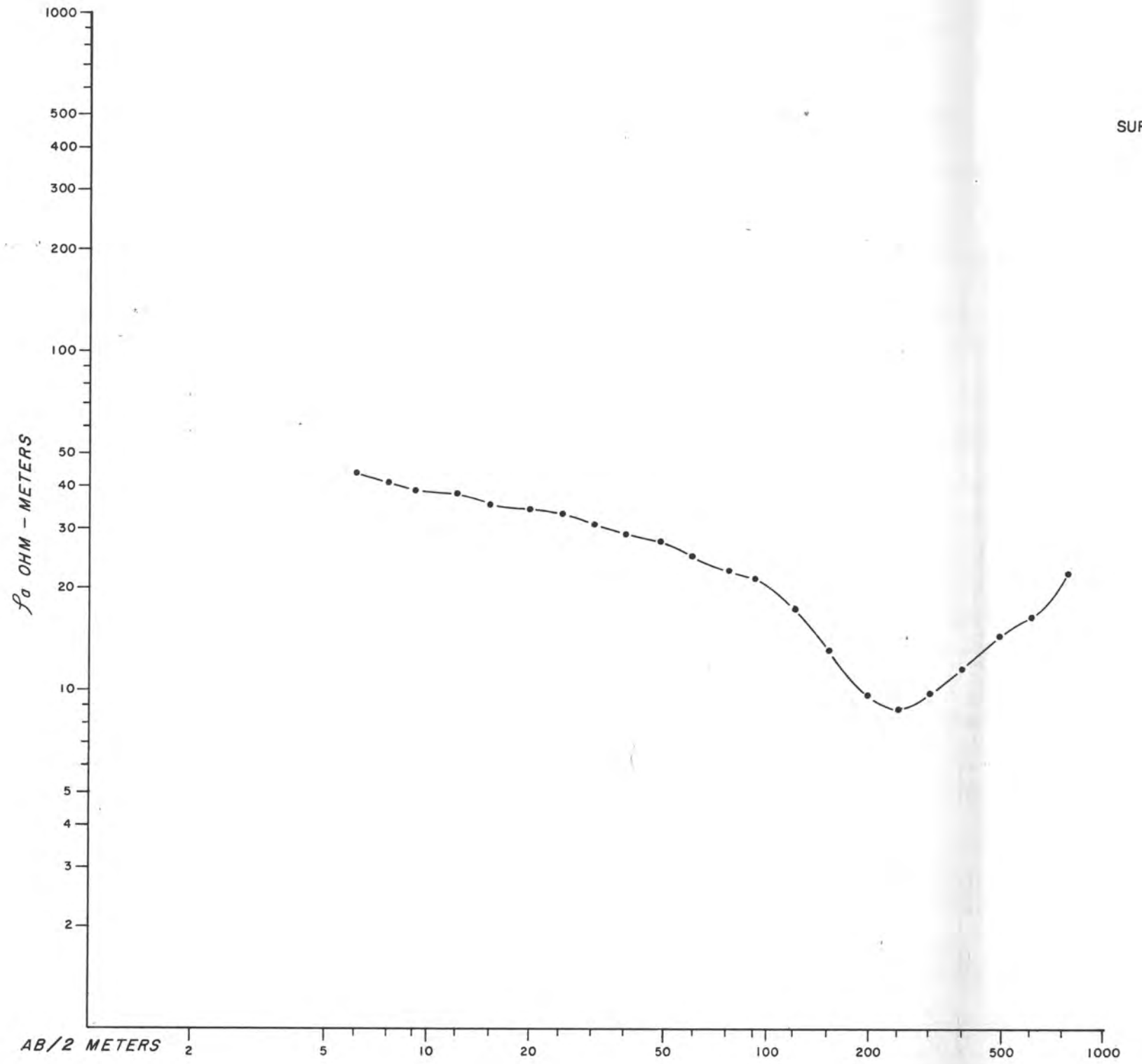
APPROVED: Bruce S Sell

DATE SURVEYED: DEC., 1975

DATE: 1/13/76

PHOENIX GEOPHYSICS

SCHLUMBERGER DEPTH SOUNDINGS



CALCULATED THICKNESS
AND RESISTIVITY

SURFACE ELEVATION 6625'

THICKNESS IN METERS	RESISTIVITY ρ-OHM METERS
11.5 (38')	40
34.5 (113')	26
287 (943')	8.1
	∞

Top of Kaibab Ls. at 5531'

TUCSON GAS & ELECTRIC COMPANY

SPRINGERVILLE AREA, APACHE COUNTY
ARIZONA

DEPTH SOUNDING I

FREQUENCY: 0.125 HZ.

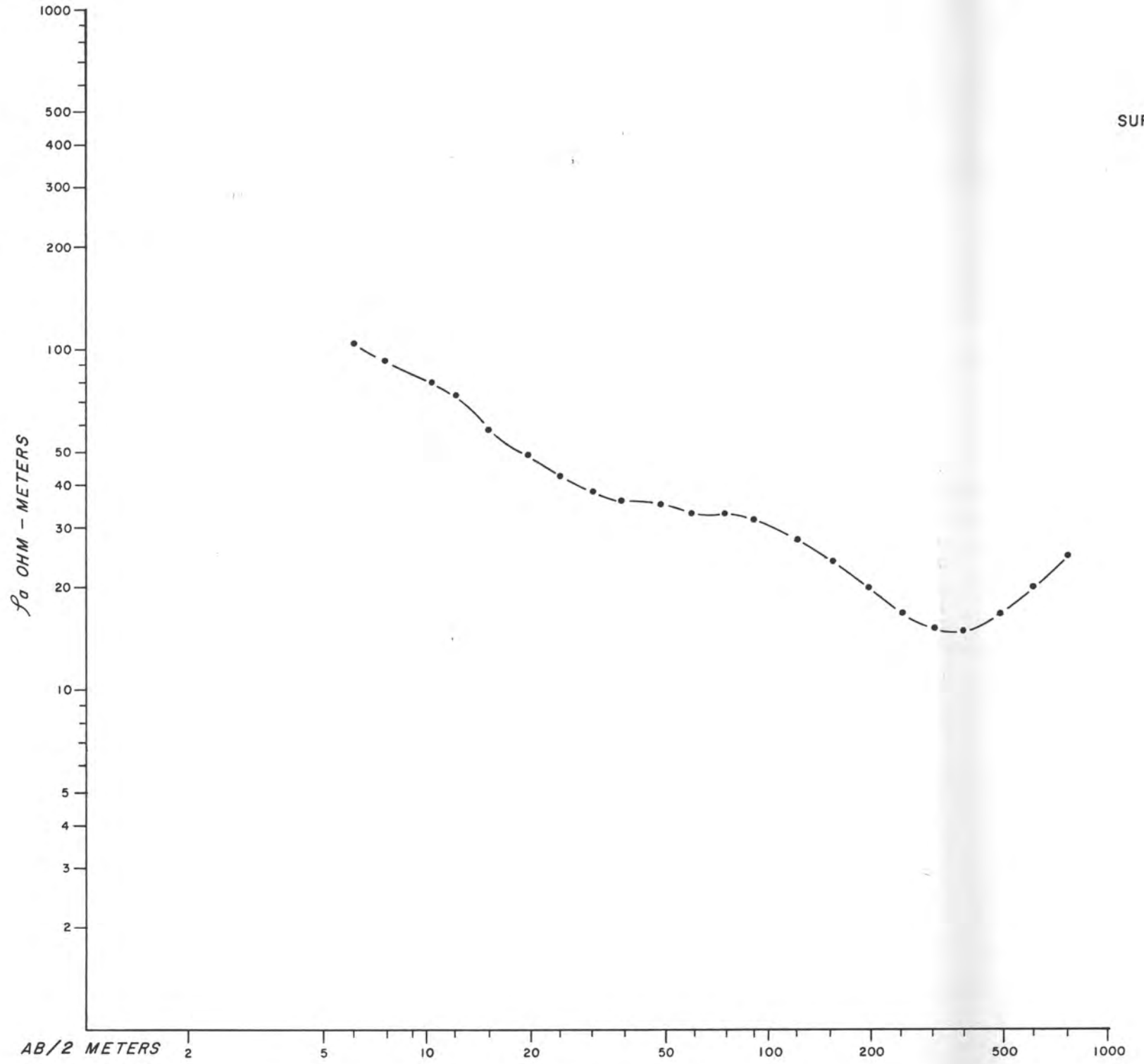
APPROVED: Bruce S Bell

DATE SURVEYED: DEC., 1975

DATE: 1/13/76

PHOENIX GEOPHYSICS

SCHLUMBERGER DEPTH SOUNDINGS



CALCULATED THICKNESS AND RESISTIVITY

SURFACE ELEVATION 6685'

THICKNESS IN METERS	RESISTIVITY ρ OHM METERS
5.2 (17')	120
111.8 (337')	40
54 (117')	12.5
	∞

Top of Kaibab Ls. at 6124'

TUCSON GAS & ELECTRIC COMPANY

SPRINGERVILLE AREA, APACHE COUNTY
ARIZONA

DEPTH SOUNDING 2

FREQUENCY: 0.125 HZ.

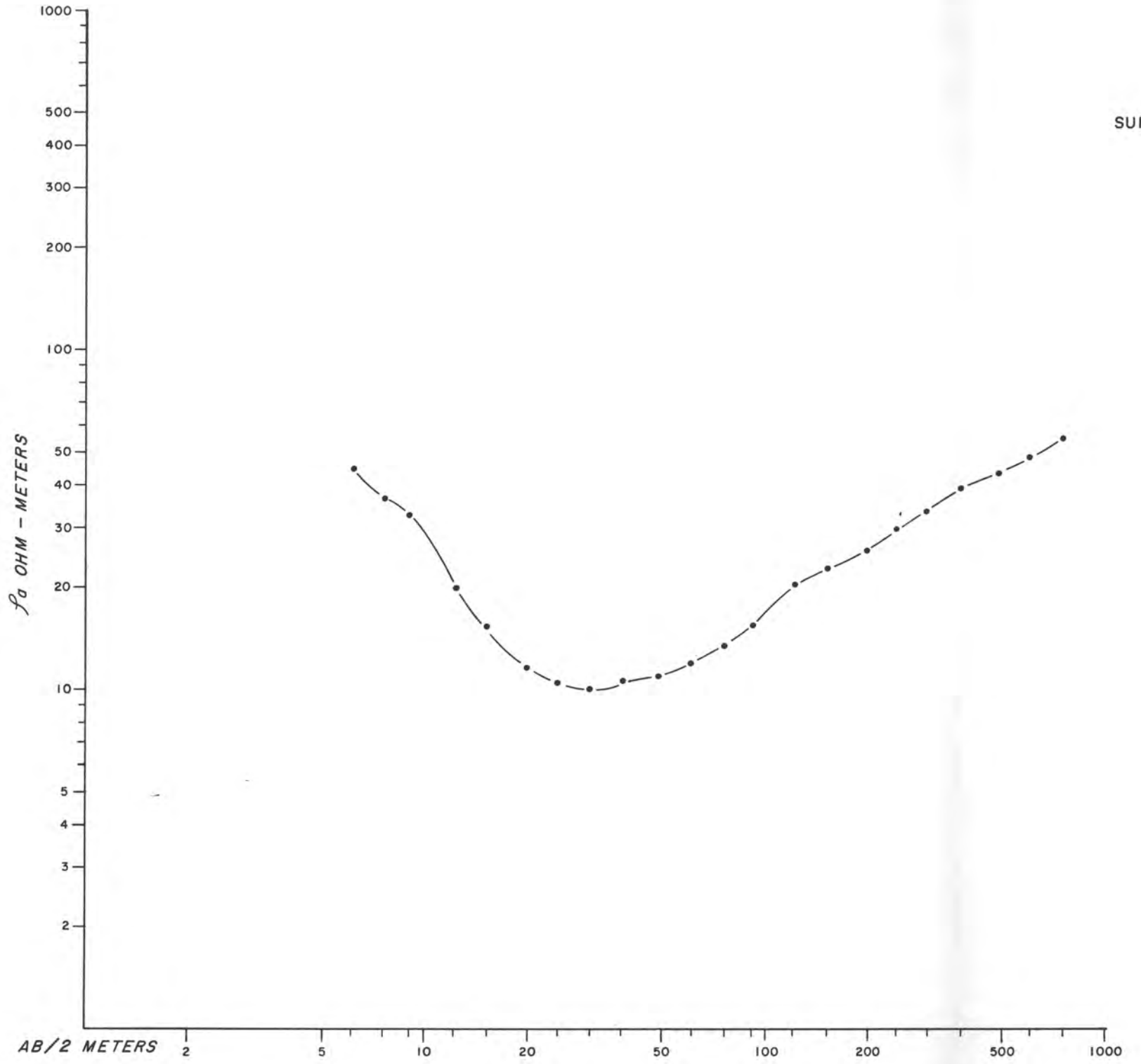
APPROVED: Bruce S. Bell

DATE SURVEYED: DEC., 1975

DATE: 1/13/76

PHOENIX GEOPHYSICS

SCHLUMBERGER DEPTH SOUNDINGS



CALCULATED THICKNESS AND RESISTIVITY

SURFACE ELEVATION 6685'

THICKNESS IN METERS	RESISTIVITY ρ-OHM METERS
3.2 (11')	92
64 (210')	9.5
	92

Top of Kaibab Ls. at 6464'

TUCSON GAS & ELECTRIC COMPANY

SPRINGERVILLE AREA, APACHE COUNTY
ARIZONA

DEPTH SOUNDING 3

FREQUENCY: 0.125 HZ.

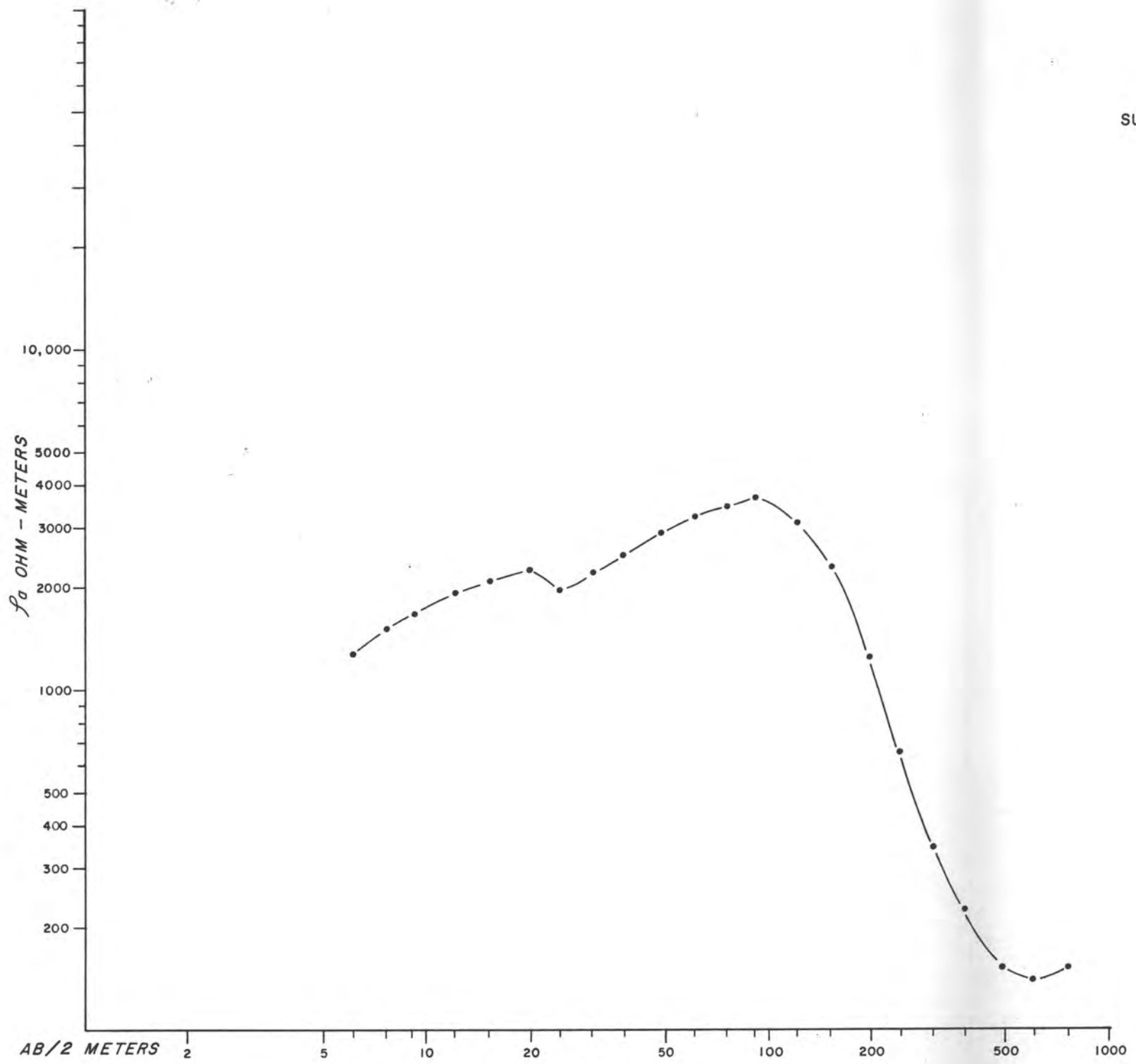
APPROVED: Bruce S Bell

DATE SURVEYED: DEC., 1975

DATE: 1/13/76

PHOENIX GEOPHYSICS

SCHLUMBERGER DEPTH SOUNDINGS



CALCULATED THICKNESS AND RESISTIVITY

SURFACE ELEVATION 6920'

THICKNESS IN METERS	RESISTIVITY ρ OHM METERS
17.7 (58')	1600
53 (174')	4000
443 (1453')	80
∞	∞

Top of Kaibab Ls. at 6862'

[High Resistivity Basement at 5235']

TUCSON GAS & ELECTRIC COMPANY

SPRINGERVILLE AREA, APACHE COUNTY
ARIZONA

DEPTH SOUNDING 4

FREQUENCY: 0.125 HZ.

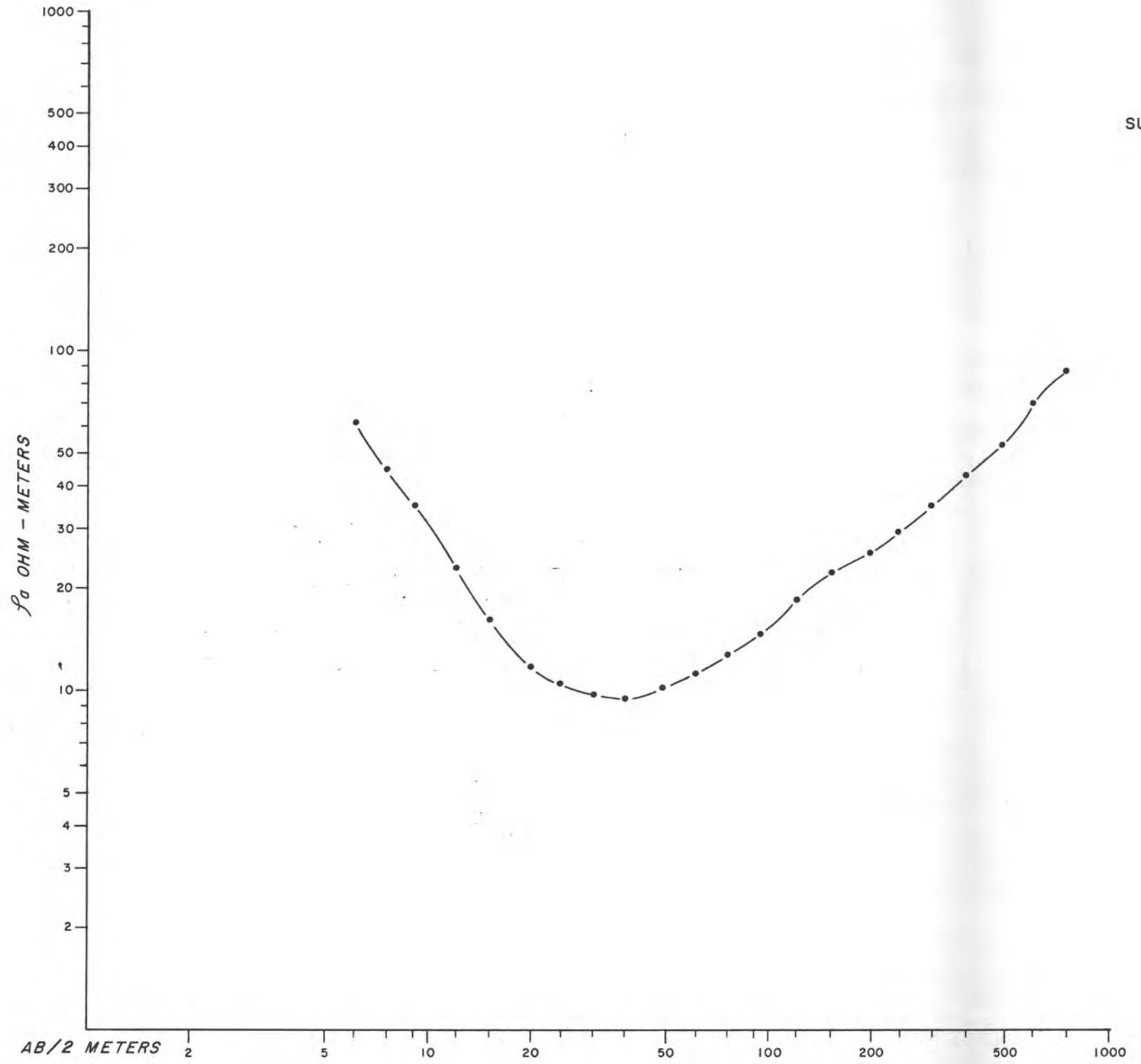
APPROVED: [signature]

DATE SURVEYED: DEC., 1975

DATE: 1/13/76

PHOENIX GEOPHYSICS

SCHLUMBERGER DEPTH SOUNDINGS



CALCULATED THICKNESS
AND RESISTIVITY

SURFACE ELEVATION 6735'

THICKNESS IN METERS	RESISTIVITY ρ-OHM METERS
3 (10')	190
75 (246')	10
	190

Top of Kaibab Ls. at 6479'

TUCSON GAS & ELECTRIC COMPANY

SPRINGERVILLE AREA, APACHE COUNTY
ARIZONA

DEPTH SOUNDING 5

FREQUENCY: 0.125 HZ.

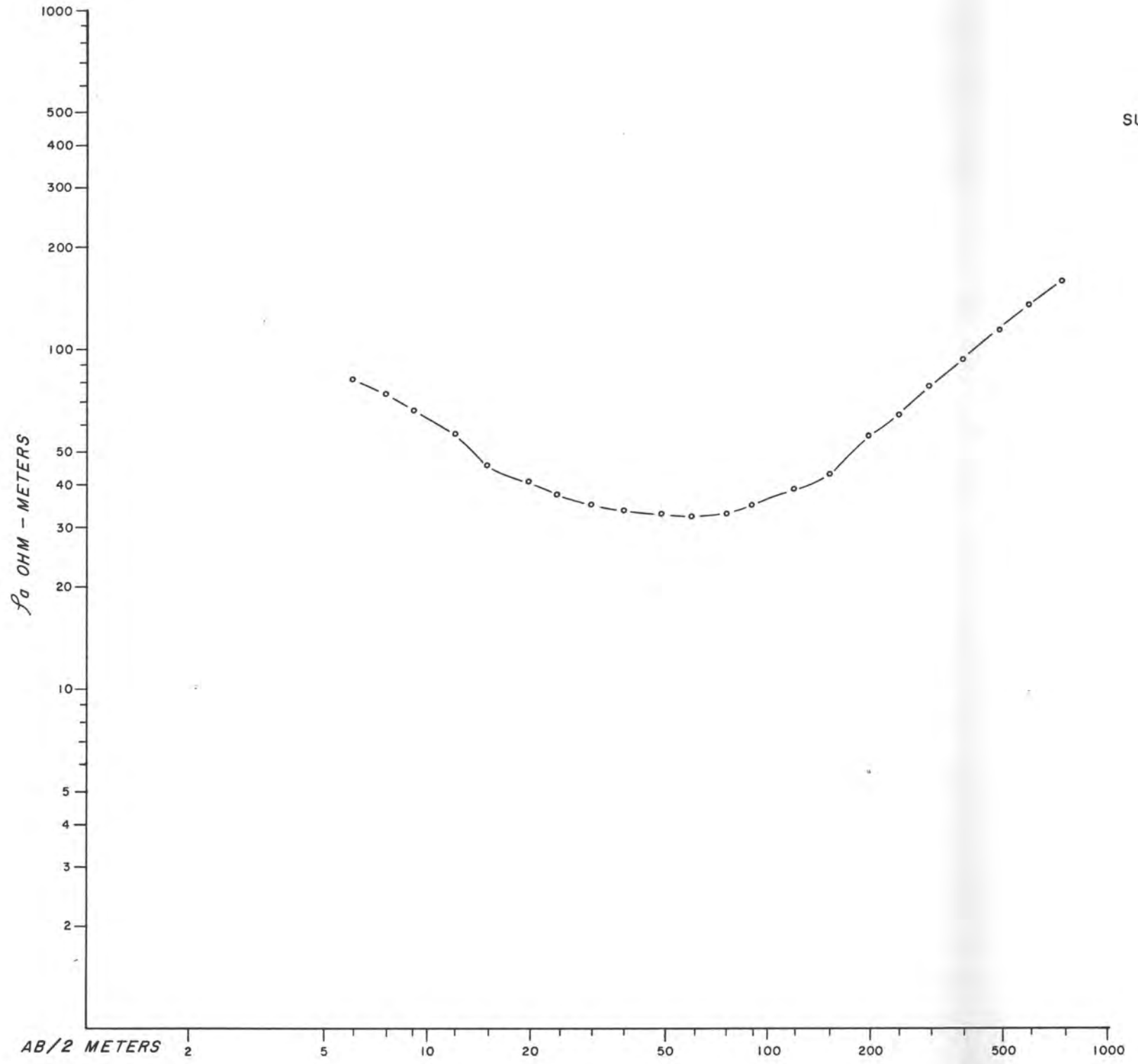
APPROVED: Bruce S Bell

DATE SURVEYED: DEC., 1975

DATE: 1/13/76

PHOENIX GEOPHYSICS

SCHLUMBERGER DEPTH SOUNDINGS



CALCULATED THICKNESS AND RESISTIVITY

SURFACE ELEVATION 6815'

THICKNESS IN METERS	RESISTIVITY ρ-OHM METERS
5.6 (18')	85
140 (459')	36
	250

Top of Kaibab Ls. at 6337'

TUCSON GAS & ELECTRIC COMPANY

SPRINGERVILLE AREA, APACHE COUNTY
ARIZONA

DEPTH SOUNDING 6

FREQUENCY: 0.125 HZ.

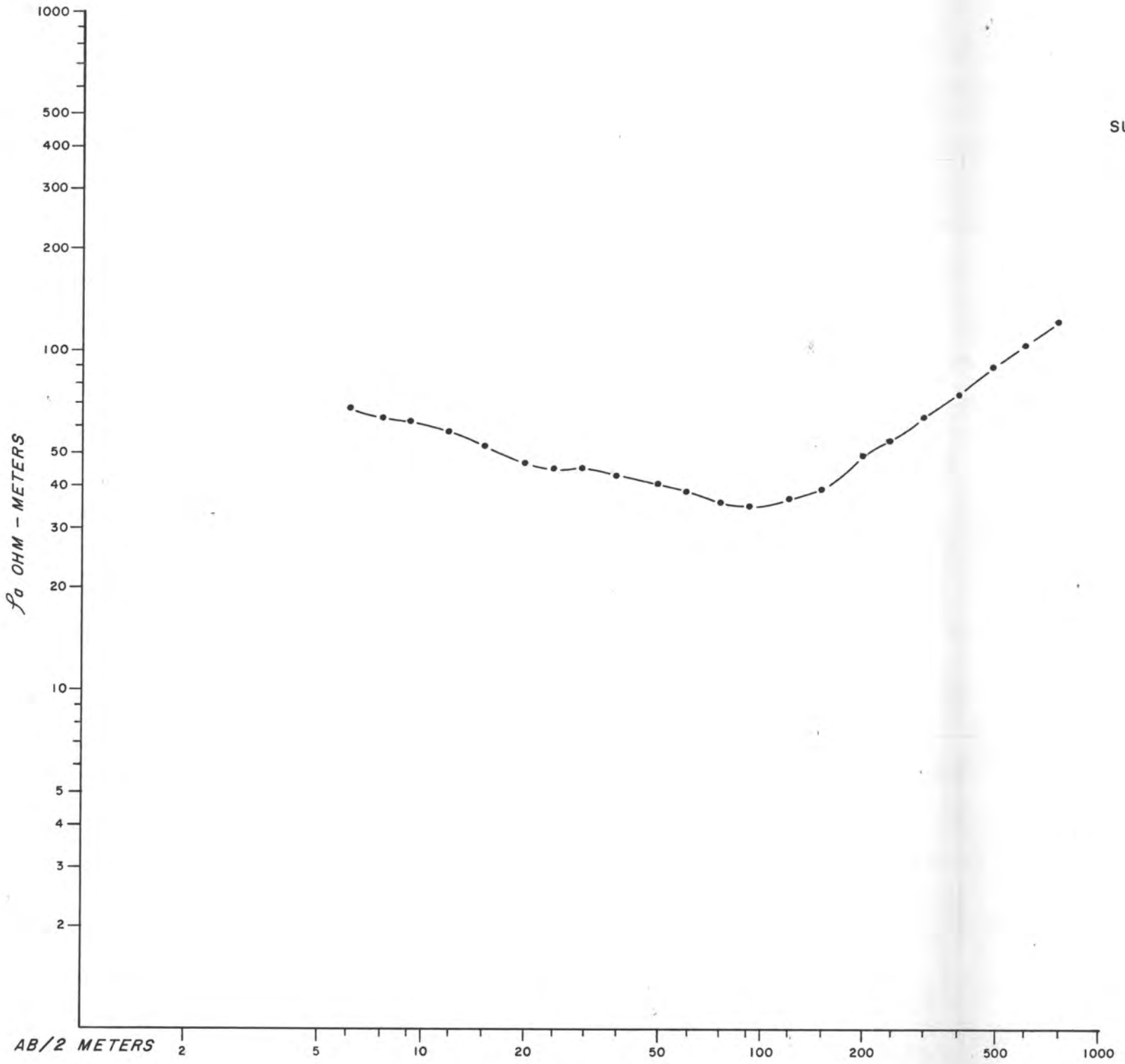
APPROVED: Bruce S Kee

DATE SURVEYED: DEC., 1975

DATE: 1/13/76

PHOENIX GEOPHYSICS

SCHLUMBERGER DEPTH SOUNDINGS



CALCULATED THICKNESS AND RESISTIVITY

SURFACE ELEVATION 6940'

THICKNESS IN METERS	RESISTIVITY ρ-OHM METERS
7.6 (25')	70
76 (250')	28
	175

Top of Kaibab Ls. at 6666'

TUCSON GAS & ELECTRIC COMPANY

SPRINGERVILLE AREA, APACHE COUNTY
ARIZONA

DEPTH SOUNDING 9

FREQUENCY: 0.125 HZ.

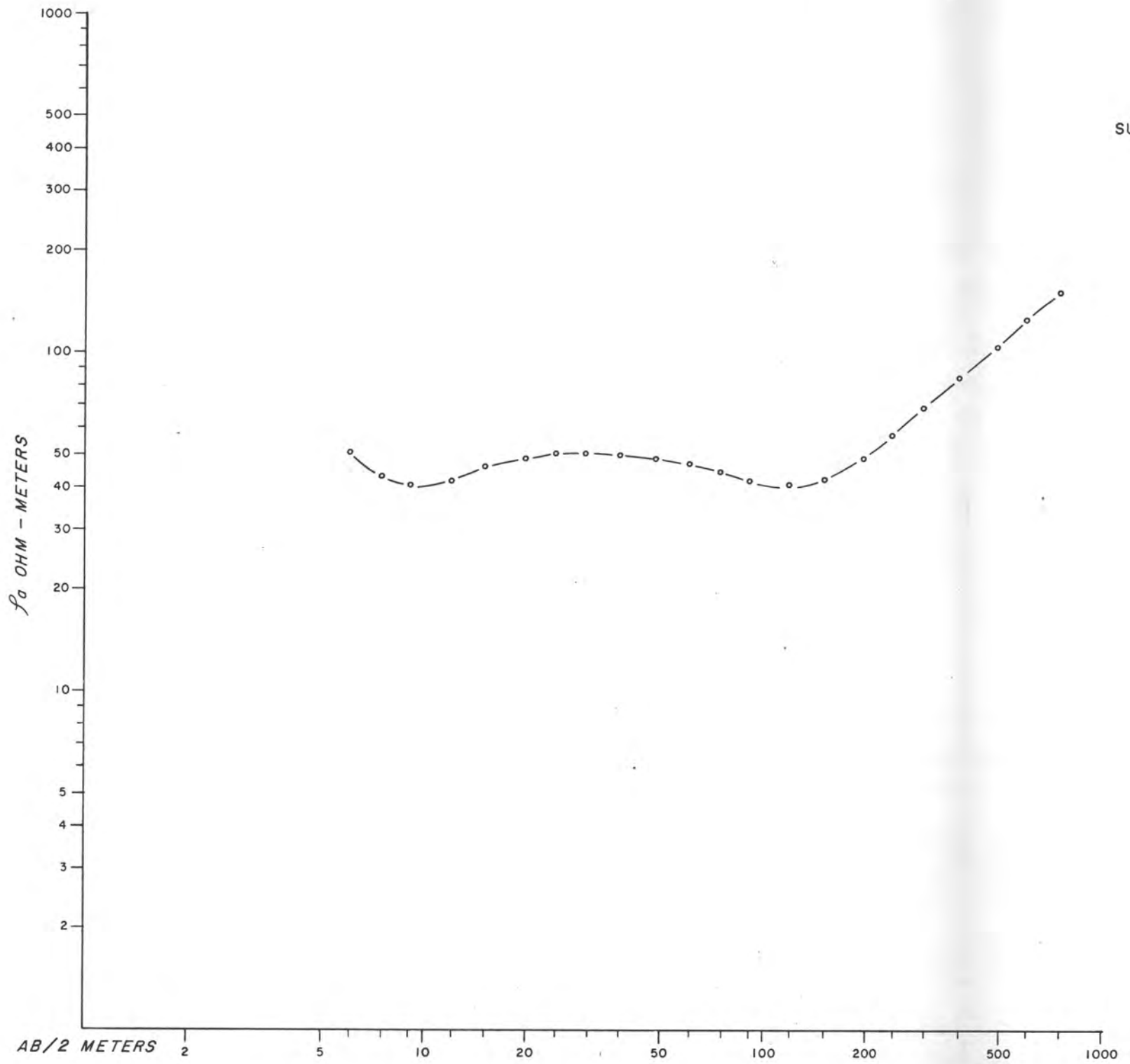
APPROVED: Dean S Bell

DATE SURVEYED: DEC., 1975

DATE: 1/13/76

PHOENIX GEOPHYSICS

SCHLUMBERGER DEPTH SOUNDINGS



CALCULATED THICKNESS AND RESISTIVITY

SURFACE ELEVATION 6860'

THICKNESS IN METERS	RESISTIVITY ρ OHM METERS
54 (177')	52
16 (53')	5.2
	∞

Top of Kaibab Ls. at 6630'

TUCSON GAS & ELECTRIC COMPANY

SPRINGERVILLE AREA, APACHE COUNTY
ARIZONA

DEPTH SOUNDING 7

FREQUENCY: 0.125 HZ.

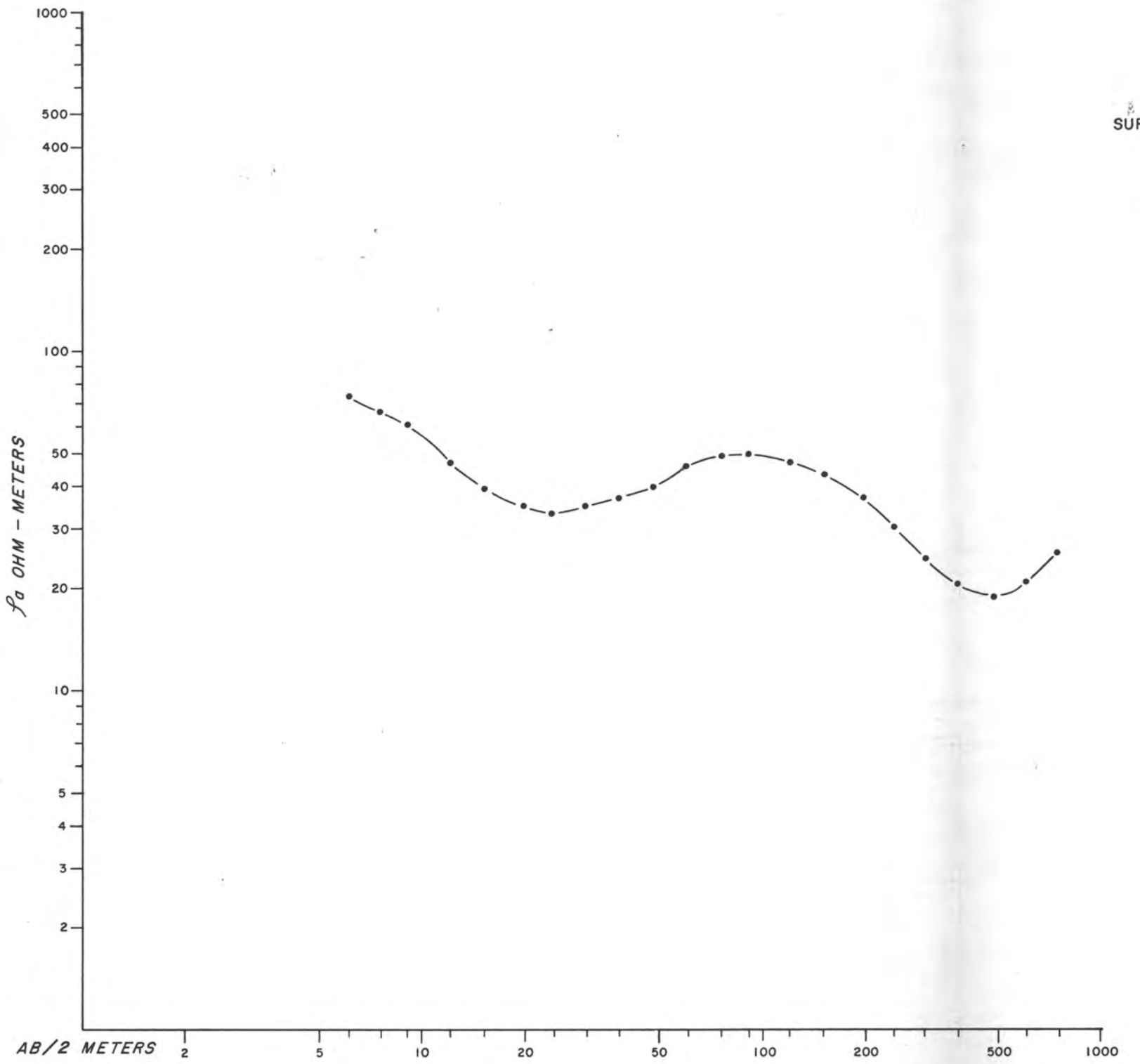
APPROVED: [signature]

DATE SURVEYED: DEC., 1975

DATE: 1/13/76

PHOENIX GEOPHYSICS

SCHLUMBERGER DEPTH SOUNDINGS



CALCULATED THICKNESS AND RESISTIVITY

SURFACE ELEVATION 6550'

THICKNESS IN METERS	RESISTIVITY ρ-OHM METERS
6.4 (21')	80
13 (43')	16
32 (105')	200
?	0
∞	∞

Top of Kaibab Ls. at 6475'

TUCSON GAS & ELECTRIC COMPANY

SPRINGERVILLE AREA, APACHE COUNTY
ARIZONA

DEPTH SOUNDING 8

FREQUENCY: 0.125 HZ.

APPROVED: Bruce S Bell

DATE SURVEYED: DEC., 1975

DATE: 1/13/76

PHOENIX GEOPHYSICS

SCHLUMBERGER DEPTH SOUNDINGS

SCHLUMBERGER RESISTIVITY
DEPTH SOUNDING INTERPRETATIONS
VOIGHT RANCH AREA
APACHE COUNTY, ARIZONA

for

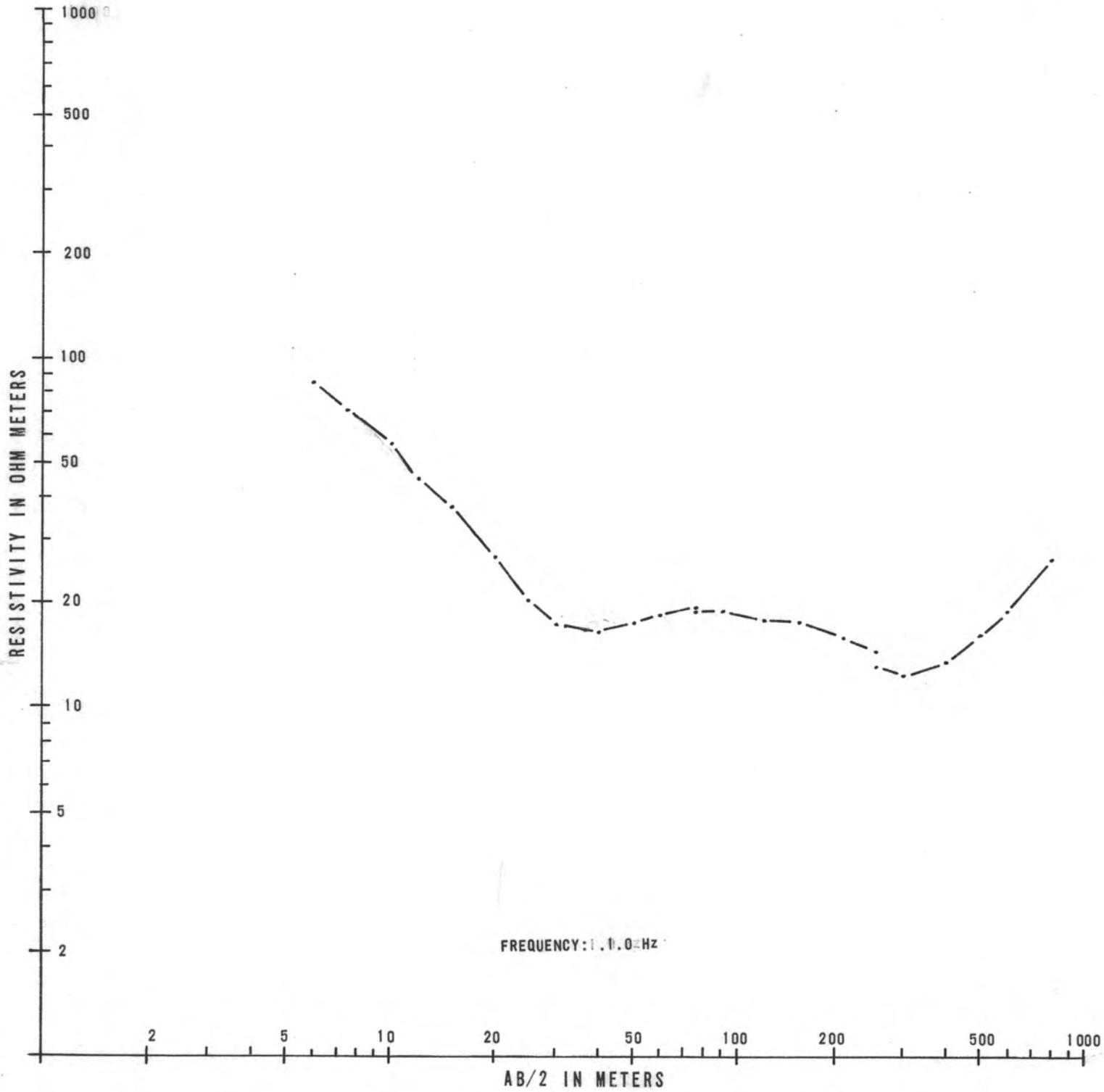
TUCSON GAS & ELECTRIC COMPANY

by

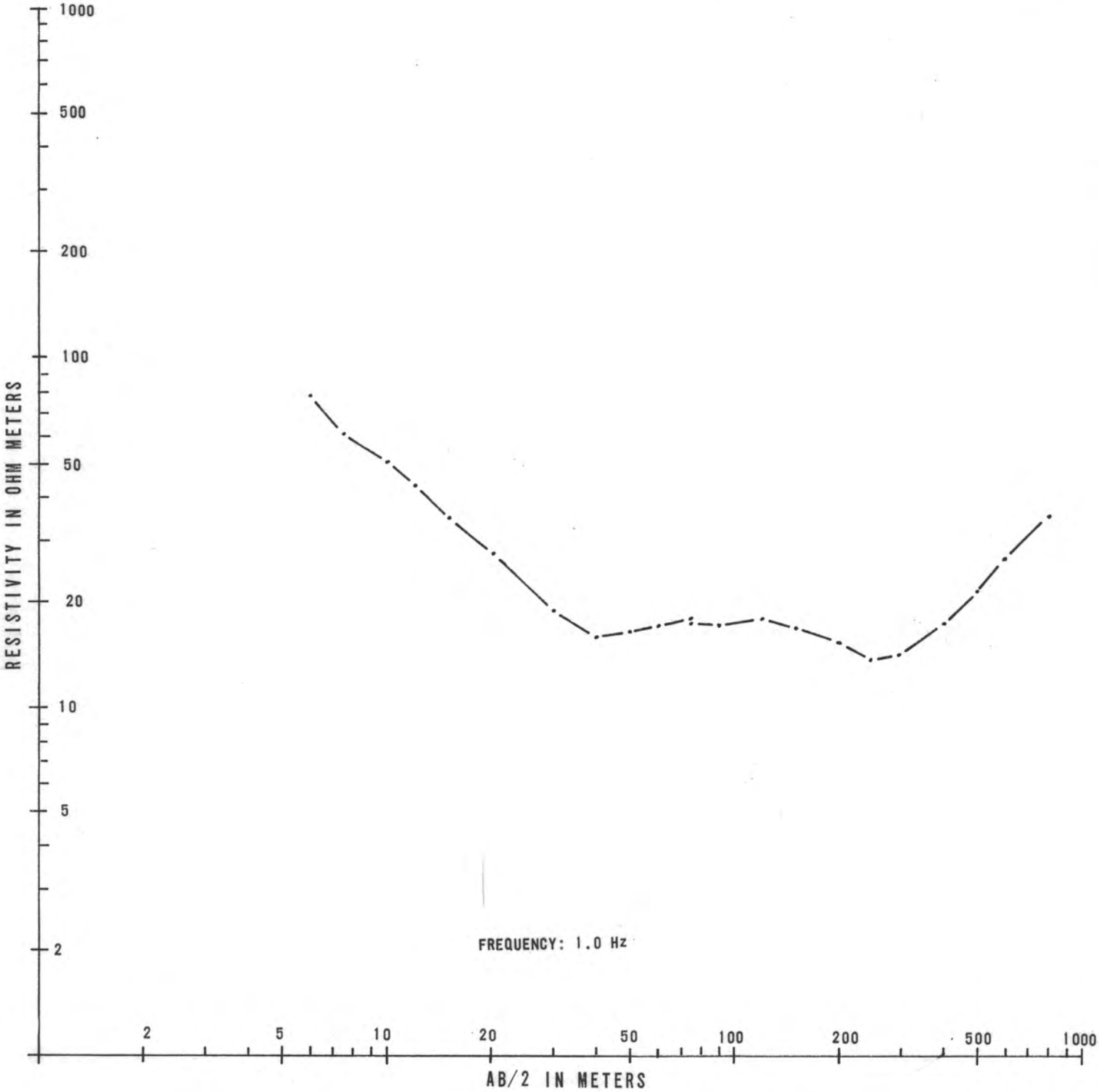
Heinrichs GEOEXploration Company
P.O. Box 5964, Tucson, AZ 85703
Job Number 1106 July 1976

SOUNDING	LAYER	RESISTIVITY (OHM-METERS)	THICKNESS (METERS AND FEET)
P(NW-SE)	1	98	5.6m (18')
	2	10-20	314 m (1030')
	3	∞	--
P(NE-SW)	1	80	6 m (20')
	2	10-20	280 m (920')
	3	∞	--
E 1	1	40	7.5m (25')
	2	400	13.5m (44')
	3	32	570 m ? (1870) ?
	4	∞	--
E 4	1	60	4.6m (15')
	2	600	14 m (46')
	3	15	140 m (460')
	4	∞	--
E 5	1	23	9 m (30')
	2	3.6	61 m (200')
	3	>130	--
VES 13	1	45	16 m (52')
	2	18	82 m (270')
	3	700	--
VES 19	1	75	7 m (23')
	2	7.5-15	90 m (295')
	3	550 ?	--
VES 20	1	480	4.8m (16')
	2	19,000	20 m ? (66') ?
	3	30	600 m ? (1970') ?
	4	∞ ?	--
VES 29	1	90	15 m (49')
	2	36	196 m (640')
	3	1400 ?	--

SCHLUMBERGER RESISTIVITY DEPTH SOUNDING
P (BEARING NW/SE)
VOIGHT RANCH AREA - APACHE COUNTY, ARIZONA
for
TUCSON GAS & ELECTRIC COMPANY
by
HEINRICHS GEOEXPLORATION COMPANY
P.O. BOX 5964, TUCSON, AZ. 85703
JOB NUMBER 1106 JULY 1976



SCHLUMBERGER RESISTIVITY DEPTH SOUNDING
P (BEARING NE/SW)
VOIGHT RANCH AREA - APACHE COUNTY, ARIZONA
for
TUCSON GAS & ELECTRIC COMPANY
by
HEINRICHS GEOEXPLORATION COMPANY
P.O. BOX 5964, TUCSON, AZ. 85703
JOB NUMBER 1106 JULY 1976



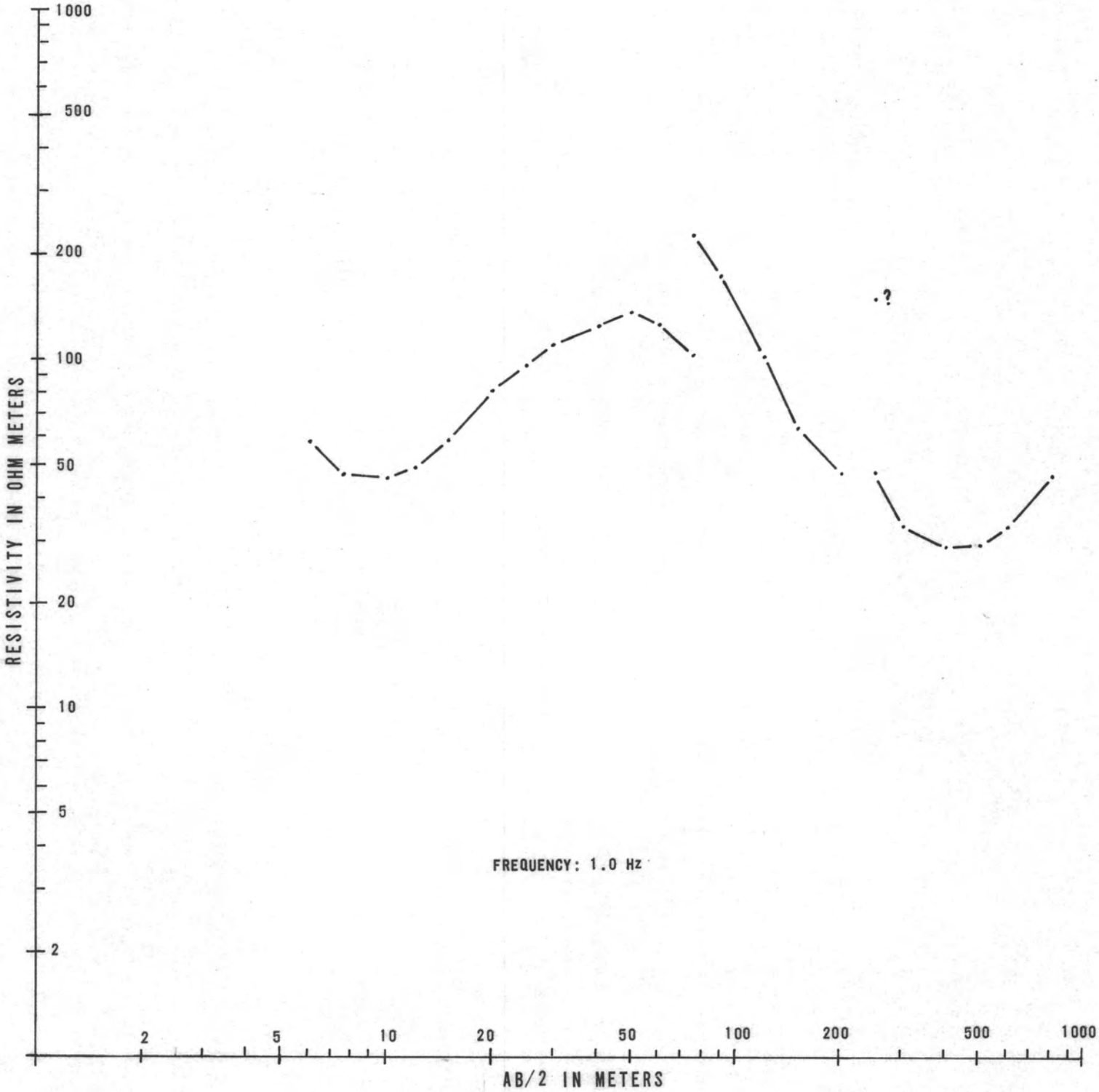
SCHLUMBERGER RESISTIVITY DEPTH SOUNDING
E1 (BEARING NW/SE)
VOIGHT RANCH AREA - APACHE COUNTY, ARIZONA

for

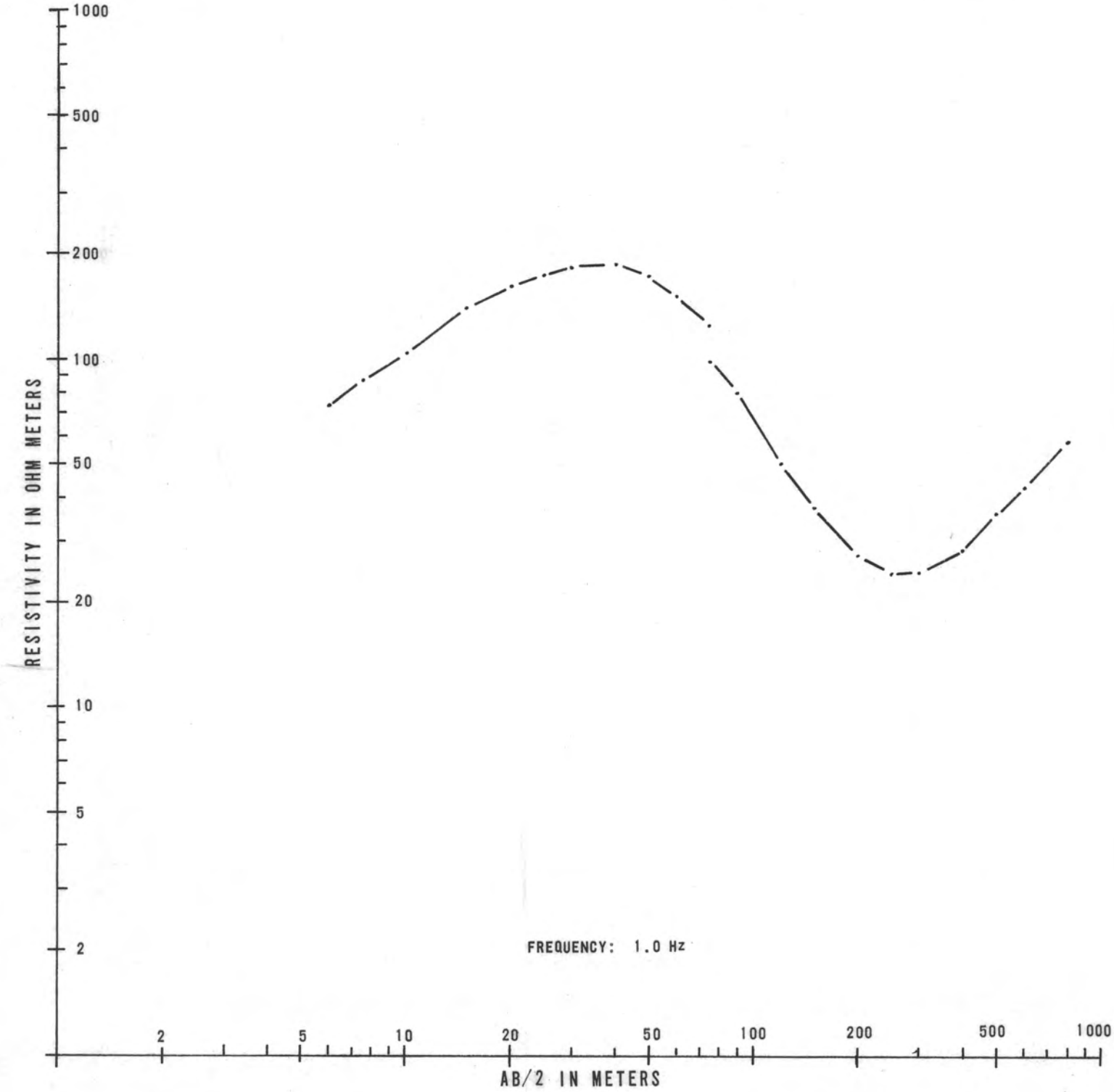
TUCSON GAS & ELECTRIC COMPANY

by

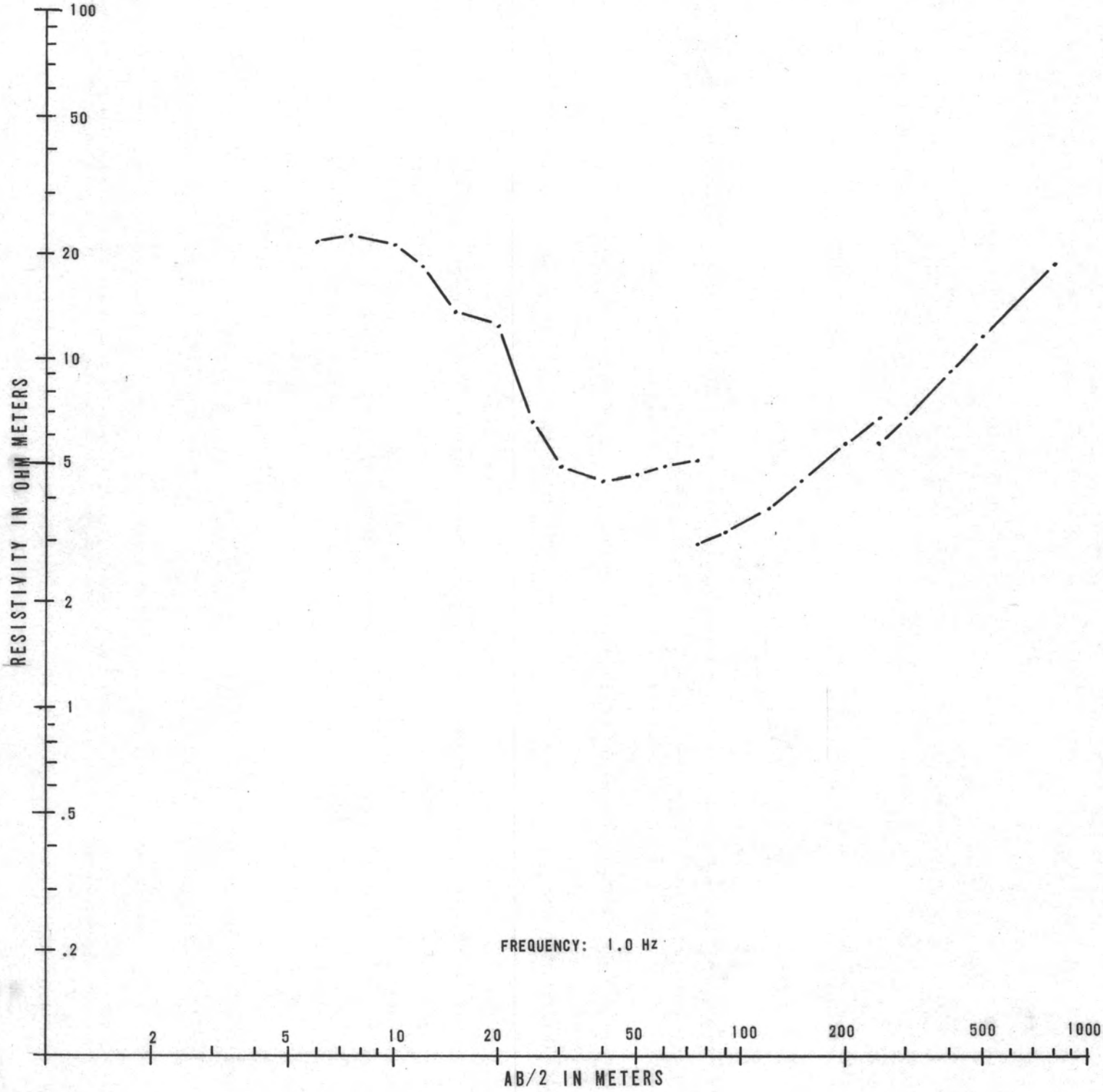
HEINRICHS GEOEXPLORATION COMPANY
P.O. BOX 5964, TUCSON, AZ. 85703
JOB NUMBER 1106 JULY 1976



SCHLUMBERGER RESISTIVITY DEPTH SOUNDING
E4 (BEARING E/W)
VOIGHT RANCH AREA - APACHE COUNTY, ARIZONA
for
TUCSON GAS & ELECTRIC COMPANY
by
HEINRICHS GEOEXPLORATION COMPANY
P.O. BOX 5964, TUCSON, AZ. 85703
JOB NUMBER 1106 JULY 1976



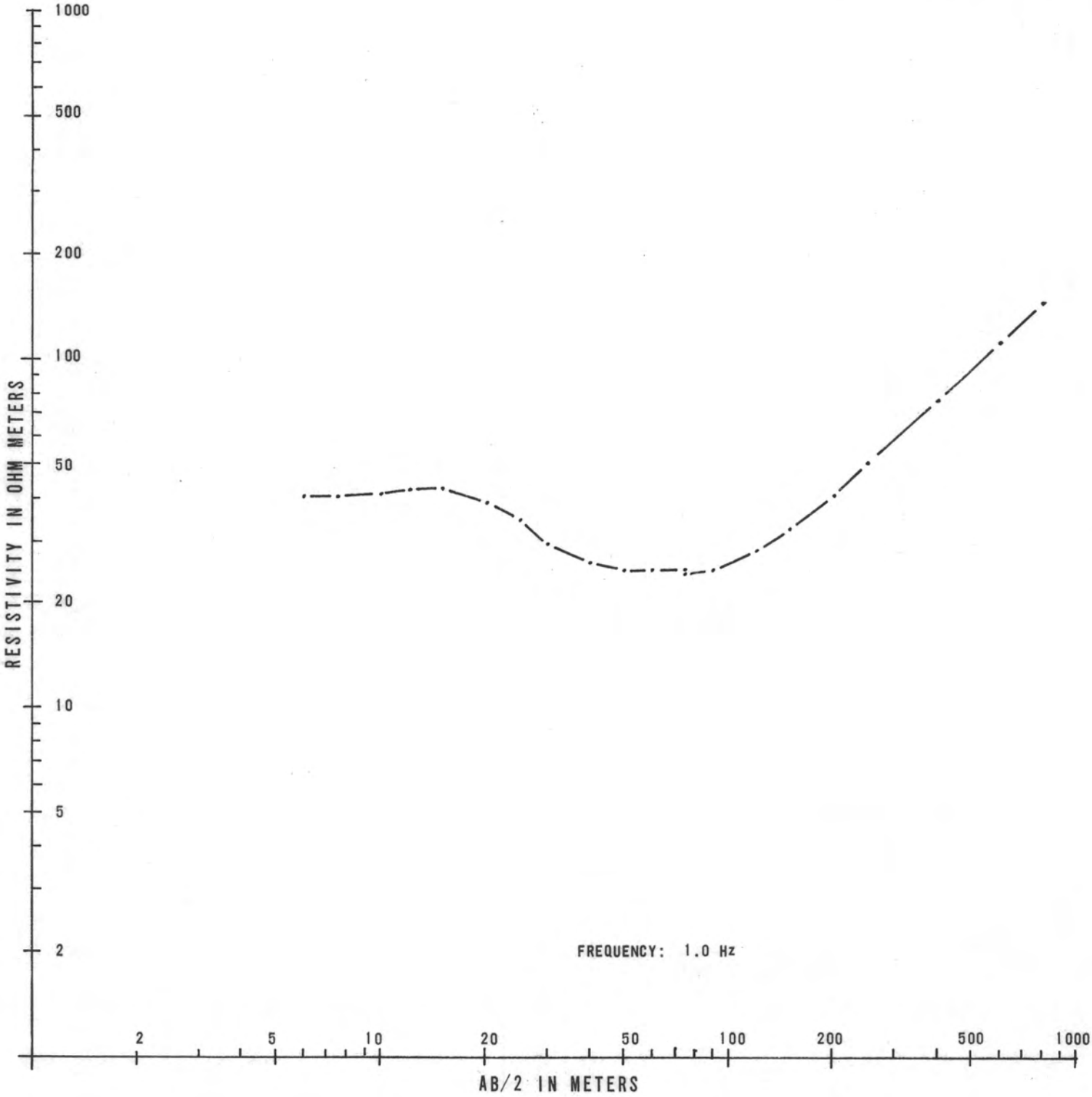
SCHLUMBERGER RESISTIVITY DEPTH SOUNDING
E5 (BEARING E/W)
VOIGHT RANCH AREA - APACHE COUNTY, ARIZONA
for
TUCSON GAS & ELECTRIC COMPANY
by
HEINRICHS GEOEXPLORATION COMPANY
P.O. BOX 5964, TUCSON, AZ. 85703
JOB NUMBER 1106 JULY 1976



SCHLUMBERGER RESISTIVITY DEPTH SOUNDING
VES 13 (BEARING NW/SE)
VOIGHT RANCH AREA - APACHE COUNTY, ARIZONA
for

TUCSON GAS & ELECTRIC COMPANY
by

HEINRICHS GEOEXPLORATION COMPANY
P.O. BOX 5964, TUCSON, AZ. 85703
JOB NUMBER 1106 JULY 1976



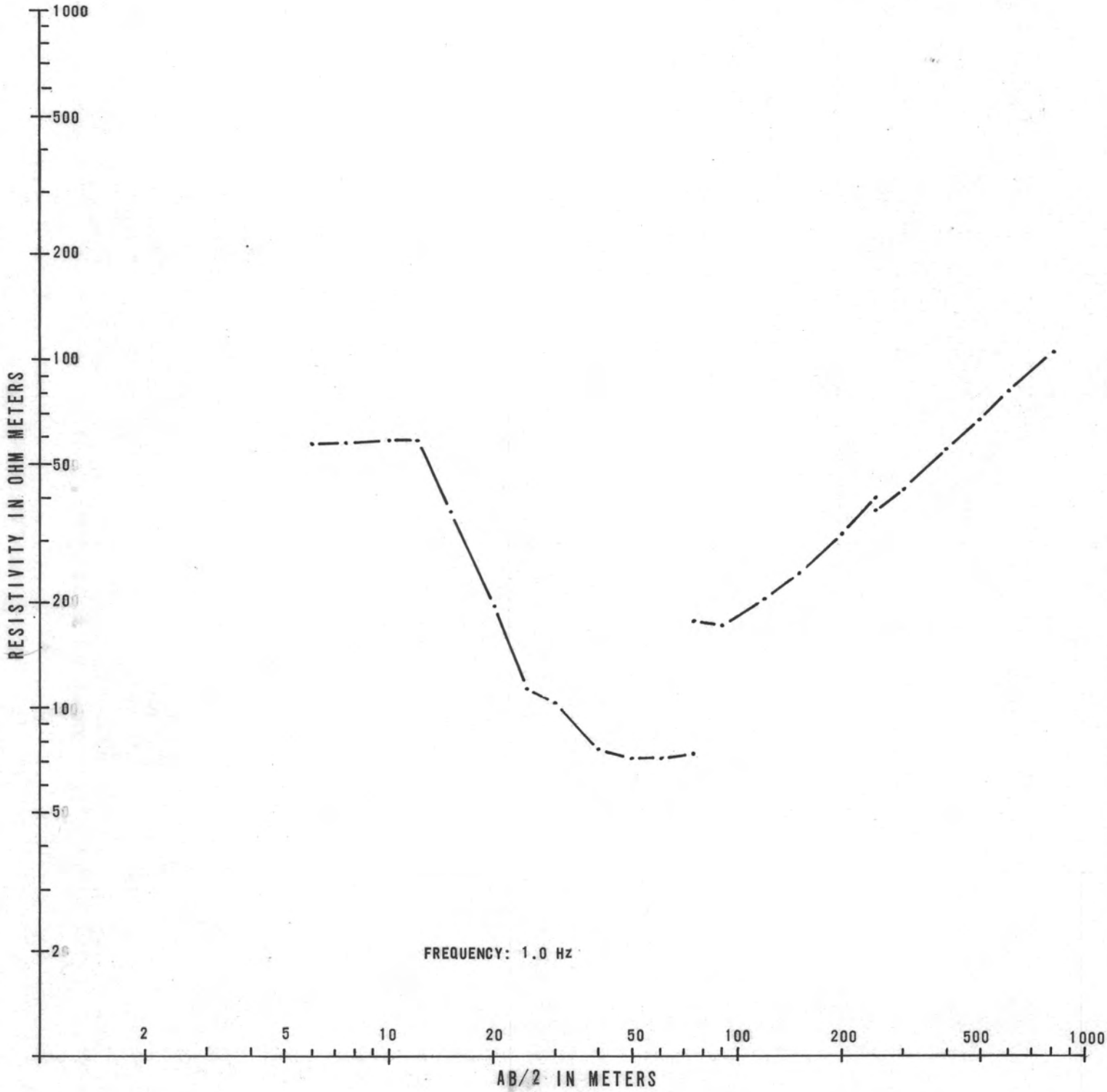
SCHLUMBERGER RESISTIVITY DEPTH SOUNDING
VES 19 (BEARING E/W)
VOIGHT RANCH AREA - APACHE COUNTY, ARIZONA

for

TUCSON GAS & ELECTRIC COMPANY

by

HEINRICHS GEOEXPLORATION COMPANY
P.O. BOX 5964, TUCSON, AZ. 85703
JOB NUMBER 1106 JULY 1976



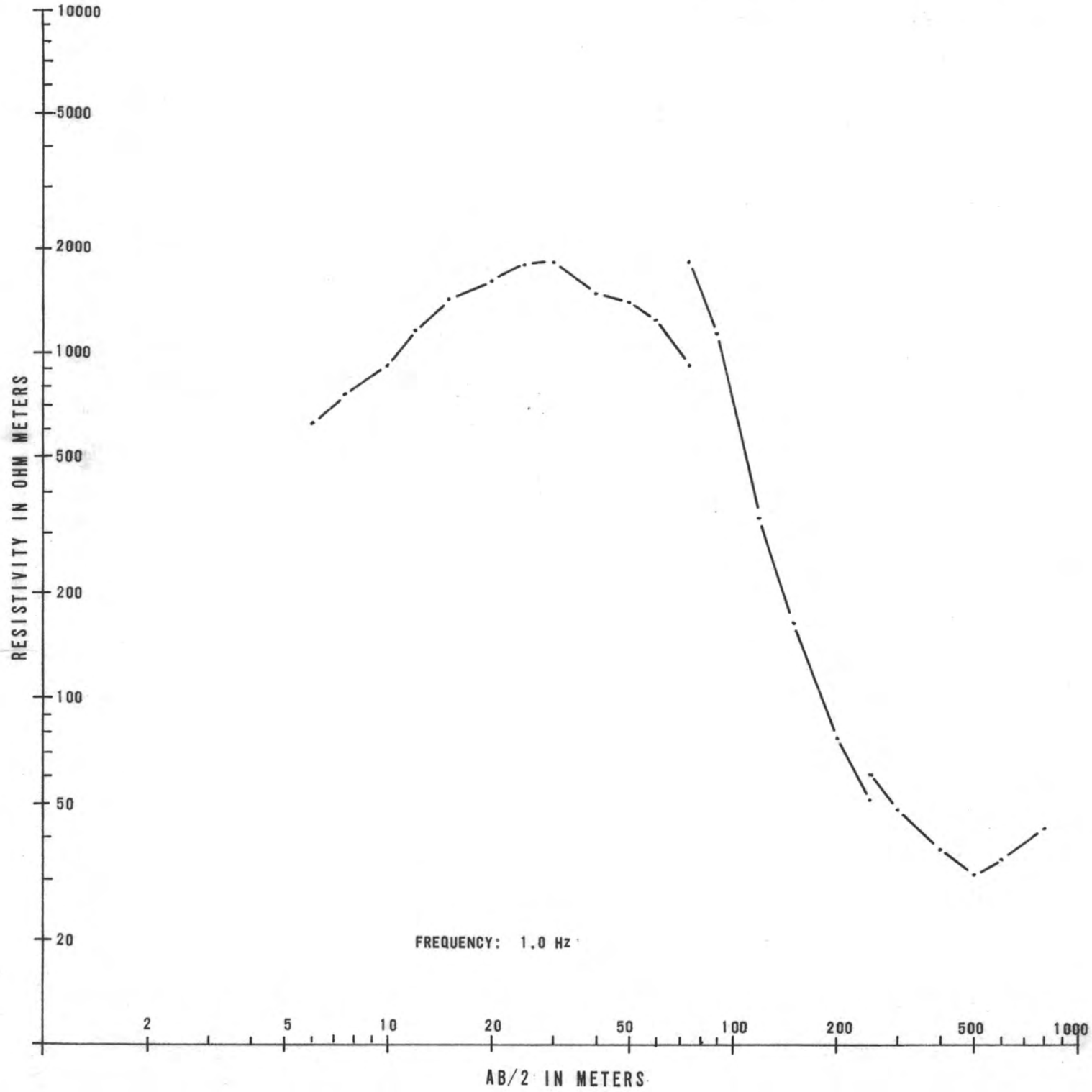
SCHLUMBERGER RESISTIVITY DEPTH SOUNDING
VES 20 (BEARING NW/SE)
VOIGHT RANCH AREA - APACHE COUNTY, ARIZONA

for

TUCSON GAS & ELECTRIC COMPANY

by

HEINRICHS GEOEXPLORATION COMPANY
P.O. BOX 5964, TUCSON, AZ. 85703
JOB NUMBER 1106 JULY 1976



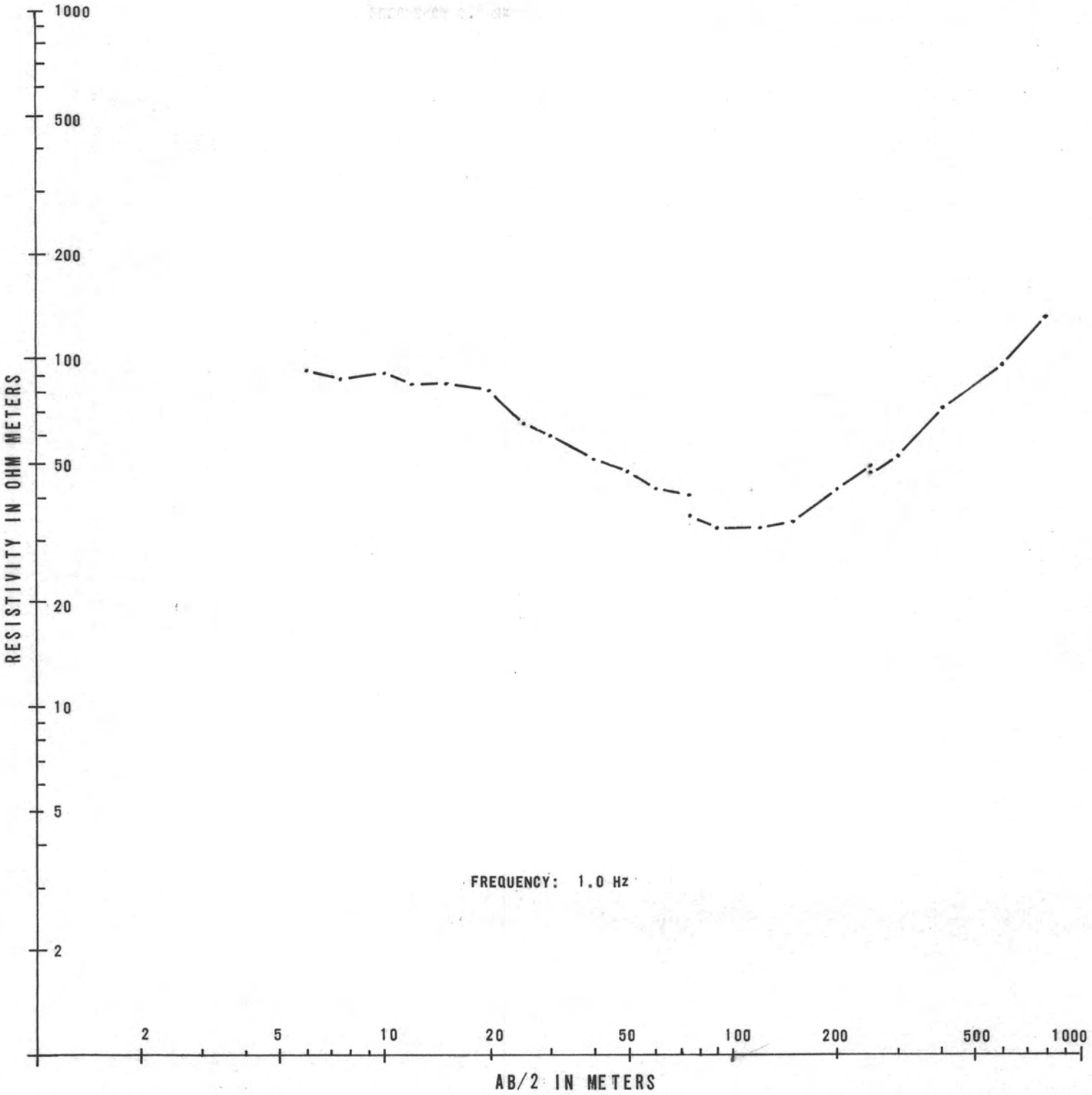
SCHLUMBERGER RESISTIVITY DEPTH SOUNDING
VES 29 (BEARING NW/SE)
VOIGHT RANCH AREA - APACHE COUNTY, ARIZONA

for

TUCSON GAS & ELECTRIC COMPANY

by

HEINRICHS GEOEXPLORATION COMPANY
P.O. BOX 5964, TUCSON, AZ. 85703
JOB NUMBER 1106 JULY 1976



P NW-SE

I. P. RECEIVER NOTES, JOB No. 1106, AREA Voigt Ranch

LINE T, HALF 1, SP. 1, a = _____, BEARING NW 45°

SENDER STA. _____ = ELECTRODE No. _____, DATE 6-23-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-6	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
MULTIPLIER	100	100	100	10	10	10	1.0	1.0	1.0	1.0
PFE										
CUR. (AMPS)	1.5	1.5	2.5	1.5	1.5	2.5	1.5	1.5	4.5	4.5
POINT NO.										
SEP. (n)	1.5	2.0	2.84	3.50	4.50	6.17	7.83	9.5	12.8	16.2
H. F. MV	3630	1890	1400	460	244	160	47.0	28.2	45.4	30.2
DRIFT										
1.0 PFE K_n/1000	.0353	.0556	.0931	.148	.233	.417	.625	.939	1.66	2.62
0.3 PFE ρ_{CAL}										
0.1 PFE PFE_c										
3.0 MV $\rho/2\pi$	94.7	70.1	52.1	45.4	38.0	27.0	19.6	17.6	16.7	17.6
DRIFT MCF	85.5	71.3	57.3	45.5	37.9	26.7	20.4	17.7	16.9	17.6
S. P.	6.9									
NOISE										
POT RES.										
CULT & CMTS										

I. P. RECEIVER NOTES, JOB No. 1106, AREA Voigt Ranch

LINE P, HALF 1, SP. 1, a = _____, BEARING NW 45°

SENDER STA. _____ = ELECTRODE No. _____, DATE 6-23-76

PAGE 2

HEINRICHS GEOEX

SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
MULTIPLIER	1.0	1.0	1.0	1.0	1.0	0.1	0.1	0.1	1.0	1.0
PFE										
CUR. (AMPS)	3.5	3.5	4.5	4.5	3.5	1.25	3.5	3.5	3.5	4.5
POINT No.										
SEP. (n)	19.5	24.5	3.25	4.0	5.5	7.0	9.5	12.0	2.62	3.25
H. F. MV	17.2	11.7	99.8	68.4	28.4	6.37	8.98	5.29	19.3	18.3
DRIFT										
1.0 PFE K_n/1000	3.76	5.88	0.867	1.266	2.25	3.51	6.26	9.79	2.39	3.49
0.3 PFE P_{CAL}										
0.1 PFE PFE_c										
3.0 MV $\rho/2\pi$	18.5	20.0	19.2	19.1	18.3	17.9	16.1	14.8	13.2	12.6
DRIFT MCF	18.5	19.7	19.3	19.1	18.2	17.9	16.1	14.8	13.2	12.6
S. P.			2.8						11.0	
NOISE										
POT RES.										
CULT & CMTS										

I. P. RECEIVER NOTES, JOB No. 1106, AREA Voigt RANCH

LINE P, HALF 1, SP. 1, a = _____, BEARING NW 45°

SENDER STA. _____ = ELECTRODE No. _____, DATE 6-23-76

PAGE 3

HEINRICHS GEOEX

SEND		19-19	20-20	21-21	22-22						
RECEIVE		80.0	80.0	80.0	80.0						
MULTIPLIER		0.1	0.1	0.1	0.1						
PFE											
CUR. (AMPS)		3.5	4.5	2.5	4.5						
POINT No.											
SEP. (n)		4.5	5.75	7.0	9.5						
H. F. MV		7.78	7.64	3.46	4.87						
DRIFT											
1.0 PFE	K_n/1000	6.22	9.75	14.1	25.1						
0.3 PFE	ρ_{CAL}										
0.1 PFE	PFE_c										
3.0 MV	$\rho/2\pi$	13.8	16.5	19.5	27.2						
DRIFT	MCF	13.8	16.6	19.5	27.1						
S. P.											
NOISE											
POT RES.											
CULT & CMTS											

I. P. SENDER NOTES

JOB No. 1106 AREA VOIGT RANCH

LINE P, HALF 1, SP. 1, DATE 6-23-96

PAGE 1

HEINRICHS GEOEX

SEND	6-6	6-6	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8,8
RECEIVE	3-0	3-0	3.0	3 0	3.0	3.0	3.0	3.0	3.0	3.0
RANGE	10x400	10X350	10x150	10x150	10x250	10x150	10x150	10X250	10x150	10x150
VOLTAGE	490	420	400	540	800	540	490	300	300	280
CURRENT	4	3.5	1.5	1.5	2.5	1.5	1.5	2.5	1.5	1.5
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. SENDER NOTES

JOB No. 1106 AREA Voight Ranch

LINE P, HALF 1, SP. 1, DATE 6-23-76

PAGE 2

HEINRICHS GEOEX

SEND	9-9	10-10	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17
RECEIVE	3.0	3.0	3.0	3.0	10.0	10.0	10.0	10.0	10.0	10.0
RANGE	10x450	10x450	10x350	10x350	10x450	10x450	10x350	10x125	10x35	10x3.5
VOLTAGE	625	675	600	560	680	700	660	640	700	640
CURRENT	4.5	4.5	3.5	3.5	4.5	4.5	3.5	1.25	3.5	3.5
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. SENDER NOTES

JOB NO. 1106 AREA Joint

LINE P, HALF 1, SP. 1, DATE 6-23-76

PAGE 3

HEINRICHS GEOEX

SEND	17-17	18-18	19-19	20-20	21-21	22-22				
RECEIVE	40	40	40	40	40	40				
RANGE	10.350	10.450	10.350	10.450	10.250	10.450				
VOLTAGE	680	720	666	760	880	520				
CURRENT	3.5	4.5	3.5	4.5	2.5	4.5				
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS: 17 - voltage from 680 - 720

Voigt Ranch Area

Line P SPD 1 NW

VES

Schlumberger Array

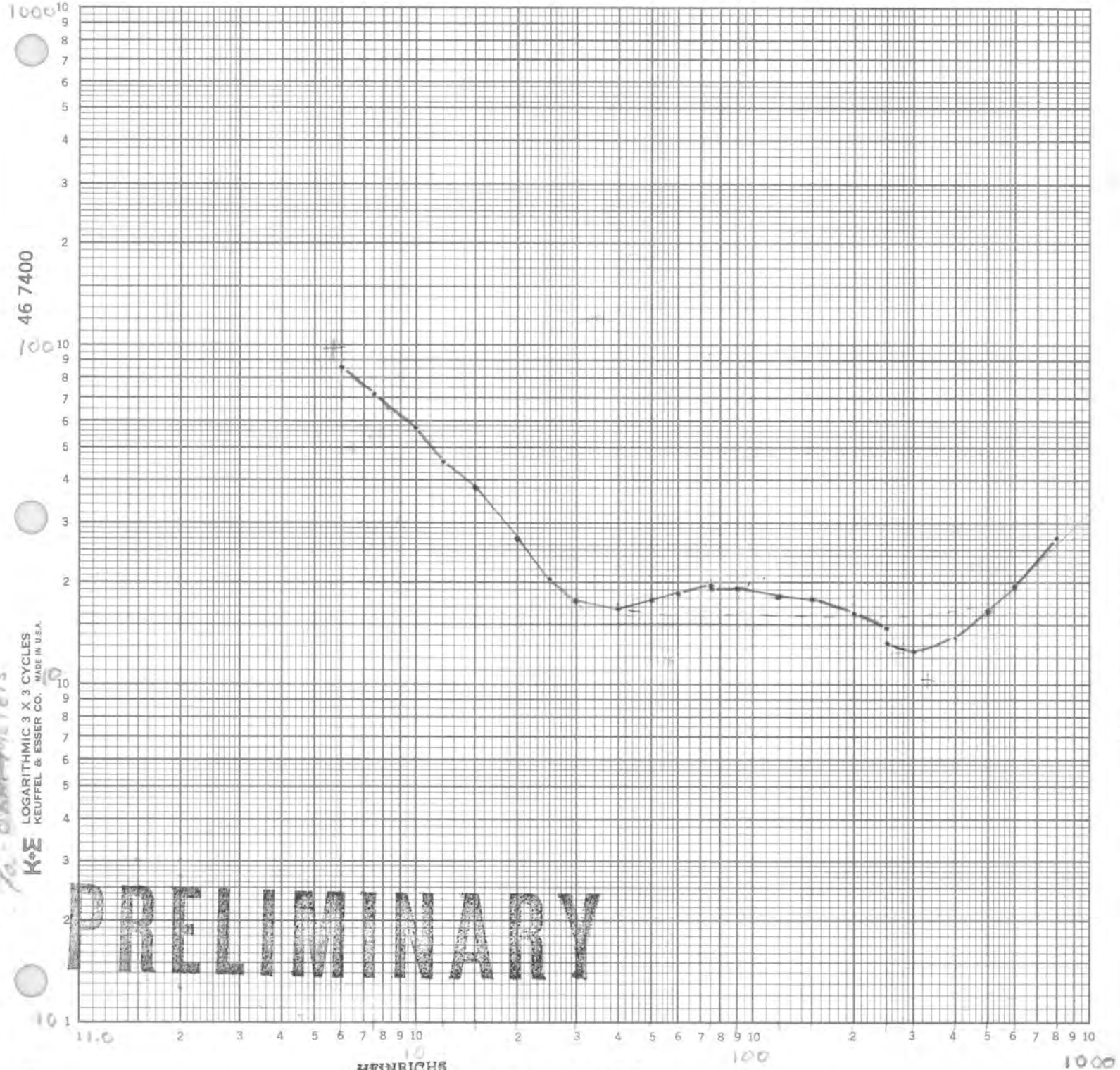
$P_1 = 98$ $E_1 = 5.6$

$P_2 = 10 \rightarrow 20$ $E_2 = 314$

$P_3 = \infty$

320m → 1-50'

$\rho = 30$



AB/2 Meters

HEINRICHS
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Phone: (602) 623-0578
Cable: GEOEX

R. Kellins 6-24-76

P NE-SW

I. P. RECEIVER NOTES, JOB NO. 1106, AREA VOGT RANCH

LINE 1, HALF 2, SP. 2, a = _____, BEARING NE 45°

SENDER STA. _____ = ELECTRODE NO. _____, DATE 6-24-76

PAGE 1

HEINRICHS GEOEX

SEND		1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
MULTIPLIER		100	100	10	10	10	1.0	1.0	1.0	1.0	1.0
PFE											
CUR. (AMPS)		2	1.5	1.5	1	1.5	1.5	1.5	1.5	1.5	1.5
POINT NO.											
SEP. (n)		1.5	2	2.84	3.50	4.50	6.17	7.83	9.5	12.8	16.2
H. F. MV		4370	1600	744	295	224	99.0	50.0	30.2	14.3	9.47
DRIFT											
1.0 PFE	K_n/1000	.0343	.0556	.0931	.148	.233	.417	.625	.934	1.66	2.62
0.3 PFE	P_{CAL}										
0.1 PFE	PFE_c										
3.0 MV	$\rho/2\pi$	77.1	59.3	46.2	43.6	34.7	27.5	20.8	18.8	15.8	16.5
DRIFT	MCF	77.2	60.3	50.8	43.8	34.8	27.5	21.7	18.9	16.0	16.5
S. P.		1.11									
NOISE											
POT RES.											
CULT & CMTS											

I. P. RECEIVER NOTES, JOB No. 1101, AREA Voigt RANCH

LINE P, HALF 2, SP. 2, a = _____, BEARING NE 45°

SENDER STA. _____ = ELECTRODE No. _____, DATE 6-24-76

PAGE 2

HEINRICHS GEOEX

SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
MULTIPLIER	0.1	0.1	1.0	1.0	0.1	0.1	0.1	0.1	1.0	0.1
PFE										
CUR. (AMPS)	1.5	1	1	2.0	1	1	1.5	1.5	2	1.5
POINT No.										
SEP. (n)	19.5	24.5	3.25	4.0	5.5	7.0	9.5	12.0	2.62	3.25
H. F. MV	6.81	3.04	20.3	27.6	8.01	4.87	3.72	2.09	11.5	6.15
DRIFT										
1.0 PFE K_n/1000	3.76	5.88	0.867	1.256	2.25	3.51	6.26	9.79	2.39	3.47
0.3 PFE ρ_{CAL}										
0.1 PFE PFE_c										
3.0 MV $\rho/2\pi$	17.1	17.8	17.6	17.3	18.0	17.1	15.5	13.6	13.7	14.2
DRIFT MCF	17.1	17.9	17.6	17.3	18.0	17.1	15.5	13.6	13.8	14.2
S. P.			7.4							
NOISE										
POT RES.										
CULT & CMTS										

I. P. RECEIVER NOTES, JOB No. 1106, AREA Voigt Ranch

LINE P, HALF 2, SP. 2, a = _____, BEARING NE 45°

SENDER STA. _____ = ELECTRODE No. _____, DATE 6-24-76

PAGE 3

HEINRICHS GEOEX

SEND		19-19	20-20	21-21	22-22		CAL	19 19			
RECEIVE		80.0	80.0	80.0	80.0						
MULTIPLIER		0.1	0.1	0.1	.01						
PFE											
CUR. (AMPS)		1.5	1.5	1	.5						
POINT No.											
SEP. (n)		4.5	5.75	7.0	7.5						
H. F. MV		4.21	3.33	1.92	.709						
DRIFT											
1.0 PFE	$K_n/1000$	6.22	9.75	14.1	25.1						
0.3 PFE	ρ_{CAL}										
0.1 PFE	PFE_c										
3.0 MV	$\rho/2\pi$	17.5	21.6	27.0	35.6						
DRIFT	MCF	17.5	21.7	27.0	35.6						
S. P.											
NOISE											
POT RES.											
CULT & CMTS											

I. P. SENDER NOTES

JOB No. 1106 AREA Voigt RANCH

LINE P, HALF 2, SP. 2, DATE 6-24

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0	3.0	3.0	3.0	30	3.0	3.0	3.0	3.0	3.0
RANGE	10X200	10X150	10X150	10X100	10X150	10X150	10X150	10X150	10X150	10X150
VOLTAGE	500	400	390	360	470	420	380	400	440	360
CURRENT	2	1.5	1.5	1.0	1.5	1.5	1.5	1.5	1.5	1.5
SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
RANGE	10X150	10X100	10X100	10X200	10X100	10X100	10X150	10X150	10X200	10X150
VOLTAGE	450	280	350	240	290	340	360	380	480	390
CURRENT	1.5	1.0	1.0	2.0	1.0	1.0	1.5	1.5	2.0	1.5

FREQUENCIES 1.0

SENDER No. 8661-S

POWER UNIT ID

OPERATOR D. LAWL

RECEIVER No. 25705A

HOURS RUN

OPERATOR RR

COMMENTS:

I. P. SENDER NOTES

JOB No. 1106 AREA VOIGT RANCH

LINE P, HALF 2, SP. 2, DATE 6-24-76

PAGE 2

HEINRICHS GEOEX

SEND	19-19	20-20	21-21	22-22						
RECEIVE	80.0	80.0	80.0	80.0						
RANGE	10X150	10X150	10X100	10X50						
VOLTAGE	450	430	320	330						
CURRENT	1.5	1.5	1.0	.5						
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES 1.0

SENDER No. 8661-5 POWER UNIT ID

OPERATOR D LANG

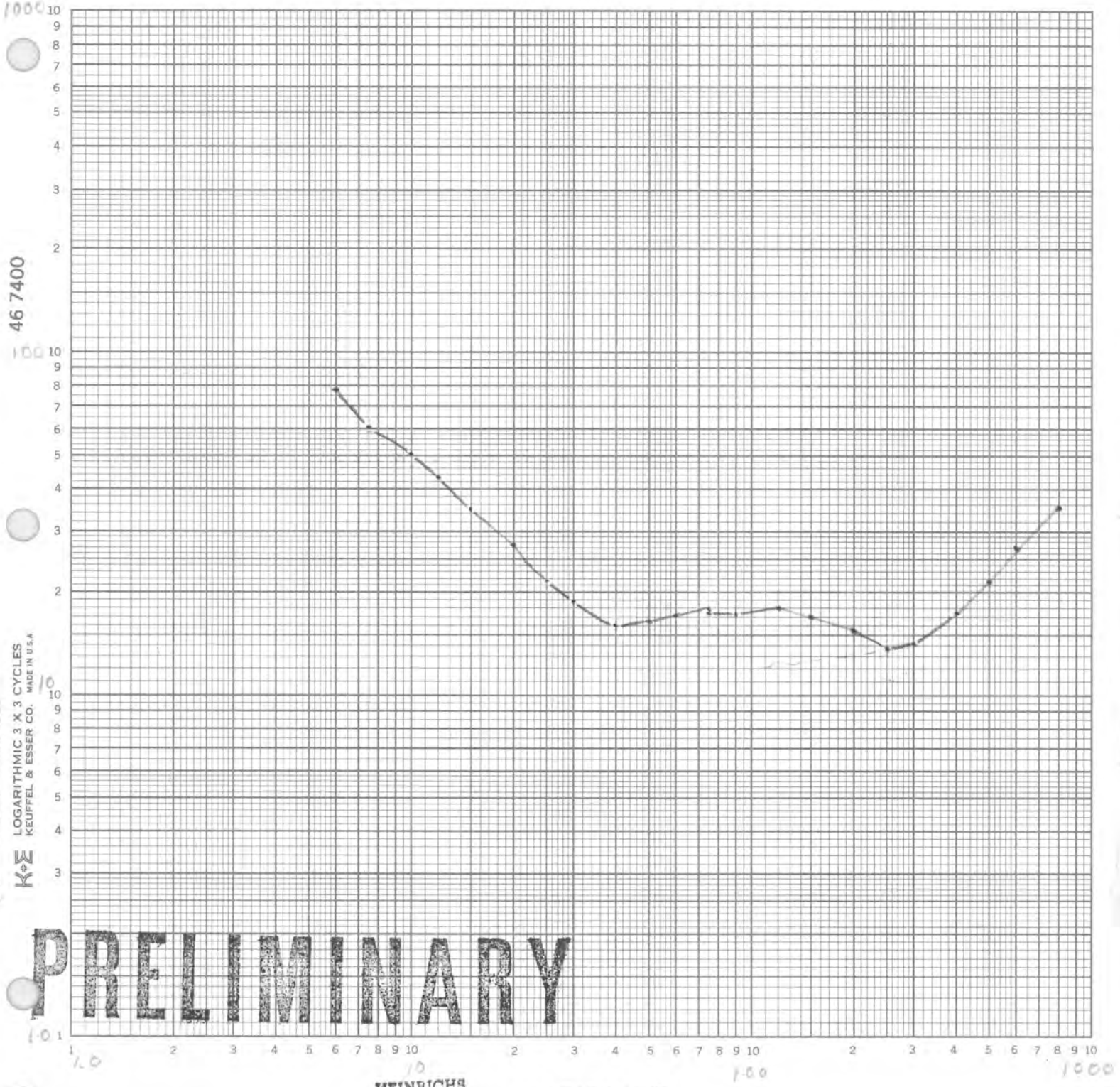
RECEIVER No. 25705R HOURS RUN

OPERATOR R R

COMMENTS:

Voigt Ranch Area
Line P Spd 2 NE
V E S
Schlumberger Array

$\rho_1 = 20$ $E_1 = 6$
$\rho_2 = 10 \to 20$ $E_2 = 280/286m = 938'$
E 23
$\rho_3 \sim \infty$



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E1 NW-SE

RCVR

I.P. SENDER NOTES

JOB No. 1106 AREA Voigt Ranch

LINE E1, HALF 1, SP. 1, DATE 6-29-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE M	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
RANGE MUL	10	10	10	1.0	1.0	1.0	1.0	1.0	1.0	1.0
VOLTAGE AMP	.3	.6	.3	.3	.3	.3	.3	.3	.3	.3
CURRENT N	1.5	2.0	2.84	3.50	4.50	6.17	7.83	9.5	12.8	16.2
SEND Norm	496	498	135	99.9	77.2	58.4	45.2	35.3	22.6	16.0
RECEIVE NF	.0353	.0556	.0931	.148	.233	.417	.625	.939	1.66	2.62
RANGE	58.4	46.9	46.1	49.4	60.0	81.1	98.3	111	126	139
VOLTAGE Pa	58.4	46.1	41.9	49.3	59.9	81.2	94.2	110.5	125.1	139.7
CURRENT SP	-3.3									

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS: 1-PO 2CE 3-PD

RCOR

I.P. SENDER NOTES

JOB No. 1106 AREA Voist Ranch

LINE E1, HALF 1, SP. 1, DATE 6-29-76

PAGE 2

HEINRICHS GEOEX

SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20-0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
RANGE MU	0.1	0.1	10.	1.0	1.0	0.1	0.1	0.1	1.0	0.1
VOLTAGE AUX	.3	.6	.6	.6	.6	.2	.6	.6	.6	.5
CURRENT N	19.5	24.5	3.25	4.0	5.5	1.0	9.5	12.0	2.62	3.25
SEND POT.	10.19	10.70	159	83.1	27.0	3.67	4.47	9.19	12.0	2.90
RECEIVE NF	3.76	5.88	0.867	1.256	2.25	3.51	6.26	9.79	2.39	3.47
RANGE	128	105	230	175	101	64.6	46.7	150	47.8	33.6
VOLTAGE Sp	127.7	104.9	229.8	175.2	101.3	64.4	46.6	149.9	47.8	33.5
CURRENT Sp			-8.7						62	

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS: 1Po-2CE-3PD
NONGROUND 5 WIRE FENCE
TWIXT 13 & 14

Rick

I.P. SENDER NOTES

JOB No. 1106 AREA Voigt Ranch

LINE E-1, HALF 1, SP. 1, DATE 6-29-76

PAGE 3

HEINRICHS GEOEX

SEND	19-19	20-20	21-21	22-22						
RECEIVE	80.0	80.0	80.0	80.0						
RANGE MU	0.1	0.1	.01	.01						
VOLTAGE AMP	.3	.6	.3	.3						
CURRENT N	4.5	5.75	7.0	9.5						
SEND POT.	1.43	1.93	.715	.565						
RECEIVE NF	6.22	9.75	14.1	25.1						
RANGE	29.7	29.7	33.5	47.2						
VOLTAGE Pa	29.6	29.7	33.6	47.3						
CURRENT SP										

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

I.P. SENDER NOTES

JOB No. 1106 AREA Voigt Ranch

LINE E-1, HALF 1, SP. 1, DATE 6-29-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0	—	—	—	—	—	—	—	—	3.0
RANGE	3 X 100	3 X 200	3 X 100	3 X 100	—	—	—	—	—	3 X 100
VOLTAGE	150	220	250	170	210	230	190	160	180	140
CURRENT	.3	.6	.3	.3	.3	.3	.3	.3	.3	.3
SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0	—	—	—	—	20.0	80.0	3 80.0
RANGE	3 X 110	3 X 200	—	—	3 X 200	1 X 200	3 X 200	—	3 X 200	3 X 100
VOLTAGE	140	230	220	210	230	220	200	270	250	190
CURRENT	.3	.6	.6	.6	.6	.2	.6	.6	.6	.3

FREQUENCIES	1.0	COMMENTS:	
SENDER No.		POWER UNIT ID	
OPERATOR	V.S		
RECEIVER No.	25705A	HOURS RUN	
OPERATOR	RR		

I. P. SENDER NOTES

JOB No. 1106 AREA VOIGH RANCH

LINE E1, HALF _____, SP. _____, DATE 6-29-76

PAGE 2

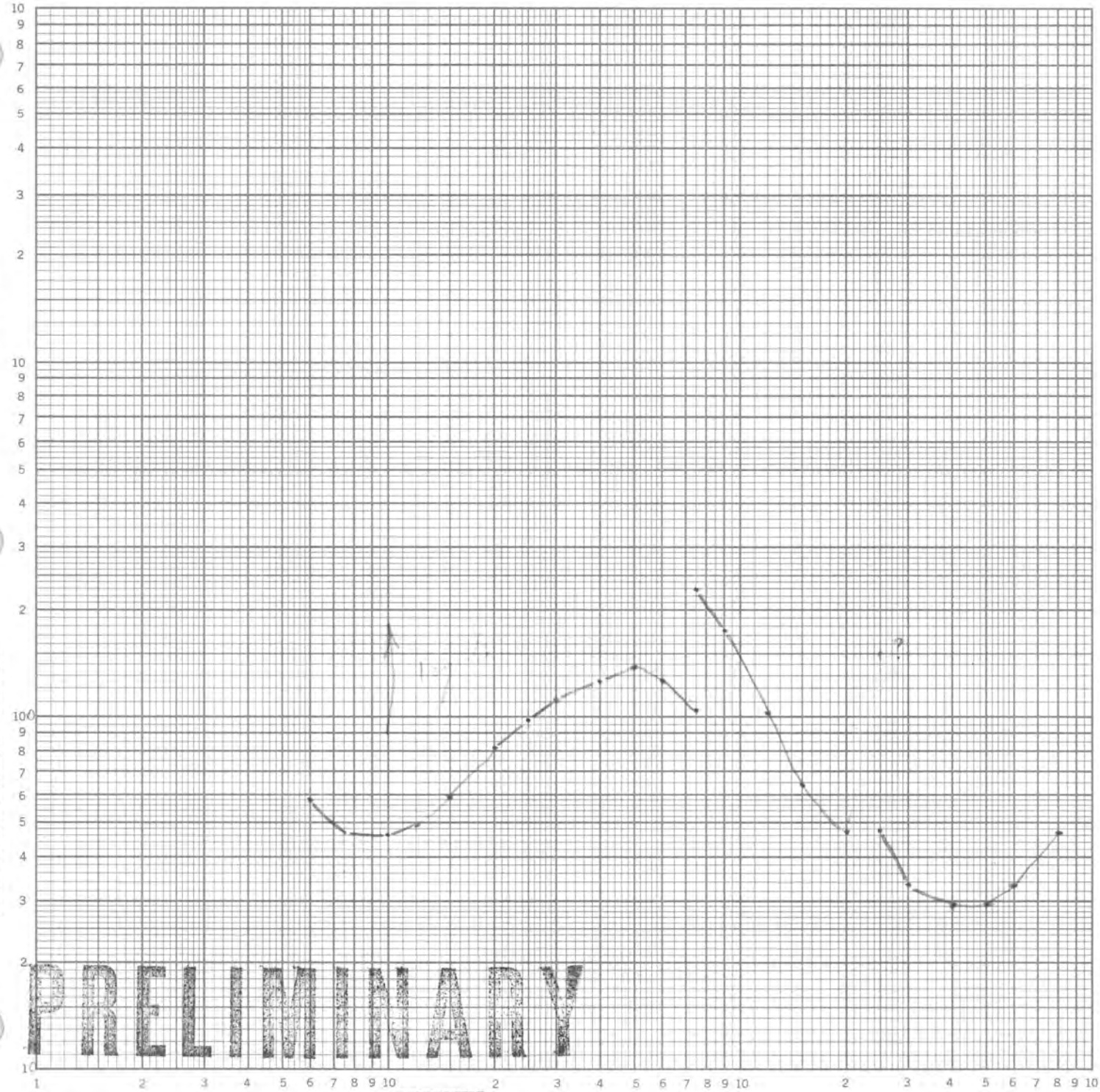
HEINRICHS GEOEX

SEND	19-19	20-20	21-21	22-22						
RECEIVE	80.0	—	—	80.0						
RANGE	3 x 100	3x200	3x100	3x100						
VOLTAGE	300	180	300	280						
CURRENT	.3	.6	.3	.3						
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES	1.0		COMMENTS:
SENDER No.	8661-5	POWER UNIT ID	
OPERATOR	V.S		
RECEIVER No.		HOURS RUN	
OPERATOR	R.R		

VOIGT RANCH AREA
LINE E1 - NW-SE
VES
Schlumberger Array

$\rho_1 = 40$ $E_1 = 7.5$
$\rho_2 = 400$ $E_2 = 13.5$
$\rho_3 = 32$ $E_3 = 570?5 = 18$
$\rho_4 = \infty$



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E4 E-W

I. P. RECEIVER NOTES, JOB No. 1106, AREA Voigt RANCH

LINE E4, HALF 1, SR 1, a = _____, BEARING E-W

SENDER STA. _____ = ELECTRODE No. _____, DATE 6-25-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
MULTIPLIER	100	100	10	10	10	10	10	10	1.0	1.0
PFE										
CUR. (AMPS)	3.5	2.5	1	1	.2	.6	1.05	2.5	.45	.75
POINT NO.										
SEP. (n)	1.5	2.0	2.84	3.50	4.50	6.17	7.83	9.5	12.0	16.2
H. F. MV	9390	3900	1017	802	123	235	285	493	51.1	49.6
DRIFT										
1.0 PFE K_n/1000	.0353	.0556	.0931	.148	.233	.417	.623	.939	1.66	2.62
0.3 PFE ρ_{CAL}										
0.1 PFE PFE_c										
3.0 MV $\rho/2\pi$	74.5	86.7	98.7	118.7	143.4	163.3	169.1	185.2	188.5	175.3
DRIFT MCF	74.6	88.2	104	119	143	163	177	185	190	173
S. P.	5.9									
NOISE										
POT RES.			CAL	3.0 2	11 0.3	.2 D=0.0				
CULT & CMTS				1.0 2	10 0.3	.2 D=0.0				

I. P. ~~SENDER~~ Reciever NOTES

JOB No. 1106 AREA Voigt Ranch

LINE E-4, HALF _____, SP. _____, DATE 6-26-76

PAGE 2

HEINRICHS GEOEX

SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
~~RANGE~~ MAX	1.0	1.0	1.0	1.0	0.1	0.1	0.1	0.1	0.1	0.1
VOLTAGE MAX	.45	.75	.75	.75	.45	.45	.3	1	1	.5
CURRENT N	19.5	24.5	3.25	4.0	5.5	7.0	9.5	12.0	2.62	3.25
SEND NOIM	18.1	16.2	86.4	48.3	10.2	4.86	1.32	2.49	10.16	3.56
RECEIVE NF	3.76	5.88	0.867	1.256	2.25	3.71	6.26	9.79	2.39	3.47
RANGE	152	127	100	80.9	50.9	38.0	27.6	24.4	24.3	24.7
VOLTAGE Pa	151.2	127.0	99.9	80.8	50.9	40.1	27.5	24.4	24.3	24.7
CURRENT SP	70.		-3.4						3.8	

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS: Fence Twixt 13 & 14
5 Wire Non-gnd
Drill Rig 800' NW CNTR

I. P. SENDER NOTES

JOB No. 1106 AREA

LINE E-4, HALF 1, SP. 1, DATE 6-26-76

PAGE 3

HEINRICHS GEOEX

SEND	19-19	20-20	21-21	22-22						
RECEIVE	80.0	80.0	80.0	80.0						
RANGE MU	0.1	0.1	0.1	0.1						
VOLTAGE AMPS	.5	.5	1.5	2.5						
CURRENT N	4.5	5.75	7.0	9.5						
SEND NA	2.31	1.87	4.58	5.89						
RECEIVE NF	6.22	9.75	14.1	25.1						
RANGE	28.7	36.5	43.0	59.1						
VOLTAGE Pa	28.7	36.5	43.1	59.1						
CURRENT SP										

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

I.P. SENDER NOTES

JOB No. 1106 AREA Voigt Ranch

LINE E-4, HALF 1, SP. P, DATE 6-26 76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
RANGE	10X350	10X250	10X100	10X100	1X200	3X200	3X350	10X250	3X150	3X250
VOLTAGE	440	380	360	400	400	320	400	320	360	460
CURRENT	3.5	2.5	1.0	1.0	0.2	0.6	1.05	2.5	0.45	0.75
SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
RANGE	3X150	3X250	3X250	3X250	3X150	3X150	3X100	10X100	10X100	10X50
VOLTAGE	340	480	480	500	440	380	400	280	280	290
CURRENT	0.45	0.75	0.75	0.75	0.45	0.45	0.30	1.00	1.0	0.5

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

2.0 3.0

I. P. SENDER NOTES

JOB No. 1106 AREA Voigt Ranch

LINE E4, HALF 1, SP. 1+, DATE 6-26-76

PAGE 2

HEINRICHS GEOEX

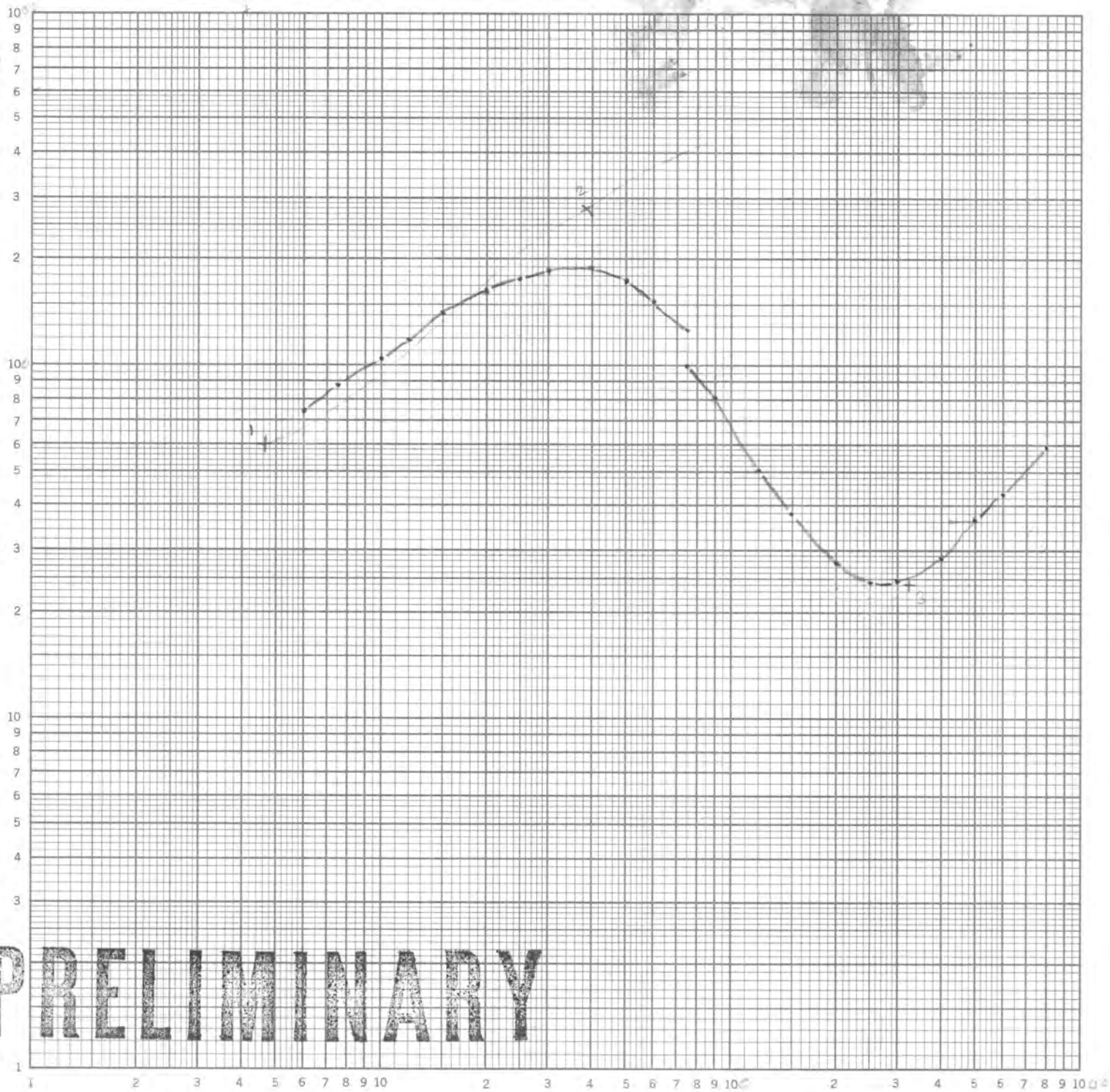
SEND	19-19	20-20	21-21	22-22						
RECEIVE	80	80	80	80						
RANGE	10X50	10X50	10X150	10X250						
VOLTAGE	380	200	340	440						
CURRENT	0.5	0.5	1.5	2.5						
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

Vogt Ranch Area
Line [illegible] E10
VES
[illegible] Array

$\rho_1 = 60$ $E_1 = 4.6m$
$\rho_2 = 600$ $E_2 = 14m$
$\rho_3 = 15$ $E_3 = 190m$ $S = 12$
$\rho_4 \sim \infty$
685'



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GEOPHYSICAL ENGINEERS

AB 2 (meters)

E5 E-W

I. P. RECEIVER NOTES, JOB No. 1106, AREA Voigt RANCH

LINE E-5, HALF 1, SP. 1, a = _____, BEARING E-W

SENDER STA. _____ = ELECTRODE No. _____, DATE 6-26-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
MULTIPLIER	100	10	10	10	1.0	1.0	1.0	0.1	0.1	0.1
PFE										
CUR. (AMPS)	2.5	.6	1	1	.6	2	2	.6	2	2
POINT NO.										
SEP. (n)	1.5	2.0	2.94	3.50	4.50	6.17	7.83	9.6	12.8	16.2
H. F. MV	1570	245	207	12.4	34.9	59.8	20.2	2.16	5.36	3.56
DRIFT										
1.0 PFE K_n/1000	.0353	.0556	.0931	.148	.233	.417	.625	.939	1.66	2.62
0.3 PFE ρ_{CAL}										
0.1 PFE PFE_c										
3.0 MV $\rho/2\pi$	22.2	22.8	19.3	18.4	13.6	12.5	6.31	4.95	4.45	4.66
DRIFT MCF	22.2	23.1	21.2	18.4	13.6	12.5	6.59	4.95	4.48	4.66
S. P.	5.1									
NOISE										
POT RES.										
CULT & CMTS										

I.P. RECEIVER NOTES, JOB No. 1106, AREA Voigt Ranch

LINE E-5, HALF 1, SP. 1, a = _____, BEARING E-W

SENDER STA. _____ = ELECTRODE No. _____, DATE 6-26-76

PAGE 2

HEINRICHS GEOEX

SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
MULTIPLIER	0.1	0.1	0.1	0.1	0.1	0.1	0.1	.01	0.1	0.1
PFE										
CUR. (AMPS)	1	1	1	1	2	2	2	1	1	2
POINT No.										
SEP. (n)	19.5	24.5	3.25	4.0	5.5	7.0	9.5	12.0	2.62	3.25
H. F. MV	1.30	.854	3.41	2.54	3.29	2.52	1.81	.684	2.40	3.88
DRIFT										
1.0 PFE K_n/1000	3.76	5.88	0.867	1.256	2.25	3.51	6.26	9.79	2.39	3.47
0.3 PFE ρ_{CAL}										
0.1 PFE PFE_c										
3.0 MV $\rho/2\pi$	4.88	5.02	3.11	3.19	3.70	4.42	5.66	6.69	5.74	6.73
DRIFT MCF	4.90	5.03	2.96	3.19	3.70	4.43	5.67	6.70	5.74	6.73
S. P.			-2.5						9.1	
NOISE										
POT RES.										
CULT & CMTS										

I.P. RECEIVER NOTES, JOB No. 1106, AREA Voigt Ranch
LINE E-5, HALF 1, SP. 1, a = , BEARING E-W
SENDER STA. = ELECTRODE No. , DATE

PAGE 3

HEINRICHS GEOEX

SEND		19-19	20-20	21-21	22-22						
RECEIVE		80.0	80.0	80.0	80.0						
MULTIPLIER		0.1	0.1	.01	.01						
PFE											
CUR. (AMPS)		1	1	1	1						
POINT No.											
SEP. (n)		4.5	5.75	7.0	9.5						
H.F. MV		1.48	1.21	.961	.744						
DRIFT											
1.0 PFE	$K_n/1000$	6.22	9.75	14.1	25.1						
0.3 PFE	ρ_{CAL}										
0.1 PFE	PFE_c										
3.0 MV	$\rho/2\pi$	9.21	11.1	13.6	18.7						
DRIFT	MCF	9.21	11.8	13.5	18.7						
S.P.											
NOISE											
POT RES.											
CULT & CMTS											

I. P. SENDER NOTES

JOB No. 1106 AREA Voigt Ranch

LINE E-5, HALF 1, SP. 1, DATE 6-26-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	~~2-2~~	~~3-3~~	~~4-4~~	~~5-5~~	2-2	3-3	4-4	5-5	6-6
RECEIVE	3.0	~~3.0~~	~~3.0~~			3				3
RANGE	10X250	~~10X100~~	~~10X100~~	~~30X100~~		3 X 200	10X100	10X100	3 X 200	10X200
VOLTAGE	430	~~400~~	~~380~~	~~230~~	~~380~~	330	240	380	320	280
CURRENT	2.5	~~1.0~~	~~1.0~~	~~3.3~~	~~.6~~	.6	1	1	.6	2
SEND	7-7	8-8	9-9	10-10	11-11	12-12	12-12	13-13	14-14	15-15
RECEIVE	3						20.0			20
RANGE	10X200	3X200	10X200	10X200	10X100	10X100	10X100	10X100	10X200	10X200
VOLTAGE	130	330	480	400	320	410	360	320	400	450
CURRENT	2	.6	2	2	1	1	1	1	2	2

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. SENDER NOTES

JOB No. 1106 AREA VOIGT RANCH

LINE E-5, HALF _____, SP. _____, DATE 6-26-76

PAGE 2

HEINRICHS GEOEX

SEND	16-16	17-17	17-17	18-18	19-19	20-20	21-21	22-22		
RECEIVE	20	20	80	80	—	—	—	80		
RANGE	10X200	10X200	10X100	10X200	10X100	10X100	10X100	10X100		
VOLTAGE	450	310	300	400	260	320	260	380		
CURRENT	2	1	1	2	1	1	1	1		
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES 1.0	
SENDER No. 8661-5	POWER UNIT ID
OPERATOR V.S	
RECEIVER No.	HOURS RUN
OPERATOR R.R	

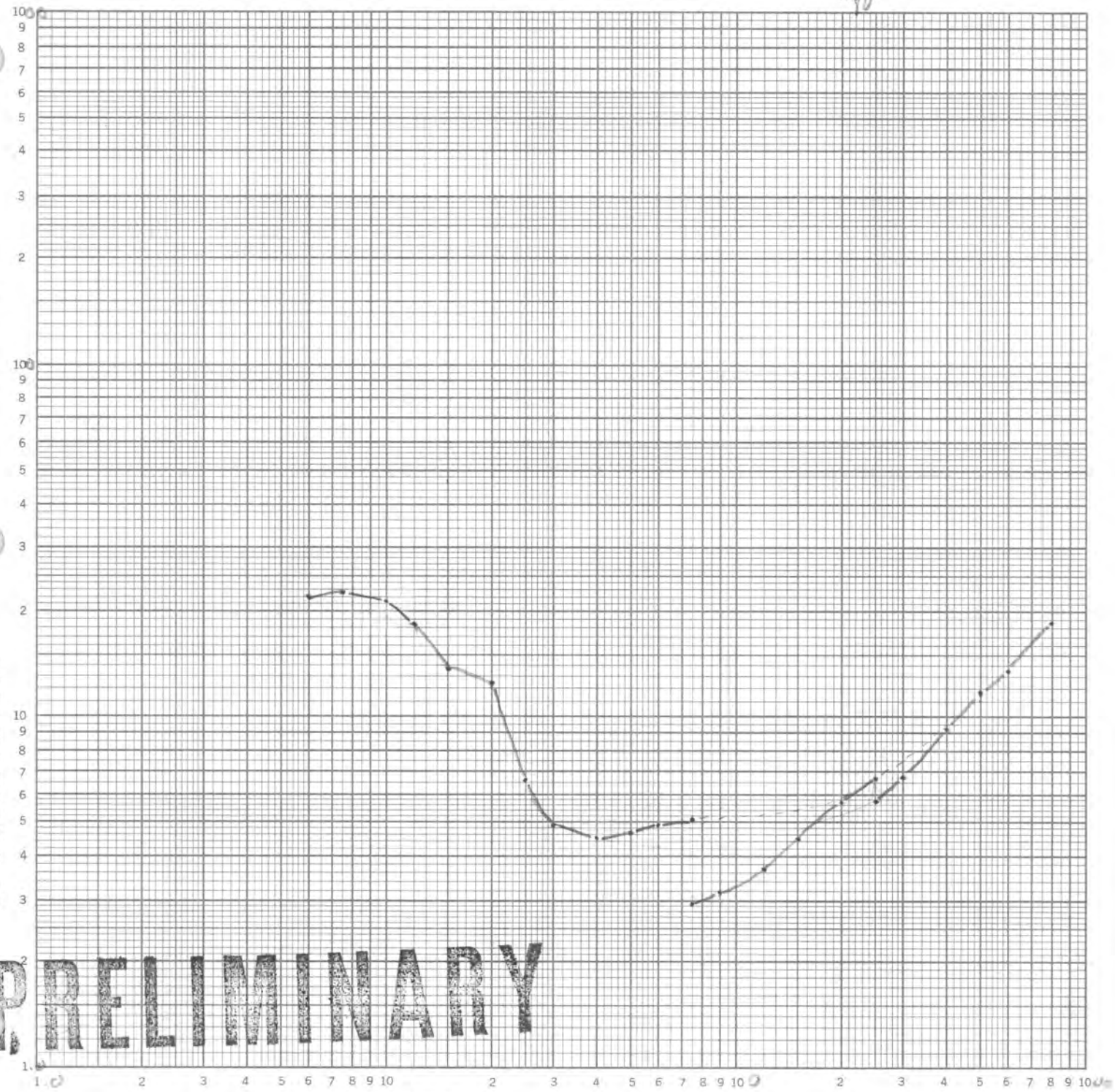
COMMENTS:

$\rho_1 = 23$ $E_1 = 9$ } 70m ~ 230'

$\rho_2 = 3.6$ $E_2 = 61$

$\rho_3 > 130$??

lateral effects



ρ_a ohm-meters

AB/2 (meters)

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VES 13 NW-SE

I. P. SENDER NOTES

PAGE 1

HEINRICHS GEOEX

JOB No. 1106 AREA Voist Ranch

LINE E 13N, HALF 1, SP. 1, DATE 6-30-76

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
RANGE MU	10	10	1.0	1.0	1.0	1.0	1.0	0.1	0.1	0.1
VOLTAGE RHO	.2	.2	.2	.2	.2	.3	.3	.3	.3	.3
CURRENT N	1.5	2.0	2.84	3.5	4.5	6.17	7.83	9.5	12.8	16.2
SEND POT	231	146	81.4	57.4	37.2	28.5	16.1	9.54	4.71	2.90
RECEIVE NF	.0353	.0556	.0931	.148	.233	.417	.625	.939	1.66	2.62
RANGE	40.8	41.3	41.7	42.6	43.4	39.6	35.0	29.9	26.3	25.3
VOLTAGE Po	40.8	40.6	37.9	42.5	43.3	39.6	33.5	28.7	26.1	25.3
CURRENT SP	-6.4									

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

RCUR

I. P. SENDER NOTES

JOB No. 1106 AREA Voigt RANCH

LINE E13N, HALF 1, SP. 1, DATE 6-30-76

PAGE 2

HEINRICHS GEOEX

SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
RANGE Mul	0.1	.01	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
VOLTAGE Mul	.3	.2	.2	.2	.2	.3	.3	.3	.2	.2
CURRENT N	19.5	24.5	3.25	4.0	5.5	7.0	9.5	12.0	2.62	3.25
SEND Adj	1.99	.844	5.64	4.0	2.54	2.79	1.99	1.56	4.15	3.40
RECEIVE NF	3.76	5.88	.867	1.256	2.25	3.51	6.26	9.79	2.39	3.49
RANGE	25.0	25.0	24.5	25.1	28.3	32.7	41.6	51.0	49.6	59.0
VOLTAGE Mul	24.9	24.8	24.4	25.1	28.6	32.6	41.5	50.9	49.6	58.9
CURRENT Sp										

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

LIME HILL TWIST ~~#~~ 18 & 19

ROUR

I. P. SENDER NOTES

JOB No. 1106 AREA Voigt RANCH

LINE E 13N, HALF 1, SP. 1, DATE 6-30-76

PAGE 3

HEINRICHS GEOEX

SEND	19-19	20-20	21-21	22-22						
RECEIVE	80.0	80.0	80-0	80.0						
RANGE Mul	0.1	.01	0.1	0.1						
VOLTAGE Amb	.1	.1	.2	.3						
CURRENT N	4.5	5.75	7.0	9.5						
SEND POT.	1.26	.948	1.60	1.76						
RECEIVE NF	6.22	9.75	14.1	25.1						
RANGE	78.4	92.5	113	147						
VOLTAGE Pa	78.4	92.4	112.8	147.3						
CURRENT SP										

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. SENDER NOTES

JOB No. 1106 AREA Voigt Ranch

LINE F13N, HALF 1, SP. 7, DATE 6-30-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
RANGE	1X200	1X200	1X200	1X200	1X200	1X300	1X300	1X300	1X300	1X300
VOLTAGE	80	70	80	80	80	80	80	90	90	80
CURRENT	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
RANGE	1X300	1X200	1X200	1X200	1X200	1X300	1X300	1X300	1X200	1X200
VOLTAGE	80	40	40	30	40	90	80	80	50	80
CURRENT	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2

FREQUENCIES 1.0

SENDER No. 8661-5 POWER UNIT ID

OPERATOR D. LANG

RECEIVER No. 25705R HOURS RUN

OPERATOR B. Rollins

COMMENTS:

I. P. SENDER NOTES

JOB No. 1106 AREA WRIGHT RANCH

LINE E 13N, HALF 1, SP. 1, DATE 6/30/76

PAGE 2

HEINRICHS GEOEX

SEND	19-19	20-20	21-21	22-22						
RECEIVE	80.0	80.0	80.0	80.0						
RANGE	1X100	1X100	1X200	1X300						
VOLTAGE	90	50	80	100						
CURRENT	0.1	0.1	0.2	0.3						
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES 1.0

SENDER No. 8661-5 POWER UNIT ID

OPERATOR D. LANG

RECEIVER No. 25705R HOURS RUN

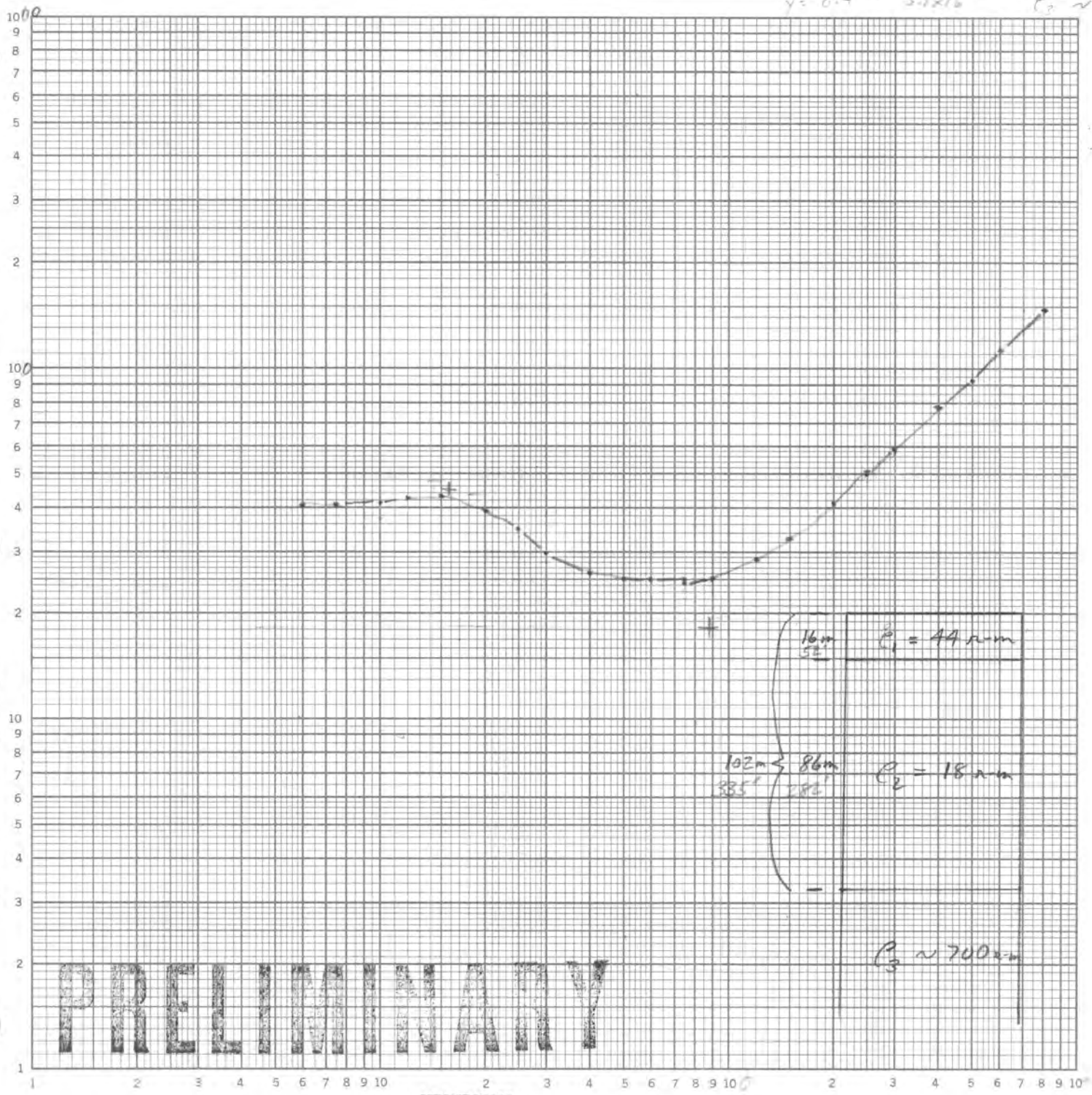
OPERATOR B Rollins

COMMENTS:

Voigt Ranch Area
Line E 13 N N-E-S-W
VES
Schlumberger Array

$\rho_1 = 45$ $E_1 = 1.6$
$\rho_2 = 18$ $E_2 = 82$
$\rho_3 \sim 700$

$x = 5.5$ $E_2 = (5.5 - 0.4)16$
$y = 0.4$ 5.1×16



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6-30-76

VES 19 E-W ~~E-S19~~

I. P SENDER NOTES

JOB No. 1106 AREA VOIGHT RANCH

LINE E-S19, HALF 1, SP. 1, DATE 6/28/76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3 CAL	3-3	4-4	5-5	6-6	7-7	8-8	9-9
RECEIVE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
RANGE	3X300	3X200	10X50	3X200	3X133	3X133	3X200	3X133	3X200	3X200
VOLTAGE	490	250	290	210	270	270	270	170	240	230
CURRENT	0.9	0.6	0.5	0.6	0.4	0.4	0.6	0.4	0.6	0.6
SEND	10-10	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17
RECEIVE	3.0	3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0
RANGE	3X200	3X200	3X200	3X200	3X200	3X300	3X300	3X133	3X133	3X133
VOLTAGE	250	270	230	205	210	360	280	250	260	230
CURRENT	0.6	0.6	0.6	0.6	0.6	0.9	0.9	0.4	0.4	0.4

FREQUENCIES 1.0

SENDER No. 8661-5 POWER UNIT ID

OPERATOR D. LANG

RECEIVER No. 25705-P HOURS RUN

OPERATOR B. ROLLINS

COMMENTS:

I. P. SENDER NOTES

JOB No. 1106 AREA VOIGHT RANCH

LINE E SIG, HALF 1, SP. 1, DATE 6/28/76

PAGE 2

HEINRICHS GEOEX

SEND	18-18	19-19	20-20	21-21	22-22					
RECEIVE	80.0	80.0	80.0	80.0	80.0					
RANGE	3X135	3X200	3X200	3X200	3X200					
VOLTAGE	280	260	280	280	210					
CURRENT	0.4	0.6	0.6	0.6	0.6					
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES 1.0

SENDER No. 8661-S	POWER UNIT ID
OPERATOR D. LANG	
RECEIVER No. 25705-R	HOURS RUN
OPERATOR B. ROLLINS	

COMMENTS:

I. P. SENDER NOTES

JOB No. E-519 AREA Voigt Ranch

LINE 1100E, HALF 1, SP. 1, DATE 6-28-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
RANGE μμ	100	10	10	10	1.0	1.0	0.1	0.1	0.1	0.1
VOLTAGE Amp	.9	.6	.6	.4	.4	.6	.4	.6	.6	.6
CURRENT N	1.5	2.0	2.94	3.50	4.50	6.17	7.83	9.5	12.8	16.2
SEND Nom	1470	613	341	158	61.9	28.3	7.07	6.65	2.72	1.66
RECEIVE NF	.0353	.0556	.0931	.148	.233	.417	.625	.939	.166	.262
RANGE										
VOLTAGE PA	51.6	56.8	52.9	58.5	36.4	19.7	11.1	10.4	.75	.72
CURRENT SP	1.457	57.8	58.2	58.6	36.1	19.7	11.5	10.4	7.58	7.24

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

CAL - .5 AMP

1.0 = 5.12

I.P. SENDER NOTES Receiver

JOB No. 1106 AREA Voigt Ranch

LINE E-19, HALF 1, SP. 1, DATE

PAGE 2

HEINRICHS GEOEX

SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
RANGE Mu	.01	.01	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
VOLTAGE Cu	.6	.6	.6	.6	.9	.9	.4	.4	.4	.4
CURRENT N	19.5	24.5	3.25	4.0	5.5	7.5	9.5	12.0	3.62	3.25
SEND Nu	1.14	.746	12.4	8.26	8.18	6.22	2.03	1.62	6.19	4.88
RECEIVE NF	3.76	5.88	.867	1.256	2.25	3.51	6.26	9.79	2.39	3.47
RANGE										
VOLTAGE Pa	7.1	7.31	17.9	17.3	20.4	24.3	31.8	39.6	36.9	42.3
CURRENT SP	~~7.16~~	~~7.32~~	~~5.5~~	~~17.3~~	~~20.4~~	~~24.3~~	~~31.8~~	~~39.7~~	6.7	—

FREQUENCIES	17.9
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

37.0 42.3

I. P. ~~SENDER~~ Receiver NOTES

JOB No. 1106 AREA Voigt Ranch

LINE E-195, HALF _____, SP. _____, DATE 6-28-76

PAGE 3

HEINRICHS GEOEX

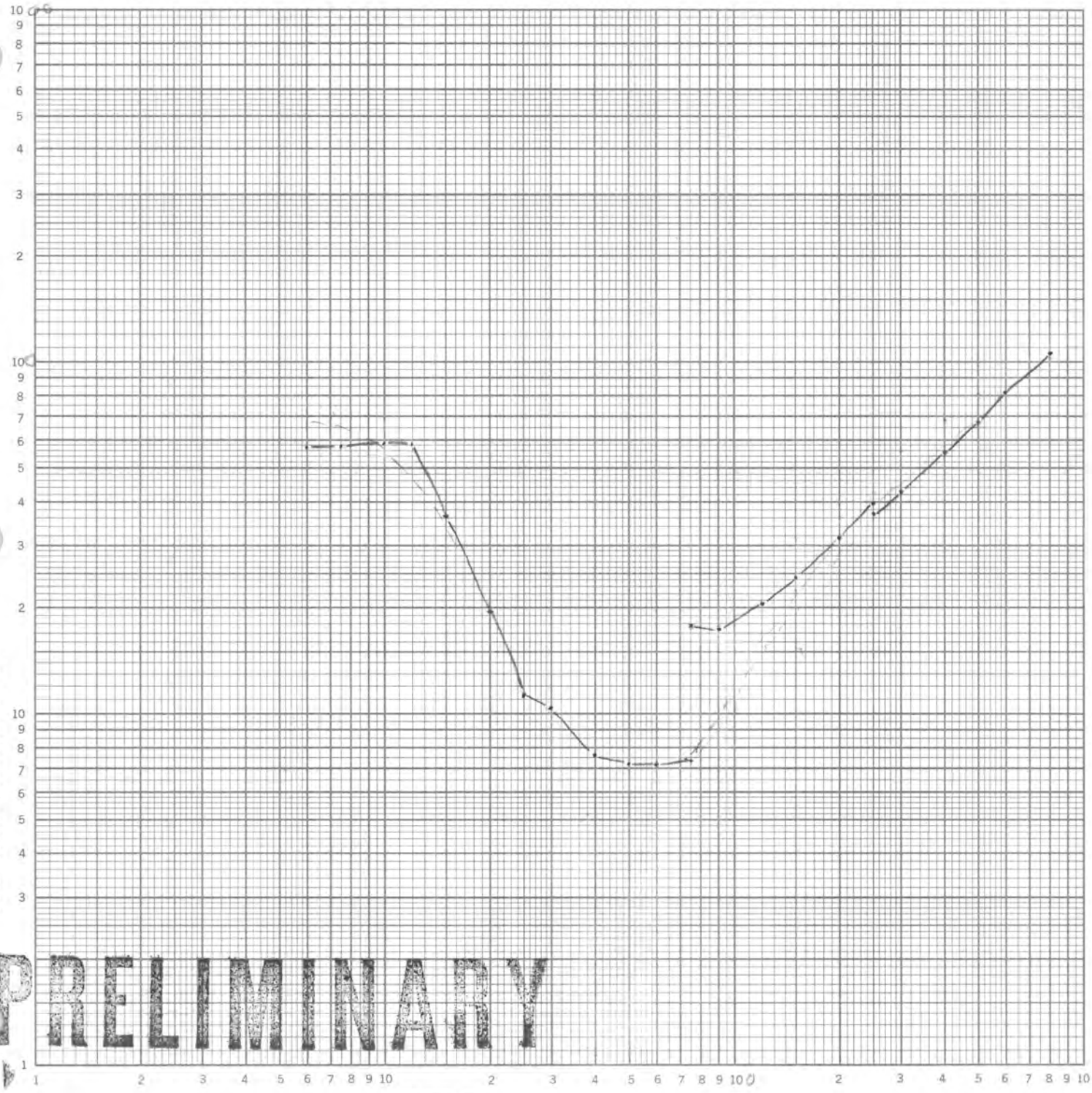
SEND	19-19	20-20	21-21	22-22						
RECEIVE	80.0	80.0	80.0	80.0						
RANGE MU	0.1	0.1	0.1	0.1						
VOLTAGE MA	.6	.6	.6	.6						
CURRENT N	4.5	5.75	20	9.5						
SEND NOIM	5.36	4.15	3.44	2.53						
RECEIVE NF	6.22	9.75	14.1	25.1						
RANGE										
VOLTAGE PA	55.6	67.4	80.8	105.8						
CURRENT SP	~~55.4~~	~~67.5~~	~~80.7~~	~~105.7~~						

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

Voigt Ranch Area
Line E 195 E W
VES

$\rho_1 = 75$ $E_1 = 7$
$\rho_2 = 7.5 \rightarrow 15$ $E_2 = 90$
$\rho_3 \approx 550$ 97m → 318'



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AB/2 (meters)

Book ~~E-20N~~ VES 20 NW-SE

I. P. SENDER NOTES

JOB No. 1106 AREA ~~6-29-76~~ Voigt Ranch

LINE E-20N, HALF 1, SP. 1, DATE 6-29-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
RANGE MUL	100	100	10	100	100	10	10	10	1.0	1.0
VOLTAGE Amp	.125	.15	.075	.15	.225	.18	.075	.1	.08	.08
CURRENT M	1.5	2.0	2.84	3.50	4.50	6.17	7.83	9.5	12.8	16.2
SEND Pot.	2230	2010	687	1200	1390	901	211	198	71.7	43.3
RECEIVE MF	.0353	.0556	.0931	.148	.233	.417	.625	.939	1.66	2.62
RANGE	631	758	938	1190	1440	1620	1830	1860	1500	1420
VOLTAGE Pa	629.8	745	844	1184	1439	1624	1758	1859	1498	1418
CURRENT Sp	-3.7									

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

RCVR

I. P. ~~SENDER~~ NOTES

JOB NO. 1106 AREA Voigt Ranch

LINE E20N, HALF 1, SP. 4, DATE

PAGE 2

HEINRICHS GEOEX

SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
RANGE MU	1.0	1.0	10	1.0	0.1	0.1	.01	.01	0.1	0.1
VOLTAGE Ma	.05	.08	.09	.07	.04	.08	.05	.09	.08	.09
CURRENT	19.5	24.5	3.25	4.0	5.5	7.0	9.5	12.0	2.62	3.25
SEND Ot	16.9	12.8	194	647	6.01	3.85	.621	.480	2.02	1.25
RECEIVE Mf	3.76	5.88	0.867	1.256	2.25	3.52	6.26	9.79	2.39	3.47
RANGE	1270	942	1870	1160	338	169	77.8	52.3	60.4	48.2
VOLTAGE Ma	1271	941	1869	1161	338.1	169.4	77.7	52.2	60.3	48.2
CURRENT Sp			23.9						5.1	

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS:

Rock

I. P. SENDER NOTES

JOB No. 1106 AREA Voigt Ranch

LINE E 20N, HALF 1, SP. 1, DATE 6-29-76

PAGE 3

HEINRICHS GEOEX

SEND	19-19	20-20	21-21	22-22						
RECEIVE	80.0	80.0	80.0	80.0						
RANGE MU	.01	.01	.01	.01						
VOLTAGE AMP	.18	.15	.25	.15						
CURRENT N	4.5	5.75	7.0	9.5						
SEND POT.	1.066	.477	.610	.260						
RECEIVE NF	6.22	9.75	14.1	25.1						
RANGE	36.8	31.0	34.3	43.5						
VOLTAGE Sa	36.8	31.0	34.4	43.5						
CURRENT SP										

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. SENDER NOTES

JOB No. 1106 AREA Voigt Ranch

LINE E-20N, HALF 1, SP. 1, DATE 6-29-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3	3	3	3	3	3	3	3	3	3
RANGE	1X125	1X150	1X75	3X50	3X75	3X60	1X75	1X100	1X80	1X80
VOLTAGE	230	200	160	120	200	190	100	80	100	100
CURRENT	0.125	0.15	.075	.15	.225	.180	.075	.1	.08	.08
SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3	3	20	20	20	20	20	20	80	80
RANGE	1X50	1X80	1X90	1X70	1X40	1X80	1X50	1X90	1X80	1X90
VOLTAGE	80	90	90	110	80	100	90	100	90	80
CURRENT	.05	.08	.09	.07	.04	.08	.05	.09	.08	.09

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. SENDER NOTES

JOB No. 1106 AREA Voigt Ranch

LINE E 2011 HALF 1, SP. 1, DATE 6-29-76

PAGE 2

HEINRICHS GEOEX

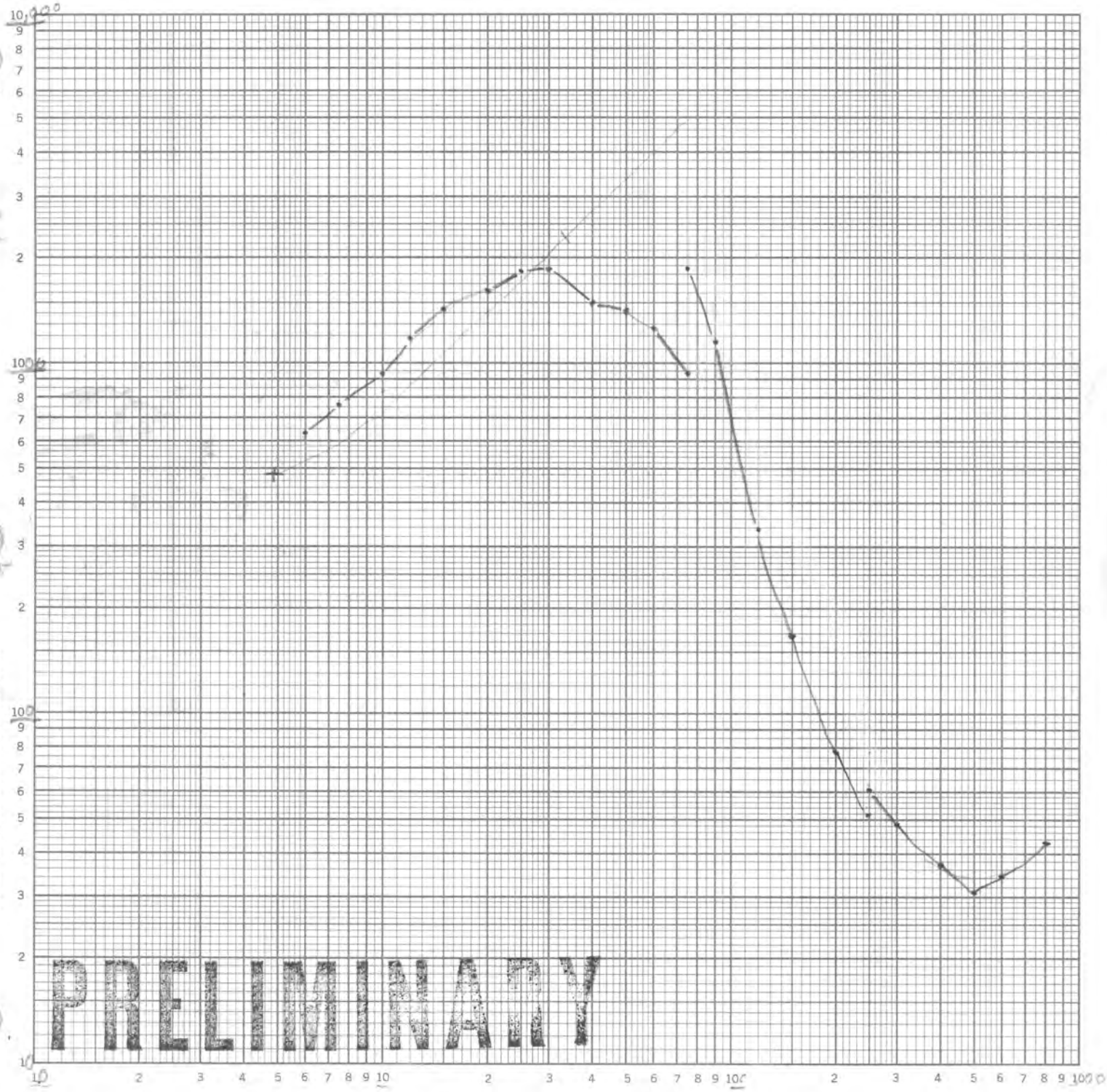
SEND	19-19	20-20	21-21	22-22						
RECEIVE	80	80	80	80						
RANGE	180x1	1X150	1X250	1X150						
VOLTAGE	80	80	80	60						
CURRENT	.18	.150	.25	.15						
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES		COMMENTS:
SENDER No.	POWER UNIT ID	
OPERATOR		
RECEIVER No.	HOURS RUN	
OPERATOR		

Voigt Ranch Area
L EZON NW-SE
VES
Schlumberger array

$\rho_1 = 480$ $E_1 = 4.8$
$\rho_2 \sim 19{,}000$ $E_2 = 20$?
$\rho_3 \sim 30$ $E_3 \sim 600$
ρ_4 ? ∞

~670m → 2200'
$\rho_{b_E} = 0.6$



46 7400

K+E LOGARITHMIC 3 X 3 CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

Pa ohm meters

AB/2 meters

HEINRICHS
GEOEXPLORATION CO.
Box 5964 Tucson, Arizona 85703
Phone: (602) 623-0578
Cable: GEOEX
GEOPHYSICAL ENGINEERS

6-30-76

VES 29

I. P. RECEIVER NOTES, JOB NO. 1106, AREA Voigt Ranch

LINE E029, HALF 1, SP. 1, a = _____, BEARING NW-SE

SENDER STA. _____ = ELECTRODE NO. _____, DATE 7-1-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
MULTIPLIER	10	10	1.0	1.0	1.0	1.0	0.1	1.0	0.1	0.1
PFE										
CUR. (AMPS)	.2	.2	.1	.1	.1	.15	.1	.2	.15	.15
POINT NO.										
SEP. (n)	1.5	2.0	2.84	3.50	4.50	6.17	7.83	9.5	12.8	16.2
H. F. MV	519	314	88.5	56.6	36.4	28.8	9.91	12.8	4.67	2.74
DRIFT										
1.0 PFE K_n/1000	.0353	.0556	.0931	.148	.233	.417	.625	.939	1.66	2.62
0.3 PFE ρ_{CAL}										
0.1 PFE PFE_c	91.7	88.8	90.6	84.0	84.9	80.0	64.6	60.2	52.1	47.8
3.0 MV $\rho/2\pi$	91.6	87.3	82.4	83.8	84.8	80.8	61.9	60.1	51.7	47.9
DRIFT MCF										
S. P.	0.3									
NOISE										
POT RES.										
CULT & CMTS										

I. P. RECEIVER NOTES, JOB No. 1106, AREA Voigt Ranch

LINE E-0-29, HALF 1, SP 1, a = _____, BEARING NW-S-E

SENDER STA. _____ = ELECTRODE No. _____, DATE _____

PAGE 2

HEINRICHS GEOEX

SEND		11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE		3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
MULTIPLIER		0.1	0.1	0.1	0.1	0.1	.01	0.1	0.1	0.1	0.1
PFE											
CUR. (AMPS)		.15	.2	.2	.2	.2	.1	.3	.3	.3	.3
POINT No.											
SEP. (n)		19.5	24.5	3.25	4.0	5.5	7.0	9.5	12.0	2.62	3.25
H. F. MV		1.69	1.39	8.18	5.29	2.96	.969	2.02	1.50	5.84	4.52
DRIFT											
1.0 PFE	$K_n/1000$	3.76	5.88	0.867	1.256	2.25	3.51	6.26	9.79	2.39	3.47
0.3 PFE	ρ_{CAL}										
0.1 PFE	PFE_c	42.4	40.9	35.5	33.2	33.2	34.1	42.2	49.0	46.6	52.3
3.0 MV	$\rho/2\pi$	42.4	40.9	35.5	33.2	33.3	34.0	42.2	48.9	46.5	52.3
DRIFT	MCF										
S. P.				4.6						1.0	
NOISE											
POT RES.											
CULT & CMTS											

I. P. RECEIVER NOTES, JOB No. 1106, AREA Voigt Ranch

LINE 1106, HALF 1, SP. 1, a = _____, BEARING NW-SE

SENDER STA. _____ = ELECTRODE No. _____, DATE 7-1-76

PAGE 3

HEINRICHS GEOEX

SEND	19-19	20-20	21-21	22-22						
RECEIVE	80.0	80.0	80.0	80.0						
MULTIPLIER	0.1	0.1	0.1	0.1						
PFE										
CUR. (AMPS)	.3	.3	.3	.3						
POINT NO.										
SEP. (n)	4.5	57.5	7.0	9.5						
H. F. MV	3.49	2.51	2.04	1.56						
DRIFT										
1.0 PFE K_n/1000	6.22	9.5	14.1	25.1						
0.3 PFE ρ_{CAL}										
0.1 PFE PFE_c	72.4	81.6	95.9	130						
3.0 MV $\rho/2\pi$	72.4	79.3	95.9	122.2						
DRIFT MCF										
S. P.										
NOISE										
POT RES.										
CULT & CMTS										

I. P. SENDER NOTES

JOB No. 1106 AREA Voigt Ranch

LINE E029, HALF 1, SP. 1, DATE 7-1-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0									3.0
RANGE	1x200	1x200	1x100	1x100	1x100	1x150	1x100	1x200	1x150	1x150
VOLTAGE	80	90	50	50	50	70	60	80	70	50
CURRENT	.2	.2	.1	.1	.1	.15	.1	.2	.15	.15
SEND	10-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0	—	—	—	—	20.0	80.0	80.0
RANGE	1x150	1x200	1x200	—	1x200	1x100	1x300	1x300	1x300	1x300
VOLTAGE	50	50	50	70	50	50	70	70	70	130
CURRENT	.15	.2	.2	.2	.2	.1	.3	.3	.3	.3

FREQUENCIES	1.0		
SENDER No.	8661-5	POWER UNIT ID	
OPERATOR	V.S		
RECEIVER No.		HOURS RUN	
OPERATOR	R.R		

COMMENTS:

CAL .3A. 80V
3x100

DEVIATION
-500
FROM 16 TO 22

I. P. SENDER NOTES

JOB No. 1106 AREA VOIGH

LINE F0-29, HALF 1, SP. 1, DATE 7-1-76

PAGE 2

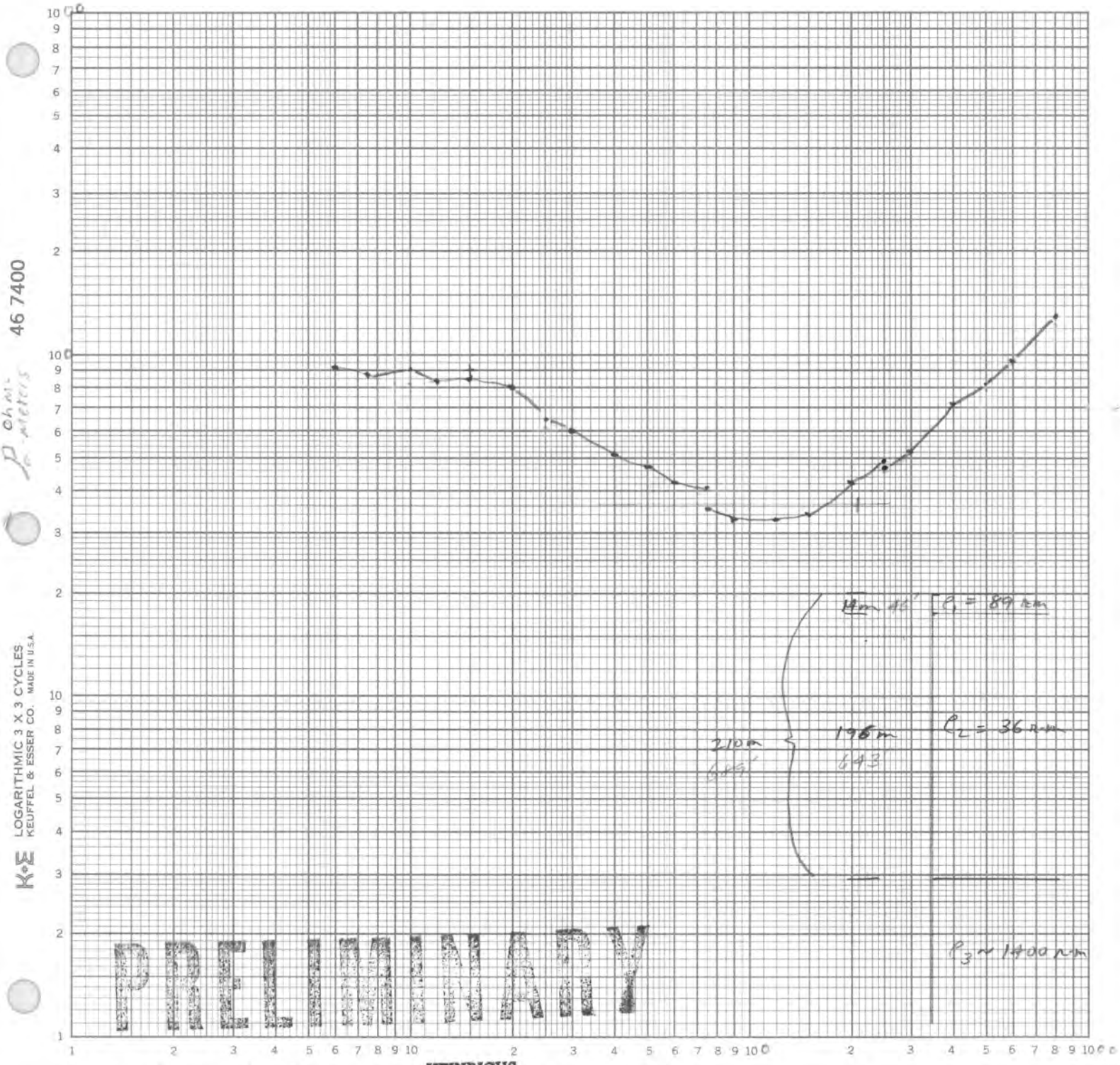
HEINRICHS GEOEX

SEND	19-19	20-20	21-21	22-22						
RECEIVE	80.0	—	—	80.0						
RANGE	1X 300	—	—	1X300						
VOLTAGE	50	50	60	50						
CURRENT	.3	.3	.3	.3						
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES	10		COMMENTS:
SENDER No.	8661-5	POWER UNIT ID	
OPERATOR	V.S		
RECEIVER No.		HOURS RUN	
OPERATOR	R.R		

Voigt Ranch Area
Line E0-29 - N1 SW
VES
Schlumberger Array

s = 6.3



AB/2 = meters

AB/2 meters E.P.

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3-L

V = 13.5
V = 014

ρ1 = 90 E1 = 13
ρ2 = 36 E2 = 15×13.1 = 196
ρ3 ~ 1400

ρ1 = 88 E1 = 13
ρL = 35 E2 = 195
ρ3 = ∞

RRoberts 7-1-76

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

VOIGT RANCH QUADRANGLE
ARIZONA–APACHE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1969. Field checked 1971

Projection and 10,000-foot grid ticks: Arizona coordinate system, east zone (transverse Mercator)
1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue. 1927 North American datum

Fine red dashed lines indicate selected fence lines

UTM GRID AND 1971 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET
MN GN 1°01' 18 MILS 13° 231 MILS

SCALE 1:24 000
1 ½ 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR WASHINGTON, D. C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

ARIZONA
QUADRANGLE LOCATION

ROAD CLASSIFICATION
Primary highway, hard surface — Light-duty road, hard or improved surface
Secondary highway, hard surface — Unimproved road
Interstate Route — U. S. Route — State Route

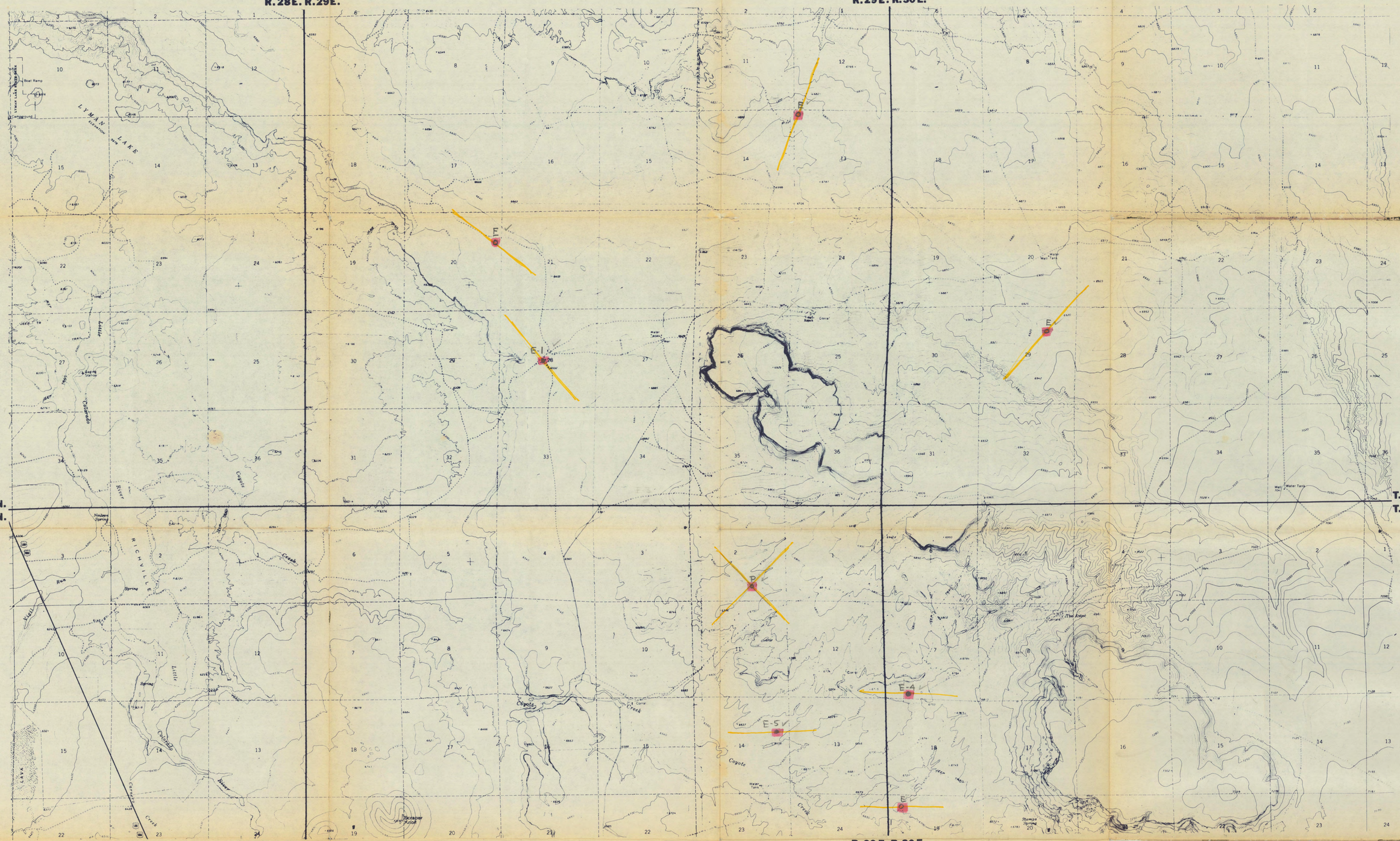
☆U.S. GOVERNMENT PRINTING OFFICE: 1973—784—297/2

VOIGT RANCH, ARIZ.
N3415—W10907.5/7.5

1971

AMS 4152 I SW—SERIES V898

3 E no.
2 P
4 E blank



LYMAN LAKE, ARIZ.

LOCATION MAP

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

R. Rollins
6734 E. Brooks Dr.
Tucson Az.
85706

THIRD CLASS

Heinrichs Geoexploration
808 W Grant Rd.
Tucson Az. 85703

GEOEX
Cable: GEOEX
Rec'd JUN 28 1976
BOX 1944 TUCSON, ARIZONA 85705
PHONE: (AREA 602) 623-0578

#1106

3 1/4 $\frac{13}{4} \cdot \frac{5}{4}$

$\frac{V}{I}$ $\frac{\pi}{n}(n+1)$ (

Max distance of pot from cent

1.	6 meters	– 1.25 meters	– 4 ft
2	7.5	– 1.25 meters	– ~~6 ft~~ 4 ft
3	10	– 1.6 meters	– ~~11 ft~~ 5 1/2 ft
4	12	– 2.0	– ~~6 ft~~ ~~13 ft~~ 6 1/2
5	15	– 2.5	– 8 ft
6	20	– 3.33	– 11 ft
7	25	– 4.16	– 14 ft
8	30	– 5.0	– 16 ft
9	40	– 6.66	– ~~22 ft~~ 22 ft
10	50	– 8.33	– 27 ft
11	60	– 10	– 33 ft
12	75	– ~~10~~ 12.5	– 41 ft
13	90	– 15	– 50
14	120	– 20	– 66 ft
15	150	– 25	– 81 ft
16	200	– 33	– 110 ft
17	250	– 40	– 140
18	300	– 50	– ~~165 ft~~ 165 ft
19	400	– 67	– 220
20	500	– 83	– 270
21	600	– 100	– 380 ft
22	800	– 133	– 440 ft

300
165
234

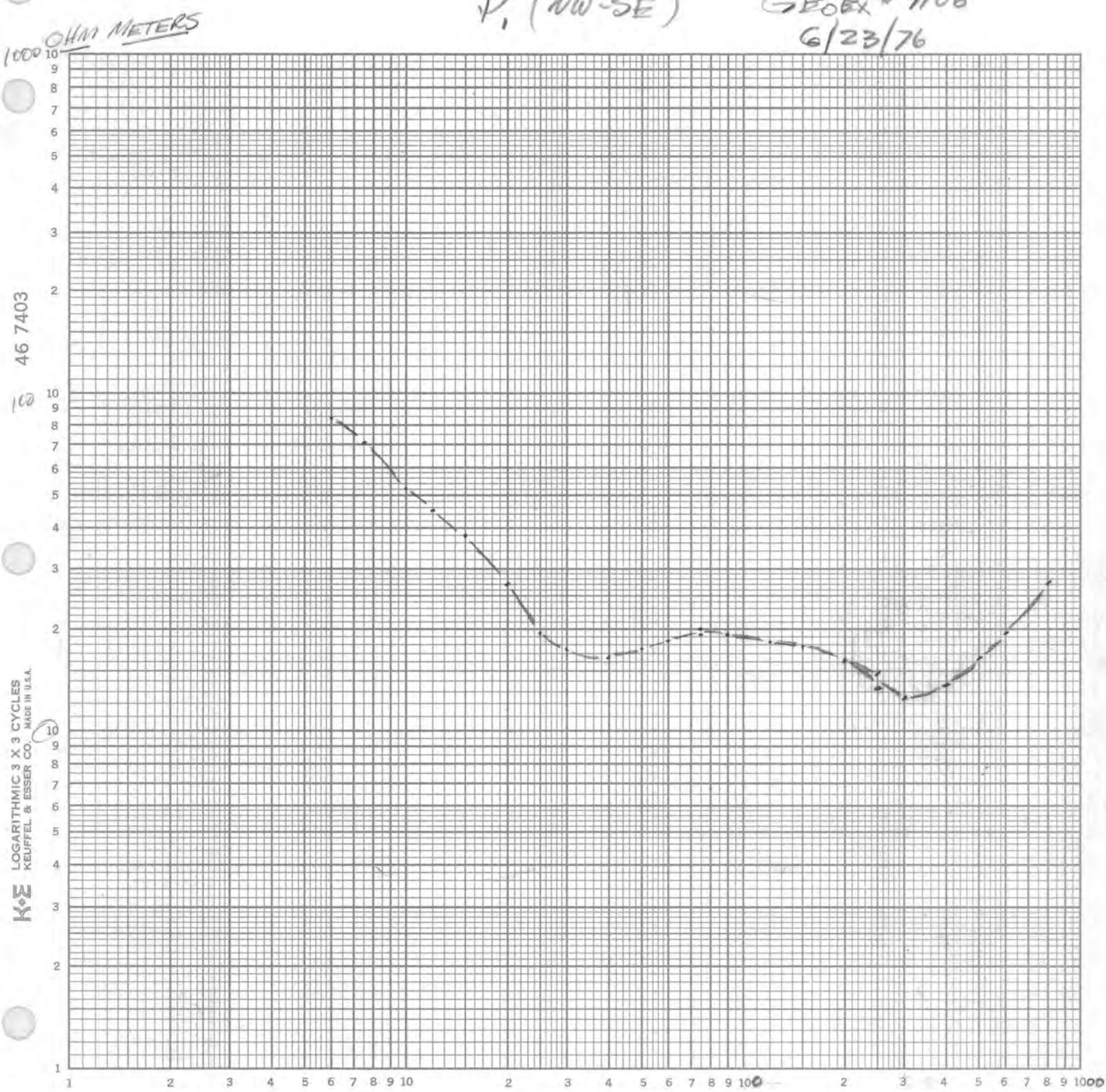
10
3.9

$\frac{1000 \text{ Amp}}{V - \text{milevolts}}$

.0001

P1 (NW-SE)

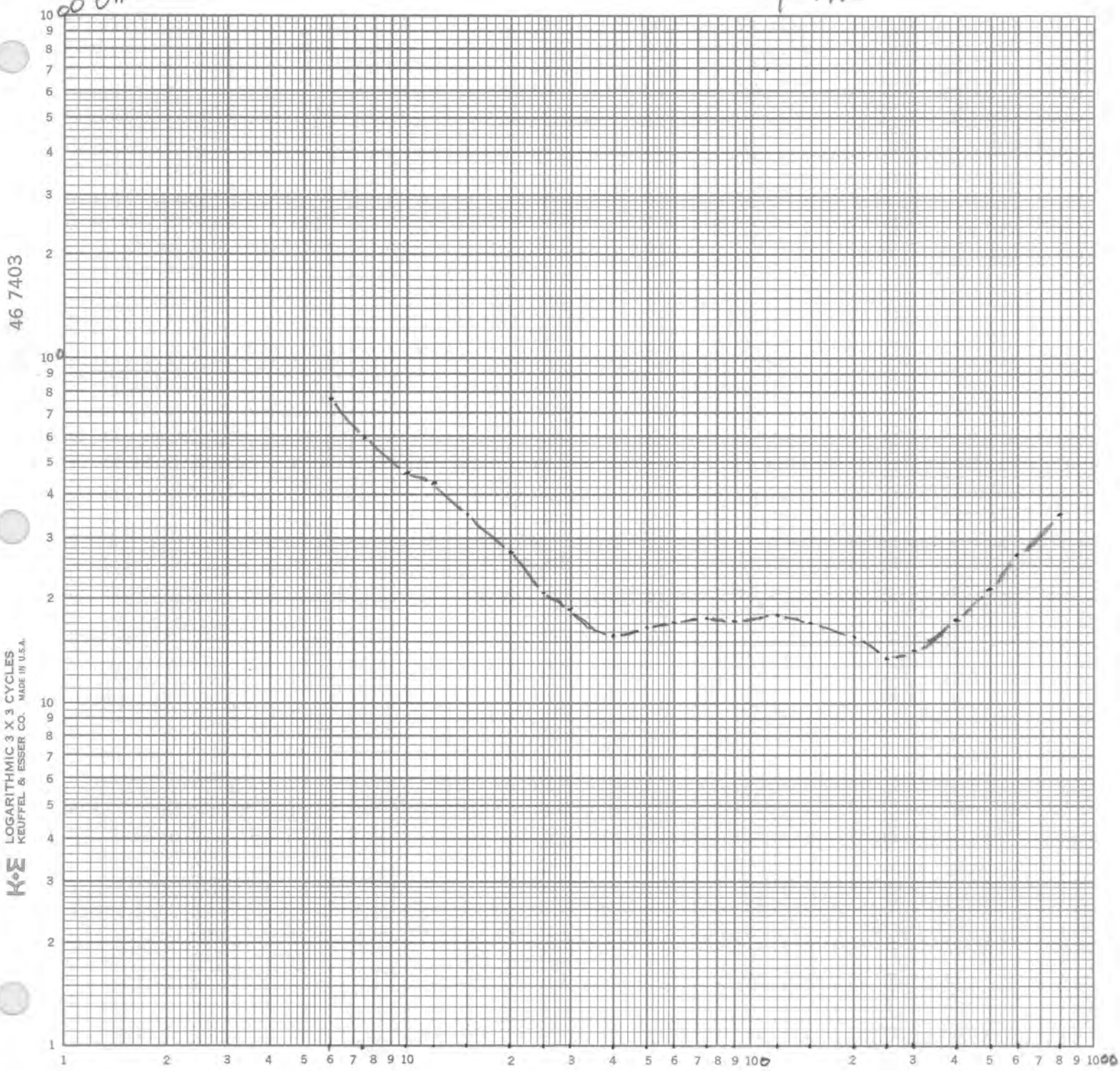
GEOEX #1106
6/23/76



$\frac{AB}{2}$ (meters)

ρ_2 (NE-SW)

GEOEX #1106
6/24/76

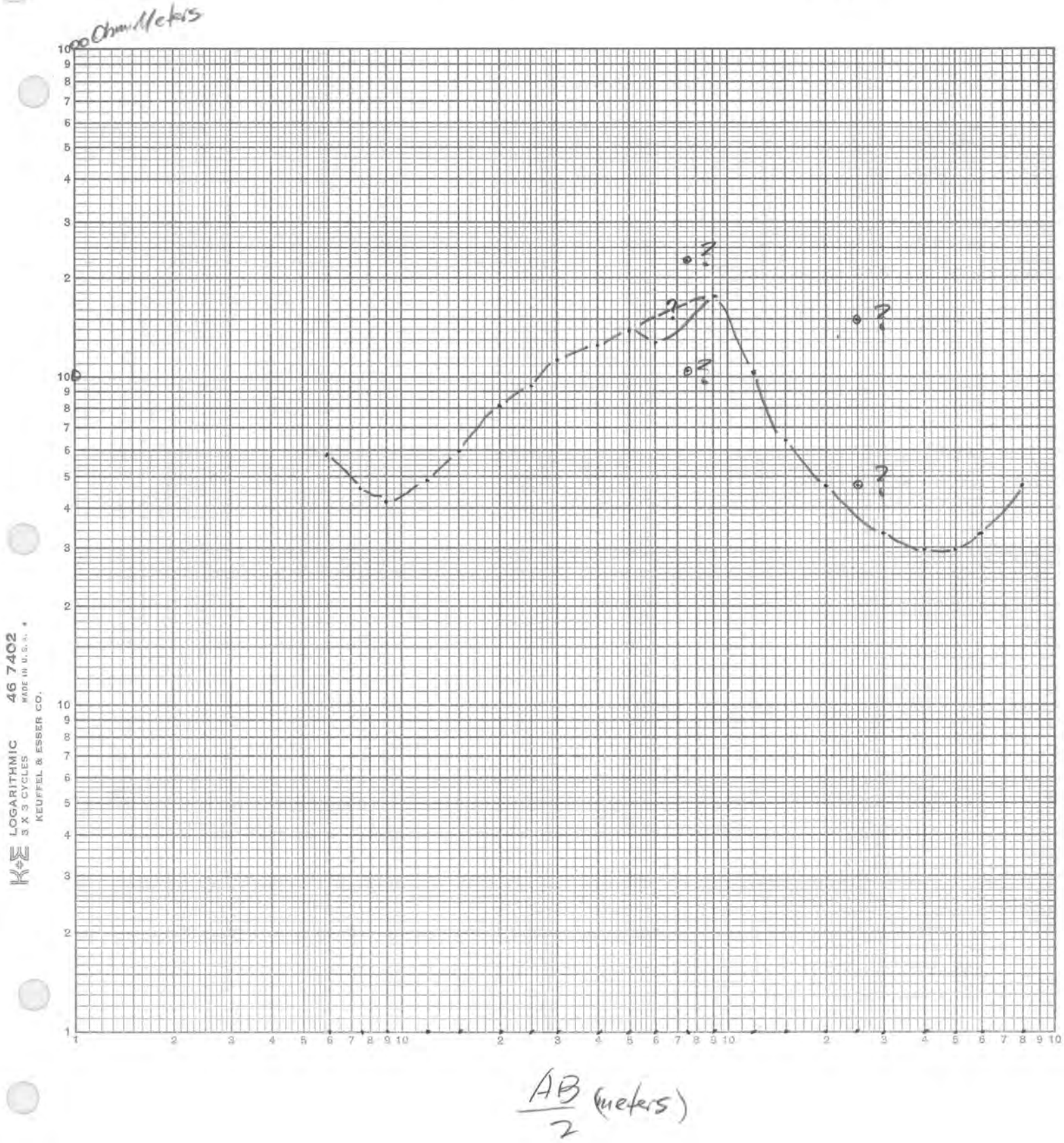


$\frac{AB}{2}$ (meters)

2/4

E_1 (NW-SE)

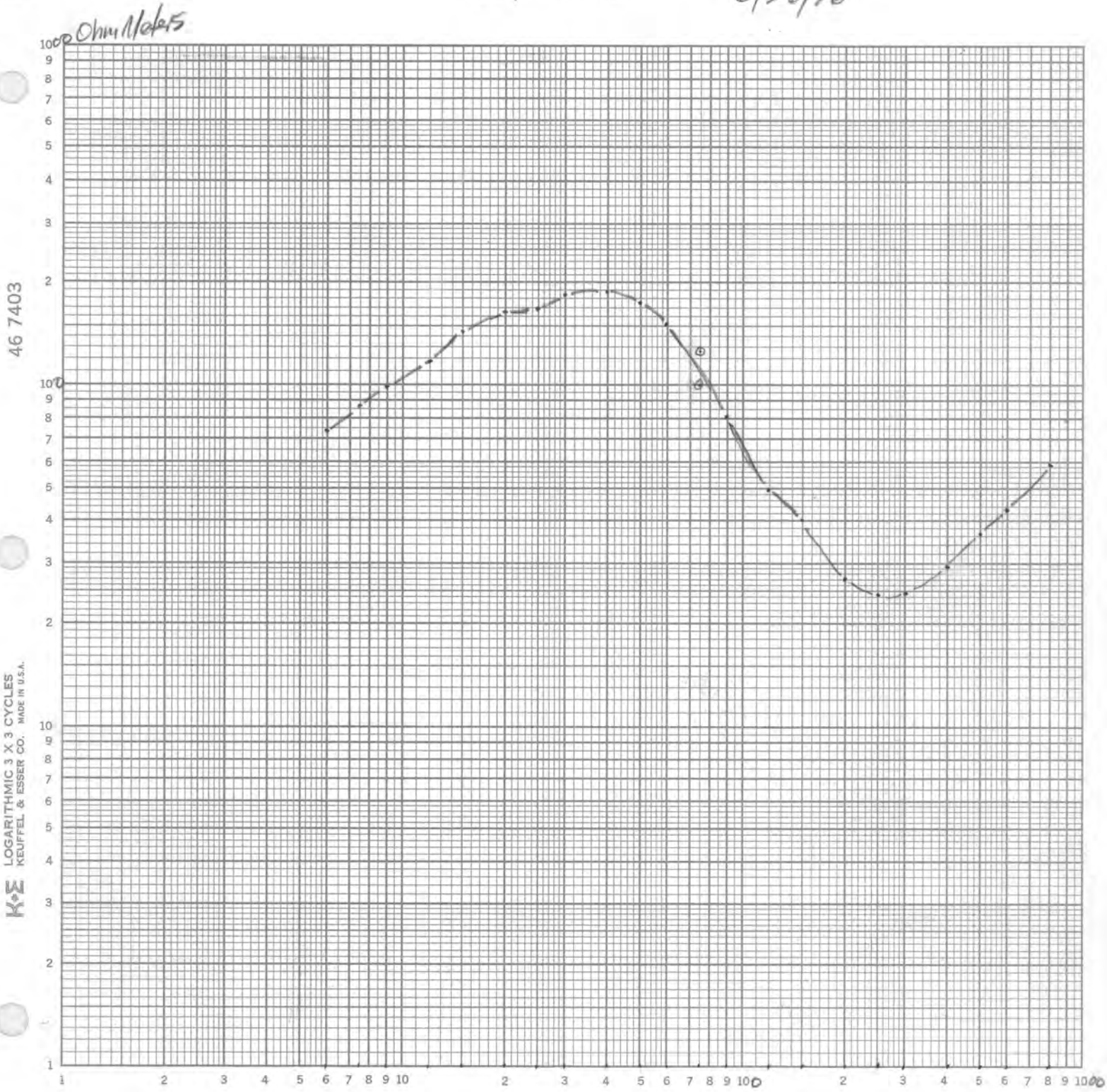
GBOBX #1106
6/29/76



	ρ	T
1	50	9
2	800	9
3	16	225 / 240
4	∞	

GEOEX #1106
6/26/76

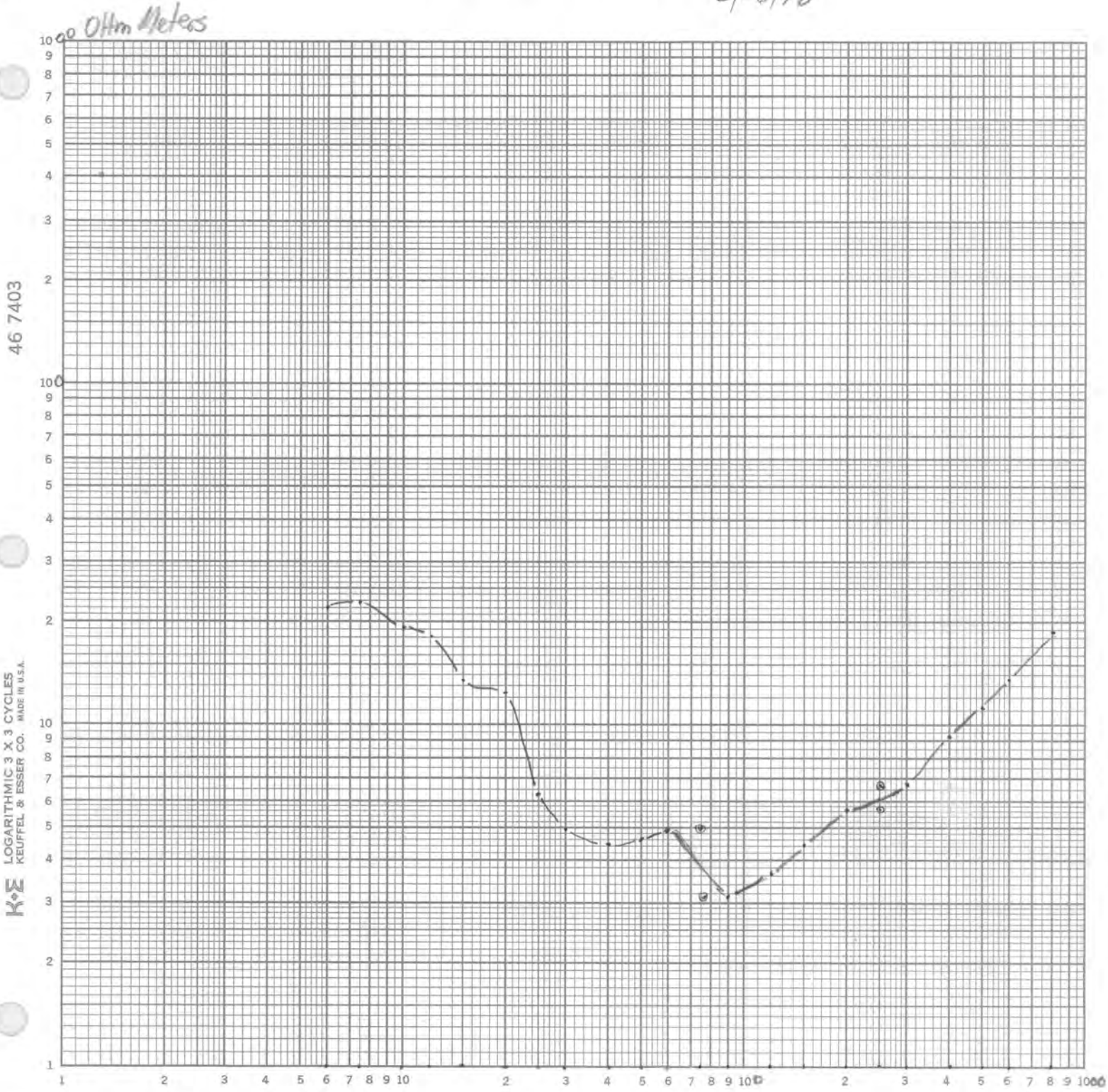
E4 - E-W



$\frac{AB}{2}$ (meters)

7/9

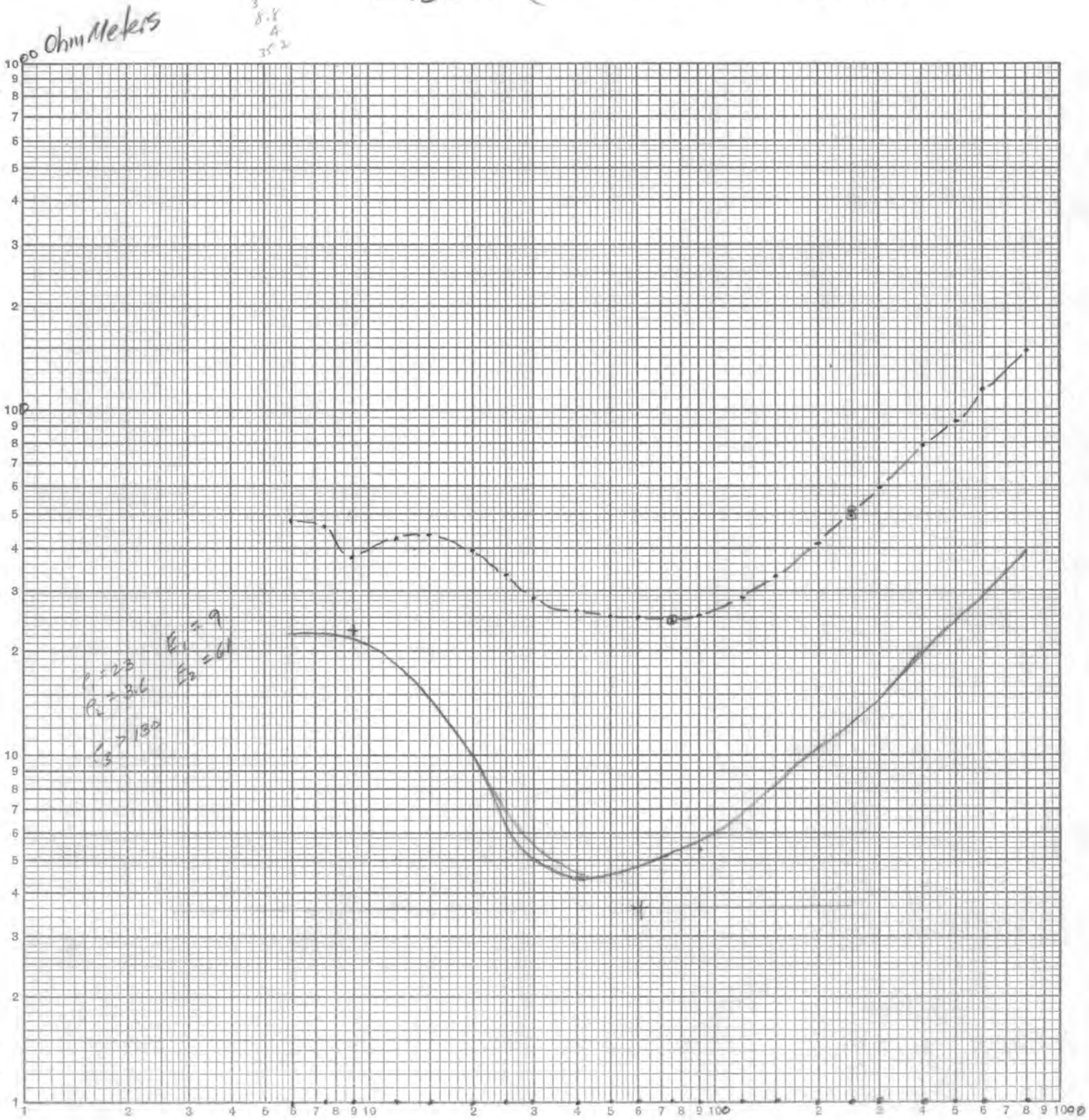
E5 - E-W GEOEX #1106
6/26/76



$\frac{AB}{2}$ meters

GEOEX #1106
6/30/76

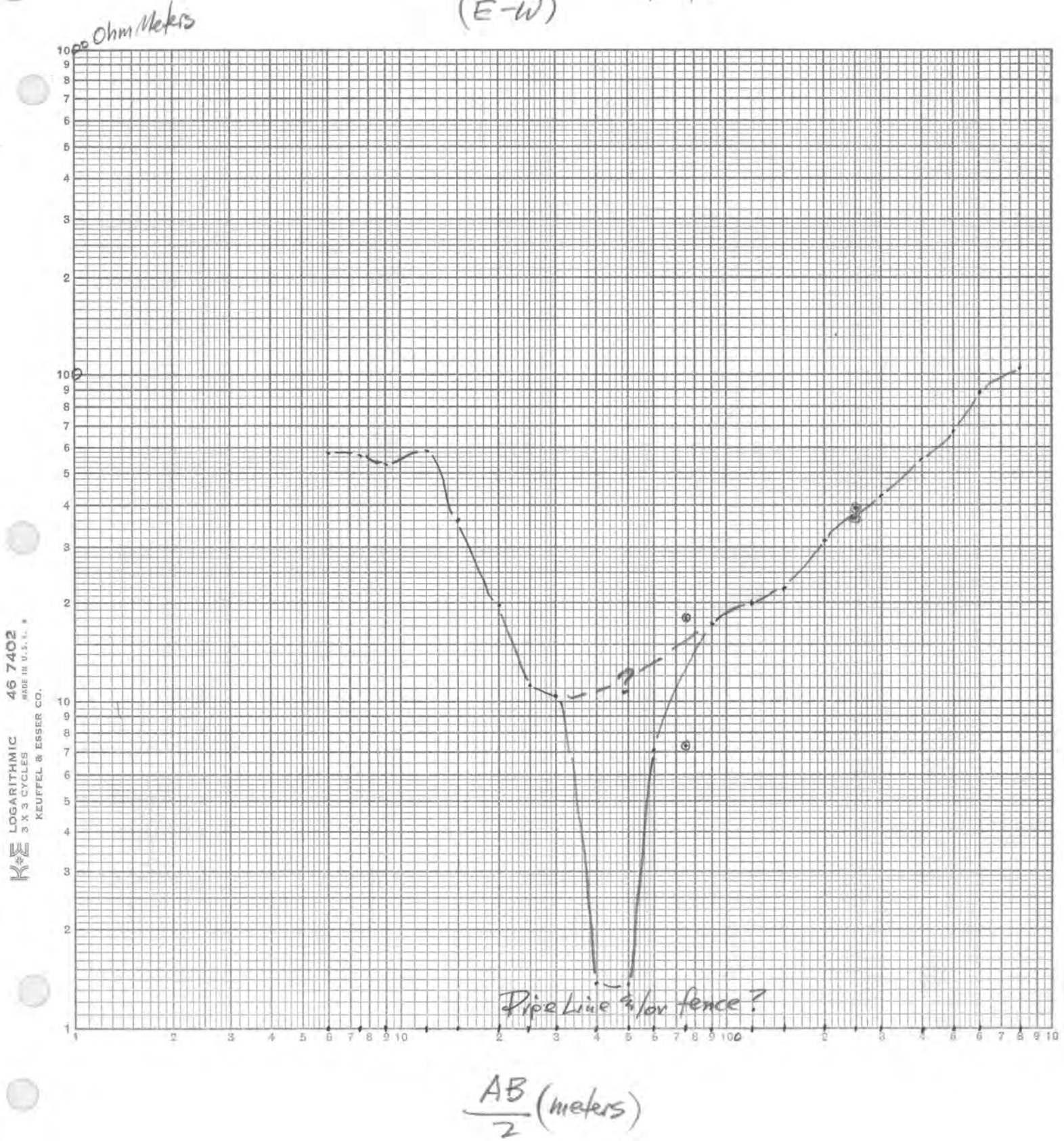
E13(N) (NE-SW)



$\frac{AB}{2}$ (meters)

GEOEX #1106
6/28/76

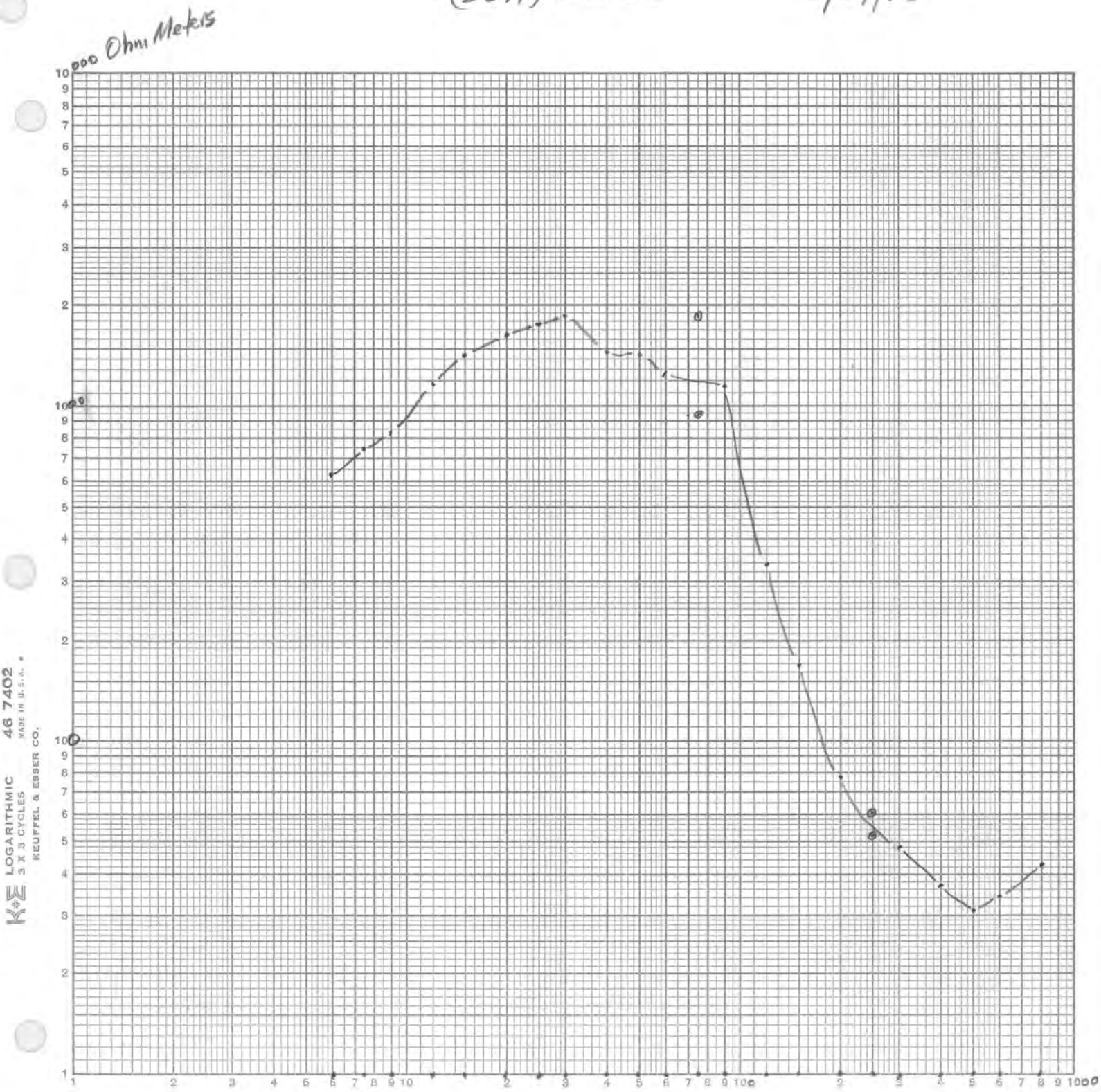
E_0 (519)
(E-W)



$\frac{AB}{2}$ (meters)

GEOEX #1106
6/29/76

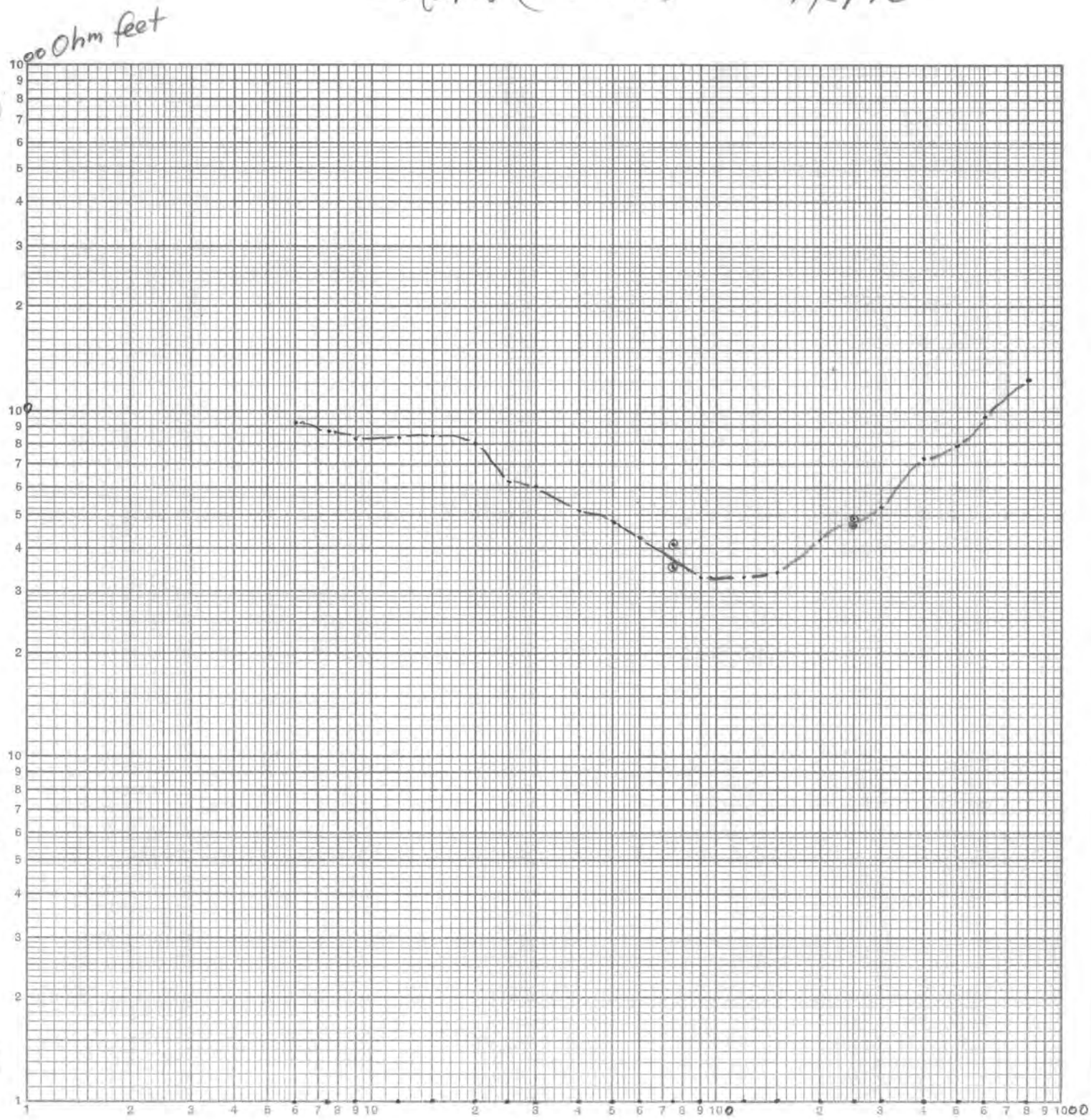
F(20N) NW-SE



$\frac{AB}{2}$ (meters)

E_o (29N) (NE-SW)

GEOBX #1106
7/1/76



$\frac{AB}{2}$ (meters)

6/25/76

E5 - 1000' off.

1.0 Hz 210 +0.2

3.0 - 211 - 0.2

E4

500' off

±50 - 60

6/30/76
NE - SW
E (13 N)

40.8	40.8
~~40.6~~	41.3
~~32.9~~	41.7
42.5	42.6
43.3	43.4
~~39.6~~	39.6
~~33.5~~	35.0
~~28.7~~	29.9
26.1	26.3
25.3	25.3
~~24.9~~	~~25.0~~
24.8	24.4 25.0
25.1	25.1
28.6	28.5
32.6	32.7
41.5	41.6
50.9	51.0
49.6	49.6
58.9	59.0
78.4	78.4
92.4	92.5
112.8	113
147.3	147

7/1/76
(NE - SW)
E (29 N)

91.6		91.7
~~87.3~~		88.8
~~82.4~~		90.6
83.8		84.0
84.8		84.9
80.0		80.0
~~61.9~~		64.6
60.1		60.2
~~51.7~~		52.1
47.9		47.8
42.4		42.4
40.9	35.5	40.9/35.5
~~33.2~~		33.2
~~33.3~~		33.2
34.0		34.1
42.2		42.2
48.9	46.5	49.0/46.6
~~52.3~~		52.3
72.4		72.4
~~79.3~~		81.6
95.9		95.7
~~122.2~~		130

6/26/76 E-W Line E-5		E-W Line E-4	
22.2		22.2	74.5	74.6
~~22.8~~		23.1	~~86.7~~	88.2
~~19.3~~		21.2	~~98.7~~	104
18.4		18.4	118.7	119
13.6		13.6	143.4	143
12.5		12.5	163.3	163
~~6.37~~		6.59	~~169.1~~	177
4.95		4.95	185.2	185
~~4.45~~		4.48	188.5	190
4.66		4.66	~~175.3~~	173
4.88		4.90	151.2	152
5.02	3.11	5.03/2.91	127.0	99.9
3.19		3.19	80.8	80.9
3.70		3.70	50.9	50.9
~~4.14~~	4.42	4.43	~~40.1~~	38.0
5.66		5.67	27.5	27.6
6.69	5.74	6.70/5.74	24.4	24.3
6.73		6.73	24.7	24.7
9.21		9.21	28.7	28.7
~~11.1~~		11.8	36.5	36.5
13.6		13.5	43.1	43.0
18.7		18.7	59.1	59.1

6/28/76 E5 19 (E-W)		6/29/76 E1 (NW-SE)		E20N (NW-SE)	
57.6	57.7	58.4	58.4	629.8	631
~~56.8~~	57.8	~~46.1~~	46.9	745	758
~~52.9~~	58.2	~~41.9~~	46.1	~~844~~	938
58.5	58.6	49.3	49.4	1184	1190
36.1	36.1	59.9	60.0	1439	1440
19.7	19.7	81.2	81.1	1624	1620
~~16.1~~	11.5	~~94.2~~	98.3	1758	1830
10.4	10.4	110.5	111	1859	1860
~~0.75~~	7.58	125.1	126	~~1478~~	1500
~~0.72~~	7.24	139.7	139	1418	1420
7.1	7.16	127.7	128	1271	1270
7.3 - 17.9	7.32/17.9	104.9 - 229.8	105/230	941 - 1869	942/1870
17.3	17.3	175.2	175	1161	1160
20.4	20.4	101.3	101	338.1	338
24.3	24.3	64.4	64.6	169.4	169
31.8	31.8	46.6	46.7	77.7	77.8
39.6 }	39.7	149.9 - 47.8	150/47.8	52.2 }	52.3
36.9 }	37.0	33.5	33.6	60.3 }	60.4
42.3	42.3	29.6	29.7	48.2	48.2
55.6	55.6	29.7	29.7	36.8	36.8
67.4	67.5	33.6	33.5	31.0	31.0
80.8	80.7	47.3	47.2	34.4	34.3
105.8	105.7			43.5	43.5

Job # 1106
8:40
8:22
18 Minutes

6/24/76

Globe to Springerville 333-2194

Mary.

1 Amp.

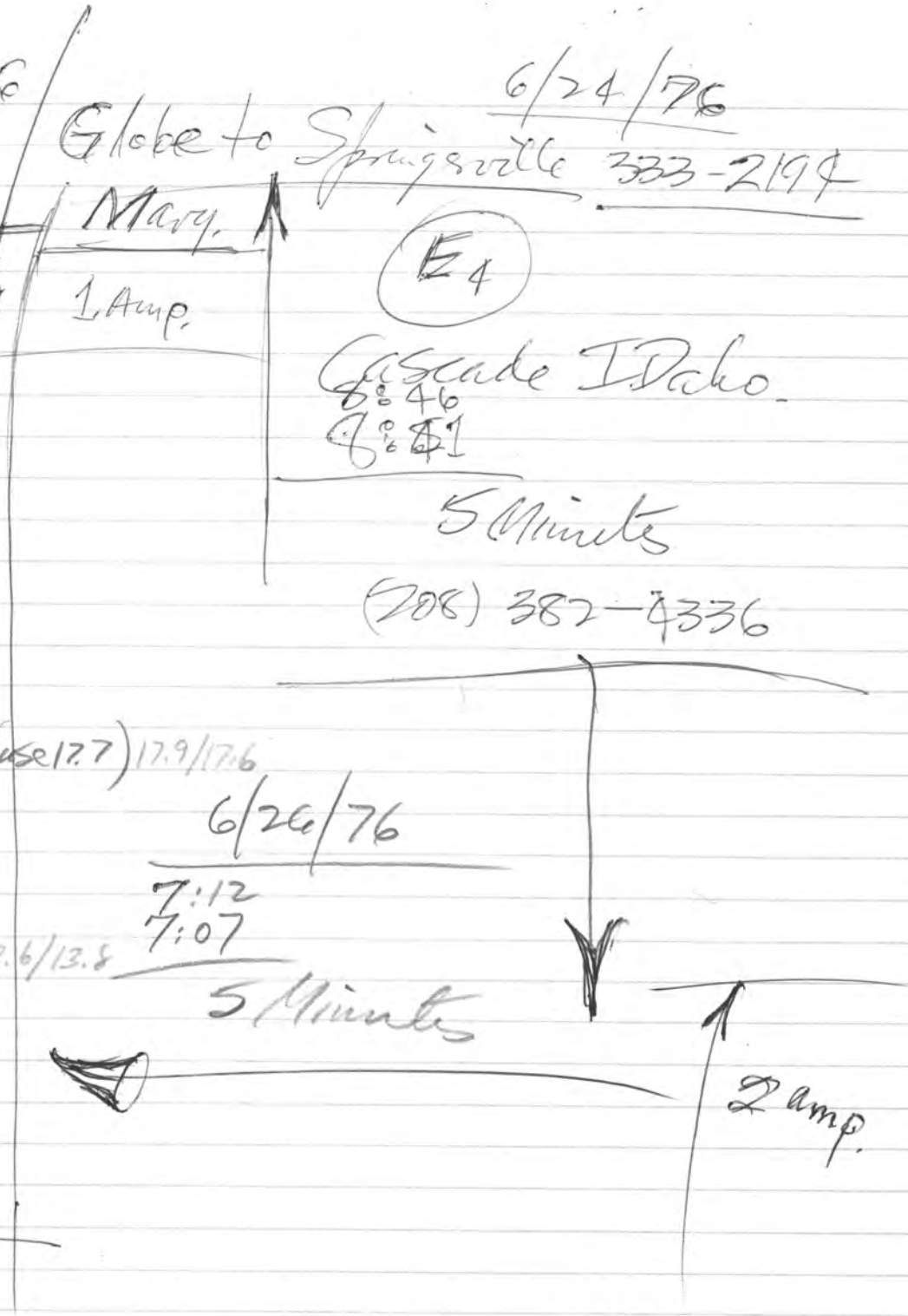
E4

Cascade Idaho.
8:46
8:41

5 Minutes

(208) 382-4336

P_2	N_2	SW.
1 -	77.1	77.2
2 -	59.3	60.3
3 -	46.2	50.8
4 -	43.6	43.8
5 -	34.7	34.8
6 -	27.5	27.5
7 -	20.8	21.7
8 -	18.8	18.9
9 -	15.8	16.0
10 -	16.5	16.5
11 -	17.1	17.1
12 -	17.8 & 17.6 (use 17.7)	17.9/17.6
13 -	17.3	17.3
14 -	18.0	18.0
15 -	17.1	17.1
16 -	15.5	15.5
17 -	13.6 & 13.7	13.6/13.8
18 -	14.2	14.2
19 -	17.5	17.5
20 -	21.6	21.7
21 -	27.0	27.0
22 -	35.6	35.6



6/26/76

7:12
7:07

5 Minutes

2 amp.

6/23/76

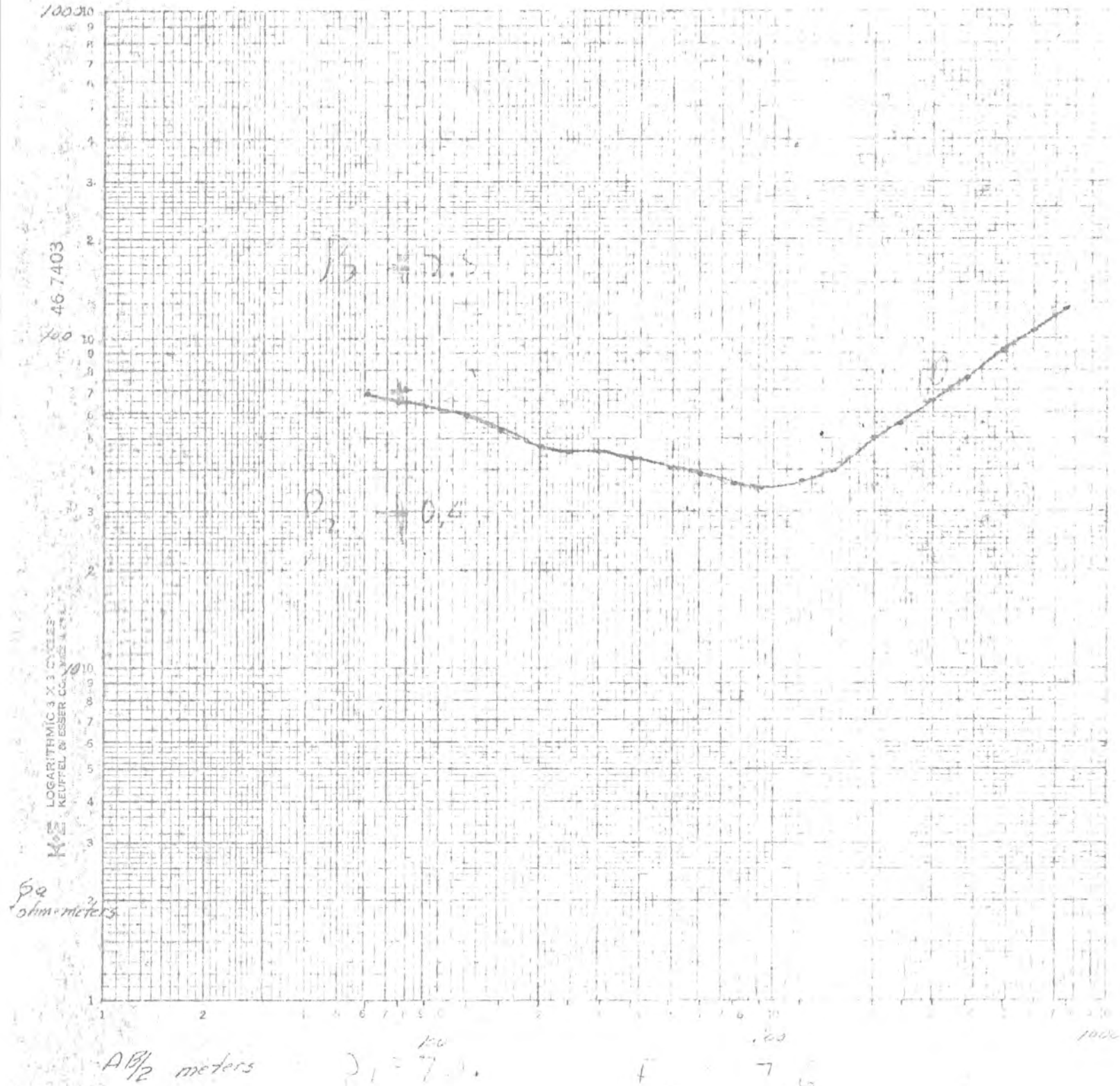
P_1 (NW-SE)

		AB/2 (feet)	AB/2 (meters)	approx MAX MN (meters)	approx MAX MN (feet)	MN used? meters?	Approx MN used? feet?			
22	1	19.9	6	2	6	3	10	3	~~24.7~~	85.5
21	2	24.8	7.5	2.5	8	3	10		20.1	71.3
20	3	33.0	10	3	11	3	10		~~52.1~~	57.3
19	4	39.6	12	4	13	3	10		45.4	45.5
18	5	49.0	15	5	16	3	10		38.0	37.9
17	6	65.6	20	6	21	3	10		27.0	26.7
16	7	82.0	25	8	27	10	33		19.6	20.4
15	8	99.0	30	10	33	10 & 20	33 & 66		17.6	17.7
14	9	132	40	13	44	20	66		16.7	16.9
13	10	164	50	16	54	20	66		17.6	17.6
12	11	198	60	20	66	20			18.5	18.5
11	12	246	75	25	82	20		3 & 20	20.0	19.7
10	13	297	90	30	99	20			19.2	19.3
9	14	396	120	40	132	20			19.1	19.1
8	15	490	150	50	163	20			18.3	18.2
7	16	655	200	65	218	20			17.9	17.9
6	17	820	250	80	273	20		20 & 80	16.1	16.1
5	18	990	300	100	330	20 & 30	66 & 99		14.8	14.8
4	19	1320	400	133	440	30	99		13.2	13.2
3	20	1640	500	166	536	30 & 40	99 & 132		12.6	12.6
2	21	1980	600	200	660	40	132		13.8	13.8
1	22	2640	800	266	880	40	132	80	16.5	16.6
									19.5	19.5
									27.2	27.1

(Kn factors feet & meters)

	n=1	n=2	n=0.5	n=3		n=4		n=5		n=6
500'a Kn/1000	~~5.75~~ 2.88	~~23.0~~ 11.5		~~57.5~~ 28.8		~~115~~ 57.5		~~201~~ 100.5		~~322~~ 161
" 1000'a ohmmeter	5.75	23.0	1.8 2.9	57.5		115		201		322

CHAMPION LINE NO. 2636


46 7403
LOGARITHMIC 3 X 3 CYCLES
KEUFFEL & ESSER CO.
ρa
ohm-meters
AB/2 meters

Field Wire

$\frac{MN}{2} =$ 265'

Current

2 [illegible] (1/2 mile)

$\frac{AB}{2} =$

A × · 1 · × B

$10 \overline{)1600 \text{ meters}}$

$\frac{}{10} = 160$ meters

$= \frac{530 \text{ feet MN max}}{2} = 265$ feet

1000 ma

0.858 mv.

0.030 = 30
0.027 = 27
0.021 = 21
0.111 = 111
0.010 = 10
0.011 = 11

I

$\frac{1000}{0.858} =$

11 1/2

I.P. RECEIVER NOTES, JOB NO. 1106, [redacted] VOIGT RANCH

LINE P, HALF 1+2, SP. 1, a = _____, BEARING NW-SE

SENDER STA. _____ = ELECTRODE NO. _____, DATE 6-21-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	88	9-9
RECEIVE	1	1	1	1	1	1	2	2	3	3
MULTIPLIER	.01	.01	.01	.01	.01	.01	.01	.01	10	10
PFE	1.3	0.2	3.1	1.3	-5.2	20.0	21.0	0.6	0.2	0.5
CUR. (AMPS)	1	2	1	1	3	4	4	4.5	4	3
POINT NO.										
SEP. (n)	1.5	2	2.84	3.56	4.60	6.17	2.0	2.5	1.0	1.5
H.F. MV	.858	.938	.204	.113	.132	.109	.108	.098	456	175
DRIFT	0.1-.880	.938	.202	.113	.125	*	*	[illegible]	458	176
1.0 PFE K_n/1000	.35.3	56.5	103	148	233	417	188	275	126	236
0.3 PFE ρ_{CAL}		.0566								
0.1 PFE PFE_c									14.36	
3.0 MV $\rho/2\pi$	30.3	26.5	21.0	16.7	10.3	11.4	5.1	6.0	14,364	13,766
DRIFT MC 0.1	.031	.027	.021							
S.P.	-0.3	-0.3	-0.2	-0.4	-0.4	-0.3	-0.4	-0.4	-0.3	-0.5
NOISE										
POT RES.	0.1 Fluct			0.1 RT side	0.1 RT side	RT side	RT side			
CULT & CMTS						* NOT EN CORNT	NOT ENUG CUR.			

STA	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10	11-11	12-12
	3.0	0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
												1.0
MOL	100	100	100	10	10	10	1.0	1.0	1.0	1.0	1.0	
CCR	1.5	1.5	2.5	1.5	1.5	2.5	1.5	1.5	4.5	4.5	3.5	3.5
N								9.5	12.8	16.2	19.5	24.5
NOM	3630	1890	1400	460	244	160	47.0	28.2	45.4	30.2	17.2	11.7
NF	.035	.0556	.0931	~~.495~~ .148	.233	.417	.625	.939	1.66	2.62	3.76	5.88
Pa	84.7	70.1	52.1	45.4	38.0	27.0	19.6	17.6	16.7	17.6	18.5	20.0
	6.9			4.4 3.0								

I.P. RECEIVER NOTES, JOB No. 1106, JOGT RANCH

LINE P, HALF 1/2, SP. 1, a = _____, BEARING NW-SE

SENDER STA. _____ = ELECTRODE No. _____, DATE 6-21-76

PAGE 2

HEINRICHS GEOEX

SEND	10-10	11-11	12-12	13-13	14-14	15-15	16-16	17-17	18-18	18-18
RECEIVE	3	3	x	3	3	3	3	3	3	4
MULTIPLIER	10	10	1.0	1.0	1.0	0.1	0.1	0.1	0.1	.01
PFE	0.7	0.7	1.8	0.7	1.0	1.9	0.6	0.4	-0.2	
CUR. (AMPS)	4	4	3	3	3	1.5	1.0	2.5	2.5	2.5
POINT No.										
SEP. (n)	12.0	2.5	3.25	4.0	5.5	7.0	9.5	12.0	14.5	9.5
H.F. MV	156	107	56.9	35.5	20.2	6.23	2.19	3.40	1.32	1.06
DRIFT 0.1	157	109	57.4	35.9	20.4	6.29	2.20	3.42	1.31	
1.0 PFE K_n/1000	377	550	868	1257	2246	3519	6267	9802	14,121	9,401
0.3 PFE ρ_{CAL}										
0.1 PFE PFE_c										
3.0 MV $\rho/2\pi$	14,703	14,712	16,463	14,874	15,123	14,616	13,724	13,331	81,091	3,986
DRIFT MCF										
S.P.	-0.4	-0.2	-4.0	-3.5	-3.0	-2.9	-2.9	-2.3	-1.9	-0.4
NOISE										
POT RES.										
CULT & CMTS										

I. P. RECEIVER NOTES, JOB No._____, A[redacted]_____

LINE_____, HALF_____, SR._____, a =_____, BEARING_____

SENDER STA._____ = ELECTRODE No._____, DATE_____

PAGE_____

HEINRICHS GEOEX

SEND										
RECEIVE										
MULTIPLIER										
PFE										
CUR. (AMPS)										
POINT No.										
SEP. (n)										
H. F. MV										
DRIFT										
1.0 PFE $K_n/1000$										
0.3 PFE ρ_{CAL}										
0.1 PFE PFE_c										
3.0 MV $\rho/2\pi$										
DRIFT MCF										
S. P.										
NOISE										
POT RES.										
CULT & CMTS										

I.P. RECEIVER NOTES, JOB No. 1106, [redacted] VOIGT RANCH

LINE _____, HALF _____, SP. _____, a = _____, BEARING N-W

SENDER STA. _____ = ELECTRODE No. _____, DATE _____

HEINRICHS GEOEX

SEND	19-19	20-20	20-20	21-21	22-22					
RECEIVE	4	4	5	5	5					
MULTIPLIER	.01	.01	.01	.01						
PFE					95					
CUR. (AMPS)	3	2.3	2.5	2.5	2.5					
POINT No.										
SEP. (n)	12.8	16.1	12.0	14.5	19.5					
H. F. MV	.138	.104	.120	.129	.129					
DRIFT										
1.0 PFE K_n/1000	16,648	25947	19603	28243	50234					
0.3 PFE ρ_{CAL}										
0.1 PFE PFE_c										
3.0 MV $\rho/2\pi$	766	1173	941	9108	2592					
DRIFT MCF										
S. P.	-.04	-.06	-.04	-.05	-.05					
NOISE										
POT RES.										
CULT & CMTS										

	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18	19-19	20-20	21-21	22-22
	20	[illegible]	20	20	20	20	80	80	80	80	80	80
MUI	1.0	1.0	1.0	0.1	0.1	0.1	1.0	1.0	0.1	0.1	0.1	0.1
CaR	4.5	4.5	3.5	1.25	3.5	3.5	3.5	4.5	3.5	4.5	2.5	4.5
N	3.25	4.0	5.5	7.0	9.5	12.0	2.62	3.25	4.5	5.75	7.0	9.5
NoM	99.8	68.4	28.4	6.37	8.98	5.29	19.3	16.3	7.78	7.64	3.46	4.87
NF	0.867	1.256	2.25	3.51	6.26	9.79	2.39	3.47	6.22	9.75	14.1	25.1
Pa	19.2	19.1	18.3	17.9	16.1	14.8	13.2	12.6	13.8	16.5	19.5	27.2
	2-850						58-110					

3332194

I. P. SENDER NOTES

JOB No. 1106 AREA Voigt RANCH

LINE P, HALF 1, SP. 1, DATE 6-22-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	8-8
RECEIVE	1					1	2	2	2	23
RANGE	10 x 100	10 x 200	10 x 100	10 x 100	10 x 300	10 x 400	10 x 400	10 x 450	20 x 250	20 x 200
VOLTAGE	500	530-800	320	360	620*	430	660	640	640	660
CURRENT	1	2	1	1	3	4	4	4.5	5	4
SEND	9-9	10-10	11-11	12-12	13-13	14-14	15-15	16-16	17-17	18-18
RECEIVE	3								32	43
RANGE	10 x 300	10 x 400	10 x 400	10 x 300	10 x 300	10 x 300	10 x 150	10 x 100	10 x 250	10 x 250
VOLTAGE	720	560	580	600	780	530	660	430	600	760
CURRENT	3	4	4	3	3	3	1.5	1.0	2.5	2.5

FREQUENCIES 1.0 0.1

SENDER No. 267215 POWER UNIT ID

OPERATOR V. S

RECEIVER No. HOURS RUN

OPERATOR R. R

COMMENTS: DRIFTED: 620 - 720

VOLTAGE DRIFTING AS MUCH AS 300 V.

I. P. SENDER NOTES

JOB NO. _____ AREA _____

LINE _____, HALF _____, SP. _____, DATE _____

PAGE _____

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	9-9
RECEIVE	1					1	2			
RANGE	10x100	10x200	10x100	10x100	10x300	10x400	10x400	10x450	20x250	20x
VOLTAGE	500	530-800	320	360	620	430	660	640	640	660
CURRENT	1	2	1	1	3					
SEND	9-9	10-10	11-11	12-12	13-13	14-14	15-15	16-16	17-17	
RECEIVE	3									
RANGE	10x300	10x400	10x400	10x300	10x360	10x300	10x100	10x100	10x150	10x
VOLTAGE	720	560	580	660	780	550		430		
CURRENT										

FREQUENCIES	1.0	0.1
SENDER NO.	267215	POWER UNIT ID
OPERATOR	V.S	
RECEIVER NO.		HOURS RUN
OPERATOR		

COMMENTS: DRIFTED 620 - 720

I. P. SENDER NOTES

JOB No. 1106 AREA VOIGHT RANCH

LINE P, HALF _____, SP. _____, DATE 6-22-76

PAGE 2

HEINRICHS GEOEX

SEND	19:19	20-20	21-21	22-22						
RECEIVE	4	—	—	4						
RANGE	10X300	10X230	10 X250	10X25						
VOLTAGE	700	780	530	520						
CURRENT	3	2.3	2.5	2.5						
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES ~~3.0~~ 1.0 0.1	
SENDER No. 267215	POWER UNIT ID
OPERATOR V.S	
RECEIVER No.	HOURS RUN
OPERATOR R.R	

COMMENTS:

I. P. SENDER NOTES

JOB NO. 106 AREA Voigt Ranch

LINE _____, HALF _____, SP. _____, DATE 6-22-76

PAGE 2

HEINRICHS GEOEX

SEND	19:19	20-20	21-21	22-22						
RECEIVE	4			4						
RANGE	10x300	10x230	15x250	10x25						
VOLTAGE	700	780	530	520						
CURRENT	3	2.3	2.3	2.5						
SEND										
RECEIVE	3									
RANGE									3	4
VOLTAGE										
CURRENT										

FREQUENCIES	300 1.0 0.1		COMMENTS:
SENDER NO.	217215	POWER UNIT ID	
OPERATOR	V.S		
RECEIVER NO.		HOURS RUN	
OPERATOR	R.R		

I. P. RECEIVER NOTES, JOB NO. 1106, AREA Voigt RANCH

LINE E029, HALF 1, SP. 1, a = _____, BEARING NW-SE

SENDER STA. _____ = ELECTRODE NO. _____, DATE 7-1-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
MULTIPLIER	10	10	1.0	1.0	1.0	1.0	0.1	1.0	0.1	0.1
PFE										
CUR. (AMPS)	.2	.2	.1	.1	.1	.15	.1	.2	.15	.15
POINT NO.										
SEP. (n)	1.5	2.0	2.84	3.50	4.50	6.17	7.83	9.5	12.8	16.2
H. F. MV	519	314	80.5	86.5	76.4	28.8	9.91	12.8	4.67	2.74
DRIFT										
1.0 PFE $K_n/1000$	.0353	.0556	[illegible]	[illegible]	.233	.417	.625	.939	1.66	2.62
0.3 PFE ρ_{CAL}										
0.1 PFE PFE_c										
3.0 MV $\rho/2\pi$	91.6	87.3	82.4	83.8	84.8	80.8	61.9	60.1	51.7	47.9
DRIFT MCF										
S. P.	0.3									
NOISE										
POT RES.										
CULT & CMTS										

I. P. RECEIVER NOTES, JOB NO. 1106, AREA Voigt Ranch

LINE E 0.29, HALF 1, SR. 1, a = _____, BEARING NW-S-E

SENDER STA. _____ = ELECTRODE NO. _____, DATE _____

PAGE 2

HEINRICHS GEOEX

SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
MULTIPLIER	0.1	0.1	0.1	0.1	0.1	.01	0.1	0.1	0.1	0.1
PFE										
CUR. (AMPS)	.15	.2	.2	.2	.2	.1	.3	.3	.3	.3
POINT NO.										
SEP. (n)	19.5	24.5	3.25	4.0	5.5	7.0	9.5	12.0	2.62	8.25
H. F. MV	1.69	1.39	8.18	5.29	2.96	.969	2.02	1.50	.84	4.52
DRIFT										
1.0 PFE $K_n/1000$	3.76	5.88	0.867	1.256	2.25	3.51	6.26	9.79	2.39	3.47
0.3 PFE ρ_{CAL}										
0.1 PFE PFE_c										
3.0 MV $\rho/2\pi$	42.4	40.9	35.5	33.2	33.3	34.0	42.2	48.9	46.5	52.3
DRIFT MCF										
S. P.			4.6						1.0	
NOISE										
POT RES.										
CULT & CMTS										

I. P. RECEIVER NOTES, JOB No. 1106, AREA Voigt Ranch

LINE 1106, HALF 1, SR. 1, a = _____, BEARING NW-SE

SENDER STA. _____ = ELECTRODE No. _____, DATE 7-1-76

PAGE 3

HEINRICHS GEOEX

SEND		19-19	20-20	21-21	22-22						
RECEIVE		80.0	80.0	80.0	80.0						
MULTIPLIER		0.1	0.1	0.1	0.1						
PFE											
CUR. (AMPS)		.3	.3	.3	.3						
POINT No.											
SEP. (n)		4.5	57.5	7.0	9.5						
H. F. Mv		3.49	2.41	2.04	1.56						
DRIFT											
1.0 PFE	$K_n/1000$	6.22	9.5	14.1	25.1						
0.3 PFE	ρ_{CAL}										
0.1 PFE	PFE_c										
3.0 MV	$\rho/2\pi$	72.4	79.3	95.9	122.2						
DRIFT	MCF										
S. P.											
NOISE											
POT RES.											
CULT & CMTS											

I. P. SENDER NOTES

JOB NO. 1106 AREA Voigt Ranch

LINE [illegible], HALF 1, SP. 1, DATE 6-9-1 76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0									3.0
RANGE	1x200	1x200	1x100	1x100	1x100	1x150	1x100	1x200	1x150	1x150
VOLTAGE	80	90	50	50	50	70	60	80	70	50
CURRENT	.2	.2	.1	.1	.1	.15	.1	.2	.15	.15
SEND	10-11	12-12	13-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0	—	—	—	—	20.0	20.0	20.0
RANGE	1x150	1x200	1x200	—	1x200	1x100	1x300	1x300	1x300	1x300
VOLTAGE	50	50	50	70	50	50	70	70	70	120
CURRENT	.15	.2	[illegible]	.2	.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

FREQUENCIES	1.0	
SENDER NO.	8661-5	POWER UNIT ID
OPERATOR	VTS	
RECEIVER NO.		HOURS RUN
OPERATOR	R.R	

COMMENTS:

EVIATION

Jd 22

I. P. SENDER NOTES

JOB No. 11106 AREA VOIGH

LINE 1029, HALF 1, SP. 1, DATE 7-17-8-76

PAGE 2

HEINRICHS GEOEX

SEND	19-19	20-20	21-21	22-22						
RECEIVE	80.0	—	—	80.0						
RANGE	1x 300	—	—	1x300						
VOLTAGE	50	50	60	50						
CURRENT	.3	.3	.3	.3						
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES	1.0		COMMENTS:
SENDER No.	8661-S	POWER UNIT ID	
OPERATOR	V.S		
RECEIVER No.		HOURS RUN	
OPERATOR	R.R		

Rcvr

I. P. SENDER NOTES

JOB NO. 1106 AREA Voist Ranch

LINE [illegible], HALF 1, SP. 1, DATE 6-30-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
RANGE Mul	10	10	1.0	1.0	1.0	1.0	1.0	0.1	0.1	0.1
VOLTAGE Avg	.2	.2	.2	.2	.2	.3	.3	.3	.3	.3
CURRENT N	1.5	2.0	2.44	3.5	4.5	6.17	7.83	9.5	12.8	15.2
SEND Pot	231	146	81.4	57.4	37.2	28.5	16.1	9.54	4.71	2.90
RECEIVE NF	.0353	.0556	.0931	.148	.233	.417	.625	.939	1.66	2.62
RANGE										
VOLTAGE %	40.8	40.6	37.9	42.5	43.3	39.6	33.5	28.7	26.1	25.3
CURRENT SP	6.4									

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. SENDER NOTES

JOB NO. 1106 AREA Voigt Ranch

LINE EISN, HALF 1, SP. 1, DATE 6-30-76

PAGE 2

HEINRICHS GEOEX

SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
RANGE MW	0.1	.01	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
VOLTAGE AVG	.3	.2	.2	.2	.2	.3	.3	.3	.2	.2
CURRENT	19.5	2.15	3.25	4.0	5.5	7.0	9.5	12.0	2.62	3.25
SEND Pot	1.99	.849	5.64	4.0	2.54	2.79	1.99	1.56	4.15	3.40
RECEIVE NF	3.76	5.88	.867	1.256	2.25	3.51	6.26	9.79	2.39	3.47
RANGE										
VOLTAGE %	24.9	24.8	24.4	25.1	28.6	32.6	41.5	50.9	49.6	58.9
CURRENT										

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS:

Lease Hill Tower #18 & 19

I. P. SENDER NOTES

JOB NO. 1106 AREA VOIGT RANCH

LINE E13N, HALF 1, SP. 1, DATE 6-30-76

PAGE 3

HEINRICHS GEOEX

SEND	19-19	20-20	21-21	22-22						
RECEIVE	80.0	80.0	80.0	80.0						
RANGE	0.1	0.1	0.1	0.1						
VOLTAGE	.1	.1	.2	.3						
CURRENT	5.75	5.75	9.0	9.5						
SEND POT	.946	.946	1.60	1.76						
RECEIVE NF	9.75	9.75	14.1	25.1						
RANGE										
VOLTAGE	92.4	92.4	112.8	142.3						
CURRENT										

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. SENDER NOTES

JOB NO. 1106 AREA Vent Ranch

LINE [illegible], HALF 1, SP. 1, DATE 6-30-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
RANGE	1X200	1X200	1X200	1X200	1X200	1X300	1X300	1X300	1X300	1X300
VOLTAGE	80	80	80	80	80	80	80	70	70	80
CURRENT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	2.0	2.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
RANGE	1X300	1X200	1X200	1X200	1X300	1X300	1X300	1X300	1X200	1X200
VOLTAGE	80	40	40	50	40	40	50	50	50	80
CURRENT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

FREQUENCIES	1.0		COMMENTS:
SENDER NO.	8614-S	POWER UNIT ID	
OPERATOR	D. LANG		
RECEIVER NO.	257[illegible]	HOURS RUN	
OPERATOR	B. Kellner		

I. P. SENDER NOTES

JOB No. 1106 AREA Weight Ranch

LINE 13, HALF 1, SP. 1, DATE 6/30/76

PAGE 2

HEINRICHS GEOEX

SEND	19-20	20-20	21-21	22-22						
RECEIVE	80.0	80.0	80.0	80.0						
RANGE	1x100	1x100	1x200	1x300						
VOLTAGE	90	50	80	800						
CURRENT	0.1	0.1	0	0.2						
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES	1.0		COMMENTS:
SENDER No.	8661-S	POWER UNIT ID	
OPERATOR	D. LANG		
RECEIVER No.	25705R	HOURS RUN	
OPERATOR	R. Reifels		

I. P. SENDER NOTES

JOB No. 1146 AREA ~~6-29-76~~ Voigt Ranch

LINE _____, HALF _____, SP. _____, DATE 6-29-76

PAGE _____

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-0
RECEIVE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
RANGE	100	100	10	100	100	10	10	10	1.0	1.0
VOLTAGE	.125	.15	.075	.15	.225	.18	.075	.1	.08	.08
CURRENT	1.5	2.0	2.87	3.50	4.50	6.17	7.83	9.5	12.8	[illegible]
SEND	2230	2010	687	1200	1390	701	211	198	71.7	43.3
RECEIVE	.0353	.0556	.0931	.148	.233	.417	.625	.939	1.66	2.62
RANGE										
VOLTAGE	629.8	745	844	1184	1439	1624	1758	1859	149.8	1418
CURRENT	[illegible]									

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

REVP

I. P. SENDER NOTES

JOB NO. 1106 AREA Voigt Range

LINE E20, HALF 1, SP. 4, DATE

PAGE 2

HEINRICHS GEOEX

SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	7-17	18-18
RECEIVE	3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
RANGE	1.0	1.0	10	1.0	0.1	0.1	.01	.01	0.1	0.1
VOLTAGE	.05	.08	-09	.07	.04	.08	.05	.09	.08	.09
CURRENT	19.5	24.5	3.25	4.0	5.5	7.0	9.5	12.0	2.82	3.25
SEND	16.9	12.8	19.4	64.7	6.01	3.85	.621	.480	2.02	1.26
RECEIVE	3.76	5.88	0.867	1.256	2.25	3.52	6.26	9.79	2.39	3.47
RANGE										
VOLTAGE	1291	941	1869	1161	338.1	169.4	77.7	52.2	60.3	48.7
CURRENT			23.9						5.1	

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS:

I.P. SENDER NOTES

JOB NO. 1106 AREA Voigt Ranch

LINE E 20N, HALF 1, SP. 1, DATE 6-29-76

PAGE 3

HEINRICHS GEOEX

SEND	19-19	20-20	21-21	22-22						
RECEIVE	80.0	80.0	80.0	80.0						
RANGE Mul	.01	.01	.01	.01						
VOLTAGE Amp	.18	.15	.25	.15						
CURRENT	4.5	5.75	7.0	9.5						
SEND POT	1.066	.477	.610	.260						
RECEIVE NF	6.22	9.75	14.1	25.1						
RANGE										
VOLTAGE Im	36.8	31.0	34.4	43.5						
CURRENT										

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS:

I.P. SENDER NOTES

JOB NO. 1106 AREA [illegible]

LINE [illegible], HALF [illegible], SP. [illegible], DATE 5-29-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3	3	3	3	3	3	3	3	3	3
RANGE	1X125	1X150	1X25	3X50	3X75	3X60	1X75	1X100	1X90	1X90
VOLTAGE	230	200	160	120	200	190	100	80	100	100
CURRENT	0.125	0.15	.075	.15	.225	.180	.075	.1	.08	.08
SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3	3	20	20	20	20	20	20	20	20
RANGE	1X50	1X80	1X90	1X70	1X40	1X80	1X50	1X90	1X80	1X90
VOLTAGE	80	90	90	110	80	100	90	100	90	80
CURRENT	.05	.08	.09	.07	.04	.08	.05	.09	.08	.09

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. SENDER NOTES

JOB No. 1106 AREA Voigt Ranch

LINE 204, HALF 1, SP. 1, DATE 6-29-76

PAGE 2

HEINRICHS GEOEX

SEND	19-19	20-20	21-21	22-22						
RECEIVE	80	60	80	80						
RANGE	120x1	1x150	1x250	1x150						
VOLTAGE	80	80	080	60						
CURRENT	.18	.150	.25	.15						
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

RCVR

I. P. SENDER NOTES

JOB NO. 1106 AREA Voigt Ranch

LINE E1, HALF 1, SP. 1, DATE 6-29-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
RANGE	10	10	10	10	1.0	1.0	1.0	1.0	1.0	1.0
VOLTAGE	.3	.6	.3	.3	.3	.3	.3	.3	.3	.3
CURRENT	1.5	2.0	[illegible]	3.5	[illegible]	6.0	[illegible]	9.5	12.[illegible]	[illegible]
SEND	49.6	49.8	13.5	99.9	77.2	58.4	45.2	35.8	22.6	16.0
RECEIVE	.0353	.0556	.0931	.198	.233	.417	.625	.937	1.66	2.62
RANGE										
VOLTAGE	58.4	46.1	41.9	49.3	59.9	81.2	99.2	110.5	125.1	139.7
CURRENT	3.2									

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS: 1-PU 2CC 3 PU

I. P. SENDER NOTES

JOB NO. 1106 AREA Voigt RANCH

LINE E1, HALF 1, SP. 1, DATE 6-29-76

PAGE 2

HEINRICHS GEOEX

SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20-0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
RANGE Mul	0.1	0.1	10.	1.0	1.0	0.1	0.1	0.1	1.0	0.1
VOLTAGE Pa	.3	.6	.6	.6	.6	.2	.6	.6	.6	.3
CURRENT	[illegible]	2.46	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.26
SEND Pot.	10.19	10.70	15.7	83.7	27.0	3.67	4.47	9.19	[illegible]	[illegible]
RECEIVE NF	3.76	5.88	0.867	1.256	2.25	3.51	6.26	9.79	2.39	3.47
RANGE										
VOLTAGE Pa	127.7	104.9	229.8	175.2	101.3	64.4	46.6	149.9	[illegible]	[illegible]
CURRENT			[illegible]						[illegible]	

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS: 1 Pa 2 of 300

Nonground [illegible] Tenor

[illegible] 13 & 14

I. P. SENDER NOTES

JOB NO. 1106 AREA Voigt RANch

LINE E-1, HALF 1, SP. 1, DATE 6-29-76

PAGE 3

HEINRICHS GEOEX

SEND	19-19	20-20	21-21	22-22						
RECEIVE	80.0	80.0	80.0	80.0						
RANGE MIN	0.1	01	.01	.01						
VOLTAGE AMP	.3	.6	.3	.3						
CURRENT	4.5	5.75	7.0	9.5						
SEND POT.	1.43	1.83	.715	.565						
RECEIVE NF	6.22	9.75	14.1	25.1						
RANGE										
VOLTAGE Pa	29.6	29.7	33.6	47.3						
CURRENT										

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. SENDER NOTES

JOB No. 1105 AREA Vogt Ranch

LINE E-1, HALF 1, SP. 1, DATE 6-29-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0									3.0
RANGE	3X100	3X200	3X100	3X100						3X10
VOLTAGE	150	220	250	170	210	230	190	160	180	140
CURRENT										
SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0					20.0	20.0	
RANGE	3X100	3X200			3X200	3X200	3X200			3X10
VOLTAGE	190	230	220	210	230	220	200	270	250	110
CURRENT										

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No. 25705A	HOURS RUN
OPERATOR RR	

COMMENTS:

I. P. SENDER NOTES

JOB NO._____ AREA VULCAN RANCH

LINE_____, HALF_____, SP._____, DATE 1-29-76

PAGE 2

HEINRICHS GEOEX

SEND	19-19	20-20	21-21	22-22						
RECEIVE	8010									
RANGE	3x100									
VOLTAGE		120								
CURRENT										
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. SENDER NOTES

PAGE 1

HEINRICHS GEOEX

JOB NO. E 519 AREA Vogt Ranch

LINE 1000, HALF 1, SP. 1, DATE 6-28-76

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
RANGE	100	10	10	10	1.0	1.0	0.1	0.1	0.1	
VOLTAGE	.9	.6	.6	.4	.4	.6	.6	.6	.6	
CURRENT										
SEND	1470	613	341	158	61.9	28.3				
RECEIVE	.0963	.0556	.0931	.148	.233	.417	.625	.939	.166	.262
RANGE Pa	57.6						11.1			
VOLTAGE	—	56.8	52.9	58.5	36.1	19.4	—	10.4		
CURRENT										

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. SENDER NOTES

JOB NO. 1106 AREA Voigt Ranch

LINE 19, HALF 1, SP. 1, DATE

PAGE 2

HEINRICHS GEOEX

SEND	11-11	12-12	13-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
RANGE	.01	.01	1.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
VOLTAGE	.6	.6	.6	.6	.9	.9	.4	.4	.4	.4
CURRENT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SEND	1.14	2.46	12.4	8.26	8.18	6.22	2.03	1.62	6.19	[illegible]
RECEIVE	3.76	5.88	.867	1.256	2.25	3.61	6.26	9.79	[illegible]	3.47
RANGE									36.9	42.3
VOLTAGE	7.1	7.31	17.9	17.3	20.4	24.3	31.8	[illegible]	[illegible]	[illegible]
CURRENT	[illegible]		5.5						[illegible]	

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS:

Receiver

I. P. SENDER NOTES

JOB NO. 1106 AREA Voigt Ranch

LINE F-195, HALF _____, SP. _____, DATE 6-28-76

PAGE 3

HEINRICHS GEOEX

SEND	19-19	20-20	21-21	22-22						
RECEIVE	80.0	80.0	80.0	80.0						
RANGE	0.1	0.1	0.1	0.1						
VOLTAGE	.6	.6	.6	.6						
CURRENT	4.5	6.75	7.0	9.5						
SEND	5.36	4.15	3.44	2.53						
RECEIVE	6.22	9.75	14.1	25.1						
RANGE										
VOLTAGE	55.6	67.4	80.8	105.8						
CURRENT										

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. SENDER NOTES

JOB NO._____ AREA_____

LINE_____, HALF_____, SP._____, DATE_____

PAGE_____

HEINRICHS GEOEX

SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. SENDER NOTES

PAGE 3

HEINRICHS GEOEX

JOB NO. [illegible] AREA Volcat Ranch

LINE [illegible], HALF 1, SP. 1, DATE 6/28/76

SEND	18-18	19-19	20-20	21-21	22-22					
RECEIVE	80.0	80.0	80.0	80.0	80.0					
RANGE	3X200	3X200	3X200	3X200	3X200					
VOLTAGE	880	2.60	880	.80	2.0					
CURRENT	[illegible]	0.6	[illegible]	0.6	[illegible]					
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES		COMMENTS:
SENDER NO.	POWER UNIT ID	
OPERATOR		
RECEIVER NO.	HOURS RUN	
OPERATOR		

I. P. RECEIVER NOTES, JOB NO. 1106, AREA [illegible] RANGE

LINE E-2, HALF 1, SP. 1, a = _____, BEARING E-W

SENDER STA. _____ = ELECTRODE NO. _____, DATE 6-26-76

PAGE 1

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
MULTIPLIER	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.1	0.1	0.1
PFE										
CUR. (AMPS)	2.5	.16	.1	.3	.6	.2	.2	.6	.2	.2
POINT NO.										
SEP. (n)	1.5	2.0	2.04	3.50	4.50	6.17	7.83	9.6	12.0	16.2
H. F. MV	1670	284	203	1.04	34.9	39.2	20.2	3.15	5.36	3.5
DRIFT										
1.0 PFE $K_n/1000$	.0353	.0556	.0931	.148	.233	.417	.625	.937	1.66	2.62
0.3 PFE ρ_{CAL}										
0.1 PFE PFE_c										
3.0 MV $\rho/2\pi$	22.2	42.8	18.3	18.4	13.6	12.5	6.31	4.35	4.40	4.60
DRIFT MCF										
S. P.	5.1									
NOISE										
POT RES.										
CULT & CMTS										

I. P. RECEIVER NOTES, JOB NO. 1106, AREA Voigt Ranch

LINE 6-3, HALF 1, SP. 1, a = _____, BEARING E-W

SENDER STA. _____ = ELECTRODE NO. _____, DATE 6-26-76

PAGE 2

HEINRICHS GEOEX

SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	18-18	18-18
RECEIVE	3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
MULTIPLIER	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
PFE										
CUR. (AMPS)	1	1	1	1	2	2	2	1	1	2
POINT NO.										
SEP. (n)	19.5	24.5	3.25	4.0	5.5	7.0	9.5	12.0	2.67	3.25
H. F. MV	1.30	.854	3.41	2.54	3.29	2.52	1.81	.684	2.[illegible]	2.[illegible]
DRIFT										
1.0 PFE $K_n/1000$	3.76	5.88	0.867	1.256	2.25	3.51	6.26	9.79	2.39	3.47
0.3 PFE ρ_{CAL}										
0.1 PFE PFE_c										
3.0 MV $\rho/2\pi$	4.[illegible]	[illegible]	3.11	3.19	3.70	4.42	5.66	6.89	[illegible]	[illegible]
DRIFT MCF										
S. P.			-2.5						40	
NOISE										
POT RES.										
CULT & CMTS										

I. P. RECEIVER NOTES, JOB NO. 1106, AREA Voigt RANCH

LINE 25, HALF ____, SP. 1, a = ____, BEARING E-W

SENDER STA. ____ = ELECTRODE NO. ____, DATE ____

PAGE 3

HEINRICHS GEOEX

SEND	19-19	20-20	21-21	22-22						
RECEIVE	80.0	80.0	80.0	80.0						
MULTIPLIER	0.1	0.1	.01	.01						
PFE										
CUR. (AMPS)	1	1	1	1						
POINT NO.										
SEP. (n)	4.5	5.75	7.0	9.5						
H. F. MV	1.40	1.21	.961	.744						
DRIFT										
1.0 PFE $K_n/1000$	6.22	9.75	14.1	25.1						
0.3 PFE ρ_{CAL}										
0.1 PFE PFE_c										
3.0 MV $\rho/2\pi$	9.21	11.1	13.6	18.7						
DRIFT MCF										
S. P.										
NOISE										
POT RES.										
CULT & CMTS										

I. P. SENDER NOTES

JOB NO. 406 AREA Vogt Ranch

LINE _____, HALF _____, SP. 1, DATE 6-26-76

PAGE 1

HEINRICHS GEOEX

SEND	11	~~2-2~~	~~3-3~~	~~4-4~~	~~5-5~~	2-2	3-3	4-4	5-5	6-6
RECEIVE	30	~~30~~	~~30~~			3				3
RANGE	10x250	10x100	10x100	30x100		3x200	10x100	10x100	3x200	10x200
VOLTAGE	430	~~400~~	~~380~~	230	~~330~~	330	240	380	320	280
CURRENT	2.5	1.0	1.5	2.5	.6	.6	1	1	.6	
SEND	7-7	8-8	9-9	10-10	11-11	12-12	13-13	13-15	14-14	15-15
RECEIVE	3									
RANGE	10x200	3x200	10x200	10x200	10x100	10x100	10x100	10x100	10x200	10x200
VOLTAGE	130	330	480	400	320	410	360	320	400	450
CURRENT	2	.6	2		1	1	1	1	2	

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. SENDER NOTES

JOB NO. 1100 AREA VOIGT RANCH

LINE _____, HALF _____, SP. _____, DATE 6-26-76

PAGE 2

HEINRICHS GEOEX

SEND	16-16	17-17	17-17	18-18	19-19	20-20	21-21	22-22		
RECEIVE	20	20	80	80	—	—	—	80		
RANGE	10X200	10X100	10X100	10X200	10X100	10X100	10X100	10X100		
VOLTAGE	450	310	300	400	260	320	260	380		
CURRENT	2	1	1	2	1	1	1	1		
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES	1.0 8661-S		COMMENTS:
SENDER NO.	K-5	POWER UNIT ID	
OPERATOR	V.S		
RECEIVER NO.		HOURS RUN	
OPERATOR	F.R		

I. P. RECEIVER NOTES, JOB NO. 406, AREA Voigt Ranch

LINE 54, HALF 1, SP. 1, a = _____, BEARING E-W

SENDER STA. _____ = ELECTRODE NO. _____, DATE 6-25-76

PAGE _____

HEINRICHS GEOEX

SEND										
RECEIVE										
MULTIPLIER										
PFE										
CUR. (AMPS)										
POINT NO.										
SEP. (n)										
H. F. MV										
DRIFT										
1.0 PFE	$K_n/1000$									
0.3 PFE	ρ_{CAL}									
0.1 PFE	PFE_c									
3.0 MV	$\rho/2\pi$									
DRIFT	MCF									
S. P.										
NOISE										
POT RES.										
CULT & CMTS										

Receiver

I. P. SENDER NOTES

JOB No. 1106 AREA Voigt Ranch

LINE E4, HALF ____, SP. ____, DATE 6-26-76

PAGE 2

HEINRICHS GEOEX

SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
RANGE MOD	1.0	1.0	1.0	1.0	0.1	0.1	0.1	0.1	0.1	0.1
VOLTAGE AFR	.45	.75	.75	.75	.45	.45	.3	1	1	.5
CURRENT N	19.5	24.5	3.25	4.0	5.5	7.0	9.5	12.0	2.62	3.35
SEND NOTM	18.1	16.2	84.4	48.3	10.29	4.86	1.32	2.49	10.16	3.50
RECEIVE NF	3.76	5.88	0.867	1.256	2.25	3.71	6.26	9.79	2.39	3.47
RANGE										
VOLTAGE Rn	151.2	127.0	189.4	80.8	50.9	40.1	27.5	24.4	24.3	24.7
CURRENT SP	-4		-3.4						3.0	

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS: Fence Twixt 13 + 14
5 wire Non-grnd
DR. 11 Rge 800' NW CNTR

RCOR

I. P. SENDER NOTES

JOB NO. 1106 AREA

LINE E-4, HALF 1, SP. 1, DATE 6-26-76

PAGE 3

HEINRICHS GEOEX

SEND	9-19	20-20	21-21	22-22						
RECEIVE	80.0	80.0	80.0	80.0						
RANGE	0.1	0.1	0.1	0.1						
VOLTAGE	.5	.5	1.5	2.5						
CURRENT	4.5	5.75	7.0	9.5						
SEND	2.31	5.89	4.58	5.89						
RECEIVE	6.22	9.99	14.1	25.1						
RANGE										
VOLTAGE	28.7	36.9	43.1	59.1						
CURRENT										

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. SENDER NOTES

JOB No. 1106 AREA Vaca Ranch

LINE 1-4, HALF 1, SP. P, DATE 6-25-76

PAGE 9

HEINRICHS GEOEX

SEND	1-1	2-2	3-3	4-4	5-5	6-6	7-7	8-8	9-9	10-10
RECEIVE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
RANGE	10x200	10x250	10x100	10x100	1x200	3x200	3x250	10x125	3x150	3x250
VOLTAGE	400	380	360	400	400	320	400	320	360	400
CURRENT	2.5	2.5	1.0	1.0	1.0	0.6	0.5	0.5	0.5	0.5
SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
RANGE	3x250	1x200	3x250	3x250	3x150	3x150	10x150	10x100	10x100	10x50
VOLTAGE	340	480	400	500	440	380	480	380	380	380
CURRENT	0.50	0.25	0.25	0.25	0.25	0.15	0.50	1.0	1.0	0.5

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. SENDER NOTES

JOB NO. 1106 AREA Voigt Ranch

LINE E4, HALF 1, SP. 1, DATE 6-26-76

PAGE 2

HEINRICHS GEOEX

SEND	19-19	20-20	21-21	22-22						
RECEIVE	80	80	80	80						
RANGE	10X50	10X50	10X150	10X250						
VOLTAGE	380	200	340	440						
CURRENT	0.5	0.5	1.5	2.5						
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. RECEIVER NOTES, JOB NO. 1106, AREA West RANCH

LINE 8, HALF 1, SP. 1, a = , BEARING NW 45°

SENDER STA. = ELECTRODE NO. , DATE 6-23-76

PAGE 1

HEINRICHS GEOEX

SEND	1.1	2.2	3.3	4.4	5.5	6.6	7.7	8.8	9.9	10.10	
RECEIVE	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
MULTIPLIER	100	100	100	10	10	1.0	1.0	1.0	1.0	1.0	
PFE											
CUR. (AMPS)	1.5	1.5	2.5	1.5	1.5	2.5	1.5	1.5	4.5	4.5	
POINT NO.											
SEP. (n)	1.5	2.0	2.84	3.56	4.50	6.17	7.23	7.5	12.8	16.2	
H. F. MV	3630	1890	1400	460	244	160	41.0	28.2	454	30.2	
DRIFT											
1.0 PFE $K_n/1000$	.0353	.0556	.0931	.149	.233	.417	.625	.939	1.66	2.62	
0.3 PFE ρ_{CAL}											
0.1 PFE PFE_c		—									
3.0 MV $\rho/2\pi$	94.7	70.1	52.1	45.4	38.0	27.0	17.6	12.6	16.7	17.0	
DRIFT MCF											
S. P.	6.9										
NOISE											
POT RES.											
CULT & CMTS											

I. P. RECEIVER NOTES, JOB NO. 1106, AREA WEST RANCH

LINE P, HALF 1, SP. 1, a = _____, BEARING NW 45°

SENDER STA. _____ = ELECTRODE NO. _____, DATE 6-23-76

PAGE 2

HEINRICHS GEOEX

SEND	11-11	12-12	12-12	13-13	14-14	15-15	16-16	17-17	17-17	18-18
RECEIVE	3.0	3.0	20.0	20.0	20.0	20.0	20.0	20.0	80.0	80.0
MULTIPLIER	1.0	1.0	1.0	1.0	1.0	0.1	0.1	0.1	1.0	1.0
PFE										
CUR. (AMPS)	3.5	3.5	4.5	4.5	3.5	1.25	3.5	3.5	3.5	4.5
POINT NO.										
SEP. (n)	19.5	24.5	3.25	4.0	5.5	7.0	9.5	12.0	2.62	3.25
H. F. MV	17.2	11.7	77.8	68.4	28.4	6.27	8.98	5.29	19.3	16.3
DRIFT										
1.0 PFE $K_n/1000$	0.76	5.88	0.867	1.256	2.25	3.51	6.26	9.79	2.39	3.49
0.3 PFE ρ_{CAL}										
0.1 PFE PFE_c										
3.0 MV $\rho/2\pi$	18.5	20.0	19.2	19.1	18.3	17.9	16.1	14.8	13.2	12.6
DRIFT MCF										
S. P.			2.8						11.0	
NOISE										
POT RES.										
CULT & CMTS										

I. P. RECEIVER NOTES, JOB NO. 1106, AREA VOGT RANCH

LINE P, HALF 1, SR. 1, a = , BEARING NW 45°

SENDER STA. = ELECTRODE NO. , DATE 6-23-76

PAGE 3

HEINRICHS GEOEX

SEND		19-19	20-20	21-21	22-22						
RECEIVE		80.0	80.0	80.0	80.0						
MULTIPLIER		0.1	0.1	0.1	0.1						
PFE											
CUR. (AMPS)		3.5	4.5	2.5	4.5						
POINT NO.											
SEP. (n)		4.5	5.75	7.0	9.5						
H. F. MV		1.78	3.64	3.46	4.87						
DRIFT											
1.0 PFE	$K_n/1000$	6.22	9.75	14.1	25.1						
0.3 PFE	ρ_{CAL}										
0.1 PFE	PFE_c										
3.0 MV	$\rho/2\pi$	12.8	16.5	19.5	27.2						
DRIFT	MCF										
S. P.											
NOISE											
POT RES.											
CULT & CMTS											

I. P. SENDER NOTES

JOB NO. 1106 AREA [illegible]

LINE P, HALF 1, SP. [illegible], DATE [illegible]

PAGE 3

HEINRICHS GEOEX

SEND	17-17	17-18	[illegible]	20-20	21-21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
RECEIVE	40	40	40	40	40	[illegible]		[illegible]		
RANGE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
VOLTAGE	680	720	680	760	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
CURRENT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS: 17 - [illegible] 720

I. P. SENDER NOTES

JOB NO. 1106 AREA

LINE , HALF , SP. , DATE

PAGE 2

HEINRICHS GEOEX

SEND	9-9	9-10	11-11							
RECEIVE										
RANGE	10x450									
VOLTAGE			200							
CURRENT										
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. SENDER NOTES

JOB No. 1106 AREA VOST RANCH

LINE P, HALF 1, SP. 1, DATE 6-23-76

PAGE 1

HEINRICHS GEOEX

SEND	6-6	6-6	1-1								
RECEIVE	3-0	3-0	3								
RANGE	10x50	10x30	10x								
VOLTAGE	470	420	400					420			
CURRENT											
SEND											
RECEIVE											
RANGE											
VOLTAGE											
CURRENT											

FREQUENCIES	
SENDER No.	POWER UNIT ID
OPERATOR	
RECEIVER No.	HOURS RUN
OPERATOR	

COMMENTS:

I. P. RECEIVER NOTES, JOB NO. _____ AREA _____

LINE _____, HALF _____, SR. _____, a = _____, BEARING _____

SENDER STA. _____ = ELECTRODE NO. _____, DATE _____

PAGE _____

HEINRICHS GEOEX

SEND											
RECEIVE											
MULTIPLIER											
PFE											
CUR. (AMPS)	2	1.5									
POINT NO.											
SEP. (n)	1.5	2.0									
H. F. MV	4370	1600									
DRIFT											
1.0 PFE $K_n/1000$											
0.3 PFE ρ_{CAL}											
0.1 PFE PFE_c											
3.0 MV $\rho/2\pi$											
DRIFT MCF											
S. P.											
NOISE											
POT RES.											
CULT & CMTS											

I. P. RECEIVER NOTES, JOB NO. 1104 AREA Vogt Ranch

LINE 2, HALF 2, SP. 2, a = _____, BEARING NE 45°

SENDER STA. _____ = ELECTRODE NO. _____, DATE 6 [illegible]

PAGE _____

HEINRICHS GEOEX

SEND	11.11	12.12	12.13	13.13	14.14	15.15	16.[illegible]	[illegible]	[illegible]	[illegible]
RECEIVE	3.0	3.0	20.0	20.0	20.0	20.0	20.0	[illegible]	[illegible]	[illegible]
MULTIPLIER	0.1	0.1	1.0	1.0	0.1	0.1	0.1	[illegible]	[illegible]	[illegible]
PFE										
CUR. (AMPS)	1.98	1	1	1.0	1	1	1.5	[illegible]	[illegible]	[illegible]
POINT NO.										
SEP. (n)	19.5	24.5	3.25	4.0	5.5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
H. F. MV	6.81	3.04	[illegible]	[illegible]	8.01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DRIFT										
1.0 PFE $K_n/1000$	3.76	5.88	0.867	1.256	2.25	3.51	6.28	[illegible]	2.39	[illegible]
0.3 PFE ρ_{CAL}										
0.1 PFE PFE_c										
3.0 MV $\rho/2\pi$	17.1	17.8	17.6	17.3	17.0	17.1	[illegible]	[illegible]	[illegible]	[illegible]
DRIFT MCF										
S. P.			7.4							
NOISE										
POT RES.										
CULT & CMTS										

I. P. RECEIVER NOTES, JOB No. _____ AREA _____

LINE _____, HALF _____, SP. _____, a = _____, BEARING _____

SENDER STA. _____ = ELECTRODE No. _____, DATE _____

PAGE _____

HEINRICHS GEOEX

SEND											
RECEIVE											
MULTIPLIER											
PFE											
CUR. (AMPS)											
POINT No.											
SEP. (n)											
H. F. MV											
DRIFT											
1.0 PFE $K_n/1000$											
0.3 PFE ρ_{CAL}											
0.1 PFE PFE_c											
3.0 MV $\rho/2\pi$											
DRIFT MCF											
S. P.											
NOISE											
POT RES.											
CULT & CMTS											

I. P. SENDER NOTES

JOB NO. _____ AREA _____

LINE _____, HALF _____, SP. _____, DATE _____

PAGE _____

HEINRICHS GEOEX

SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS:

J. P. SENDER NOTES

JOB NO._____ AREA_____

LINE_____, HALF_____, SP._____, DATE_____

PAGE_____

HEINRICHS GEOEX

SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										
SEND										
RECEIVE										
RANGE										
VOLTAGE										
CURRENT										

FREQUENCIES	
SENDER NO.	POWER UNIT ID
OPERATOR	
RECEIVER NO.	HOURS RUN
OPERATOR	

COMMENTS:

Job 1106

6/14/76

"D" location first

Two 90° expanders NE

E4 — one E-W Schlumberger expander

E5 — " " "

E (5/0)(19) — " " "

E1 — " NW-SE "

E 0 (N)(20) — " NW-SE "

E 0 (NE)(13) — " NE SW on road ok. "

E 0 (E)(29) " NW-SE

333-2194 White-Hotel

Send raw data from field preferably Mail to Idaho address (see Summer card)

John back 7th July

off set from collars 100' +

A 15 B
na 03 na
M
a N

Job 1106

$\frac{AB}{2} \cong 800\,m$

$\rho_a = \frac{V}{I} \cdot \pi n(n+1)(\cancel{\ldots})$

6/14/76

$n =$

FEET & (inches)

$MN = \leq \frac{1}{6} AB$

1: 19'-9" = $\frac{AB}{2}$ = 6 meters

2 24'-8" = 7.5 " — AB = 15 m use 3 meters for MN

3 33'-0" = 10 "

4 39'-6" = 12 " (4 m. MN)

5 49'-0" = 15 " (5 m. MN)

6 65'-6" = 20 " 3 MN

7 82'-0" = 25 " 10 MN Potential (p-pot spread)

8 99'-0" = 30 " 20 & 10 MN (MN) 10 meters OK = 33 feet

9 132' = 40 " 20 top Low

10 164' = 50 " till signal needs

11 198' = 60 " expansion

12 246' = 75 " 20 meters MN

13 297' = 90 "

14 396' = 120 " then move out to 20 meters, ie: 33 feet out from center (both ways) then 30 meters, MN

15 490' = 150 " 40 MN

16 655' = 200 "

17 820' = 250 " etc. 10 & 10 ...

18 990' = 300 " 30 & 20 MN

19 1320' = 400 " = (1/4 mile) 30 100 MN

20 1640' = 500 " 30 & 40 MN

21 1980' = 600 "

22 2640' = 800 " = (1/2 mile) to an MN = 80 meters max, ie: 132' MN/2

St John's or Springerville

Lyman Lakes
Voigt Ranch } 7 1/2' Quads

6/12/76

$\frac{AB}{2} \cong 800\,m$

$n =$

$\rho_a = \frac{V}{I} \frac{\theta\pi}{n(n+1)(\Sigma Q \frac{1}{2})}$

	h ↓	hfactor
$\frac{AB}{2}$ 6 meters	1.5	.0353
7.5 "	2	.0566
10 "	2.84	.0931 .1028
12 "	3.50	.495
15 "	4.50	.233
20 "	6.17	.417
25 "	7.83	.652
30 "	2.50	.275
40 "	3.50	.495
50 "	4.5	.778
60 "	5.5	1.123
75 "	7.0	1.759
90 "	8.5	2.537
120 "	11.5	4.516
150 "	14.5	7.061
200 "	19.5	12.560
250 "	24.5	19.630
300 "	29.5	28.270
400 "	39.5	50.260
500 "	49.5	78.530
600 "	59.5	113.100
800 "	79.5	201.100

$MN = \leq \frac{1}{6} AB$

AB = 15 m use 3 meters

MN 10 meters OK

till signal needs expansion

30 meters

St John's or Springerville

Lyman Lakes
Voigt Ranch } 7½' Quads

$\frac{AB}{2} \cong 300$ m

$\rho_a = \frac{V}{I} \frac{2\pi}{n(n+1)} (\varepsilon a)$

	h	h factor
$\frac{AB}{2}$ – 6 m elev	1.5	.0353
7.5 "	2	.0566
10 "	2.84	.0931
12 "	3.50	.495
15 "	4.50	.233
20 "	6.17	.417
25 "	7.83	.652
30 "	2.50	.275
40 "	3.50	.495
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800 "	79.5	201.100

$MN = \leq \frac{1}{6} AB$

AB = 15 m use 3 meters

MN 10 meters ok

fill signal needs

expansion

30 meters

St John's or Springerville

Lyman Lake
Voigt Ranch } 7½ Quads

$$\rho = \pi \frac{Volt}{I} n(n+1) a$$

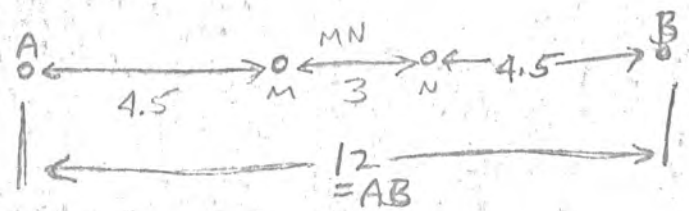
$$= 3.14159 \frac{Volt}{I} n(n+1) a$$

---

1. Current goes on outside (A-B)
2. pots go on inside (M-N)
3. determine center point of expander
4. put pots in 1.5 meters both sides of center

   ∴ MN = 3 meters
5. a. put currents on at 6 meters from center

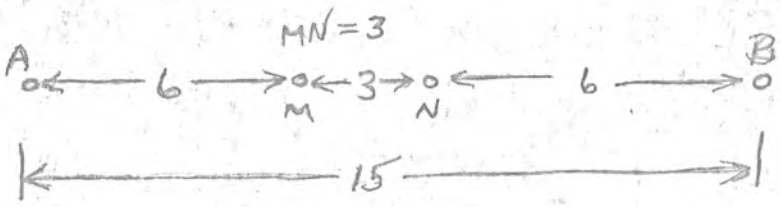
   ∴ AB = 12 meters so n = 1.5



$3(n) = 4.5 \quad n = 1.5$

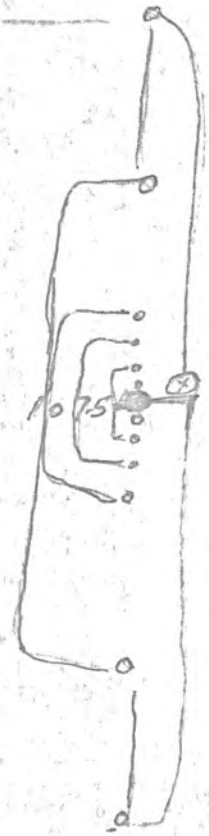
6. move currents to 7.5 meters both sides

   then AB = 15 meters ∴ n = 2



$3(n) = 6 \quad n = 2$

— calculate (N)



$$\rho = \pi \frac{Volt}{I} n(n+1) a$$

$$= 3.14159 \frac{Volt}{I} n(n+1) a$$

---

1. Current goes on outside (A-B)
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4. put pots in 1.5 meters both sides of center

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5. a. put currents in at 6 meters from center

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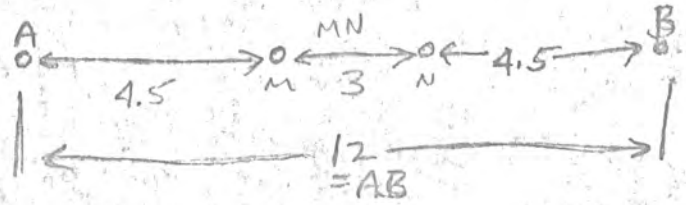
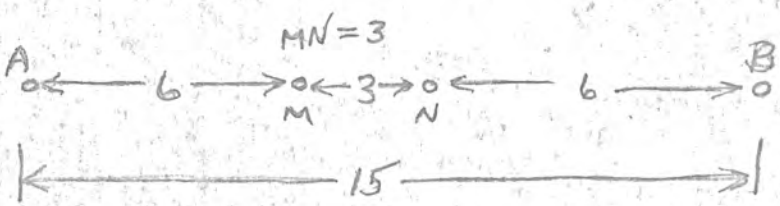


$3(n) = 4.5 \quad n = 1.5$

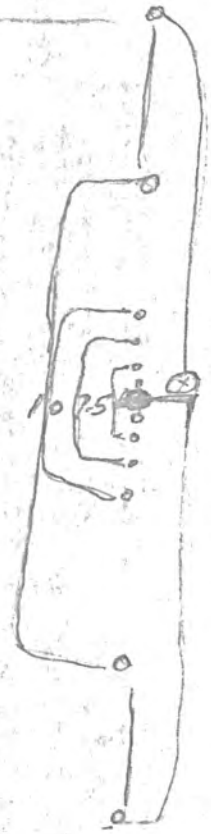
b. move currents to 7.5 meters both sides

then AB = 15 meters ∴ n = 2



$3(n) = 6 \quad n = 2$

— calculate (N)



$$\rho_a = (n \text{ factor}) \frac{V(mV)}{I(\text{amps})}$$

so, for $n = 2$, $mV = 525$, $I = 2$ amps
for 3 meters

$$\rho_a = (n \text{ factor}) \frac{525}{2}$$

$$= (.0566) \frac{525}{2} = 14.9 \ \Omega\text{-meters}$$

or, for $n = 2.50$, $mV = 525$, $I = 2$ amps
for 10 meters

$$= (.275) \frac{525}{2} = 72.2 \ \Omega\text{-meters}$$

$$n \text{ factor} = (n)(n+1.0)(3.14159)(\text{MN distance in meters})$$

$$\rho_a = (n \text{ factor}) \frac{V(mV)}{I(\text{amps})}$$

so, for $n = 2$ (for 3 meters), $mV = 525$, $I = 2$ amps

$$\rho_a = (n \text{ factor}) \frac{525}{2}$$

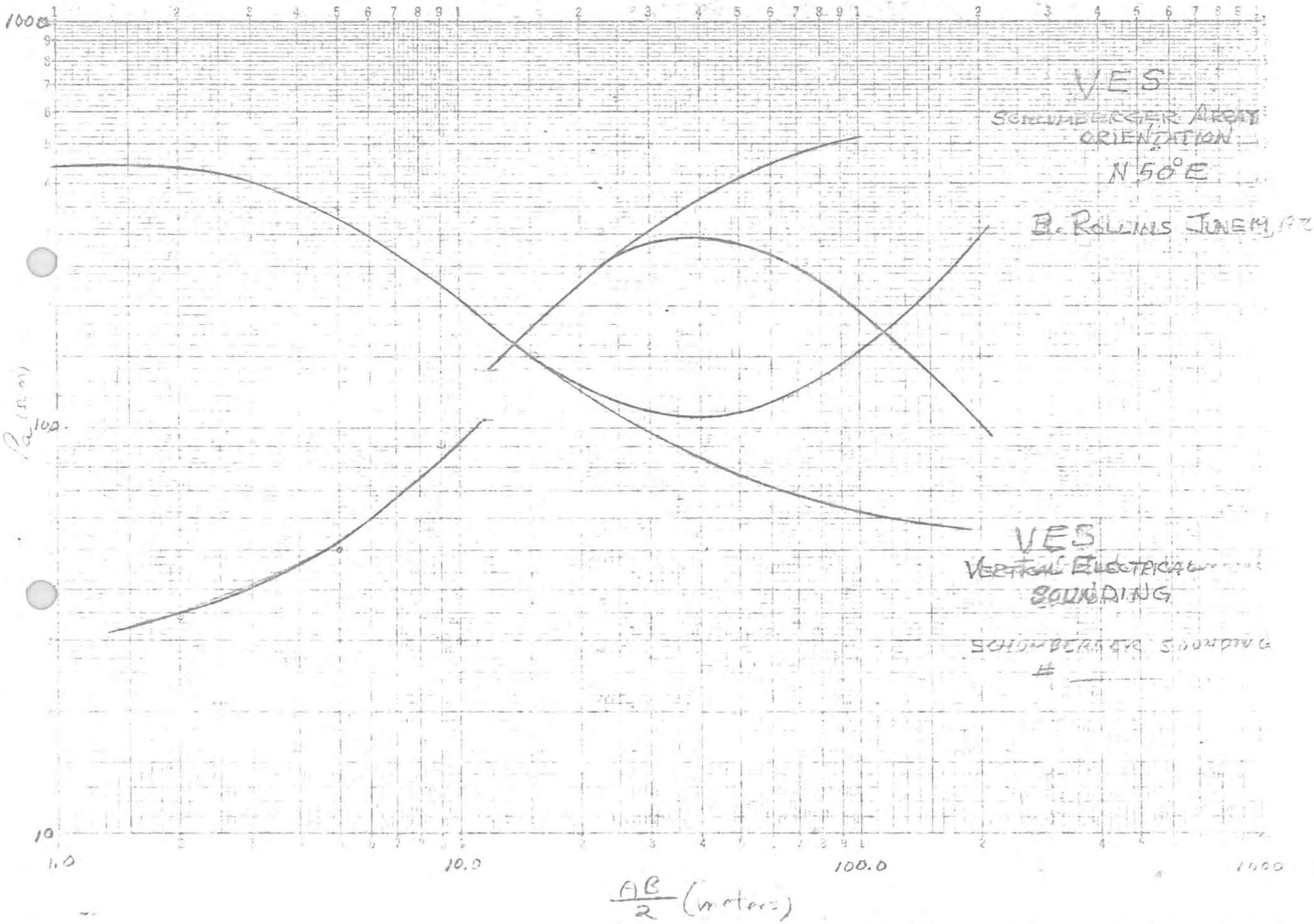
$$= (.0566) \frac{525}{2} = 14.9 \ \Omega\text{-meters}$$

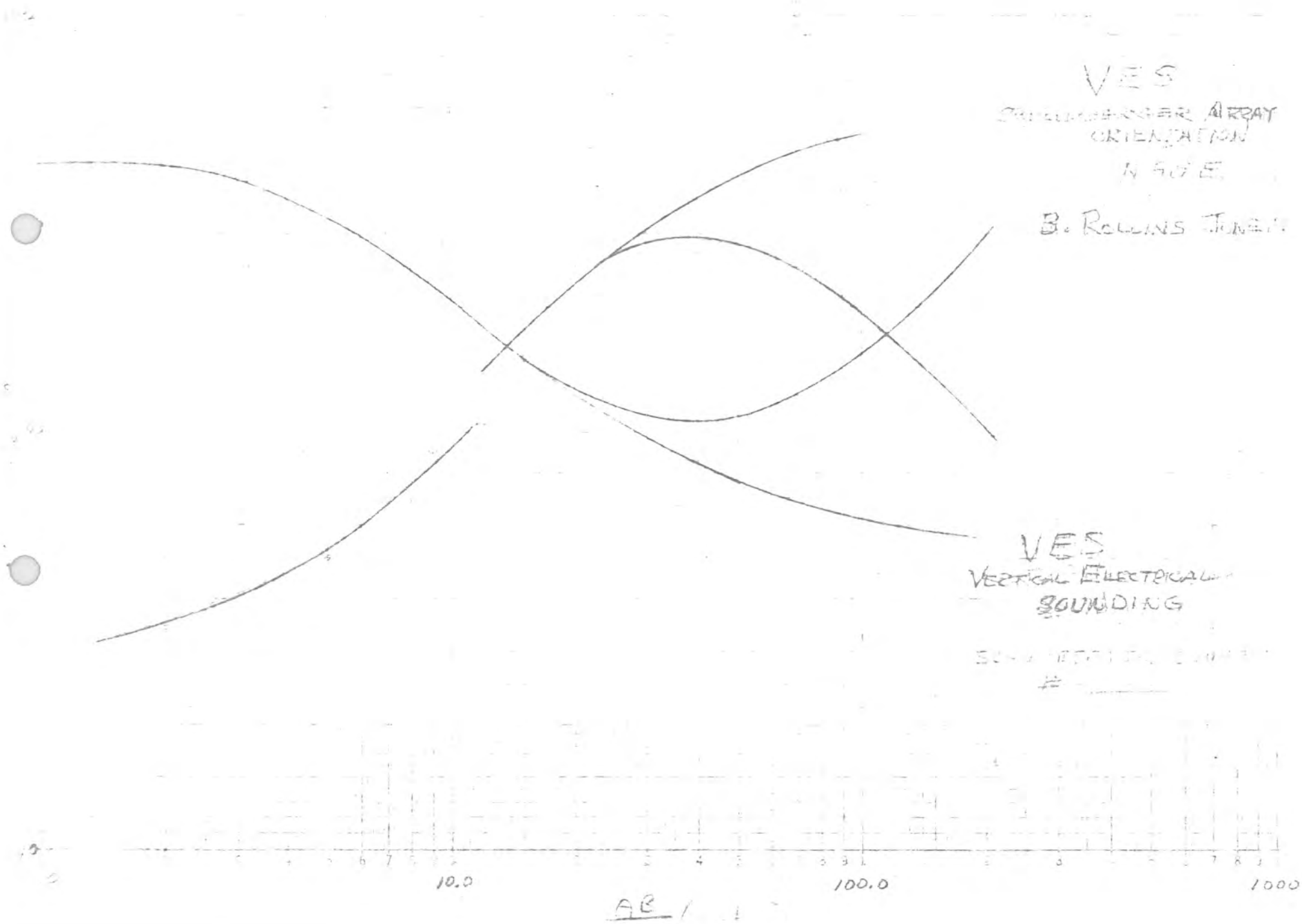
or, for $n = 2.50$ (for 10 meters), $mV = 525$, $I = 2$ amps

$$= (.275) \frac{525}{2} = 72.2 \ \Omega\text{-meters}$$

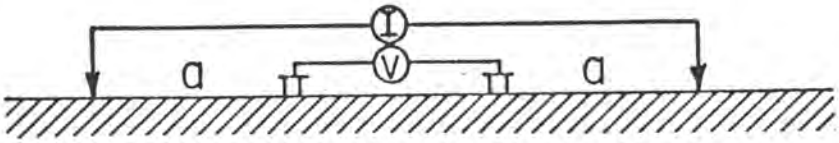
$$n \text{ factor} = (n)(n+1.0)(3.14159)(\text{MN distance in meters})$$

K+E LOGARITHMIC 46 7323
2 X 3 CYCLES
KEUFFEL & ESSER CO.



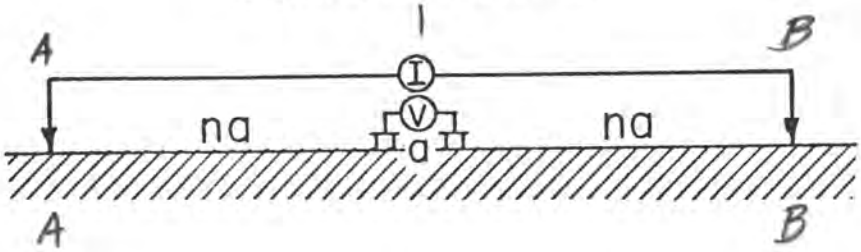

VES
ARRAY
ORIENTATION
B. ROLLINS
VES
VERTICAL ELECTRICAL
SOUNDING
10.0
100.0
1000
AB

WENNER



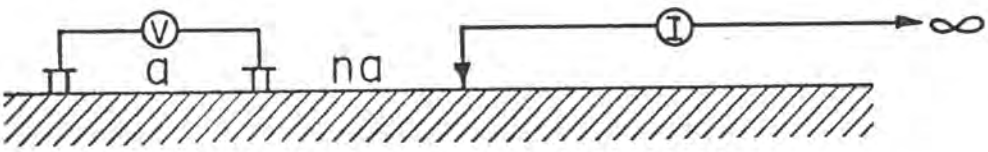
$$\rho = 2\pi \frac{V}{I} a$$

SCHLUMBERGER



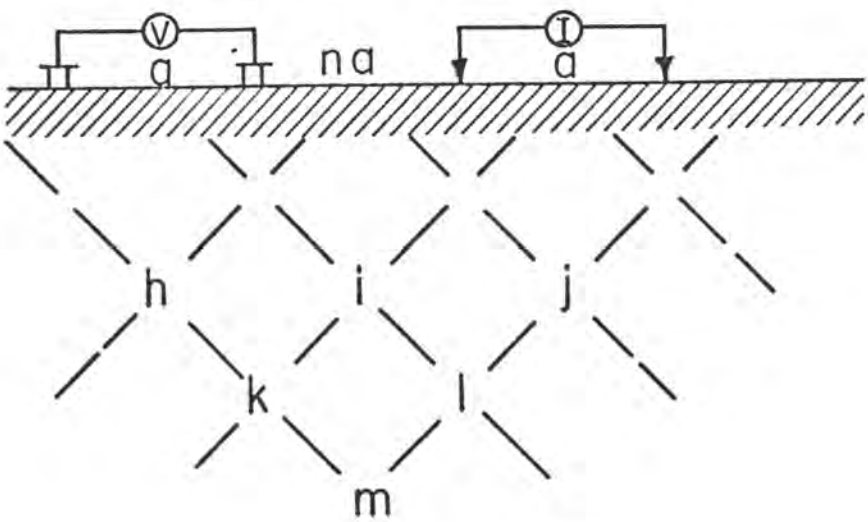
$$\rho = \pi \frac{V}{I} n(n+1) a$$

THREE – ELECTRODE (POLE – DIPOLE)



$$\rho = 2\pi \frac{V}{I} n(n+1) a$$

DIPOLE – DIPOLE



$$\rho = \pi \frac{V}{I} n(n+1)(n+2) a$$

Job #1106

MEMO TO: Walt

TIME: 12:15

DATE: 6·14·76

NAME: John Sumner

FIRM:

PHONE: 884-2417

- [x] TELEPHONED
- [ ] RETURNED YOUR CALL
- [x] PLEASE CALL
- [ ] WILL CALL AGAIN
- [ ] WAS IN
- [ ] WILL CALL AGAIN
- [ ] _____

within the next five minutes

M

ZELLERBACH PAPER COMPANY

ZB-530 REV. 10-70

Job #1106
6/14/76

Summer.

	T.G.&E.
N.E.	$300.00 / + exp. enses.
Slumber.	$17.00 day / +21 / mile
Water well Search.	$450.00 / day.
$2000	incl report.

Phone Data to Idaho each day at first.

6/14/76

GEOEX Job # 1106

J. THOMAS VIA, JR.
VICE PRESIDENT

TUCSON GAS & ELECTRIC COMPANY
TUCSON, ARIZONA 85702

602 622 6661
220 WEST SIXTH STREET
P O BOX 711